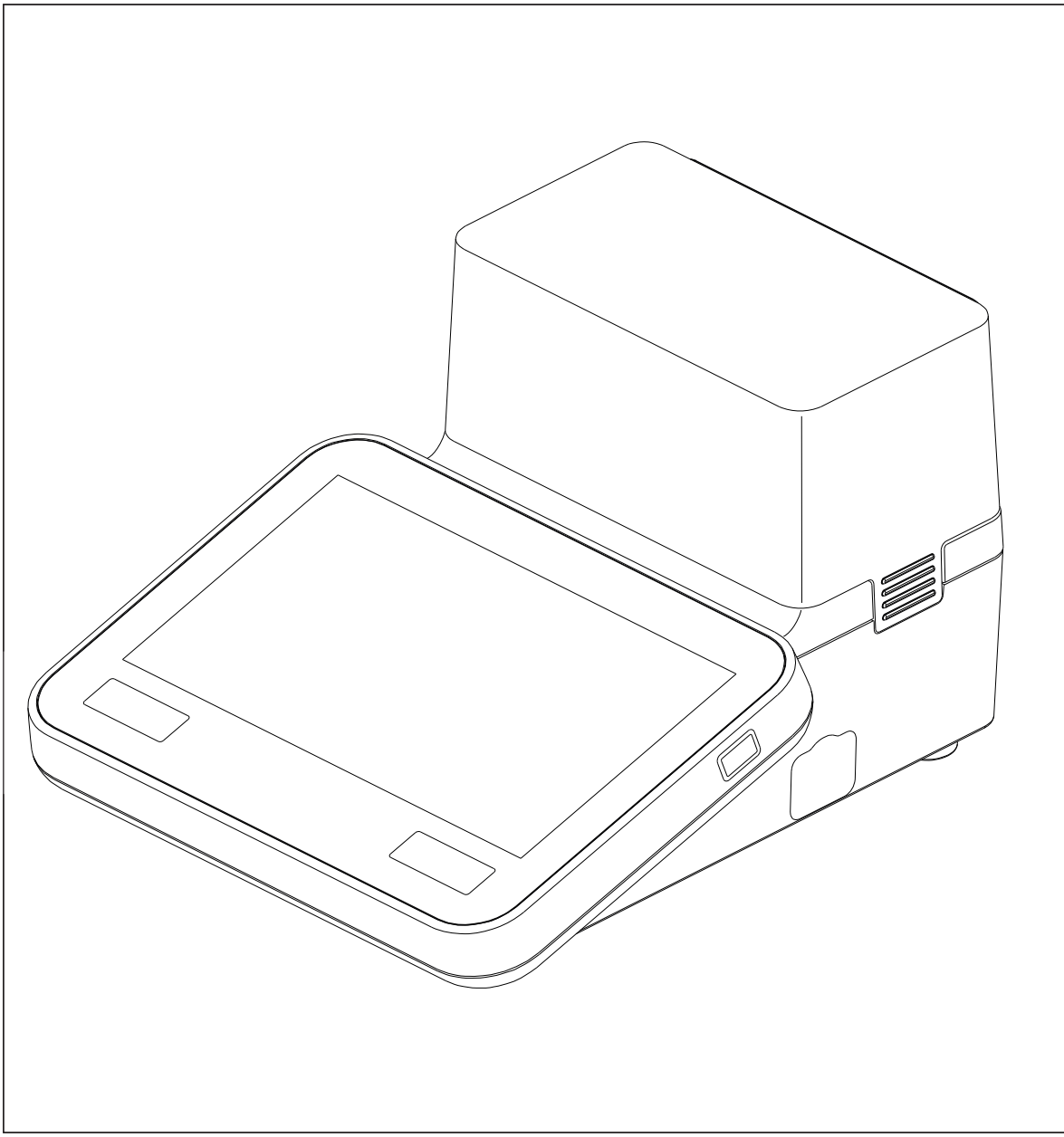
Reference Manual

# SevenExcellence™

## pH/ORP/Ion/Conductivity/DO



METTLER TOLEDO

# Table of Contents

# 1 Introduction

The METTLER TOLEDO SevenExcellence™ is a modern, professional instrument suitable for use in a wide variety of application areas and segments. It can be used, for example, in quality control as well as in research and development and meets the most demanding requirements.

This flexible meter perfectly combines easy-to-understand operation with a high level of measurement accuracy and outstanding reliability. Thanks to the plug & play capability, the detection of external devices and ISM® sensors occurs automatically, in this way supporting the comfortable handling of SevenExcellence™.

Straightforward user guidance on the large color touch screen makes the operation particularly intuitive. User-definable shortcuts allow methods to be activated directly from the home screen with a single tap.

### About this document

The instructions in this document refer to running firmware version **4.3.0** or higher.

The firmware license is subject to the End User License Agreement EULA version 3.0. See the following link for the license text:

▶ www.mt.com/EULA

For third party licenses and open source attribution files, see the following link:

▶ www.mt.com/licenses

If you have any additional questions, contact your authorized METTLER TOLEDO service representative or dealer.

▶ www.mt.com/contact

### Conventions and symbols

**Note** For useful information about the product.

### Elements of instructions

Instructions always contain action steps and can contain prerequisites, intermediate results and results. If an instruction contains more than one action step, the action steps are numbered.

- Prerequisites that must be fulfilled before the individual action steps can be executed.

1 Action step 1

➡ Intermediate result

2 Action step 2

➡ Result

# 2 Safety information

Two documents named "User Manual" and "Reference Manual" are available for this instrument.

- The User Manual is printed and delivered with the instrument.
- The electronic Reference Manual contains a full description of the instrument and its use.
- Keep both documents for future reference.
- Include both documents if you transfer the instrument to other parties.

Only use the instrument according to the User Manual and the Reference Manual. If you do not use the instrument according to these documents or if the instrument is modified, the safety of the instrument may be impaired and Mettler-Toledo GmbH assumes no liability.

User Manual and Reference Manual are available online.

▶ www.mt.com/library

## 2.1 Definitions of signal words and warning symbols

Safety notes contain important information on safety issues. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results. Safety notes are marked with the following signal words and warning symbols:

### Signal words

**WARNING** A hazardous situation with medium risk, possibly resulting in death or severe injury if not avoided.

**NOTICE** A hazardous situation with low risk, resulting in damage to the instrument, other material damage, malfunctions and erroneous results, or loss of data.

### Warning symbols

Electrical shock

## 2.2 Product specific safety notes

### Intended use

This instrument is designed to be used by trained staff. The SevenExcellence™ is intended for measuring pH, mV, ion, conductivity, DO/BOD.

Any other type of use and operation beyond the limits of use stated by Mettler-Toledo GmbH without consent from Mettler-Toledo GmbH is considered as not intended.

### Responsibilities of the instrument owner

The instrument owner is the person holding the legal title to the instrument and who uses the instrument or authorizes any person to use it, or the person who is deemed by law to be the operator of the instrument. The instrument owner is responsible for the safety of all users of the instrument and third parties.

Mettler-Toledo GmbH assumes that the instrument owner trains users to safely use the instrument in their workplace and deal with potential hazards. Mettler-Toledo GmbH assumes that the instrument owner provides the necessary protective gear.

## ⚠ WARNING

**Death or serious injury due to electric shock**

Contact with parts that carry a live current can lead to death or injury.

1 Only use the METTLER TOLEDO AC/DC adapter designed for your instrument.
2 Keep all electrical cables and connections away from liquids and moisture.
3 Check the cables and the plugs for damage and replace damaged cables and plugs.

## NOTICE

**Damage to the instrument or malfunction due to the use of unsuitable parts**

– Only use parts from METTLER TOLEDO that are intended to be used with your instrument.

### FCC Rules

This device complies with Part 15 of the FCC Rules and Radio Interference Requirements of the Canadian Department of Communications. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

# 3 Design and Function

## 3.1 Description of the instrument

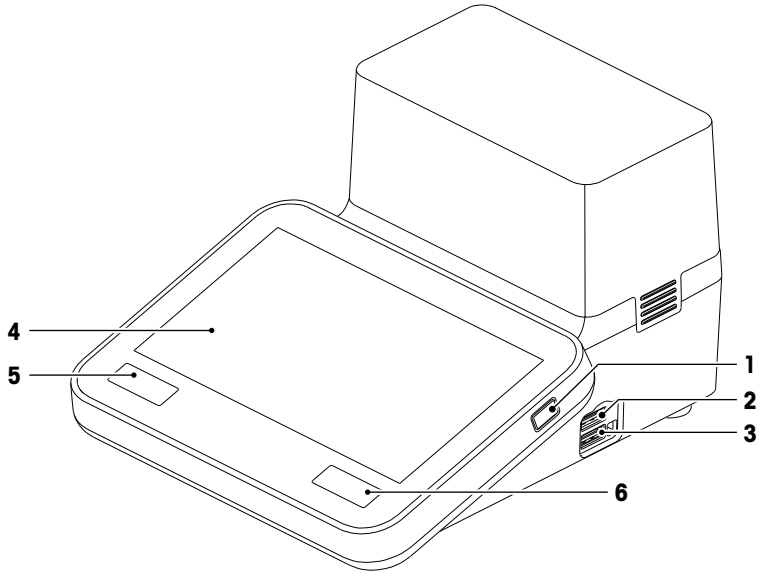
The SevenExcellence™ bench meters are based on precise electrochemical measuring technique. Modular expansion units, automatically recognized ISM® sensors and the plug & play function for external devices make SevenExcellence a comfortable instrument for reliable measurement.

For the optimal use of your SevenExcellence™ bench meters, the following devices can be connected:

- **Modules**
  - METTLER TOLEDO pH/mV module
  - METTLER TOLEDO pH/Ion module
  - METTLER TOLEDO conductivity module
  - METTLER TOLEDO DO/BOD module
- **Sensors**
  - Select from the wide range of METTLER TOLEDO electrodes, the electrode value box supports you to find the right tool. www.electrodes.net.
  - ISM® sensors are detected automatically.
  - Temperature probes can be connected separately.
- Rondolino sample changer allows fully automatic analysis of up to 9 samples. The optional Power-Shower™ perfectly rinses contaminated electrodes.
- InMotion sample changer allows fully automatic analysis of up to 303 samples in different beaker sizes (only if operated by **LabX**).
- Computer for operation with **LabX** or **EasyDirect pH** software.
- uMix™ magnetic stirrer to optimize workflows and to enhance the reproducibility of results.
- Barcode reader for scanning sample data.
- Logstraight™ fingerprint reader for user identification.
- Compact printer (USB-P25), to print out results.
- USB stick to store and transfer data.
- LAN for printing with network printer.
- Additional compact printers, including RS-P25, RS-P26, RS-P28.

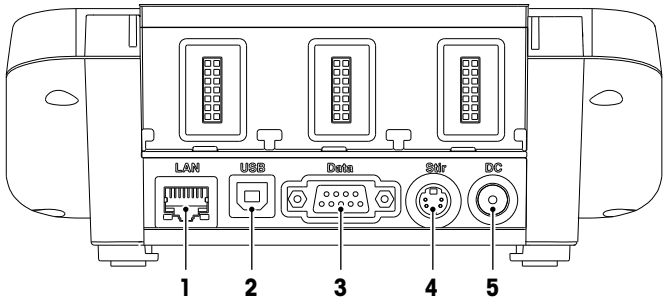
## 3.2 Overview

### Front view




| | | | |
|---|---|---|---|
| **1** | On/Off button | **2** | USB A interface |
| **3** | USB A interface | **4** | Touch screen |
| **5** | **Info**<br>Opens a screen with information about the instrument and the attached modules. | **6** | **Home**<br>Brings you back to the homescreen. |

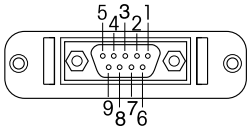
### Rear view




| | | |
|---|---|---|
| **1** | **LAN** | Network connection |
| **2** | **USB** | USB B interface for PC connection (**LabX** or **EasyDirect pH** software) |
| **3** | **Data** | RS232 interface |
| **4** | **Stir** | Socket for METTLER TOLEDO stirrer (Mini-DIN) |
| **5** | **DC** | Power supply socket |

### Pin Assignments

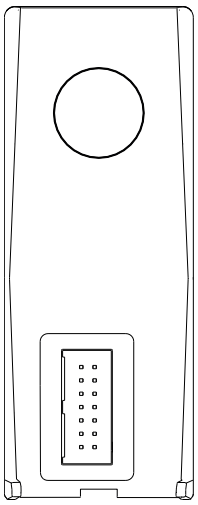
Below the PIN assignments for the RS-232 interface are shown. METTLER TOLEDO printers such as RS-P25 can be connected to this interface.




| | | | |
|---|---|---|---|
| Pin 1 | NC | Pin 6 | NC |
| Pin 2 | TxD (out) | Pin 7 | NC |
| Pin 3 | RxD (in) | Pin 8 | NC |
| Pin 4 | NC | Pin 9 | NC |
| Pin 5 | RSGND | | |

## 3.3 Module connections

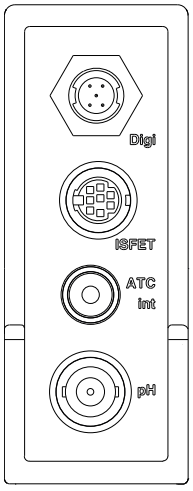
### Instrument connection



In the lower area you find the socket for connecting the module to the instrument. A guide rail on the backside of the housing supports attaching the module.

### Connections on the pH/mV module

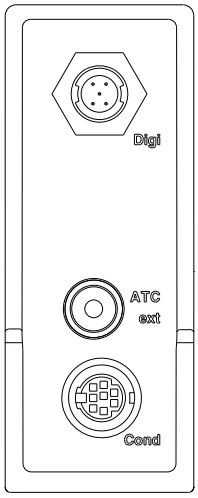
The type of module is identified by a colored tag. Yellow for pH/mV.




| | |
|---|---|
| **Digi** | Mini-LTW socket for digital sensors |
| **ISFET** | Mini-DIN socket for ISFET sensors |
| **ATC int** | RCA (Cinch) socket for internal temperature input (NTC30k) |
| **pH** | BNC socket for mV/pH sensors |

### Connections on the conductivity module

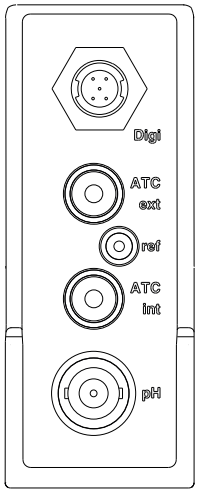
The type of module is identified by a colored tag. Purple for conductivity.




| | |
|---|---|
| **Digi** | Mini-LTW socket for digital sensors |
| **ATC ext** | RCA (Cinch) socket for external temperature input (NTC30k or PT1000) |
| **Cond** | Mini-DIN socket for conductivity sensors |

### Connections on the pH/Ion module

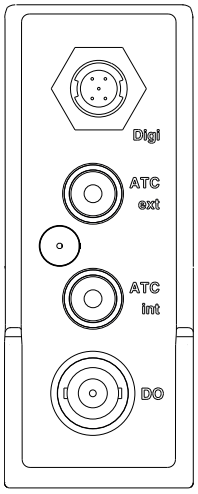
The type of module is identified by a colored tag. Orange for pH/Ion.




| | |
|---|---|
| **Digi** | Mini-LTW socket for digital sensors |
| **ATC ext** | RCA (Cinch) socket for external temperature input (NTC30k or PT1000) |
| **ref** | 2 mm banana socket for reference electrode |
| **ATC int** | RCA (Cinch) socket for internal temperature input (NTC30k) |
| **pH** | BNC socket for mV/pH sensors |

### Connections on the DO/BOD module

The type of module is identified by a colored tag. Blue for DO/BOD.




| | |
|---|---|
| **Digi** | Mini-LTW socket for digital sensors |
| **ATC ext** | RCA (Cinch) socket for external temperature input (NTC22k) |
| **ATC int** | RCA (Cinch) socket for internal temperature input (NTC22k) |
| **DO** | BNC socket for the DO sensorss |

## 3.4 User interface

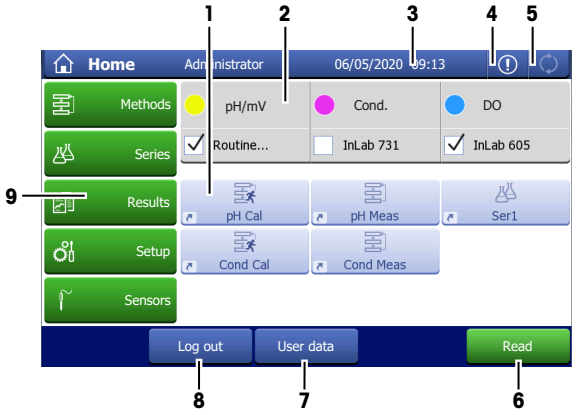
**NOTICE**

**Danger of damaging the touch screen with pointed or sharp objects!**

Pressing on the touch screen with pointed or sharp objects may be damaged it.

– Operate the touch screen by applying gentle pressure with the pad of your finger.

### 3.4.1 Homescreen




| | Name | Explanation |
|---|---|---|
| 1 | **Shortcuts** | User-specific shortcuts for frequently used methods. Shortcuts are saved in the user profile and can be defined, changed and deleted by the user. |
| 2 | **Modules** | Attached modules and connected electrodes are shown. |
| 3 | **Status bar** | The status bar contains the current menu item, user name as well as date and time. |
| 4 | **News** | Indicates important changes of the system like expiration of resources etc. or disconnected PnP devices. |
| 5 | **Tasks** | Shows the current working status of the instrument. The list of tasks can be accessed. |
| 6 | **Read** | Initiate a direct measurement from the Home Screen, without the need to first set up a measurement method. |
| 7 | **User data** | Access an overview of the currently logged in user, the user group, and the time since the current user has been logged in. |
| 8 | **Log out** | Allows you to log out of the instrument, change user levels, or lock the instrument with a personalized password. |
| 9 | **Menus** | **Methods**<br>Create and handle methods for every measurement type. |
| | | **Series**<br>Create and manage series of individual samples |
| | | **Results**<br>Display all measurement results, print out or export them. Find detail information about every single result. |
| | | **Setup**<br>Define all system settings in this menu, e.g, hardware settings, user management or user preferences. These settings are usually made during installation of the instrument. |
| | | **Sensors**<br>Modify and manage sensors. |

## Footer buttons

Depending on the selected submenu there are specific buttons in the footer.

| | |
|---|---|
| **AddToHome** | Create a shortcut of a quick analysis. |
| **Back** | Go back one step in the menu structure. |
| **Cancel** | Cancel the current input without saving. |
| **Delete method** | Delete the selected method. Shortcuts and series which reference to this method will also be deleted. |
| **Expired resources** | Shows the expired resources connected to this instrument. |
| **Insert** | Insert a method function in an existing method. |
| **Log out** | Log out the current user. |
| **New** | Creates a new method, sample series, sensor etc. |
| **OK** | Confirm the entered settings. |
| **Preview** | When entering a text with an alphanumeric keypad, you can preview your input. |
| **Print** | Print out the currently shown screen in tabular form. A printer must be connected to the instrument. |
| **Samples** | Open the list with your defined samples. |
| **Read** | Start a quick analysis directly from the homescreen. |
| **Start** | Start a selected method. |
| **User data** | Access an overview of the currently logged in user |

## Input field types

In the single menus you have different kinds of parameter-fields to enter information, values or names or to choose an option in a drop-down list. Depending on the input field (value or name) you will get a numeric or alphabetic keypad for entering your values.


**Text input field**

Any text comprised of letters (up tp 30 characters), numbers and symbols can be entered into these fields.


**Text input field (extended)**

Any text comprised of letters (up to 500 characters), numbers and symbols can be entered into these fields.


**Number input field**

Numbers and formulas can be entered into these fields.

**Drop-down list**

A drop-down list opens from which you can select an entry.

**Shortlist**

A shortlist opens from which you can select an entry.

**Formula field**

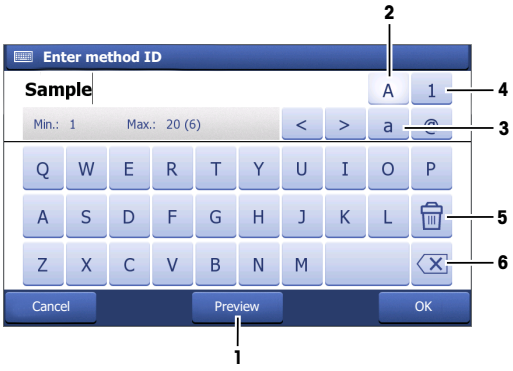
A formula must be entered in these fields.

**Info field**

The displayed content is only for information (read only).

## Keypads

### Alphabetic keypad




- Tap (1) to preview the entry.
- Tap (2) to enter capital letters.
- Tap (3) to enter lowercase letters.
- Tap (4) to switch to a numeric keypad and (2) to turn back to alphanumeric.
- Tap (5) to delete all entered letters or numbers.
- Tap (6) to delete the last entered letter or number.

### Numeric keypad


- Tap (1) to delete all entered numbers.
- Tap (2) to delete the last entered number.

If the user language is set to Chinese, an additional button **CN** appears in the alphabetic keypad at the end of the input field. Tab it to enter Chinese character in Pinyin and select the character from the list below the input field. Be aware that Chinese characters cannot be printed on compact printers.

# 4 Putting into Operation

## 4.1 Scope of delivery

Unpack the instrument and check the scope of delivery. Keep the calibration certificate in a safe place.

SevenExcellence™ is delivered with:

- uPlace™ electrode arm
- Measurement modules and blank modules (according to your order)
- Sensors (kit version or according to your order)
- Universal AC adapter
- User Manual
- Declaration of conformity
- Calibration certificate
- EasyDirect pH PC software

## 4.2 Connecting and removing modules

**Note**

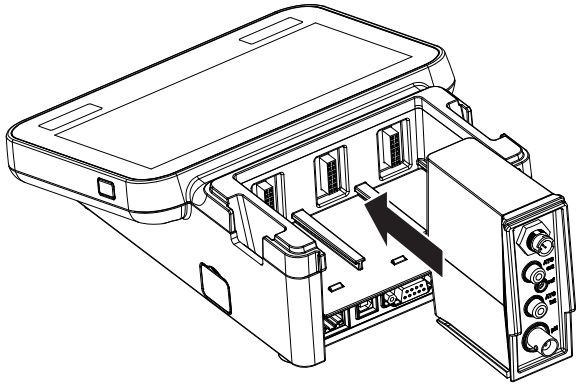
- Before connecting or removing modules switch off the instrument.

METTLER TOLEDO offers different types of modules. The type of module is identified by a colored tag.

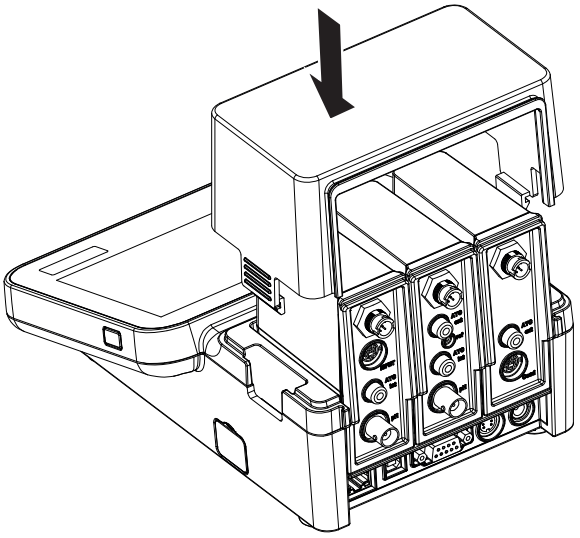
The instrument can be equipped with up to three modules. The modules can be combined in any composition and order according to your requirements.
With less than three modules installed, protect the open sockets against moisture or contamination by installing a blank module.

**Connecting modules**

1 Insert the expansion unit into the slot. The guide rails simplify the connecting.

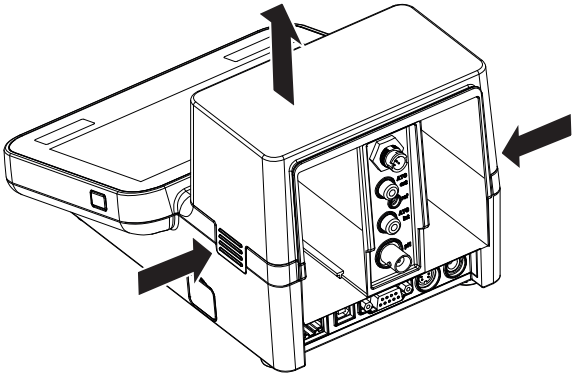


2 Attach the cover.

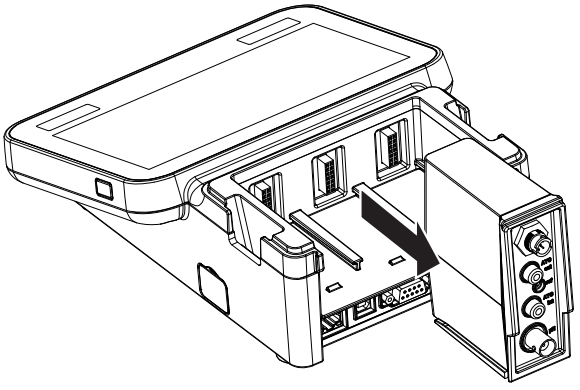


**Removing modules**

1 To remove the cover, press the clips on both sides and lift it up.

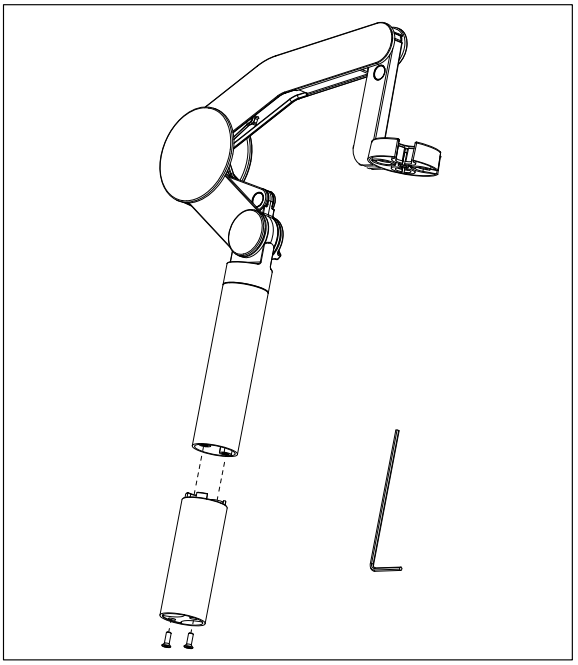


2 To remove a module, pull it out of the slot.



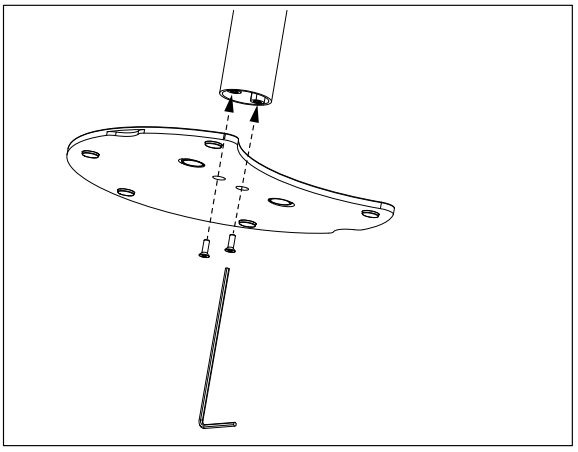
## 4.3 Mounting uPlace™ electrode arm

The electrode arm can be used as stand alone or it can be attached to the instrument on the left or right side, according to your preferences. The height of the electrode arm can be varied by using the extension shaft part. Use the wrench to attach the extension part .

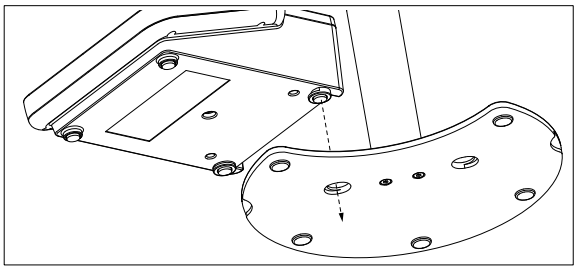


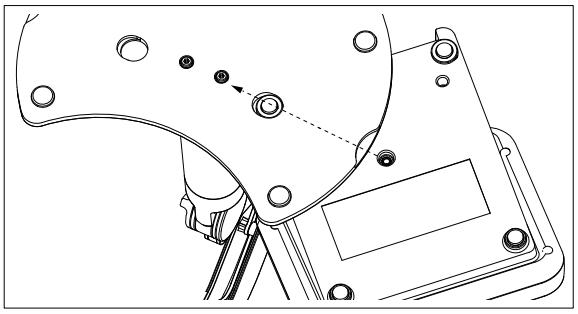
**Assembly of the electrode arm**

1 Use the wrench to attach the base to the electrode arm by tightening the screws. The electrode arm can now be used in the stand alone mode.

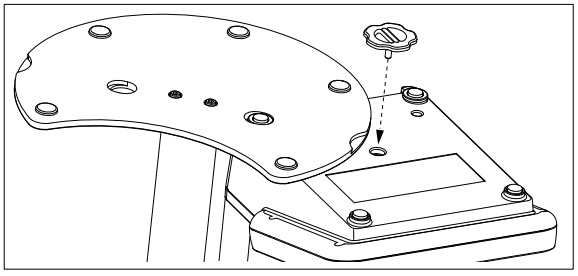


2 Then insert the foot of the meter to the arm base and shift the meter in the direction of the arrow to make the foot fit.





3 Use the lock screw to attach the meter to the base of the arm.



## 4.4 Installing power supply

**⚠ WARNING**

**Death or serious injury due to electric shock**

Contact with parts that carry a live current can lead to death or injury.

1 Only use the METTLER TOLEDO AC/DC adapter designed for your instrument.
2 Keep all electrical cables and connections away from liquids and moisture.
3 Check the cables and the plugs for damage and replace damaged cables and plugs.

**NOTICE**

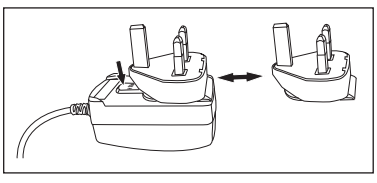
**Danger of damage to the AC adapter due to overheating!**

If the AC adapter is covered or in a container, it is not sufficiently cooled and overheats.

1 Do not cover the AC adapter.
2 Do not put the AC adapter in a container.

The instrument is operated using an AC adapter. The AC adapter is suitable for all supply line voltages ranging from 100...240 V AC ±10% and 50-60 Hz.

1 Insert the correct connector plug into the AC adapter until it is completely inserted.
2 Connect the cable of the AC adapter with the DC socket of the instrument.
3 Install the cables in such a way that they cannot be damaged or interfere with operation.



4 Insert the plug of the AC/DC adapter into a power outlet that is easily accessible.

➡ To remove the connector plug, push the release button and withdraw the connector plug.

## 4.5 Switching the instrument on and off

### Switching the instrument on

1 Press the **On/Off** button.

➡ The power button lights up green.

2 The instrument is initialized and a system test is performed. This process will take some time.

➡ If only one user is defined, the instrument starts directly with the home screen without showing the login screen.

### Switching the instrument off

1 Tap **Home** > **Log out** > **Shut down**.
- or -
Press the **On/Off** button.

2 The instrument stops running tasks and shuts down. This process will take some time.

➡ When the light goes out, the instrument is in the standby mode.

### Note

- In the standby mode, the control circuit for the **On/Off** switch is energized. The rest of the instrument is no longer energized.

## 4.6 Initial startup wizard

At first startup of the instrument or after a factory reset an intuitive wizard guides you through the most important settings of the instrument. In three steps you can select a language, date, time and region as well as if you would like to have predefined shortcuts on the Home screen. These shortcuts refer to predefined METTLER TOLEDO methods and enable an immediate start with one click. If you enable predefined shortcuts the Home screen shows a calibration and a measurement method shortcut per measurement parameter. Depending on the selected region, the default pH buffer group for calibration is defined.

## 4.7 Connecting sensors

Connect the sensor and make sure that the plugs are properly inserted. For sensors with a built-in temperature probe, connect the second cable to the appropriate ATC socket (**ATC int**). When using seperate temperature sensors, connect the cable to the appropriate ATC socket (**ATC ext**).Twist the RCA (Cinch) plug to ease the attachment of the sensor.

### ISM® sensor

ISM® sensors are automatically recognized upon connection.
When connecting an ISM® sensor to the instrument, verify that no analysis is running. In case an analysis is running, the sensor identification will be displayed after the endpoint of the analysis is reached.

## 4.8 Connecting autosampler

### InMotion autosampler

With the InMotion autosampler the automatic measurement of up to 303 samples is possible. InMotion is only supported when the instrument is connected to the **LabX** software. The InMotion autosampler is connected to the instrument with an USB cable and can only be used in **LabX** connected mode. Several different configurations are available for the InMotion autosampler depending on your requirements.

### Rondolino sample changer

With the Rondolino sample changer the automatic measurement of up to 9 samples is possible. To connect the Rondolio sample changer to the instument, a "Rondolino USB-TTL box" is required. Use the USB cable to connect the USB A interface of the instrument to the USB-TTL box. Use the 9-pin cable to connect the the Rondolino sample changer with the TTL box. Connect the compact stirrer to the stirrer adapter cable and then to the instrument. The compact stirrer is an overhead stirrer.

**See also**


- Rondolino ▸ Page 30
- InMotion ▸ Page 30


## 4.9 Connecting stirrers

Connect uMix™, the METTLER TOLEDO external magnetic stirrer, or the METTLER TOLEDO Compact Stirrer (overhead stirrer, adapter cable needed) to the instrument. The stirrers are powered by the instrument and will be automatically switched on/off during an analysis according to the settings. Before connecting a stirrer, switch off the instrument. Use the stirrer socket (**Stir**) on the rear side, note the designation. Note the corresponding chapter of the operating instructions concerning the settings of peripheral devices.

## 4.10 Connecting PnP devices

USB sticks, barcode reader, US-P25 printer and fingerprint reader can be connected to the instrument via the USB connections on the left side of the instrument for immediate use. The instrument has a plug & play detection to support the comfortable handling of peripheral devices.

## 4.11 Connecting computers

The instrument can be connected to a PC with **LabX** or **EasyDirect pH** software.

Connected to the PC software **LabX** via USB or Ethernet, SevenExcellence profits from additional functionalities such as data and resource management, report creation and ERP/LIMS integration. The instrument can be controlled via touchscreen and PC software. In addition, **LabX** offers regulation support (e.g. 21 CFR part 11) and allows combined analysis with other METTLER TOLEDO laboratory instruments.

Find out more and visit us on:

▸ www.mt.com/LabX

The PC software **EasyDirect pH** allows for easy and efficient transfer of results to a PC. SevenExcellence is connected via USB, one instrument per PC.

For simplified data transmission to a PC or network via RS232, the RS232 Compact Printer can be selected in the printer settings.

# 5 Configuring the instrument

**Navigation**: **Home** > **Setup**

This chapter provides you information on setting up the instrument according to your requirements.

The following summary shows the buttons available for the various setting options.

| | |
|---|---|
| **Buffers & Standards** | **Buffers & Standards** |
| **Hardware** | **Sensors** |
| | **Automation** |
| | **Peripherals** |
| | **Communication settings** |
| | **Network settings** |
| | **Auxiliary instruments** |
| **User settings** | **Language** |
| | **Screen** |
| | **Beep** |
| | **Shortcuts** |
| | **Keyboards** |
| **Global settings** | **System** |
| | **User management** |
| | **Analysis and resources behavior** |
| | **Physical properties** |
| | **Operation mode** |
| **Tables** | **Tables** |
| **Maintenance & Service** | **MT-Service** |
| | **Import / Export** |
| | **Reset to factory settings** |
| | **Firmware** |
| | **Update** |

## 5.1 Buffers & standards

This section describes how to manage buffers and standards. You can use predefined buffers and standards or you can create, edit or delete user-defined buffers and standards.

A maximum of 20 user-defined buffer sets and standard groups can be created with up to 20 temperature-dependent values per buffer or standard. A total of 13 buffer sets and standard groups for pH, ion and conductivity calibration are predefined.

The predefined pH buffer sets offer the option to create individual buffer sets based on a mixture of different commercial buffers.

**Note**

- Before you perform a calibration, buffers or standards must be defined.

### 5.1.1 Predefined buffers and standards

The button [**Buffers & Standards**] opens the list of predefined buffer sets and standards. The predefined buffer sets and standards cannot be modified or deleted. The parameters of the following buffers and standards are stored, see in the Appendix [Predefined buffers & standards ▸ Page 133].

| Type | Name |
|---|---|
| pH | METTLER TOLEDO USA (Ref. 25 °C) |
| | METTLER TOLEDO Europe (Ref. 25 °C) |
| | METTLER TOLEDO Verification Buffers (Ref. 25°C) |
| | MERCK (Ref. 20 °C) |
| | DIN(19266)/NIST (Ref. 25 °C) |
| | DIN(19267) (Ref. 25 °C) |
| | JJG119 (Chinese) (Ref. 25 °C) |
| | Technical (Ref. 25 °C) |
| | JIS Z 8802 (Japanese) (Ref. 25 °C) |
| Conductivity | International (Ref. 25 °C) |
| | Saturated NaCl (Ref. 25 °C) |
| | Chinese (Ref. 25 °C) |
| | Japanese (Ref. 20 °C) |
| Ion | METTLER TOLEDO ION (Ref. 25 °C) |

1 Tap a buffer set or standard group.
   ➡ **Name of the buffer set or standard** is displayed with more detailed information about the stored values.
2 Tap a value.
   ➡ **Temp. related value** is displayed.
   The parameters **Temperature** and **Value** are shown.

**Note**
This list has information character concerning the predefined buffers and standards. When user-defined buffers and standards are defined, they are shown in this list too.

## 5.1.2 User-Defined buffers and standards

The button [**Buffers & Standards**] leads to the list of the stored buffer sets and standard groups. When creating a user-defined buffer set or standard group you can make use of the already existing buffer sets and standard groups. In this way you can create new individual sets and groups with buffers and standards from different groups. User-defined buffers and standards will be added to the list of predefined buffers and standards.

### Creating user-defined buffer and standard group

**Navigation**: **Home** > **Setup** > **Buffers & Standards** > **New**

| Parameter | Description | Values |
|---|---|---|
| Type | Defines the type of the buffer or standard for the calibration. | pH I Ion I Conductivity |
| Name | Defines the name of the buffer or standard group. The name must be unique and must not contain any special characters or spaces. | - |
| Unit | For preparing a pH buffer group, pH as standard value is shown as information.<br>For preparing an ion buffer group, select a unit. | pH<br>mmol/L I mol/L I mg/L I ppm I % I pX |
| Reference temperature | Defines the temperature of the nominal buffer or standard value (usually 20 °C or 25 °C). | 15.0...35.0 °C |
| Use predefined buffers | **Active**: This group is used to mix buffers from existing groups.<br>**Inactive**: User-defined pH buffers with temperature dependent values are entered. | Active I Inactive |

1 In **Type** select the type of the buffer or standard.
2 Give the buffer or standard group a meaningful name.

➡ A name **Calibration Standard** with consecutive number is entered automatically, it can be overwritten.

3 In **Reference temperature** enter a temperature.

4 If type **Ion** is selected, select a unit.
- or -
If type **pH** is selected and you want to assemble a buffer set from stored buffer sets, activate **Use predefined buffers**.

5 Tap [**Save**].

➡ Now you have created a user-defined buffer or standard group. The name of the user-defined buffer or standard group is displayed.

In the next step values need to be determined for:

- User-defined pH buffer groups based on predefined buffer sets
- User-defined pH buffer groups
- User-defined ion standards
- User-defined conductivity standards

| Parameter | Description | Values |
|---|---|---|
| Reference temperature | Defines the temperature of the nominal buffer or standard value (usually 20 °C or 25 °C). | 15.0...35.0 °C |

### Add values for user-defined pH buffer groups based on predefined buffers

**Navigation: Home > Setup > Buffers & Standards > My group > New**

| Parameter | Description | Values |
|---|---|---|
| Buffer group | Opens the list of predefined buffers and standards.<br>Displayed if **Use predefined buffers** is activated. | - |
| pH value | Opens the list of predefined values.<br>Displayed if **Use predefined buffers** is selected. | - |
| Reference temperature | Information on the defined reference temperature. | - |

1 Tap the list field **Buffer group**.

➡ **Select buffer / standard group** is displayed.

2 Select a buffer group.

3 Tap the list field **pH value**.

➡ **Select buffer / standard** is displayed.

4 Select a pH value.

5 Tap [**OK**]

➡ The pH value at reference temperature is displayed in the list.

6 To enter additional values, tap [**New**] and repeat the previous steps.
- or -
To finish and save the entries tap [**Save**].

### Add values for user-defined pH buffer groups

**Navigation: Home > Setup > Buffers & Standards > My group > New**

| Parameter | Description | Values |
|---|---|---|
| Reference temperature | Information on the defined reference temperature. | - |
| pH value | Defines the pH value of the calibration standard to be used. | - |

1 Enter a pH value and confirm with [**OK**].

➡ The nominal value of the user-defined buffer or standard is displayed. The value is set.

2 To enter temperature related values for this standard, select it.

3 Tap [**New**] and enter the values in **Reference temperature** and **pH value**, then tap [**OK**]. Repeat this step for every temperature, then tap [**OK**].

4 To enter additional values, tap [**New**] and repeat the previous steps.
- or -
To finish and save the entries tap [**Save**].

### Add values for user-defined ion standards

**Navigation: Home > Setup > Buffers & Standards > My group > New**

| Parameter | Description | Values |
|---|---|---|
| Reference temperature | Information on the defined reference temperature. | - |
| Standard value | Defines the value of the calibration standard to be used. | - |

1 Enter a standard value and confirm with [**OK**].

➡ The nominal value of the standard is displayed. The value is set.

2 To enter temperature related values for this standard, select it.

3 Tap [**New**] and enter the values in **Reference temperature** and **Standard value**, then tap [**OK**]. Repeat this step for every temperature, then tap [**OK**].

4 To enter additional values, tap [**New**] and repeat the previous steps.
- or -
To finish and save the entries tap [**Save**].

### Add values for user-defined conductivity standard groups

**Navigation: Home > Setup > Buffers & Standards > My group > New**

| Parameter | Description | Values |
|---|---|---|
| Unit | Defines the measurement unit for conductivity. | µS/cm I mS/cm I S/m I µS/m I mS/m |
| Reference temperature | Information on the defined reference temperature. | - |
| Conductivity | Defines the value for the calibration standard to be used in the unit selected in **Unit**. | - |

1 In **Unit** select a type to which your calibration refers to.

2 Enter a conductivity value and confirm with [**OK**].

➡ The nominal value of the standard is displayed. The value is set.

3 To enter temperature related values for this standard, select it.

4 Tap [**New**] and enter the values in **Reference temperature** and **Conductivity**, then tap [**OK**]. Repeat this step for every temperature, then tap [**OK**].

5 To enter additional values, tap [**New**] and repeat the previous steps.
- or -
To finish and save the entries tap [**Save**].

### Modify user-defined buffers and standards

**Navigation: Home > Setup > Buffers & Standards**

1 Select the appropriate buffer set or standard group from the **Buffer / Standard group** list.

➡ Name of the user-defined buffer or standard group is displayed.

2 Tap the standard to be modified.

➡ **Temp. related value** is displayed.

3 Tap the temperature related value to be modified.

➡ The value, depending on the selected buffer or standard is displayed.

4 Modify the value and confirm with [**OK**].

5 Confirm with [**OK**].

➡ **Temp. related value** is displayed.

6 To modify additional values repeat previous steps.

7 To finish, tap [**Back**].

➡ Name of the user-defined buffer or standard group is displayed.

8 To store the entries tap [**Save**].

**Note**

Values of user-defined buffer groups created from predefined buffer groups can not be modified.

### Delete user-defined buffers and standards

**Navigation: Home > Setup > Buffers & Standards**

1 Select the appropriate buffer set or standard group.

➡ Name of the user-defined buffer or standard group is displayed.

2 Tap the value to be deleted.

➡ **Temp. related value** is displayed.

3 Tap [**Delete**].

4 To finish and store entries tap [**Save**].

**Note**

When a value of a buffer set or standard group is deleted, methods that refer to the deleted buffer set or standard group are no longer executable.

### Delete user-defined buffer and standard groups

**Navigation: Home > Setup > Buffers & Standards**

1 Select the appropriate buffer set or standard group.

➡ Name of the user-defined buffer or standard group is displayed.

2 Tap [**Parameters**] to open the parameters.

3 Tap [**Delete**].

**Note**

When buffer sets or standard groups are deleted, methods that refer to the deleted buffer sets or standard groups are no longer executable.

### Modify the name of a user-defined buffer or standard group

**Navigation: Home > Setup > Buffers & Standards**

1 Select the appropriate buffer set or standard group.

➡ Name of the user-defined buffer or standard group is displayed.

2 Tap [**Parameters**] to open the parameters.

3 Overwrite the name for the user-defined buffer set or standard group.

4 To finish and store entries, tap [**Save**].

## 5.2 Hardware

This section describes how to configure the hardware components connected to the instrument, such as:

- **Sensors**

- **Automation**
- **Peripherals**
- **Communication settings**
- **Network settings**

### 5.2.1 Sensors

Sensors for pH, redox, ISFET, conductivity, dissolved oxygen, ion and temperature measurement can be connected to the instrument. One default sensor per sensor type is predefined.

Sensors can be added, modified and deleted. The usable life and life span of a sensor can be set and monitored (for redox and temperature sensors only the life span can be monitored). You can display or print out the calibration history.

**Note**

Digital ISM® sensors are detected automatically. The factory calibration will be transferred when ISM® sensors are used.

**Navigation: Home > Setup > Hardware > Sensors**

| Parameter | Description | Values |
|---|---|---|
| Type | Information on the type of measurement. | - |
| Name | Information on the name of the sensor. | - |
| Serial number | Information on the serial number of the sensor. | - |
| Module | Module to which the sensor is attached. ISM® sensors are detected automatically.<br>For ISM® sensors **A-ISM**, **B-ISM** or **C-ISM** is displayed. For non ISM sensors **A**, **B** or **C** is displayed.<br>Displayed if a module is connected to the instrument and a sensor is connected to a module. | - |

**Adding sensors**

**Navigation: Home > Setup > Hardware > Sensors > New**

| Parameter | Description | Values |
|---|---|---|
| Sensor type | Select a sensor type according to the measurement type. | pH I Redox I ISFET I Conductivity I DO I Ion I |
| Temperature signal | Select a type according to the specifications of the temperature sensor.<br>Displayed if **Sensor type** = **Temperature**. | NTC30kOhm I Pt1000 |
| Sensor name | Define a name for the sensor. | - |
| Serial number | Each sensor has a serial number. The serial number of ISM® sensors are detected automatically. | - |
| Ion | The ion charge and molar mass values of predefined ions are stored in the instrument.<br>Displayed if **Sensor type** = **Ion**. | $Ag^+$ I $Ca^{2+}$ I $Cl^-$ I $CN^-$ I $Cu^{2+}$ I $F^-$ I $I^-$ I $K^+$ I $Na^+$ I $NO_3^-$ I $Pb^{2+}$ I $S^{2-}$ I Other |
| Molar mass | Molar mass of an ion is calculated by adding the atomic weight of the individual atoms the ion is composed of. This parameter is needed for calculations of the units mol/L and mmol/L.<br>Displayed if **Ion** = **Other**. | - |
| Ion charge | Ion charge of the ion to be detected.<br>Displayed if **Ion** = **Other**. | -3 I -2 I -1 I +1 I +2 I +3 |

| | | |
|---|---|---|
| Detection | Information about the detection mode of a DO sensor. Manually added sensors always have Polarographic detection.<br>Displayed if **Sensor type** = **DO**. | - |
| Cell constant | Conductivity measurement depends on the cell constant of the probe. The precise cell constant is noted in the certificate of the probe.<br>Displayed if **Sensor type** = **Conductivity**. | - |
| Cal. mode | Information on calibration mode.<br>Displayed if **Sensor type** = **pH** or **ISFET** or **Ion**. | - |
| Offset | Information on offset.<br>Displayed if **Sensor type** = **pH** or **ISFET** or **Ion**. | - |
| Slope | Information on the slope.<br>Displayed if **Sensor type** = **pH** or **ISFET** or **Ion** or **DO**. | - |
| Calibration procedure | Information on calibration procedure.<br>Displayed if **Sensor type** = **pH** or **ISFET** or **Conductivity** or **Ion** or **DO** or **Temperature**. | - |
| Date/Time of calibration | Information on date and time of calibration.<br>Displayed if **Sensor type** = **pH** or **ISFET** or **Conductivity** or **Ion** or **DO** or **Temperature**. | - |
| Calibrated by | Name of the user performing the calibration.<br>Displayed if **Sensor type** = **pH** or **ISFET** or **Conductivity** or **Ion** or **DO** or **Temperature**. | - |
| Monitoring usable life | Specifies whether the usable life is to be monitored.<br>Displayed if **Sensor type** = **pH** or **ISFET** or **Conductivity** or **Ion** or **DO** . | Active I Inactive |
| Time period | Defines the unit for the period of time.<br>Displayed if **Monitoring usable life** is activated. | Days I Hours |
| Usable life | Defines the period in days or hours up to next calibration.<br>Displayed if **Monitoring usable life** is activated. | - |
| Expiry date | Information on the sensors lifetime, calculated from the predefined parameters.<br>Displayed if **Monitoring usable life** is activated. | - |
| Monitoring life span | Based on your requirements a period of time for usable life can be defined. Not displayed for optical DO sensor because its sensor cap anyway has a limited life span of one year. | - |
| Initial operation | Here you can enter the date of initial commissioning of the sensor.<br>Displayed if **Monitoring life span** is activated. | - |
| Life span | Describes the period of time after which a resource is consumed and should be replaced.<br>Displayed if **Monitoring life span** is activated. | - |
| Expiry date | Information on the end of the life span, calculated on base of the predefined parameters.<br>Displayed if **Monitoring life span** is activated. | - |

1 Select **Sensor type**. Different parameters and information are displayed depending on the sensor type.

- ➡ If **Temperature** is defined, select a unit in **Temperature signal**.
- ➡ If **Ion** is defined, select a predefined parameter or **Other** in **Ion type**.
- ➡ If **Other** is defined, enter a value in **Molar mass** and select a value in **Ion charge** of the sample to be analyzed.
- ➡ If **Conductivity** is selected, enter the value in **Cell constant** of your conductivity probe (found in the certificate of the probe). The unit is predefined.

2 Enter a sensor name. The name **Sensor** with consecutive number is entered automatically.
The name in **Sensor name** is unique. If an already existing name is used, a warning will be displayed. Tap [**OK**] and change the name.

3 Enter the serial number.

4 To monitor the usable life of the sensor activate **Monitoring usable life**.
Enter days or hours in **Time period** and **Usable life**. **Expiry date** is shown as information.

5 To monitor the life span of the sensor, activate **Monitoring life span**.
Enter the date and time in **Initial operation**. In **Life span**, enter the number of months until the sensor must be replaced. **Expiry date** is shown as information.

6 To finish and store the entries tap [**Save**].

➡ The sensor was added to the list.

### Modifying sensors

**Navigation: Home > Setup > Hardware > Sensors**

The parameters that can be modified are:

- **Sensor name**
- **Monitoring usable life**
- **Monitoring life span**
- **Cell constant** (conductivity only)

1 Tap the sensor to be modified.
➡ **Parameters** is displayed.

2 Modify the required parameters.

3 To finish and store the entries tap [**Save**].

**Note**

- The type of the sensor cannot be modified
- A sensor that is currently in use cannot be modified.
- Changing the sensor name does not create a new sensor in the list.

### Deleting sensors

**Navigation: Home > Setup > Hardware > Sensors**

1 Tap the sensor to be deleted.
➡ **Parameters** is displayed.

2 Tap [**Delete**].

➡ The sensor has been deleted without warning.

**Note**

- The last sensor of a type cannot be deleted.
- A sensor that is currently in use cannot be deleted.
- Predefined sensors cannot be deleted.

### Show and print calibration history

**Navigation: Home > Setup > Hardware > Sensors**

1 Tap the required sensor.
➡ **Parameters** is displayed.

2 Tap [**Calibration history**] to display the history.

3 To print the history, tap [**Print**].

➡ The history is printed.

## 5.2.2 Automation

The following automation units can be installed.

### 5.2.2.1 Rondolino

The instrument has PnP (Plug & Play) identification. As soon as Rondolino is connected, the appropriate information is displayed.

**Navigation: Home > Setup > Hardware > Automation > Rondolino**

| Parameter | Description | Values |
|---|---|---|
| Type | Shows the instrument type. | - |
| Status | Information if Rondolino is installed or not. | Installed I Not installed |

### 5.2.2.2 InMotion

The instrument has PnP (Plug & Play) identification. As soon as InMotion autosmapler is connected, the appropriate information is displayed.

The InMotion Autosamplers can hold multiple samples depending on the base unit (**Flex**, **Pro** or **Max**) and the accompanying sample rack. The InMotion Autosampler connects to a USB interface on the instrument. InMotion autosamplers and attached towers are PnP devices that are automatically recognized and installed upon connection to the instrument.

InMotion autosamplers can only be used if the instrument is connected to the **LabX** PC software. Only one tower can be used.

**Navigation: Home > Setup > Hardware > Automation > InMotion**

| Parameter | Description | Values |
|---|---|---|
| Type | Shows the instrument type. | - |
| Base type | Indicates the sample changer type. | Flex I Pro I Max |
| Status | Information if an InMotion autosampler is installed. | Installed I Not installed I Installed, not supported |
| Stirrer output | Defines the stirrer output on the InMotion where the stirrer is connected. | InMotion/Stirrer1 … InMotion/Stirrer6 |
| PowerShower output | Specifies the pump connection on the InMotion where the PowerShower pump is connected. | InMotion/Pump1 … InMotion/Pump6 |
| Rate | Specifies the pump rate for the PowerShower pump [mL/min]. | 0.1…1000 |
| Drain pump output | Specifies the pump connection on the InMotion where the drain pump is connected. | InMotion/Pump1 … InMotion/Pump6 |
| Rate | Specifies the pump rate for the drain pump [mL/min]. | 0.1…1000 |
| CoverUp | Information if lid handling is installed. | Installed I Not installed |
| Rack | Indicates the type of the installed rack.<br>**Standard**: Standard rack.<br>**Water bath**: Rack including a wather bath. | Standard I Water bath |
| Rack size | Indicates the size of the installed rack. | Number of positions on the rack |
| Beaker height | Defines the beaker height [mm]. | 65…215 |
| Barcode reader | Information if a barcode reader is installed. | Installed I Not installed |

## 5.2.3 Peripherals

**Navigation: Home > Setup > Hardware > Peripherals**

In the dialog **Peripherals**, the following devices and settings can be configured:

- **USB stick**

- **Fingerprint reader**
- **Printer**
- **Barcode reader**
- **Stirrer**

The following chapter describes the management of the various peripherals which can be connected to the instrument. This includes the instruction how to add peripherals and how to change the parameters.

### 5.2.3.1 USB stick

**Navigation: Home > Setup > Hardware > Peripherals > USB stick**

Commercially available USB sticks of USB Version 1.1 are supported with FAT12, FAT16, or FAT32, or exFAT (but not NTFS) file system. Two USB sockets are located on the right side of the instrument. As soon as the USB stick is connected, the instrument recognizes the peripheral device. The status field informs if the external memory is installed or not.

### 5.2.3.2 Fingerprint reader

Connect the fingerprint reader to the USB output of the instrument. Two USB sockets are located on the right side of the instrument. Before the fingerprint reader can be used, the corresponding functions need to be configured, see [Account policies ▸ Page 40].

**Navigation: Home > Setup > Hardware > Peripherals > Fingerprint reader**

| Parameter | Description | Values |
|---|---|---|
| Activate fingerprint reader | Activate the fingerprint reader. | Active I Inactive |
| Status | Information that the peripheral device is installed.<br>Displayed if check box **Activate fingerprint reader** is selected. | Installed I Not installed |

– To activate the fingerprint reader, select **Activate fingerprint reader**.

➡ A status field is shown and informs that the peripheral device is connected.

### 5.2.3.3 Printer

The instrument supports different printers and a PDF writer to store the data on a USB stick. The selected type of printer is used for all kind of print-outs, e.g. during execution of a direct measurement or a method with method function Report. The language for print-outs is defined in the user setting as report language.

**Navigation: Home > Setup > Hardware > Peripherals > Printer**

| Parameter | Description | Values |
|---|---|---|
| Printer type | Several types of printers and pdf writers are offered to store or print data. | PDF Writer I USB Compact Printer I RS232 Compact Printer I Network printer |
| Auto baudrate | If activated, the settings for the RS232 connection will be determined automatically. | Active I Inactive |
| Baud rate | Defines the baud rate for data transmission via the RS232 interface. | 1200 I 2400 I 4800 I 9600 I 19200 |
| Number of bits | Defines the number of data bits for RS232 connections. | 7 I 8 |
| Stop bits | Defines the stop bit used for RS232 connections. Read-only if **Auto baudrate** is enabled. | 1 I 1.5 I 2 |
| Parity | Defines the parity method for RS232 connections. | Even I Odd I None |
| Handshake | Defines the handshake used for RS232 connections. | None I Xon/Xoff |

| | | |
|---|---|---|
| Type | Offers different types of command language for the connected network printer. | HP PLC I Epson ESC/P2 |
| IP address | Enter the IP address of the network printer. | - |
| Port number | Enter the port number of the network printer. | - |
| Paper size | Defines the paper size suitable for the selected network printer. | A4 I Letter |
| PDF storage location | Information on the data storage.<br>Displayed if **PDF Writer** is selected. | USB stick |

1 Select a type in **Printer type**

2 If **RS232 Compact Printer** is selected and **Auto baudrate** not enabled, enter the corresponding parameters.
- or -
If **Network printer** is selected, enter the corresponding parameters.

3 To print out a test page, tap [**Test page**].

4 To finish and save the entries tap [**Save**].

**See also**


- Language ▸ Page 34
- Calibration history ▸ Page 49
- Starting direct calibration ▸ Page 50
- Starting from module settings ▸ Page 53
- Measure (Interval) ▸ Page 88
- Printing analysis data ▸ Page 116


### 5.2.3.4 Barcode reader

**Navigation: Home > Setup > Hardware > Peripherals > Barcode reader**

Connect the barcode reader to a USB socket. Two USB sockets are located on the right side of the instrument. The PnP function of the instrument recognizes if a barcode reader is connected. The status field informs that a barcode reader is connected.

### 5.2.3.5 Stirrer

Connect the stirrer to the corresponding socket at the backside of the housing. The PnP function of the instrument recognizes if a stirrer is connected.

**Navigation**: **Home** > **Setup** > **Hardware** > **Peripherals** > [**Stirrer**]

| Parameter | Description | Values |
|---|---|---|
| Status | Information if a stirrer is connected. | Installed I Not installed |
| Stirrer type | Select a stirrer from different standard types or define individual parameters for a stirrer. | Magnetic stirrer I Overhead stirrer I User-defined stirrer |
| 10% | Defines the minimum voltage for the defined stirrer. | - |
| 100% | Defines the maximum voltage for the defined stirrer. | - |

1 In **Stirrer type** select the type of stirrer to be used.

2 Enter a value for the minimum voltage for the current stirrer.

3 Enter a value for the maximum voltage for the current stirrer.

4 To check the settings of the stirring speed, tap [**Test**].

5 To finish and store the entries tap [**Save**].

**Note**

The stirrer type can only be selected, if a stirrer is connected to the instrument.

### 5.2.4 Communication settings

SevenExcellence can be connected to a PC for communication with the laboratory software **LabX** or **EasyDirect pH** for remote control.

**Navigation: Home > Setup > Hardware > Communication settings**

| Parameter | Description | Values |
|---|---|---|
| Communication | Defines the type of communication.<br>**Transfer results to EasyDirect**: To transfer results to **EasyDirect pH**.<br>**Remote control at start-up**: Activates remote interface via Ethernet and USB.<br>**Connect to LabX at start-up**: A connection to **LabX** will be established on startup. | Off I Transfer results to EasyDirect I Remote control at start-up I Connect to LabX at start-up |
| Connection type | Defines how the instrument is connected to the PC, either via the network connection or via the USB connection.<br>Displayed if **Communication** = **Remote control at start-up** or **Connect to LabX at start-up** is selected. | Ethernet I USB |
| Port number | Defines the port for a network connection of the instrument.<br>Displayed if **Connection type** = **Ethernet** is selected. | 1024…65535 |
| Host status | Information if a host is connected or not.<br>Displayed if **Communication** = **Transfer results to EasyDirect** is selected. | Installed I Not installed |

### 5.2.5 Network settings

Configure these settings if you have your instrument connected to a network.

**Navigation: Home > Setup > Hardware > Network settings**

| Parameter | Description | Values |
|---|---|---|
| Type | Information on the type of network connection. | Ethernet |
| Obtain IP address automatically | If activated, the device automatically obtains an IP address. | Active I Inactive |
| IP address | Defines the IP address of the instrument.<br>Only if **Obtain IP address automatically** is not activated. | 000.000.000.000 … 255.255.255.255 |
| Subnet mask | Defines the subnet mask to link the subnet's IP address, to run the instrument on a local subnetwork.<br>Only if **Obtain IP address automatically** is not activated. | 000.000.000.000 … 255.255.255.255 |
| Standard gateway | Defines the address of the standard gateway for communication between the various networks.<br>Only if **Obtain IP address automatically** is not activated. | 000.000.000.000 … 255.255.255.255 |

### 5.2.6 Auxiliary instruments

During method execution, SevenExcellence can send data to and get data from an auxiliary instrument which is connected via RS232 cable using a specific USB-RS232 adapter. The communication settings can be defined per auxiliary instrument.

**Navigation: Home > Setup > Hardware > Auxiliary instruments**

Select an existing auxiliary instrument from the list or tab **New** to create a new one. To delete an auxiliary instrument from the list, select it and tab **Delete**. One item has to remain in the list and cannot be deleted.

| Parameter | Description | Values |
|---|---|---|
| Control type | Defines the way the auxiliary instrument is connected to the instrument. | USB-RS232 |
| Name | Specify a descriptive name of your choice. | Arbitrary |
| Baud rate | Defines the baud rate for data transmission via the RS232 interface. | 1200 I 2400 I 4800 I 9600 I 19200 |
| Number of bits | Defines the number of data bits for RS232 connections. | 7 I 8 |
| Stop bits | Defines the stop bit used for RS232 connections. | 1 |
| Parity | Defines the parity protocol. | Even I Odd I None |
| Handshake | Defines the handshake used for RS232 connections. | None I Xon/Xoff |

**See also**

Accessories ▸ Page 125

## 5.3 User settings

**Navigation: Home > Setup > User settings**

The dialog **User settings** contains the settings that can be made specifically for each currently logged in user.

**User settings** include the following settings:

- **Language**
- **Screen**
- **Beep** for signal tones
- **Shortcuts**
- **Keyboards** (alphanumeric and numeric)

### 5.3.1 Language

The language can be defined separately for the operation of the user interface as well as for the reports that are to be printed out.

**Navigation: Home > Setup > User settings > Language**

| Parameter | Description | Values |
|---|---|---|
| Screen | Defines the language setting for user interface. | English I French I German I Italian I Spanish I Portuguese I Russian I Chinese I Japanese I Korean |
| Report | Defines the language setting for printout. | English I French I German I Italian I Spanish I Portuguese I Russian |

1 Select a language in **Screen**.

2 Select a language in **Report**.

3 To finish and store the entries tap [**Save**].

### 5.3.2 Screen

The screen can be adapted to individual needs. Activate the screen saver if it is desired and set the time period up to displaying.

**Navigation: Home > Setup > User settings > Screen**

| Parameter | Description | Values |
|---|---|---|
| Primary color | Information on the color scheme of the user interface. | Blue |
| Brightness | Defines the brightness of the display. | 50…100% |
| Screen saver | Activates the screen saver. | Active I Inactive |
| Wait time | Defines how long in [min] the system should wait after the user's last action on the terminal before activating the screen saver. | 1…120 |

1 Select a percentage value for **Brightness**.

2 To use the screen saver, activate **Screen saver** and set a time for **Wait time**.

3 To finish and store the entries tap [**Save**].

### 5.3.3 Beep

A signal tone can be activated. With the push of a button, in case of error messages, stability of measurement results, additional news or if user interaction is required you hear a beep.

**Navigation: Home > Setup > User settings > Beep**

| Parameter | Description | Values |
|---|---|---|
| Push of a button | Enables the audio signal when tapping on the touch screen. | Active I Inactive |
| Error message | Activates a beep in case of error messages. | Active I Inactive |
| Stability signal | Enables the audio signal when a measurement result is stable. | Active I Inactive |
| News | Enables the audio signal when events occur that appear under **News**. | Active I Inactive |
| User interaction required | Activates a beep when user interaction is required. | Active I Inactive |

1 To hear a signal in certain cases, activate the check boxes according to your requirements.

2 To finish and store the entries tap [**Save**].

### 5.3.4 Shortcuts

**Navigation: Home > Setup > User settings > Shortcuts**

Shortcuts can be created after the parameters for methods and series have been set, see [Creating shortcuts for methods ▸ Page 62], [Creating shortcuts for series ▸ Page 111]. The administration of shortcuts takes place in the menu **Setup**. This chapter describes how to modify or delete shortcuts.

#### Modify shortcuts

Shortcuts allow you to start methods, series, and manual operations directly from the home screen. You can place shortcuts on the home screen by pressing the **AddToHome** button. **AddToHome** is located in the start dialog of each method, series and manual operation.

**Navigation: Home > Setup > User settings > Shortcuts**

– Select a method or series from the list.

➡ **Shortcut parameters** is displayed.

| Parameter | Description | Values |
|---|---|---|
| Type | If the shortcut refers to a series, **Series** as type is shown, if it refers to a method, **Method** as type is displayed as information. | - |

| | | |
|---|---|---|
| Description | A meaningful name for the series or method can be entered and will be displayed on the home screen. | - |
| Series ID or Method ID | If the shortcut refers to a series the **Series ID** is show, if it refers to a method, the **Method ID** is shown. | - |
| Immediate start | If activated, the method or series starts can be started immediately. | Active I Inactive |
| Homescreen position | Shows the position on the home screen. Nine positions are offered, they are numbered 1-9 from left to right in three rows. | - |
| Created by | Information about the administrator who created the shortcut. | - |

1 To change the entry in **Description**, overwrite it.

2 To change the options for **Immediate start**, activate or deactivate the check box.

3 To change the position, tap the list field in **Homescreen position**.
Touching a free area in **Select location for shortcut** will assign the new home screen position.

4 To finish and store the entries tap [**Save**].

#### Delete shortcuts

**Navigation: Home > Setup > User settings > Shortcuts**

1 Select the relevant shortcut from the list.
➡ **Shortcut parameters** is displayed.

2 Tap [**Delete**].

➡ The shortcut has been deleted without warning.

### 5.3.5 Keyboards

The layout for the alphanumeric and the numeric input fields can be set here.

**Navigation: Home > Setup > User settings > Keyboards**

| Parameter | Description | Values |
|---|---|---|
| ABC keyboard | Defines the layout of the alphanumeric input field. | English I French I German |
| 123 keyboard | Defines the layout of the numeric input field. | Calculator I Phone |

1 Select a layout for **ABC keyboard**.

2 Select a layout for **123 keyboard**.

3 To finish and store the entries tap [**Save**].

## 5.4 Global settings

**Navigation: Home > Setup > Global settings**

In **Global settings**, you can make general instrument settings that apply to all users. The settings in this dialog can only be changed by users with the appropriate authorizations.

Global settings include settings for:

- **System**
- **User management**: Create user accounts and set assigning rights.
- **Analysis and resources behavior**
- **Physical properties** include **Temperature unit** and **Barometric pressure unit**.
- **Operation mode**

### 5.4.1 System

Instrument identification, date and time format and current date and time can be set in this dialog.

**Navigation: Home > Setup > Global settings > System**

| Parameter | Description | Values |
|---|---|---|
| Identification | Information on identification and software versions of the instrument. | - |
| Date/Time | Settings for date and time. | - |
| Header and footer | Settings for header, footer, and signature lines of print-outs. | - |

### 5.4.1.1 Identification

You can enter your own code to identify the instrument.

**Navigation: Home > Setup > Global settings > System > Identification**

| Parameter | Description | Values |
|---|---|---|
| Instrument ID | Define the instrument identification. | - |
| Firmware version | Information on the firmware version of the instrument. | - |
| Instrument SN | Information on the serial number of the instrument. | - |
| Module A | Information on the type of module currently plugged in. | pH/mV I pH/Ion I Conductivity I DO/BOD |
| Module ID | Define the module identification of the module currently plugged in. | - |
| Module serial number | Information on the serial number of the module currently plugged in. | - |
| Module firmware version | Information on the firmware of the module currently plugged in. | - |
| Module B | Information on the type of module currently plugged in. | pH/mV I pH/Ion I Conductivity I DO/BOD |
| Module ID | Define the module identification of the module currently plugged in. | - |
| Module serial number | Information on the serial number of the module currently plugged in. | - |
| Module firmware version | Information on the firmware of the module currently plugged in. | - |
| Module C | Information on the type of module currently plugged in. | pH/mV I pH/Ion I Conductivity I DO/BOD |
| Module ID | Define the module identification of the module currently plugged in. | - |
| Module serial number | Information on the serial number of the module currently plugged in. | - |
| Module firmware version | Information on the firmware of the module currently plugged in. | - |
| Radio clock firmware version | Information on the firmware of the radio controlled clock. | - |

1 Enter the ID in **Instrument ID**.

2 To enter an ID for **Module ID**, connect a module to the instrument.

3 To finish and store the entries tap [**Save**].

### 5.4.1.2 Date/Time

You can enter a display format for date and time and set the current date and time.

**Navigation: Home > Setup > Global settings > System > Date/Time**

| Parameter | Description | Values |
|---|---|---|
| Date format | Defines the format for displaying the date. | dd/mm/yyyy I mm/dd/yyyy I yyy/dd/mm I yyyy/mm/dd I dd-mmm-yy I mmm-dd-yy I yy-dd-mmm I yy-mmm-dd I mmm-dd-yyyy I dd-mmm-yyy I yyyy-dd-mmm I yyyy-mmm-dd |
| Time format | Defines the format for displaying the time. | 24h I a.m./p.m. |
| Enable radio clock | Activate the radio clock for time synchronization.<br>Only available on instrument hardware with radio clock. | Active I Inactive |
| Sender | Define the transmitter for the reception.<br>Only if **Enable radio clock** is activated. | Auto I List of transmitter |
| Date/Time | Enter the current date and time.<br>Only if **Enable radio clock** is not activated. | - |
| Time zone | Define the time zone of your location. | UTC+ I UTC- |
| Daylight saving time | Activates to switch automatically to daylight saving time. | Active I Inactive |

1 Select a format in **Date format**.

2 Select a format in **Time format**.

3 To use the radio clock, activate **Enable radio clock**.
- or -
Tap list field [**Date/Time**], enter the current day and time and confirm with [**OK**].

4 Select your location in **Time zone**.

5 To switch automatically to daylight saving time, activate **Daylight saving time**.

6 To finish and store the entries tap [**Save**].

**Note**

- Some instrument versions are equipped with a radio clock. The radio clock will attempt to synchronize every 7 hours. To avoid interruption of measurements during synchronization of the radio clock, the synchronization will only occur when the instrument is switched off. For reduction of interference during synchronization of the radio clock it is recommended to disconnect the power supply overnight or during long periods of non-use.
- Automated Daylight saving time and the radio clock should not be used at the same time.

### 5.4.1.3 Header and footer

You can define the header, footer, and signature lines of print-outs.

**Navigation: Home > Setup > Global settings > System > Header and footer**

| Parameter | Description | Values |
|---|---|---|
| Header text | Defines a text which is shown in the header lines, e.g. company name or instrument location. | - |
| End of report | If activated, signature lines are added at the end of the report. | Active I Inactive |
| Created by | If activated, a signature line **Created by** will be printed if **End of report** is activated. | Active I Inactive |
| Modified by | If activated, a signature line **Modified by** will be printed if **End of report** is activated. | Active I Inactive |

| | | |
|---|---|---|
| Checked by | If activated, a signature line **Checked by** will be printed if **End of report** is activated | Active I Inactive |
| Approved by | If activated, a signature line **Approved by** will be printed if **End of report** is activated. | Active I Inactive |
| Header/footer on compact print-out | If activated, header and footer lines are printed on:<br>- **RS232 Compact Printer**<br>- **USB Compact Printer**.<br>Header and footer lines are always printed on:<br>- **PDF Writer** and<br>- **Network printer**. | Active I Inactive |

1 Enter a text in **Header text**.

2 To add signature lines at the end of a report, activate **End of report** and activate which signature lines to print

3 To have the header and footer printed on a compact printer, activate **Header/footer on compact print-out**.

4 To finish and store the entries tap [**Save**].

## 5.4.2 User management

**Navigation: Home > Setup > Global settings > User management**

In the dialog **User management** you can administer the settings for **User** and **Account policies**. A maximum of 30 different users can be defined, whereby only one can be logged in (1 user operation). User accounts can be deleted and edited. There is a default user with a predefined user name (user name: **Administrator**, user group: Administrator) that cannot be deleted.

### 5.4.2.1 User

In this dialog you have access to the list of users. You can enter user names and assign the users to a user group. The user groups have different user rights, see [User groups and user rights ▸ Page 42]. User accounts can be locked, edited or deleted.

#### User list

All registered users are listed in the user list. The user list gives a quick overview on the users and their assigned user groups.

**Navigation: Home > Setup > Global settings > User management > User**

#### Enter user and assign user rights

New user can be added at any time. A maximum of 30 user can be added to the list. If the maximum is reached, delete a user to create a new entry.

The number of parameters that are displayed depend on the settings in **Account policies**.

**Navigation: Home > Setup > Global settings > User management > User > New**

| Parameter | Description | Values |
|---|---|---|
| User name | Defines the user name which uniquely identifies him to the system. | - |
| Full name | Defines the full name of the user. | - |
| User group | Assignment of the user to a user group.<br>Depending on the user group, the user has various rights. | Administrator I Expert I Technician I Operator |
| Reset password | If activated, the password for the user will be reset to **123456**.<br>Displayed if **Enforce password/fingerprint** is activated. | Active I Inactive |

| | | |
|---|---|---|
| Lock user | If activated, the user will be locked and cannot access the instrument.<br>Displayed if **Enforce password/fingerprint** is activated. | Active I Inactive |
| Enforce password change | If activated, the entry of a new password will be enforced with the next login.<br>Displayed if **Enforce password/fingerprint** is activated. | Active I Inactive |
| Created by | Information on the administrator logged in at time of account creation. | - |
| Created on | Information on date and time of account creation. | - |
| Modified by | Information on the administrator logged in at time of account modification. | - |
| Modified on | Information on date and time of account modification. | - |

1 Enter a user name in **User name**.
2 Enter the full name of the user in **Full name**.
3 Assign a group in **User group**.
4 To lock a user, activate **Lock user**.
5 To finish and store entries tap [**Save**].

**Note**

**Reset password** and **Enforce password change** are displayed when the option **Enforce password/fingerprint** is activated. No changes are possible in this submenu. To edit the settings, see [Account policies ▸ Page 40].

#### Edit user

**Navigation: Home > Setup > Global settings > User management > User**

The settings for access permissions and user data can be changed.

1 Select a user from the list **User**.
➡ **User parameters** is displayed.
2 Edit the entries.
3 To finish and store entries tap [**Save**].

#### Delete user

**Navigation**: **Home** > **Setup** > **Global settings** > **User management** > **User**

User entries can be deleted.

1 Select a user from the list **User**.
➡ **User parameters** is displayed.
2 Tap [**Delete**].
➡ The user has been deleted without warning.

### 5.4.2.2 Account policies

In the dialog **Account policies** you can set the options for password or fingerprint reader, also see [Peripherals ▸ Page 30].

**Navigation: Home > Setup > Global settings > User management > Account policies**

| Parameter | Description | Values |
|---|---|---|
| Enforce password/ fingerprint | Activates to log in by entering a password or via the fingerprint reader. | Active I Inactive |
| Min. password length | Defines the minimum length of the user passwords<br>Displayed if **Enforce password/fingerprint** is activated. | 0…20 |

| | | |
|---|---|---|
| Password complexity required | Enforces the user to define a password that must contain number, capital letters and small letters.<br>Displayed if **Enforce password/fingerprint** is activated. | Active I Inactive |

1 To activate the login screen when turning on the instrument, activate **Enforce password/fingerprint**. In **Min. password length**, enter the number of digits required.

2 To finish and store the entries tap [**Save**].

### 5.4.2.3 User management settings and login screen

Depending on the settings in **User** and **Account policies**, the following login options are available:

**Enforce password/fingerprint is deactivated**

- If only one user is defined, the instrument starts directly with the home screen without showing the login screen.
- If several users are defined, the instrument starts with the login screen, the user can select an entry from the list. The input of a password is not required.

**Enforce password/fingerprint is deactivated, fingerprint reader is connected and activated**

- If only one user is defined, the instrument starts directly with the home screen without showing the fingerprint logon screen.
- If several users are defined, the instrument starts with the fingerprint logon screen. The identification by fingerprint leads to the home screen. In case of problems with the fingerprint identification the user can change to the manual login screen and selects an entry from the list. The input of a password is not required.

**Enforce password/fingerprint is activated, fingerprint reader is not activated**

- If the user logs in for the first time or **Enforce password change** is deactivated, the instrument starts with the login screen, enter username and password.
- If the user logs in for the first time or **Enforce password change** is active, the instrument starts with the login screen, enter username and password. Change password screen is displayed, enter a new password, repeat the password and confirm with [**OK**].

**Note**

- Login resets the parameter in **Enforce password change**.

**Enforce password/fingerprint is activated, fingerprint reader is activated**

- If **Enforce password change** is deactivated, the instrument starts with the fingerprint logon screen. The identification by fingerprint leads to the home screen. In case of problems with the fingerprint logon the user can change to the manual login screen to enter user name and password.
- If user logs in for the first time or **Enforce password change** is activated, the instrument starts with the fingerprint logon screen. The identification by fingerprint leads to the Change password screen, enter new password, repeat the password and confirm with [**OK**].
- If user logs in for the first time or **Enforce password change** is activated, the instrument starts with the fingerprint logon screen. The user changes to the password login and enters user name and password. Change password screen is displayed, enter a new password, repeat the password and confirm with [**OK**].

#### 5.4.2.4 User groups and user rights

Every user is assigned to a user group.

The following table shows the user rights that are assigned to the corresponding user group:

| User right | Operator | Technician | Expert | Administrator |
|---|---|---|---|---|
| **Performance of analysis** | | | | |
| Start method or series via shortcut | • | • | • | • |
| Start method from method list | | • | • | • |
| Start series from series list | | • | • | • |
| Start direct measurement from home screen | • | • | • | • |
| Start direct measurement from module screen | • | • | • | • |
| Start direct calibration from module screen | • | • | • | • |
| Review results | • | • | • | • |
| Delete results | | | • | • |
| **Modification of analysis parameters** | | | | |
| Change sample ID in start analysis screen or module screen | • | • | • | • |
| Create, edit and delete methods | | | • | • |
| Create, edit and delete series | | | • | • |
| Import / export of methods and series | | | • | • |
| Change module settings | | • | • | • |
| **User interface settings** | | | | |
| Modify user-specific screen language | • | • | • | • |
| Modify user-specific notification signal (beep) | • | • | • | • |
| Modify user-specific keyboard layout | • | • | • | • |
| Modify user-specific screen brightness | • | • | • | • |
| Create, edit and delete shortcuts | | • | • | • |
| **Instrument settings** | | | | |
| Review sensor data and calibration history (last 5 calibrations) | • | • | • | • |
| Create, edit and delete sensors | | | • | • |
| Manually modify cell constant of conductivity sensors | | | • | • |
| Create, edit and delete buffer and standard solution lists | | | • | • |
| Import / export of sensors, buffers, tables | | | • | • |
| Modify peripherals settings | | | • | • |
| Modify analysis sequence settings | | | • | • |
| Modify actions when sensor expire | | | • | • |
| Modify physical properties (e.g. temperature unit) | | | | • |
| Modify operation mode | | | • | • |
| Modify report language | | | • | • |
| Edit system settings (instrument ID, date/time, header and footer) | | | | • |
| Create, edit and delete users | | | | • |
| Reset to factory settings | | | | • |
| Update instrument and module firmware | | | | • |

### 5.4.3 Analysis and resources behavior

**Navigation: Home > Setup > Global settings > Analysis and resources behavior**

The following settings can be defined:

- **Analysis sequence settings**
- **Actions when sensors expire**

#### 5.4.3.1 Analysis sequence settings

With these settings the instrument shows all required resources at the start of a method or series. Additionally you can specify whether the analysis ends automatically or manually.

**Navigation: Home > Setup > Global settings > Analysis and resources behavior > Analysis sequence settings**

| Parameter | Description | Values |
|---|---|---|
| Show required resources at start | All resources that are required to perform the analysis are shown. | Active I Inactive |
| Allow taking of manual endpoint | A button **Take manual endpoint** is shown on the online display to finish the measurement manually. If enabled this button is shown independent of the defined endpoint type. If disabled this button is only shown if **Endpoint type** = **Manual**. | Active I Inactive |
| Confirm end of analysis | Instrument waits for confirmation after every measurement. | Active I Inactive |
| Show calculated results after analysis | Before the end of a method, all calculated results are shown and have to be confirmed. | Active I Inactive |
| Suppress limits-/ threshold popup-sConfirm end of analysis | Hinders the instrument to show messages if limits or thresholds are exceeded. | Active I Inactive |
| Save results on instrument | Results of up to 250 analysis are stored in the instrument. Please note that the method step **Follow** for analysis type BOD and BCV cannot be started if activated. | Active I Inactive |

#### 5.4.3.2 Actions when sensors expire

With these settings you specify whether the instrument warns, warns and blocks or does not react, when usable life and life span expired.

**Navigation: Home > Setup > Global settings > Analysis and resources behavior > Actions when sensors expire**

| Parameter | Description | Values |
|---|---|---|
| Usable life | Select the action when exceeding usable life. | Warn I Warn and block I None |
| Life span | Select the action when exceeding life span. | Warn I Warn and block I None |

1 To be warned and/or blocked, when **Usable life** expires, activate **Usable life**.

2 To be warned and/or blocked, when **Life span** expires, activate **Life span**.

3 To finish and store the entries tap [**Save**].

### 5.4.4 Physical properties

In **Physical properties** dialog you can define the parameters for **Temperature unit**. The setting will be applied after restarting the instrument.

**Navigation: Home > Setup > Global settings > Physical properties**

| Parameter | Description | Values |
|---|---|---|
| Temperature unit | Defines the temperature unit applicable for all measurements.<br>All entries and representations will be provided in the selected unit. | °C I °F |

| | | |
|---|---|---|
| Barometric pressure unit | Defines the barometric pressure unit applicable for dissolved oxygen measurements.<br>All entries and representations will be provided in the selected unit. | mbar I hPa I mmHg I atm |

### 5.4.5 Operation mode

You can define if direct measurements and direct calibrations can be started beside methods and series. The settings defined for the module are used. If direct measurements are not allowed, the **Read** button in the home screen and the **Read** and **Calibrate** button in the module settings are hidden.

**Navigation: Home > Setup > Global settings > Operation mode**

| Parameter | Description | Values |
|---|---|---|
| Allow direct measurements | If enabled, starting direct measurements and calibrations is possible. | Active I Inactive |

**See also**

Starting direct measurement ▸ Page 53

## 5.5 Tables

**Navigation**: **Home** > **Setup** > [**Tables**]

This instrument offers the comfort to enter data and calculate results, based on these data, see [Formula Syntax ▸ Page 117] and [Results ▸ Page 114]. Tables can be used in calculations.

Tables are always assigned to an application. The list can be sorted according to the application.

There are two types of tables:

- METTLER TOLEDO tables:
  These tables are included in the factory settings; they are listed and neither can be modified nor deleted.
- User-defined tables:
  The layout of the table is a value table (x-y). It can be created, edited and deleted. User-defined tables are added to the list of METTLER TOLEDO tables.

### 5.5.1 METTLER TOLEDO tables

**Navigation: Home > Setup > Tables**

In **Tables** you find a list of predefined buffer and standard tables. User-defined buffer and standard tables can be added.

The following buffer and standard tables with their temperature related values are available:

- METTLER TOLEDO Europe pH 2.00
- METTLER TOLEDO Europe pH 4.01
- METTLER TOLEDO Europe pH 7.00
- METTLER TOLEDO Europe pH 9.21
- METTLER TOLEDO Europe pH 11.00
- **Ultra pure water** (Ultra-pure water (USP/EP))
- **Purified water** (Purified water (EP))
- Conductivity Standard 10 µS/cm
- Conductivity Standard 84 µS/cm
- Conductivity Standard 1413 µS/cm
- Conductivity Standard 12.88 mS/cm
- Oxygen solubility in water
- USP645 Stage 3 pH and conductivity requirements

For detailed information concerning the temperature related values:

– Tap a table from the list.

➡ **Tables** is displayed and shows the selected pH value related to the temperature, starting at 5 °C to 50 °C in steps of 5 °C.
The conductivity values for ultra-pure water and purified water are displayed in µS/cm.
The table with the temperature related values of ultra-pure water contains all data between 0 °C and 100 °C in steps of 5 °C.
The table with the temperature related values of purified water contains all data between 0 °C and 100 °C in steps of 10 °C.

For more information about the conditions for the calculation of the values:

– Tap **Parameter**.

➡ **Parameters** is displayed and provides information on:
- **Name**
- **Input value**
- **Output value**
- **Fit type**
- **Comment**

**See also**

METTLER TOLEDO tables ▸ Page 139

## 5.5.2 User-defined tables

**Navigation: Home > Setup > Tables**

The following section describes how to create and administer a user-defined table, how to enter, modify and delete values and how to delete tables.

**Note**

- A total of 10 user-defined tables can be created. If the limit is exceeded delete a table before you create a new one.

### Creating tables

**Navigation: Home > Setup > Tables > New**

| Parameter | Description | Values |
|---|---|---|
| Name | Enter a name that uniquely identifies the table in the system. The name of the table can be entered in the method function **Calculation** > **Formula**. | - |
| Input value | Defines the table heading for the input value. | - |
| Output value | Defines the table heading for the output value. | - |
| Fit type | Information on the definition of the curve type for the calculation. Linear interpolation corresponds to a segmented curve. | - |
| Comment | Defines a short comment that will be displayed. | - |

1 Enter a name in **Name**. The new table name must be unique.

2 Enter a table heading value for **Input value**.

3 Enter a table heading value for **Output value**.

4 Enter a comment in **Comment**.

5 Tap [**Save**].

➡ **Table** is displayed.

### Entering values in tables

– Tap [**New**].

➡ **Values** is displayed.

| Parameter | Description | Values |
|---|---|---|
| x | Defines the input value of the value pair. | - |
| y | Defines the output value of the value pair. | - |

1 Enter value for **x**.
2 Enter value for **y**.
3 Confirm with [**OK**].
4 To enter additional values, tap [**New**] and repeat previous steps.
5 To finish and store the entries tap [**Save**].

**Note**

The maximum number of value entries per table is 25. If you enter by mistake identical values for **Input value** and **Output value**, a prompt informs that his value already exists.

### Modifying table parameters

**Navigation: Home > Setup > Tables**

1 Select a table from **Tables**.
➡ **Table** is displayed.
2 Tap [**Parameter**].
➡ **Parameters** is displayed.
3 To Following parameters can be modified:
- **Name**
- **Input value**
- **Output value**
- **Comment**
4 To finish and store the entries tap [**Save**].

### Modifying values

**Navigation: Home > Setup > Tables**

1 Select a table from **Tables**.
➡ **Table** is displayed.
2 Tap a value from the list.
➡ **Values** is displayed.
3 To modify the value, overwrite it and confirm with [**OK**].
4 To modify additional values, repeat previous steps.
5 To finish and store the entries tap [**Save**].

### Deleting values

**Navigation: Home > Setup > Tables**

1 Select a table from **Tables**.
➡ **Table** is displayed.
2 Tap the value on the list.
➡ **Values** is displayed.
3 Tap [**Delete**].
4 To delete additional values, repeat previous steps.
5 To finish and store the entries tap [**Save**].
➡ The values have been deleted.

### Deleting tables

**Navigation: Home > Setup > Tables**

1 Select a table from **Tables**.
   ➡ **Table** is displayed.
2 Tap [**Parameter**].
   ➡ **Parameters** is displayed.
3 Tap [**Delete**].

➡ The table has been deleted.

**Note**

Calculations which refer to deleted tables can no longer be carried out.

## 5.6 Maintenance & service

**Navigation: Home > Setup > Mainten. & Service**

The following functions are available:

- **MT-Service**
- **Import / Export**
- **Reset to factory settings**
- **Firmware**
- **Update**

### 5.6.1 MT service

**Navigation: Home > Setup > Mainten. & Service > MT-Service**

In this dialog a list is shown with (max. 10 entries) METTLER TOLEDO maintenance information. Each entry contains information about the date of last maintenance and the executive service technician. The most recently performed maintenance appears at the bottom of the list.

#### Set service life

**Navigation**: **Home** > **Setup** > **Mainten. & Service** > **MT-Service** > **Settings**

Define the parameter for the service life to determine the date of the next maintenance interval. You can set a reminder to be informed on the upcoming maintenance. The following parameters can be set:

- **Service life**: Set the maintenance intervals (in days).
- **Reminder**: Activates whether a reminder informs about the days before the next maintenance takes place.
- **Days before expiration**: Define the number of days before the reminder informs about expiration of the maintenance interval.
  The entered number of days must be smaller than the number of days you set for the service life (displayed if **Reminder** is activated).

### 5.6.2 Import/export

**Navigation: Home > Setup > Mainten. & Service > Import / Export**

With the aid of this function you can either transfer data to or from USB sticks. Using a **Memory copy** is an easy way to transfer the settings from one instrument to another. Quickly you have installed two instruments with identical functions.

The following data can be imported or exported:

- **Methods**
- **Series**
- **Buffers & Standards**
- **Sensors**

- **Memory copy**
- **User management**
- **Log file**

**Note**

- The function **Import / Export** is only possible when a USB stick is connected and when no task is running.
- All the saved results, analysis data, shortcuts and METTLER TOLEDO tables, METTLER TOLEDO methods as well as predefined buffer sets and standard groups are **not** contained in a memory copy.
- When you import or export user management settings, the entire user management settings, with all users and their properties, will be imported or exported.
- You need to have administrator rights to create and re-import a backup copy.

1 In **Action**, select **Import** or **Export**.
2 Tap [**Data**] and select an item from the list.
3 To transfer data tap [**Start**].

### 5.6.3 Reset to factory settings

**Navigation: Home > Setup > Mainten. & Service > Reset to factory settings**

You can reset all instrument settings to factory settings. A pop-up informs you that all existing data and settings will be deleted.

**Note**

If reset is performed all created data, amendments, settings, setup entries and results will be lost.
Please create a **Memory copy** before you reset to factory settings.

1 Tap [**Reset to factory settings**].
➡ An information is displayed.
2 Tap [**Start**] to proceed.
➡ A second information is displayed.
3 Tap [**Continue**] to start the procedure.
➡ The instrument is shutting down and all the data will be deleted.

### 5.6.4 Firmware

**Navigation: Home > Setup > Mainten. & Service > Firmware**

The list shows all the firmware updates. The first entry on the list corresponds to initial operation.

All list entries show the following information:

- **Date**: The date of the installation.
- **FW Version**: The software version installed.
- **User name**: Name of technician.

### 5.6.5 Update

**Navigation: Home > Setup > Mainten. & Service > Update**

Firmware updates of the instrument and modules can be managed from this screen. Data can be transferred from USB stick.

**Note**

- You need administrator rights to implement a firmware update.
- METTLER TOLEDO provides additional information for updating instruments. These instructions will be part of the firmware update.

# 6 Sensors

**Navigation: Home > Sensors**

Additional to the sensor management in the setup menu, SevenExcellence™ allows managing the sensors and sensor settings directly from the home screen.

## 6.1 Available sensors

**Navigation: Home > Sensors**

**Sensors** leads you to the list of available sensors according to the sensor settings, see [Sensors ▸ Page 27]. You have a quick view over the defined sensors and the modules to which they are connected. Furthermore you have access to the calibration history.

## 6.2 Sensor parameters

**Navigation: Home > Sensors**

To get detailed information concerning the sensor parameters, to change the sensor name and the conditions for usable life and life span, proceed as follows:

1 Select a sensor.
   ➡ **Parameters** is displayed with all information concerning sensor settings.
2 Define the parameters according to your requirements.
3 To finish and store the entries, tap [**Save**].

## 6.3 Calibration history

To get reliable and exact measurement values, check the calibration history before starting a measurement. Calibrate the sensor or replace it if necessary. You can print the calibration history for your documentation.

1 Tap [**Sensors**].
   ➡ **Sensors** is displayed.
2 Select a sensor.
   ➡ **Parameters** is displayed.
3 Tap **Calibration history**.
   ➡ **Calibration history** is displayed.
4 If desired, tap [**Print**].

➡ The calibration history is beeing printed.

# 7 Starting Analysis

An analysis can be started in various ways:

- Start by tapping [**Read**] on the **Home screen**
- Start by tapping [**Read**] from **Module settings**
- Start by tapping [**Calibrate**] from **Module settings**
- Start by tapping [**Shortcuts**] on the **Home screen**
- Start from the Methods/Series editor

The different options that are offered depend on the settings you have done before and on the kind of analysis. The following chapters show how to start:

- **Direct calibration**
- **Direct measurement**
- **Methods**
- **Series**

**Note**

- Before you start a calibration or measurement using a METTLER TOLEDO method, connect a module to the instrument and connect a sensor to the module suitable to the method.
- Add the sensor to the **Sensors** list, see [Sensors ▸ Page 27].
  ISM® sensors are recognized automatically and enable to start the method immediately.

## 7.1 Starting direct calibration

You can start a direct calibration from the module displayed on the home screen. Before you start a direct calibration you have to set the following parameters:

- **Sensor**
- **Temperature sensor** (optional)
- **General settings**
- **Calibration settings**

The following section guides you through this process.

– Tap the colored tag of the relevant module displayed on the top of the **Home screen**.

➡ **Module settings** is displayed.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>A selected sensor is referenced by its name. | List of defined sensors |
| Temperature sensor | Opens the list of temperature sensors, according to the sensor settings.<br>Displayed for **pH/Ion**, **Conductivity**, and **DO/BOD** module. | - |
| General settings | All parameters concerning endpoint and temperature for direct calibration and direct measurement. | - |
| Measurement settings | All parameters concerning the measurement and the result (only for direct measurement). | - |
| Calibration settings | All parameters concerning buffers or standards (only for direct calibration). | - |

1 Tap list field **Sensor name**.

➡ **Select sensor** is displayed.

2 Select a type.

3 To use an external temperature sensor, tap list field **Temperature sensor**.

➡ **Select sensor** is displayed.

4 Select a type.

### General settings

In **General settings** you set the conditions for **Endpoint type**, **Endpoint criteria** and **Temperature capture**. Additionally you can set whether the results of the calibration should be printed or not.

– Tap [**General settings**].

➡ **General settings** is displayed.

| Parameter | Description | Values |
|---|---|---|
| Measurement type | Information on the measurement type. | - |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| Temperature capture | Select the temperature capture mode.<br>**Internal**: The used temperature sensor is integrated in the measurement sensor.<br>**External**: A separate temperature sensor is used.<br>**Manual**: The temperature is entered manually. | Internal I External I Manual |
| Temperature | Defines the temperature for the measurement.<br>Displayed if **Temperature capture** = **Manual** is selected. | -30…130 °C /<br>-22...266 °F |
| Barometric pressure capture | Select the **Barometric pressure capture** mode. Displayed in case of **Measurement type** = **Dissolved Oxygen** | Automatic I Manual |
| Barometric pressure | Defines the barometric (atmospheric) pressure.<br>Displayed in case of **Measurement type** = **Dissolved Oxygen** and **Barometric pressure capture** = **Manual**. | 500.0…1100.0 mbar |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |
| Print | Defines if data will be printed to the connected printer. | Active I Inactive |
| Print format | **Summary**: Covers most important data concerning date, time, user and parameters according to the settings of the measurement type. | Summary |

1 Select **Endpoint type**.

2 Select **Endpoint criteria**.

3 Select **Temperature capture**.
If **Manual** is selected, enter a value for **Temperature**.

4 If desired, activate check box **Print**.

5 Confirm with [**OK**].

### Calibration settings

– Tap [**Calibration settings**].

➡ **Calibration settings** is displayed.

| Parameter | Description | Values |
|---|---|---|
| Measurement type | Information on the measurement type. | - |
| Buffer group | Select a buffer group from the list of predefined and user-defined buffer groups.<br>Displayed if **Measurement type** = **pH**. | - |
| Calibration standard group | Opens the list of predefined and user-defined standard groups.<br>Displayed if **Measurement type** = **Ion** or **Conductivity**. | - |
| Unit | Information on the preselected unit.<br>Displayed if **Measurement type** = **Ion** | - |
| Cal. mode | Specifies whether calibration data will be approximated with one straight line segment or left as a series of segments.<br>Displayed if **Measurement type** = **pH** or **Ion**. | Linear I Segmented |
| Number of buffers | Defines the number of buffers for the calibration.<br>Displayed if **Measurement type** = **pH**. | 1 I 2 I 3 I 4 I 5 |
| Number of standards | Defines the number of calibration standards to be used.<br>For**Measurement type** = **Ion** up to 5, for **Conductivity** up to 2. | 1 I 2 I 3 I 4 I 5 |
| Standard 1 - Standard 5 | Number of fields depends on the number of defined standards. Up to 5 standards for ion sensors and up to 2 standards for conductivity sensors are displayed with consecutive numbers. Each field opens the list of preselected standard groups.<br>Displayed if **Measurement type** = **Ion** or **Conductivity**. | - |
| Automatic buffer recognition | Activates the automatic recognition of buffers. Only available for predefined pH buffer groups.<br>Displayed if **Measurement type** = **pH**. | Active I Inactive |
| Buffer 1 - Buffer 5 | The number of fields depends on the number of defined buffers. Up to 5 buffers are displayed with consecutive numbers. Select a buffer for each calibration point from the list.<br>Displayed if **Measurement type** = **pH** and **Automatic buffer recognition** is not activated. | - |
| Calibration points | Option to choose between different number of calibration points.<br>Displayed if **Measurement type** = **Dissolved Oxygen**. | 1 I 2 |
| Calibration standard 1 | Select the standard for the first calibration point.<br>Displayed if **Measurement type** = **Dissolved Oxygen**. | Saturated air |
| Calibration standard 2 | Defines the standard for the second calibration point. Cannot be edited.<br>Displayed if **Measurement type** = **Dissolved Oxygen** and **Calibration points** = **2**. | Zero point standard |

1 Tap the list field **Buffer group** or **Calibration standard group**.
   ➡ **Buffer / Standard group** is displayed.
2 Select a buffer or standard from the list.
3 If **Measurement type** pH or ion is selected, select a **Cal. mode**.
4 Select the number of buffers you want to use from the list **Number of buffers**.
   - or -
   Select **Automatic buffer recognition**.
5 If **Number of buffers** is selected, select specific values for **Buffer**.
   - or -
   Select **Standard**.
6 Confirm with [**OK**].

7 Tap [**Save**].
8 Immerse the sensor into the first buffer.
9 Tap [**Calibrate**].

**Note**

- The calibration settings are saved even if you log out.

**See also**

Endpoint criteria ▶ Page 110

## 7.2 Starting direct measurement

A direct measurement can be started in two ways. You can start the analysis via the **Module settings** or directly from the **Home screen** via the button [**Read**].

### 7.2.1 Starting from module settings

You can start a direct measurement from the module displayed on the **Home screen**. Before you start a direct measurement you have to set the following parameters:

- Select a sensor
- Select a temperature sensor (optional)
- Adjust the **General settings**
- Adjust the **Measurement settings**

The following section guides you through this process.

– Tap the colored tag of the relevant module displayed on the top of the **Home screen**.
➡ **Module settings** is displayed.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>A selected sensor is referenced by its name. | List of defined sensors |
| Temperature sensor | Opens the list of temperature sensors, according to the sensor settings.<br>Displayed for **pH/Ion**, **Conductivity**, and **DO/BOD** module. | - |
| General settings | All parameters concerning endpoint and temperature for direct calibration and direct measurement. | - |
| Measurement settings | All parameters concerning the measurement and the result (only for direct measurement). | - |
| Calibration settings | All parameters concerning buffers or standards (only for direct calibration). | - |

1 Tap list field **Sensor name**.
➡ **Select sensor** is displayed.
2 Select a type.
3 To use an external temperature sensor, tap list field **Temperature sensor**.
➡ **Select sensor** is displayed.
4 Select a type.

**General settings**

– Tap **General settings**.
➡ **General settings** is displayed.

| Parameter | Description | Values |
|---|---|---|
| Measurement type | Information on the measurement type. | - |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| Temperature capture | Select the temperature capture mode.<br>**Internal**: The used temperature sensor is integrated in the measurement sensor.<br>**External**: A separate temperature sensor is used.<br>**Manual**: The temperature is entered manually. | Internal I External I Manual |
| Temperature | Defines the temperature for the measurement.<br>Displayed if **Temperature capture** = **Manual** is selected. | -30…130 °C /<br>-22...266 °F |
| Barometric pressure capture | Select the **Barometric pressure capture** mode. Displayed in case of **Measurement type** = **Dissolved Oxygen** | Automatic I Manual |
| Barometric pressure | Defines the barometric (atmospheric) pressure.<br>Displayed in case of **Measurement type** = **Dissolved Oxygen** and **Barometric pressure capture** = **Manual**. | 500.0…1100.0 mbar |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |
| Print | Defines if data will be printed to the connected printer. | Active I Inactive |
| Print format | **Summary**: Covers most important data concerning date, time, user and parameters according to the settings of the measurement type. | Summary |

1 Select **Endpoint type**.

2 Select **Endpoint criteria**.

3 Select **Temperature capture**.
If **Manual** is selected, enter a value for **Temperature**.

4 If desired, activate check box **Print**.

5 Confirm with [**OK**].

### Measurement settings

– Tap **Measurement settings**.

➡ **Measurement settings** is displayed.

| Parameter | Description | Values |
|---|---|---|
| Measurement type | Information on the measurement type. | - |
| Sample ID | Defines the sample ID. | - |
| Auto sequential sample ID | Activates auto sequential sample ID. | Active I Inactive |
| Conductivity mode | Defines the mode of the method.<br>Displayed if **Measurement type** = **Conductivity** is selected. | Conductivity I TDS I Salinity I Resistivity |

| | | |
|---|---|---|
| Unit | The unit to be used for the measurement.<br>The displayed units depend on the selected measurement types. | pH I mV<br>µS/cm I mS/cm I S/m I µS/m I mS/m<br>ppm I ppt ($^0/_{00}$) I mg/L I g/L<br>psu I ppt ($^0/_{00}$)<br>MΩ.cm I Ω.cm<br>mV I Rel.mV<br>mmol/L I mol/L I ppm I % I pX I mV |
| Offset | Defines the offset [mV].<br>Displayed if **Measurement type** = **Redox** and **Unit** = **Rel.mV** is selected. | -2000…2000 mV |
| Temperature correction | Defines the relationship between conductivity, temperature and ion concentration.<br>**Linear**: Use for the temperature correction of medium and highly conductive solutions.<br>**Non-linear**: Use for natural water (only for temperature between 0…36 °C). The measured conductivity at the sample temperature is corrected to the defined reference temperature (20 °C or 25 °C).<br>**Off**: The conductivity value at the current temperature is displayed.<br>**Pure water**: An optimized type of temperature algorithm is used for **Measurement type** = **Conductivity** or **Resistivity**.<br>Displayed if **Measurement type** = **Conductivity**, **TDS** or **Resistivity** is selected. | Linear I Non-linear I Off I Pure water |
| α-coefficient | Defines the factor for the linear dependency.<br>Displayed if **Cond.mode** = **Conductivity**, **TDS** or **Resistivity** in combination with **Temperature correction** = **Linear** is selected. | 0.00…10.00 |
| Reference temperature | The conductivity reading will be directly corrected to the set reference temperature.<br>If **Measurement type** = **Conductivity** or **Resistivity** in combination with **Temperature correction** = **Pure water** is selected a reference temperature of 25 °C is automatically set.<br>Displayed if **Measurement type** = **Conductivity**, **TDS** or **Resistivity** in combination with **Temperature correction** = **Linear** is selected. | 20°C I 25°C |
| TDS factor | To calculate the TDS value, the conductivity will be multiplied with this factor.<br>Displayed if **Conductivity** = **TDS** is selected. | 0.00…10.00 |
| Decimal places | Defines the number of digits for the displayed measurement result. The displayed decimal places depend on the selected unit. | 1 I 2 I 3 I 4 |
| Interval | Activates the interval measurement.<br>The measurement data will be stored after each period specified in **Interval time**. | Active I Inactive |
| Interval time | Defines the time period between successive readings [s]. | 1…$10^6$ |
| Print after each interval | Activates printing out the result after each interval.<br>Only if method type = **Interval**. | Active I Inactive |
| Limits | Activates to define the limits for the measurement. | Active I Inactive |
| Lower limit | Defines a value for the deviation of the measured value downward. | - |
| Upper limit | Defines a value for the deviation of the measured value upward. | - |

1 Enter a sample ID.
2 If desired, activate **Auto sequential sample ID**.
3 Select a unit.
4 Select the resolution decimals to be displayed.
5 Enter measurement parameters according to your measurement type and requirements.
6 If desired:
- Activate **Interval** and enter a value for **Interval time**.
- Activate **Limits** and enter values for **Lower limit** and **Upper limit**.
7 Confirm with [**OK**].
8 To finish and store entries, tap [**Save**].
9 Immerse the sensor into the sample.
10 Tap [**Read**].

**See also**

Endpoint criteria ▸ Page 110

### 7.2.2 Starting from home screen

A measurement can also be started directly from the home screen. In this case the last saved settings of the module are used for the measurement.

**Note**

- Verify that the sensor according to the module settings is connected.

1 Activate the check box of the module.
2 Tap the colored tag of the module.
3 Immerse the sensor into the sample.
4 Tap [**Read**].

**Note**

- If stirring is enabled in the settings of one or several selected modules, the stirrer is activated and uses the lowest of all stirring speeds.

## 7.3 Starting methods/series

**Methods** and **Series** can be started in different ways.

- Start directly after creating a method or series.
- Start from the method an series list.
- Start from the **Home screen** via shortcut or direct shortcut.

### 7.3.1 Start directly after creating methods/meries

When you have created a method or series and saved all settings you can immediately start the analysis.

1 Tap [**Start**].
➡ The start analysis dialog is displayed.
2 Tap [**Start**].

### 7.3.2 Starting from methods/series list

You can start predefined and user-defined methods and series directly from the method or series lists.

1 Tap [**Methods**] or [**Series**].
➡ **Methods** or **Series list** is shown.
2 Select the method or series you want to run.
3 Tap [**Start**].

➡ **Start analysis** dialog is displayed.

4 Tap [**Start**].

### 7.3.3 Starting from shortcut/direct shortcut

You can start methods and series via shortcuts and direct shortcuts displayed on the home screen.

1 Tap the shortcut on the home screen.

➡ **Start analysis** is displayed.

2 Tap [**Start**].

**Note**

- Tapping a direct shortcut triggers an immediate start of an analysis. The on-line display is shown forthwith.

## 7.4 Interrupting analysis

Ongoing analyses can be interrupted in the on-line display via [**Terminate**]. To continue the task tap [**Cancel**].

## 7.5 Errors in the analysis sequences

Analyses may show errors. Four types of errors can be identified during an analysis sequence:

- **Error**
- **Terminate Error**
- **Critical error**
- **Failed**

### 7.5.1 Malfunction Types: Error

Malfunctions of the **Error** type are:

- Interrupting the analysis.

The malfunction **Error** triggers the following behavior:

- A message appears with information and hints on the error
- All remaining method functions will not be executed
- The processing of further tasks is interrupted
- The analysis with the status Error is listed in the analysis list.

**See also**

Results ▸ Page 114

### 7.5.2 Malfunction types: Terminate error

Malfunctions of the type **Terminate Error** are:

- Disconnected ISM® sensor
- Connecting ISM® sensor during measurement

The malfunction **Terminate Error** triggers the following response:

- An information message for the relevant error appears
- The task is terminated immediately
- The processing of further tasks is interrupted
- No results are generated

### 7.5.3 Malfunction types: Critical error

Malfunctions of the type **Critical error** are:

- Disconnected module

- Connecting the module during measurement

The malfunction **Critical error** triggers the following response:

- A message appears with information on the error
- The task is terminated immediately
- The processing of further tasks is interrupted
- The instrument is shut down automatically to prevent further damage
- No results are generated
- After the restart of the instrument a popup is shown, indicating which critical error has occurred

### 7.5.4 Malfunction types: Failed

Malfunctions of the type **Failed** are:

- Calibration analysis failed
- Method function **Sensor check** failed
- Method function **Calculation** failed

The malfunction **Failed** triggers the following response:

- A message appears with information on the error
- The task is terminated immediately
- The processing of further tasks is interrupted
- All remaining method functions will not be executed, except **Report**
- An entry is generated in **Results** with information according to the failure

# 8 Methods

**Navigation: Home > Methods**

To perform a calibration, sensor test or measurement you can create methods. Methods can also be created for interval measurements or incremental ion measurements. A method is an analysis program and consists of a sequence of method functions. Method functions encompass the type of method, its configuration, the selection of expansion units, the definition of measurement criteria desired and ultimately the creation of a report for the measurements recorded. Parameters of method functions can be defined depending on the requirements of the method.

## 8.1 Method types

SevenExcellence offers the following seven method types.

| Method type | Description |
|---|---|
| **Measurement** | This is the method type for a normal measurement. Up to three (parallel) measurement types can be defined in one method. Multiple measurements and several calculations can be defined. |
| **Calibration** | In this method type, the number of buffers or standards to perform a calibration is defined. The method function **Measure (Calibration)** repeats for the defined number of buffers/standards. The calibration data of the sensor is calculated automatically and will be transferred to the sensor setup. |
| **Interval** | This method type is very similar to method type **Measurement**. The difference is that data points during the measurement are recorded and stored in a value table or printed out during execution. |
| **Incremental** | Incremental methods are exclusively for the measurement type Ion. Only one module can be used. The method function **Measure (Incremental)** repeats for the defined number of samples/standard additions all other method functions are not repeated. The concentration of the sample is calculated automatically. |
| **Sensor Test** | This method type is related to method type **Calibration** and gives information about the condition of the sensor. The sensor calibration data is not transferred to the sensor setup, it serves only informative purposes. |
| **BOD** | Method type **BOD** (Biological Oxygen Demand) is only for the measurement type **Dissolved Oxygen**. Only one module can be used. The method function **Measure (BOD)** repeats for the defined number of bottles; all other method functions are not repeated. The BOD value of the sample is calculated automatically. The same method is used for the DO measurement before and after the incubation time. The measurement at start is called **Base**, the measurement afterwards (e.g. 5 days for BOD5) is called **Follow**. With one **Base** measurement several measurements of type **Follow** can be done (e.g. after 5 days and after 10 days). |
| **BCV** | Method type BCV (**BOD Check Values**) is only for the measurement type Dissolved Oxygen. Only one module can be used. The method functions **Measure (Blank)**, **Measure (Seeded blank)** and **Measure (Standard)** are repeated for the defined number of bottles in method types **Blank (BOD)**, **Seeded blank (BOD)** and **Standard (BOD)**; all other method functions are not repeated. A BCV method determines the BOD of different solutions needed for measurement correction or validation of the application. Every BCV method supports a BOD method; without relation to a BOD method it is useless. At BOD method start the relation between BCV and BOD method is built.<br>The same BCV method is used for the DO measurement before and after the incubation time of the check solutions. The measurement at start is called **Base**, the measurement afterwards (e.g. 5 days for BOD5) is called **Follow**. With one **Base** measurement several measurements of type **Follow** can be done (e.g. after 5 days and after 10 days). It is needed to run the BCV method always before running the related BOD method. |

## 8.2 METTLER TOLEDO methods

**Navigation: Home > Methods**

A wide range of standard calibration and measurement methods, used in daily laboratory practice, are covered by predefined METTLER TOLEDO methods. This way the instrument allows the immediate use of methods to carry out calibrations and measurements or to create a series in combination with a METTLER TOLEDO method.

**Predefined METTLER TOLEDO methods**

The following METTLER TOLEDO methods for different applications are available:

| Method | Used for |
|---|---|
| **M001** | pH calibration with METTLER TOLEDO Europe buffer group |
| **M001-US** | pH calibration with METTLER TOLEDO USA buffer group |
| **M002** | conductivity calibration |
| **M003** | ion calibration |
| **M004** | pH measurement |
| **M005** | pH measurement of pure water according to USP/EP/Ch.P. |
| **M006** | conductivity measurement |
| **M007** | conductivity measurement with α-coefficient determination |
| **M008** | USP645 Bulk Water Stage 1 |
| **M011** | conductivity of bioethanol |
| **M012** | Rel.mV measurement with offset determination |
| **M013** | incremental measurement with single standard addition |
| **M014** | incremental measurement with multiple standard additions |
| **M015** | incremental measurement with single sample addition |
| **M016** | interval pH measurement |
| **M017** | sensor test of pH sensor |
| **M018** | DO calibration |
| **M019** | DO measurement |
| **M020** | biochemical oxygen demand (BOD) analysis |
| **M021** | BOD check values (BCV) analysis |
| **M027** | pH Calibration in pH 4.01 and 7.00 |
| **M028** | USP645 sterile water analysis for <10 mL volume |
| **M029** | USP645 sterile water analysis for >10 mL volume |
| **M030** | USP645 bulk water stage 2 |
| **M031** | USP645 bulk water stage 3 |
| **M032** | advanced sensor test for pH sensor |
| **M033** | pH calibration verification in pH 4.01, 7.00, and 9.21 |
| **M034** | conductivity calibration verification in 84 µS/cm |
| **M035** | Purified Water EP/ChP |
| **M036** | Water Injection EP/ChP Stage 1 |
| **M037** | Water Injection EP/ChP Stage 2 |
| **M038** | Water Injection EP/ChP Stage 3 |

## 8.3 Creating methods

Various ways of generating a method are available to you in the instrument. Either you create a new method by changing the parameters of a delivered METTLER TOLEDO method and saving it under a new method ID or you select an appropriate method template from the list of proposals, modify it and save it under a new method ID. Lastly, you can also create a method by copying and saving an existing method.

A maximum number of 50 user-defined methods can be stored.

### 8.3.1 Copying an existing method

**Navigation: Home > Methods**

The easiest way to create a new method, is copying an existing method by changing the method ID.

1 Select a method with the parameters that are nearest to the calibration or measurement you wish to carry out.
   ➡ The method ID of the method is displayed.
2 Tap [**Title**].
3 Enter a new ID in **Method ID** and confirm with [**OK**].
4 Tap [**OK**] to accept the entries.
   ➡ A message box appears with the information that the new method has been created as copy of the preselected method.
5 Confirm the message box with [**OK**].
6 Adapt the method according to your requirements, e.g. insert additional method functions and adjust method parameters.
7 Tap [**Save**] to save your entries.

➡ The new method has been saved.

### 8.3.2 Creating methods based on templates

Using method templates is another way to create a method. The parameters can be modified according to your requirements.

**Navigation: Home > Methods**

| Type | ID | Title | Description |
|---|---|---|---|
| MS | T0001 | **Measure** | Method type for normal measurements. |
| CAL | T0002 | **Calibration** | Method type for calibrating sensors. |
| INT | T0003 | **Interval** | Method type that record data points during the measurements. |
| INC | T0004 | **Incremental** | Incremental methods for the measurement type Ion. |
| ST | T0005 | **Sensor Test** | Method type that provide information about the condition of sensors. |
| BOD | T0007 | **BOD** | Method type for the measurement type Dissolved Oxygen. |
| BCV | T0006 | **BOD Check Values** | BCV methods determine the BOD of different solutions needed for measurement correction or validation of applications. |

1 In **Methods**, tap [**New**] and select a template from the list.
   ➡ The method function **Configuration** of the new method is displayed.
2 Define the measurement type(s) and tap [**OK**] to proceed.
   **Note**: Once confirmed, the measurement type(s) cannot be modified anymore.
3 Adapt the method according to your needs, e.g. insert additional method functions and adjust method parameters.
4 To finish and store the method tap [**Save**].

➡ The new method has been saved.

**See also**


- Editing methods ▸ Page 62
- Method functions ▸ Page 71


## 8.4 Creating shortcuts for methods

**Navigation: Home > Methods**

Shortcuts can be placed on the **Home screen** and constitute links to executable methods. Shortcuts can be created from the **Start analysis** screen using the **AddToHome** button. The administration of shortcuts takes place in the setup of the instrument. This chapter describes how you can create shortcuts to start a method from the **Home screen**.

1. Select a method from the list.
   ➡ The name of the method is displayed with all parameters.
2. Tap [**Start**].
   ➡ **Start analysis** is displayed.
3. Tap [**AddToHome**].
   ➡ **Shortcut parameters** is displayed.
4. Enter a meaningful text in **Description** that will be displayed in the shortcut.
5. Select **Immediate start**, to create a direct shortcut.
6. Tap the list field **Homescreen position**.
   ➡ **Select location for shortcut** is displayed.
7. Select a free position.
8. Tap [**Save**] to save your entries.

➡ The shortcut is displayed on the selected position of the home screen.

**Note**

- With direct shortcuts a series can be started immediately. Shortcuts lead to the **Start analysis** screen from where you can start the serial analysis.

**See also**


- Shortcuts ▸ Page 35


## 8.5 Editing methods

**Navigation: Home > Methods**

1. Select the method to be modified.
2. Select and edit the parameters to be modified.
3. Adapt the method according to your requirements, e.g. insert additional method functions and adjust method parameters.
4. Tap [**Save**] to save your entries.

➡ The modified method has been saved.

**Note**

- Predefined METTLER TOLEDO methods cannot be modified. Changing the method ID will create a method copy, which can be modified according to your requirements.

The following tables show the predefined method functions and the method functions that can be added per method type.

**Measure**

| Predefined Method Functions | Additional Method Functions |
|---|---|
| **Title** | |
| | < **Instruction** |
| **Configuration** | |
| | < **Instruction** |
| **Sample** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Sample verification**<br>< **Sensor check**<br>< **Measure (Temperature)**<br>< **Auxiliary instrument** |
| **Measure** | |
| | < **Instruction**<br>< **Measure**<br>< **Calculation**<br>< **Wait/Stir**<br>< **Measure (Temperature)**<br>< **Auxiliary instrument** |
| **Report** | |
| | < **Instruction**<br>< **Measure**<br>< **Calculation**<br>< **Wait/Stir**<br>< **Measure (Temperature)**<br>< **Auxiliary instrument** |

**Calibration**

| Predefined Method Functions | Additional Method Functions |
|---|---|
| **Title** | |
| | < **Instruction** |
| **Configuration** | |
| | < **Instruction** |
| **Sample (Calibration)** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Auxiliary instrument** |
| **Measure (Calibration)** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Calibration analysis**<br>< **Auxiliary instrument** |
| **Report** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Calibration analysis**<br>< **Auxiliary instrument** |

**Interval**

| Predefined Method Functions | Additional Method Functions |
|---|---|
| **Title** | |
| | **< Instruction** |
| **Configuration** | |
| | **< Instruction** |
| **Sample** | |
| | **< Instruction**<br>**< Wait/Stir**<br>**< Sample verification**<br>**< Sensor check**<br>**< Measure (Temperature)**<br>**< Auxiliary instrument** |
| **Measure (Interval)** | |
| | **< Instruction**<br>**< Measure (Interval)**<br>**< Calculation**<br>**< Wait/Stir**<br>**< Measure (Temperature)**<br>**< Auxiliary instrument** |
| **Report** | |
| | **< Instruction**<br>**< Measure (Interval)**<br>**< Calculation**<br>**< Wait/Stir**<br>**< Measure (Temperature)**<br>**< Auxiliary instrument** |

**Incremental**

| Predefined Method Functions | Additional Method Functions |
|---|---|
| **Title** | |
| | < **Instruction** |
| **Configuration** | |
| | < **Instruction** |
| **Sample (Incremental)** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Sample verification**<br>< **Sensor check**<br>< **Measure (Temperature)**<br>< **Auxiliary instrument** |
| **Measure (Incremental)** | |
| | < **Instruction**<br>< **Calculation**<br>< **Wait/Stir**<br>< **Measure (Temperature)**<br>< **Auxiliary instrument** |
| **Report** | |
| | < **Instruction**<br>< **Calculation**<br>< **Wait/Stir**<br>< **Measure (Temperature)**<br>< **Auxiliary instrument** |

**Sensor Test**

| Predefined Method Functions | Additional Method Functions |
|---|---|
| **Title** | |
| | < **Instruction** |
| **Configuration** | |
| | < **Instruction** |
| **Sample (Sensor test)** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Auxiliary instrument** |
| **Measure (Sensor test)** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Auxiliary instrument** |
| **Sensor evaluation** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Auxiliary instrument** |
| **Report** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Auxiliary instrument** |

**BOD**

| Predefined Method Functions | Additional Method Functions |
|---|---|
| **Title** | |
| | < **Instruction** |
| **Configuration** | |
| | < **Instruction** |
| **Sample (BOD)** | |
| | < **Instruction**<br>< **Wait/Stir**<br>< **Sensor check**<br>< **Auxiliary instrument** |
| **Measure (BOD)** | |
| | < **Instruction**<br>< **Analysis (BOD)**<br>< **Calculation**<br>< **Wait/Stir**<br>< **Auxiliary instrument** |
| **Report** | |
| | < **Instruction**<br>< **Analysis (BOD)**<br>< **Calculation**<br>< **Wait/Stir**<br>< **Auxiliary instrument** |

**BCV**

| Predefined Method Functions | Additional Method Functions |
|---|---|
| **Title** | |
| | **Instruction** |
| **Configuration** | |
| | **Instruction** |
| **Blank (BOD)** | |
| | **< Instruction**<br>**< Wait/Stir**<br>**< Sensor check**<br>**< Auxiliary instrument** |
| **Measure (Blank)** | |
| | **< Instruction**<br>**< Analysis (Blank)**<br>**< Calculation**<br>**< Wait/Stir**<br>**< Auxiliary instrument** |
| **Seeded blank (BOD)** | |
| | **< Instruction**<br>**< Wait/Stir**<br>**< Sensor check**<br>**< Auxiliary instrument** |
| **Measure (Seeded blank)** | |
| | **< Instruction**<br>**< Analysis (Seeded blank)**<br>**< Calculation**<br>**< Wait/Stir**<br>**< Auxiliary instrument** |
| **Standard (BOD)** | |
| | **< Instruction**<br>**< Wait/Stir**<br>**< Sensor check**<br>**< Auxiliary instrument** |
| **Measure (Standard)** | |
| | **< Instruction**<br>**< Analysis (BOD)**<br>**< Calculation**<br>**< Wait/Stir**<br>**< Auxiliary instrument** |
| **Report** | |

## 8.6 Deleting methods

**Navigation: Home > Methods**

1 Select the method you want to delete.

2 Tap [**Delete method**].

➡ A message box appears with the information that references to the method will also be deleted.

3 Tap [**Delete**].

➡ The method has been deleted.

**Note**

- METTLER TOLEDO methods cannot be deleted.
- Referred shortcuts and sample series will also be deleted.

## 8.7 Method functions

### 8.7.1 Overview

Up to three measurement types can be defined in one method of the type measurement. The method functions will run sequentially from top to bottom. You can select the following functions to carry out the method. The total number of method functions is limited to 100.

| Method function | Details | Used in method types | Maximum occurrences per method |
|---|---|---|---|
| **Title** | Method name, ID, author and SOP text | All | 1 |
| **Configuration** | Measurement types, sensors, temperature capture, barometric pressure capture, basic settings for BOD | All | 1 |
| **Sample** | Sample ID and other sample behaviors | MS, INT | 1 |
| **Sample (Calibration)** | Calibration standards, calibration mode | CAL | 1 |
| **Sample (Incremental)** | Type of incremental analysis, volume and concentration of added solutions | INC | 1 |
| **Sample (Sensor test)** | Calibration standards, drift test | ST | 1 |
| **Blank (BOD)** | BOD bottles used for blank value determination | BCV | 1 |
| **Seeded blank (BOD)** | BOD bottles used for seeded blank value determination | BCV | 1 |
| **Standard (BOD)** | BOD bottles used for standard value determination | BCV | 1 |
| **Sample (BOD)** | BOD bottles used for BOD measurement | BOD | 1 |
| **Sample verification** | Request to confirm of sample ID | MS, INT, INC | 1 |
| **Sensor check** | Check of calibration values, calibration date and calibration range of used sensor | MS, INT, INC, BCV, BOD | 1 |
| **Measure** | Measurement parameters like unit, resolution, endpoint type, stirring | MS | 6 |
| **Measure (Calibration)** | Measurement parameters like endpoint type and stirring | CAL | 1 |
| **Measure (Interval)** | Measurement parameters like unit, resolution, endpoint type, stirring | INT | 6 |
| **Measure (Temperature)** | Measurement parameters like temperature source, unit, resolution, endpoint type, stirring | MS, INT, INC | 6 |
| **Measure (Incremental)** | Measurement parameters like unit, resolution, endpoint type, stirring | INC | 1 |
| **Measure (Sensor test)** | Measurement parameters like endpoint type and stirring | ST | 1 |
| **Measure (Blank)** | Measurement parameters like unit, resolution, endpoint type, stirring for blank value | BCV | 1 |
| **Measure (Seeded blank)** | Measurement parameters like unit, resolution, endpoint type, stirring for seeded blank value | BCV | 1 |
| **Measure (Standard)** | Measurement parameters like unit, resolution, endpoint type, stirring for standard value | BCV | 1 |
| **Measure (BOD)** | Measurement parameters like unit, resolution, endpoint type, stirring | BOD | 1 |
| **Calibration analysis** | Check of calibration results like slope, offset or cell constant | CAL | 1 |

| Method function | Details | Used in method types | Maximum occurrences per method |
|---|---|---|---|
| **Sensor evaluation** | Check of sensor test results like slope, offset or drift | ST | 1 |
| **Analysis (Blank)** | Check for blank value results | BCV | 1 |
| **Analysis (Seeded blank)** | Check for seeded blank value results | BCV | 1 |
| **Analysis (Standard)** | Check for standard value results | BCV | 1 |
| **Analysis (BOD)** | Check for BOD results | BOD | 1 |
| **Instruction** | Message in a pop-up window | All | no limit |
| **Wait/Stir** | Waiting time or stirring duration | All | no limit |
| **Calculation** | Name, unit, formula und resolution to calculate a result | MS, INT, INC, BCV, BOD | 20 |
| **Report** | Content of the report | All | 1 |
| **Auxiliary instrument** | Sends data to or gets data from an auxiliary instrument | All | 20 |

### 8.7.2 Title

This method function describes the contents and context of the method.

| Parameter | Description | Values |
|---|---|---|
| Method type | Information on type of measurement. | Measurement I Calibration I Interval I Incremental I Sensor Test I BCV I BOD |
| Method ID | The method is uniquely identified in the system via the method ID. Once the method has been saved, the method ID cannot be changed. A change of the method ID results in the creation of a copy of the method. METTLER TOLEDO methods begin with "M" followed by numbers (M is reserved for METTLER TOLEDO methods). | - |
| Title | Defines the name of the method. | - |
| Author | Information on the author (logged in user) of this method. | - |
| Created on | Information on the date of creation. | - |
| Modified on | Information on the date of modification. | - |
| Modified by | Information on the author (logged in user) of modification. | - |
| Protect | Protects the method against deletion or modification by other users than the author (logged in user) or administrator. | Active I Inactive |
| SOP | Activates a text to be displayed before the start of the analysis. | Active I Inactive |
| SOP text | Defines the SOP text.<br>Displayed if check box **SOP** is activated. | - |
| Method type | Information on type of measurement. | Measurement I Calibration I Interval I Incremental I Sensor Test I BCV I BOD |

### 8.7.3 Configuration

This method function defines the sensors to be used, how to capture temperature and barometric pressure, and basic parameters for BOD analysis.

### Method types Measurement, Calibration, Interval, Incremental, Sensor Test

| Parameter | Description | Values |
|---|---|---|
| Measurement type 1 | Information on the measurement type 1. | pH I Ion I Conductivity I Dissolved Oxygen I Redox |
| Sensor name | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>A selected sensor is referenced by its name. | List of defined sensors |
| Check value ID | Defines the ID for all check values. | - |
| Temperature capture | Select the temperature capture mode.<br>**Internal**: The used temperature sensor is integrated in the measurement sensor.<br>**External**: A separate temperature sensor is used.<br>**Manual**: The temperature is entered manually. | Internal I External I Manual |
| Barometric pressure capture | Select the barometric pressure capture mode. Displayed in case of **Measurement type 1** = **Dissolved Oxygen** | Automatic I Manual |
| Temperature sensor | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>Displayed if **Temperature capture** = **External** is selected. | List of defined sensors |
| Measurement type 2 | Information on measurement type 2.<br>Displayed if **Measurement type 2** is defined. | pH I Ion I Conductivity I Dissolved Oxygen I Redox |
| Sensor name | Opens the sensor list, according to the sensor settings.<br>Displayed if **Measurement type 2** is selected. | - |
| Temperature capture | Different kinds of temperature captures can be selected.<br>Displayed if **Measurement type 2** is selected. | Internal I External I Manual |
| Barometric pressure capture | Select the barometric pressure capture mode. Displayed if **Measurement type 2** = **Dissolved Oxygen** | Automatic I Manual |
| Temperature sensor | Opens the list of temperature sensors, according to the sensor settings.<br>Displayed if **Measurement type 2** is selected in combination with **Temperature capture** = **External**. | List of defined sensors |
| Measurement type 3 | Information on measurement type 3.<br>Displayed if **Measurement type 3** is defined. | pH I Ion I Conductivity I Dissolved Oxygen I Redox |
| Sensor name | Opens the sensor list, according to the sensor settings.<br>Displayed if **Measurement type 3** is selected. | List of defined sensors |
| Temperature capture | Different kinds of temperature captures can be selected.<br>Displayed if **Measurement type 3** is selected. | Internal I External I Manual |
| Barometric pressure capture | Select the barometric pressure capture mode. Displayed if **Measurement type 3** = **Dissolved Oxygen** | Automatic I Manual |
| Temperature sensor | Opens the list of temperature sensors, according to the sensor settings.<br>Displayed if **Measurement type 3** is selected in combination with **Temperature capture** = **External**. | List of defined sensors |
| Shared temperature value | If parallel measurements have been defined, one temperature sensor can be used for all measurements. | Active I Inactive |

| | | |
|---|---|---|
| Used temperature | Select the channel to be used for temperature capture.<br>Displayed if **Shared temperature value** is activated. | Measurement type 1 l Measurement type 2 l Measurement type 3 |

### Method type BCV

| Parameter | Description | Values |
|---|---|---|
| Measurement type | Define the measurement type. | Dissolved Oxygen |
| Sensor name | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>A selected sensor is referenced by its name. | List of defined sensors |
| Check value ID | Defines the ID for all check values. | - |
| Blank | Activates the measurement of a blank value, which is the BOD in the dilution water including inorganic nutrients. | Active l Inactive |
| Seeded blank | Acitvates the measurement of a seeded blank value, which is the BOD of a solution including all ingredients except the sample. | Active l Inactive |
| Standard | Activates the measurement of a standard value, which is the BOD of a solution with a well-defined BOD value (typically 2% glucose glutamine acid). | Active l Inactive |
| Salinity correction | Activates salinity corrections of several solutions. The reading of dissolved oxygen in the samples is corrected in regards of the entered **Salinity of dilution water**, **Enter salinity of seed solution** and **Enter salinity of standard solution**. | Active l Inactive |
| Salinity of dilution water | Defines the salinity of the water used to dilute the samples.<br>Displayed if check box **Salinity correction** is activated and any of the check boxes **Blank**, **Seeded blank** or **Standard** is activated. | 0.0…70.0 ppt |
| Enter salinity of seed solution | Defines the salinity of the seed solution which is added to either the dilution water or the BOD bottle.<br>Displayed if check box **Salinity correction** is activated and check box **Seeded blank** or **Standard** is activated. | 0.0…70.0 ppt |
| Enter salinity of standard solution | Defines the salinity of the standard stock solution used to prepare the standards.<br>Displayed if check boxes **Salinity correction** and **Standard** are activated. | 0.0…70.0 ppt |
| Seed added | Defines to whether the seed is added to the bottle directly or to the dilution water first.<br>If this selection is changed, all set volumes for sample, seed, and dilution water are reset to default values. | To bottle l To dilution water |
| Seed dilution factor | Ratio of seed solution to dilution water.<br>Displayed if **Seed added** = **To dilution water** is selected. | 1.0…999.9 |
| Blank correction | Activates the blank correction for BOD measurements. When activated, the BOD of dilution water including the inorganic nutrients used to dilute the samples is determined to check the presence of oxidizable compounds in the dilution water. The result will be subtracted from the BOD of the sample. | Active l Inactive |
| Bottle volume | Defines the volume of used BOD bottle.<br>If this value is changed, all set volumes for sample, seed, and dilution water are adapted proportionally. | 10.0 - 1000.0 mL |

| | | |
|---|---|---|
| Temperature capture | Select the temperature capture mode.<br>**Internal**: The used temperature sensor is integrated in the measurement sensor.<br>**External**: A separate temperature sensor is used.<br>**Manual**: The temperature is entered manually. | Internal I External I Manual |
| Temperature sensor | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>Displayed if **Temperature capture** = **External** is selected. | List of defined sensors |
| Barometric pressure capture | Select the barometric pressure capture mode. | Automatic I Manual |

### Method type BOD

| Parameter | Description | Values |
|---|---|---|
| Measurement type | Define the measurement type. | Dissolved Oxygen |
| Sensor name | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>A selected sensor is referenced by its name. | List of defined sensors |
| Salinity correction | Activates salinity corrections of several solutions. The reading of dissolved oxygen in the samples is corrected in regards of the entered **Salinity of dilution water**, **Enter salinity of seed solution** and **Enter salinity of standard solution**. | Active I Inactive |
| Enter salinity of seed solution | Defines the salinity of the seed solution which is added to either the dilution water or the BOD bottle.<br>Displayed if check box **Salinity correction** is activated and check box **Seeded blank** or **Standard** is activated. | 0.0…70.0 ppt |
| Salinity of dilution water | Defines the salinity of the water used to dilute the samples.<br>Displayed if check box **Salinity correction** is activated and any of the check boxes **Blank**, **Seeded blank** or **Standard** is activated. | 0.0…70.0 ppt |
| Salinity of undiluted sample | Defines the salinity of the sample before addition of seed or dilution water.<br>Displayed if check box **Salinity correction** is activated. | 0.0…70.0 ppt |
| Seed added | Defines to whether the seed is added to the bottle directly or to the dilution water first.<br>If this selection is changed, all set volumes for sample, seed, and dilution water are reset to default values. | To bottle I To dilution water |
| Seed dilution factor | Ratio of seed solution to dilution water.<br>Displayed if **Seed added** = **To dilution water** is selected. | 1.0…999.9 |
| Blank correction | Activates the blank correction for BOD measurements. When activated, the BOD of dilution water including the inorganic nutrients used to dilute the samples is determined to check the presence of oxidizable compounds in the dilution water. The result will be subtracted from the BOD of the sample. | Active I Inactive |
| Bottle volume | Defines the volume of used BOD bottle.<br>If this value is changed, all set volumes for sample, seed, and dilution water are adapted proportionally. | 10.0 - 1000.0 mL |

| | | |
|---|---|---|
| Temperature capture | Select the temperature capture mode.<br>**Internal**: The used temperature sensor is integrated in the measurement sensor.<br>**External**: A separate temperature sensor is used.<br>**Manual**: The temperature is entered manually. | Internal I External I Manual |
| Temperature sensor | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>Displayed if **Temperature capture** = **External** is selected. | List of defined sensors |
| Barometric pressure capture | Select the barometric pressure capture mode. | Automatic I Manual |

### 8.7.4 Sample

In this method function you can enter the sample ID and an optional comment that will be displayed in the Start analysis screen.

| Parameter | Description | Values |
|---|---|---|
| Sample ID | Defines the sample ID. | - |
| Temperature | Defines the temperature for the measurement.<br>Displayed if **Temperature capture** = **Manual** is selected. | -30…130 °C /<br>-22...266 °F |
| Salinity correction factor | Defines the sample's salinity. The oxygen concentration depends on temperature and salinity of the sample.<br>Displayed if **Measurement type** = **Dissolved Oxygen**. | - |
| Barometric pressure | Defines the barometric (atmospheric) pressure.<br>Displayed if **Measurement type** = **Dissolved Oxygen** and **Barometric pressure capture** = **Manual** | 500.0…1100.0 mbar |
| Comment | Defines a short comment that will be displayed. | - |

### 8.7.5 Sample (Calibration)

In this method function buffer sets and standard groups and calibration modes can be defined.

| Parameter | Description | Values |
|---|---|---|
| Measurement type | Information on the measurement type. | - |
| Sensor name | Information on the sensor name selected for the method. | - |
| Buffer group | Select a buffer group from the list of predefined and user-defined buffer groups.<br>Displayed if **Measurement type** = **pH**. | - |
| Calibration standard group | Opens the list of predefined and user-defined standard groups.<br>Displayed if **Measurement type** = **Ion** or **Conductivity**. | - |
| Unit | Information on the preselected unit.<br>Displayed if **Measurement type** = **Ion** | - |
| Cal. mode | Specifies whether calibration data will be approximated with one straight line segment or left as a series of segments.<br>Displayed if **Measurement type** = **pH** or **Ion**. | Linear I Segmented |
| Number of buffers | Defines the number of buffers for the calibration.<br>Displayed if **Measurement type** = **pH**. | 1 I 2 I 3 I 4 I 5 |
| Automatic buffer recognition | Activates the automatic recognition of buffers. Only available for predefined pH buffer groups.<br>Displayed if **Measurement type** = **pH**. | Active I Inactive |

| | | |
|---|---|---|
| Buffer 1 - Buffer 5 | The number of fields depends on the number of defined buffers. Up to 5 buffers are displayed with consecutive numbers. Select a buffer for each calibration point from the list.<br>Displayed if **Measurement type** = **pH** and **Automatic buffer recognition** is not activated. | - |
| Number of standards | Defines the number of standards for the calibration (up to 5 for ion sensors, up to 2 for conductivity sensors).<br>Displayed if **Measurement type** = **Ion** or **Conductivity**. | 1 I 2 I 3 I 4 I 5 |
| Standard 1 - Standard 5 | Number of fields depends on the number of defined standards. Up to 5 standards for ion sensors and up to 2 standards for conductivity sensors are displayed with consecutive numbers. Each field opens the list of preselected standard groups.<br>Displayed if **Measurement type** = **Ion** or **Conductivity**. | - |
| Calibration points | Option to choose between different number of calibration points.<br>Displayed if **Measurement type** = **Dissolved Oxygen**. | 1 I 2 |
| Calibration standard 1 | Select the standard for the first calibration point.<br>Displayed if **Measurement type** = **Dissolved Oxygen**. | Saturated air |
| Calibration standard 2 | Defines the standard for the second calibration point. Cannot be edited.<br>Displayed if **Measurement type** = **Dissolved Oxygen** and **Calibration points** = **2**. | Zero point standard |
| Barometric pressure | Defines the barometric (atmospheric) pressure.<br>Displayed if **Barometric pressure capture** = **Manual** is selected. | 500.0…1100.0 mbar I 500…1100 hPa I 375…825 mmHg I 0.493…1.086 atm |
| Temperature | Defines the temperature for the measurement.<br>Displayed if **Temperature capture** = **Manual** is selected. | -30…130 °C / -22...266 °F |
| Comment | Defines a short comment that will be displayed. | - |

### 8.7.6 Sample (Incremental)

In this method function you can define the basic parameters to perform a concentration determination. You can select the type of incremental measurement, enter the sample parameters and the concentration of the standard, the number of standard additions and the added volume.

| Parameter | Description | Values |
|---|---|---|
| Sample ID | Defines the sample ID. | - |
| Measurement type | Information on the measurement type**.** | Ion |
| Incremental type | Select the incremental type. | Standard addition I Standard subtraction I Sample addition I Sample subtraction |
| Sample volume | Defines the volume of the sample (mol is set).<br>Displayed if **Incremental type** = **Standard addition** or **Standard subtraction** is selected. | - |
| Standard volume | Defines the volume of the standard (unit mL is set).<br>Displayed if **Incremental type** = **Sample addition** or **Sample subtraction** is selected. | - |
| Standard unit | Defines the unit of the ion standard to be used. | mmol/L I mol/L Img/L I ppm I % I pX |
| Standard concentration | Defines the concentration of the added sample. | - |

| | | |
|---|---|---|
| Ion ratio | Defines the ion ratio of the precipitated salts.<br>Displayed if **Incremental type** = **Standard subtraction** or **Sample subtraction** is selected. | - |
| Number of standard additions | Defines the number of additions.<br>Displayed if **Incremental type** = **Standard addition** is selected. | 1 I 2 I 3 I 4 I 5 |
| Added volume per addition | Defines the value for the volume to be added (unit mL is set). | 0.010…1000 mL |
| Used slope | Defines the kind of slope to be detected. | From calibration I Theoretical I Enter known slope |
| Enter known slope | Defines the value of the known slope to be used (mV/pX is set).<br>Displayed if **Used slope Enter known slope** is selected. | - |
| Comment | Defines a short comment that will be displayed. | - |
| Temperature | Defines the temperature for the measurement.<br>Displayed if **Temperature capture** = **Manual** is selected. | -30…130 °C / -22...266 °F |

### 8.7.7 Sample (Sensor test)

This method function gives an overview of the conditions used for the sensor test such as buffer sets and standard groups and drift.

| Parameter | Description | Values |
|---|---|---|
| Measurement type | Information on the measurement type. | pH |
| Sensor name | Select a sensor from the list of defined sensors, if the method always runs with the same sensor. If not selected, you can choose any suitable sensor when you start the method.<br>A selected sensor is referenced by its name. | List of defined sensors |
| Buffer group | Select a buffer group from the list of predefined and user-defined buffer groups. | - |
| Calibration | Activates using sensor test in context with calibration. | Active I Inactive |
| Cal. mode | Specifies whether calibration data will be approximated with one straight line segment or left as a series of segments. | Linear I Segmented |
| Number of buffers | Defines the number of buffers for the calibration. | 1 I 2 I 3 I 4 I 5 |
| Automatic buffer recognition | Activates the automatic recognition of buffers. Only available for predefined pH buffer groups. | Active I Inactive |
| Buffer 1 - Buffer 5 | The number of fields depends on the number of defined buffers. Up to 5 buffers are displayed with consecutive numbers. Select a buffer for each calibration point from the list of predefined and user defined buffer groups.<br>Displayed if **Automatic buffer recognition** is not activated. | - |
| Temperature | Defines the temperature for the measurement.<br>Displayed if **Temperature capture** = **Manual** is selected. | -30…130 °C / -22...266 °F |
| Drift test | Activate to start a drift test. | Active I Inactive |
| Test measurements | Activates test measurements. | Active I Inactive |
| No. of test measurements | Defines the number of measurements.<br>Displayed if **Test measurements** is activated. | 1 I 2 I 3 I 4 I 5 |

| | | |
|---|---|---|
| Test buffer 1 - Test buffer 5 | Number of fields depends on the number of defined buffers. Up to 5 test buffers are displayed with consecutive numbers. Each field opens the list of predefined and user-defined buffer groups. Displayed if **Test measurements** is activated. | - |
| Comment | Defines a short comment that will be displayed. | - |

### 8.7.8 Blank (BOD)

In this method function you can define the basic parameters to perform a BOD determination of a blank solution (dilution water including inorganic nutrients). You can define a comment and the number of bottles. In the bottle list you can enter the bottle ID and a comment.

| Parameter | Description | Values |
|---|---|---|
| Blank ID | Information of the Blank ID entered in method function Configuration. | - |
| Comment | Defines a short comment that will be displayed. | - |
| Sample type | Information on the sample type. | Blank |
| Same bottles used for base and follow | Activates that DO is measured before (**Base**) and after (**Follow**) incubation time in the same bottles. | Active I Inactive |
| Number of bottles (base) | Defines the number of bottles of this sample ID for base measurement (before incubation). | 1…10 |
| Number of bottles (follow) | Defines the number of bottles of this sample ID for follow measurement (after incubation).<br>Displayed if check box **Same bottles used for base and follow** is de-activated. | 1…10 |
| Temperature | Defines the sample temperature.<br>Displayed if **Temperature capture** = **Manual** is selected in method function **Configuration**. | 0...60 °C / 32...140 °F |
| Barometric pressure | Defines the barometric (atmospheric) pressure.<br>Displayed if **Barometric pressure capture** = **Manual** is selected. | 500.0…1100.0 mbar I 500…1100 hPa I 375…825 mmHg I 0.493…1.086 atm |

**Bottle settings**

| Parameter | Description | Values |
|---|---|---|
| Blank ID | Information of the Blank ID entered in method function Configuration. | - |
| Bottle ID | Defines the bottle ID. | - |
| Comment | Defines a short comment that will be displayed. | - |
| Seed volume | Defines the seed volume in the bottle, which equals always 0 mL. | - |
| Dilution volume | Information on the dilution volume in the bottle. Value is calculated from other volumes above. | - |

### 8.7.9 Seeded blank (BOD)

In this method function you can define the basic parameters to perform a BOD determination of a seeded blank solution (dilution water including all ingredients except the sample). You can define a comment and the number of bottles. In the bottle list you can enter the bottle ID and a comment.

| Parameter | Description | Values |
|---|---|---|
| Blank ID | Information of the Blank ID entered in method function Configuration. | - |

| | | |
|---|---|---|
| Comment | Defines a short comment that will be displayed. | - |
| Sample type | Information on the sample type. | Blank |
| Same bottles used for base and follow | Activates that DO is measured before (**Base**) and after (**Follow**) incubation time in the same bottles. | Active l Inactive |
| Number of bottles (base) | Defines the number of bottles of this sample ID for base measurement (before incubation). | 1…10 |
| Number of bottles (follow) | Defines the number of bottles of this sample ID for follow measurement (after incubation).<br>Displayed if check box **Same bottles used for base and follow** is de-activated. | 1…10 |
| Temperature | Defines the sample temperature.<br>Displayed if **Temperature capture** = **Manual** is selected in method function **Configuration**. | 0...60 °C / 32...140 °F |
| Barometric pressure | Defines the barometric (atmospheric) pressure.<br>Displayed if **Barometric pressure capture** = **Manual** is selected. | 500.0…1100.0 mbar l 500…1100 hPa l 375…825 mmHg l 0.493…1.086 atm |

**Bottle settings**

| Parameter | Description | Values |
|---|---|---|
| Seeded blank ID | Information on given seeded blank ID. | - |
| Bottle ID | Defines the bottle ID. | - |
| Comment | Defines a short comment that will be displayed. | - |
| Seed volume | Defines the seed volume in the bottle.<br>The seed volume equals the bottle volume if **Seed added** = **To dilution water** in **Configuration** method function. | - |
| Dilution volume | Information on the dilution volume in the bottle. Value is calculated from other volumes above. | - |

### 8.7.10 Standard (BOD)

In this method function you can define the basic parameters to perform a BOD determination of a seeded blank solution (dilution water including all ingredients except the sample). You can define a comment and the number of bottles. In the bottle list you can enter the bottle ID and a comment.

| Parameter | Description | Values |
|---|---|---|
| Blank ID | Information of the Blank ID entered in method function Configuration. | - |
| Comment | Defines a short comment that will be displayed. | - |
| Sample type | Information on the sample type. | Blank |
| Same bottles used for base and follow | Activates that DO is measured before (**Base**) and after (**Follow**) incubation time in the same bottles. | Active l Inactive |
| Number of bottles (base) | Defines the number of bottles of this sample ID for base measurement (before incubation). | 1…10 |
| Number of bottles (follow) | Defines the number of bottles of this sample ID for follow measurement (after incubation).<br>Displayed if check box **Same bottles used for base and follow** is de-activated. | 1…10 |

| | | |
|---|---|---|
| Temperature | Defines the sample temperature.<br>Displayed if **Temperature capture** = **Manual** is selected in method function **Configuration**. | 0...60 °C / 32...140 °F |
| Barometric pressure | Defines the barometric (atmospheric) pressure.<br>Displayed if **Barometric pressure capture** = **Manual** is selected. | 500.0…1100.0 mbar l 500…1100 hPa l 375…825 mmHg l 0.493…1.086 atm |

**Bottle settings**

| Parameter | Description | Values |
|---|---|---|
| Standard ID | Information on given standard ID. | - |
| Bottle ID | Defines the bottle ID. | - |
| Comment | Defines a short comment that will be displayed. | - |
| Standard volume | Defines the standard volume in the bottle. | - |
| Seed volume | Defines the seed volume in the bottle.<br>The seed volume equals the residual bottle volume if **Seed added** = **To dilution water** in **Configuration** method function. | - |
| Dilution volume | Information on the dilution volume in the bottle. Value is calculated from other volumes above. | - |

## 8.7.11 Sample (BOD)

In this method function you can define the basic parameters to perform a BOD determination. You can the sample ID, the number of bottles, a corresponding comment and the seed addition unit. In the bottle list the you can enter the bottle ID, the sample volume, the volume of seed addition and the salinity correction factor.

| Parameter | Description | Values |
|---|---|---|
| Sample ID | Defines the sample ID. | - |
| Comment | Defines a short comment that will be displayed. | - |
| Sample type | Information on the sample type. | Sample |
| Number of bottles (base) | Defines the number of bottles of this sample ID for base measurement (before incubation). | 1…10 |
| Number of bottles (follow) | Defines the number of bottles of this sample ID for follow measurement (after incubation).<br>Displayed if check box **Same bottles used for base and follow** is de-activated. | 1…10 |
| Temperature | Defines the sample temperature.<br>Displayed if **Temperature capture** = **Manual** is selected in method function **Configuration**. | 0...60 °C / 32...140 °F |
| Barometric pressure | Defines the barometric (atmospheric) pressure.<br>Displayed if **Barometric pressure capture** = **Manual** is selected. | 500.0…1100.0 mbar l 500…1100 hPa l 375…825 mmHg l 0.493…1.086 atm |

**Bottle settings**

| Parameter | Description | Values |
|---|---|---|
| Sample ID | Defines the sample ID. | - |
| Bottle ID | Defines the bottle ID. | - |
| Comment | Defines a short comment that will be displayed. | - |

| | | |
|---|---|---|
| Sample volume | Defines the volume of sample in the bottle.<br>Editable for base bottle. Editable for follow bottle only if checkbox **Same bottles used for base and follow** is de-activated. | - |
| Seed volume | Defines the seed volume in the bottle.<br>Editable if checkbox **Same bottles used for base and follow** is de-activated and **Seed added** = **To bottle** is selected in method function Configuration. | - |
| Dilution volume | Information on the dilution volume in the bottle. Value is calculated from other volumes above. | - |

## 8.7.12 Sample verification

This method function is mainly used in remote control mode. It requests the operator to verify if the correct sample is taken for the subsequent measurement. The sample ID defined in the method or at method start must be retyped or scanned with a barcode reader.

| Parameter | Description | Values |
|---|---|---|
| Instruction | Text that will be displayed on the screen. Formula symbols can be used. | - |
| Interrupt after time span | The sample ID request will be interrupted when exceeding the time limit, if activated. | Active I Inactive |
| Time | Defines the period of time for the method to be interrupted.<br>Displayed if **Interrupt after time span** is activated. | - |

**See also**

Formula Syntax ▸ Page 117

## 8.7.13 Sensor check

This method function allows you to define special criteria for a sensor so that only sensors with a satisfying last calibration will be used. Calibration data can be checked and optionally the measurement can be interrupted if the sensor criteria are outside limits.

| Parameter | Description | Values |
|---|---|---|
| Check offset and slope | Activates checking the offset and slope value of the last calibration.<br>Displayed if **Measurement type** = **pH** or **Ion**. | Active I Inactive |
| Min. slope | Defines the minimum slope value, in [%].<br>Displayed if **Check offset and slope** is enabled. | 10…200 |
| Max. slope | Defines the maximum slope value, in [%].<br>Displayed if **Check offset and slope** is enabled. | 10…200 |
| Min. offset | Defines the minimum offset value, in [mV].<br>Displayed if **Check offset and slope** is enabled. | -2000…2000 |
| Max. offset | Defines the maximum offset value, in [mV].<br>Displayed if **Check offset and slope** is enabled. | -2000…2000 |
| Check slope | Activates checking the offset and slope value of the last calibration.<br>Displayed if **Measurement type** is **Dissolved Oxygen**. | Active I Inactive |
| Min. slope | Defines the minimum slope value, in [%].<br>Displayed if **Check slope** is enabled. | 10…200 |
| Max. slope | Defines the maximum slope value, in [%].<br>Displayed if **Check slope** is enabled. | 10…200 |

| | | |
|---|---|---|
| Check cell constant | Activates checking the offset and slope value of the last calibration.<br>Displayed if **Measurement type** is **Conductivity**. | Active I Inactive |
| Min. cell constant | Defines the minimum cell constant, in [/cm].<br>Displayed if **Check cell constant** is enabled. | 0…100 |
| Max. cell constant | Defines the maximum cell constant, in [/cm].<br>Displayed if **Check cell constant** is enabled. | 0…100 |
| Check calibration date | Activates checking the calibration date of the sensor. | Active I Inactive |
| Monitoring period | Defines the unit for the monitoring period.<br>Displayed if **Check calibration date** is enabled. | Days I Hours |
| Max. elapsed period | Defines the maximum time period between calibration date and method execution, in days or hours. | 1…100 |
| Check calibration range | Activates checking the calibration ranges of the sensor. | Active I Inactive |
| Min. calibration points | Defines the minimum number of calibration points within the below defined calibration range.<br>Displayed if **Check calibration range** is enabled. | - |
| Unit for calibration range | Defines the unit for the below values of the calibration range.<br>Displayed if **Check calibration range** is enabled. | - |
| Lower limit for calibration range | Defines the lower limit for the calibration range in the unit defined before.<br>Displayed if **Check calibration range** is enabled. | - |
| Upper limit for calibration range | Defines the upper limit for the calibration range in the unit defined before.<br>Displayed if **Check calibration range** is enabled. | - |
| Accept calibration points outside range | Defines if further calibration points outside the above defines calibration range can be accepted.<br>Displayed if **Check calibration range** is enabled. | Active I Inactive |
| Interrupt outside limits | Activates to interrupt the measurement when exceeding the limits. | Active I Inactive |

## 8.7.14 Measure

This method function defines all measurement parameters like unit, decimal places, endpoint type and temperature correction.

### Measurement types pH, Redox, Ion, Dissolved oxygen

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Unit | The unit to be used for the measurement.<br>The available units depend on the selected measurement type. | pH I mV I mg/L I ppm I mol/L I mmol/L I % I pX I Rel.mV |
| Offset | Defines the offset [mV].<br>Displayed if **Measurement type** = **Redox** and **Unit** = **Rel.mV** is selected. | -2000…2000 mV |
| Decimal places | Defines the number of digits for the displayed measurement result. The displayed decimal places depend on the selected unit. | 1 I 2 I 3 I 4 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |

| | | |
|---|---|---|
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |
| Condition | A logical condition can be defined. The method function is executed or not on the result (true or false) of the calculation. | Active I Inactive |
| Formula | Here you can enter a formula whose result (true or false) will determine the execution of the method function.<br>Displayed if **Condition** is activated. | - |

**See also**


- Endpoint criteria ▸ Page 110
- Formula Syntax ▸ Page 117


### Measurement type Conductivity

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Unit | Defines the measurement unit for conductivity. | µS/cm I mS/cm I S/m I µS/m I mS/m |
| Decimal places | Defines the number of digits for the displayed measurement result. The displayed decimal places depend on the selected unit. | 1 I 2 I 3 I 4 |

| | | |
|---|---|---|
| Temperature correction | Defines the relationship between conductivity, temperature and ion concentration.<br>**Linear**: Use for the temperature correction of medium and highly conductive solutions.<br>**Non-linear**: Use for natural water (only for temperature between 0…36 °C). The measured conductivity at the sample temperature is corrected to the defined reference temperature (20 °C or 25 °C).<br>**Off**: The conductivity value at the current temperature is displayed.<br>**Pure water**: An optimized type of temperature algorithm is used for **Measurement type** = **Conductivity** or **Resistivity**.<br>Displayed if **Measurement type** = **Conductivity**, **TDS** or **Resistivity** is selected. | Linear I Non-linear I Off I Pure water |
| α-coefficient | Defines the factor for the linear dependency.<br>Displayed if **Cond.mode** = **Conductivity**, **TDS** or **Resistivity** in combination with **Temperature correction** = **Linear** is selected. | 0.00…10.00 |
| Reference temperature | The conductivity reading will be directly corrected to the set reference temperature.<br>If **Measurement type** = **Conductivity** or **Resistivity** in combination with **Temperature correction** = **Pure water** is selected a reference temperature of 25 °C is automatically set.<br>Displayed if **Measurement type** = **Conductivity**, **TDS** or **Resistivity** in combination with **Temperature correction** = **Linear** is selected. | 20°C I 25°C |
| TDS factor | To calculate the TDS value, the conductivity will be multiplied with this factor.<br>Displayed if **Conductivity** = **TDS** is selected. | 0.00…10.00 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| Stir | Activates the stirrer. | Active I Inactive |

| | | |
|---|---|---|
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |
| Condition | A logical condition can be defined. The method function is executed or not on the result (true or false) of the calculation. | Active I Inactive |
| Formula | Here you can enter a formula whose result (true or false) will determine the execution of the method function.<br>Displayed if **Condition** is activated. | - |

**See also**


- Endpoint criteria ▸ Page 110
- Formula Syntax ▸ Page 117


## 8.7.15 Measure (Calibration)

In this method function endpoint type and endpoint criteria are selected. You can also define whether stirring during calibration takes place or not.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |

**See also**


- Endpoint criteria ▸ Page 110

### 8.7.16 Measure (Temperature)

This method function defines all measurement parameters like temperature source, unit, resolution, endpoint type and stirring.

| Parameter | Description | Values |
|---|---|---|
| Temperature signal | Select the channel to be used for the temperature capture. | Measurement type 1 I Measurement type 2 I Measurement type 3 |
| Sensor name | Information on the sensor name selected for the method. | - |
| Unit | Information on the temperature unit. | °C I °F |
| Decimal places | Defines the number of digits for the displayed measurement result. | 0 I 1 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed I Set value |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>**Standard**: Value varies less than 0.1 °C for the last 6 seconds.<br>**User-defined**: The relevant settings are displayed.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Standard I User-defined |
| dT | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dT, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 0.1…1.0 |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| Mode | Defines how the endpoint is reached when a set value is defined.<br>Displayed if **Endpoint type** = **Set value**. | T > set value I T < set value I T within range |
| Set value | Defines the temperature for the set value.<br>Displayed if **Endpoint type** = **Set value** and **Mode** = **T > set value** or **T < set value**. | pH/Redox I Ion I Conductivity: -30… 130 °C / -22…266 °F I DO: 0…60 °C / 32… 140 °F |
| Lower limit | Defines the temperature for the lower limit.<br>Displayed if **Endpoint type** = **Set value** and **Mode** = **T within range**. | See Set value |

| | | |
|---|---|---|
| Upper limit | Defines the temperature for the upper limit.<br>Displayed if **Endpoint type** = **Set value** and **Mode** = **T within range**. | See Set value |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the criteria for the set value of the endpoint type are not fulfilled.<br>Displayed if **Endpoint type** = **Set value**. | 1…100000 |
| Mean value | The mean value of all measured values over a defined time span must exceed the set value before the measurement stops.<br>Displayed if **Endpoint type** = **Set value**. | Active I Inactive |
| Time span | Defines the time span to calculate the mean value. | 1…60 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |
| Condition | A logical condition can be defined. The method function is executed or not on the result (true or false) of the calculation. | Active I Inactive |
| Formula | Here you can enter a formula whose result (true or false) will determine the execution of the method function.<br>Displayed if **Condition** is activated. | - |

**See also**


- InMotion ▸ Page 30
- Formula Syntax ▸ Page 117


## 8.7.17 Measure (Interval)

This method function defines all measurement parameters like unit, decimal places, endpoint type and temperature correction.

### Measurement types pH, Redox, Ion, Dissolved oxygen

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Unit | The unit to be used for the measurement.<br>The available units depend on the selected measurement type. | pH I mV I mg/L I ppm I mol/L I mmol/L I % I pX I Rel.mV |
| Offset | Defines the offset [mV].<br>Displayed if **Measurement type** = **Redox** and **Unit** = **Rel.mV** is selected. | -2000…2000 mV |
| Decimal places | Defines the number of digits for the displayed measurement result. The displayed decimal places depend on the selected unit. | 1 I 2 I 3 I 4 |
| Interval time | Time period between starting and storing measurement data [s].<br>Only if method type = **Interval**. | - |
| Print after each interval | Activates printing out the result after each interval.<br>Only if method type = **Interval**. | Active I Inactive |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |

| | | |
|---|---|---|
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>**Strict**: Value varies less than 0.03 mV for the last 8 seconds or 0.1 mV for the last 20 seconds.<br>**Standard**: Value varies less than 0.1 mV for the last 6 seconds.<br>**Fast**: Value varies less than 0.6 mV for the last 4 seconds.<br>**User-defined**: The relevant settings are displayed.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |
| Threshold | Activates thresholds to be monitored, with optionally finding an endpoint of the measurement upon exceeding a threshold. | Active I Inactive |
| Lower threshold | Defines the value for the threshold.<br>Displayed if **Threshold** is activated. | - |
| Upper threshold | Defines the value for the threshold.<br>Displayed if **Threshold** is activated. | - |
| Endpoint when threshold exceeded | Defines that the endpoint is reached when the threshold value is exceeded.<br>Displayed if **Threshold** is activated. | Active I Inactive |
| Condition | A logical condition can be defined. The method function is executed or not on the result (true or false) of the calculation. | Active I Inactive |
| Formula | Here you can enter a formula whose result (true or false) will determine the execution of the method function.<br>Displayed if **Condition** is activated. | - |

**See also**

Formula Syntax ▸ Page 117

### Measurement type Conductivity

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Unit | Defines the measurement unit for conductivity. | µS/cm I mS/cm I S/m I µS/m I mS/m |
| Decimal places | Defines the number of digits for the displayed measurement result. The displayed decimal places depend on the selected unit. | 1 I 2 I 3 I 4 |
| Interval time | Time period between starting and storing measurement data [s].<br>Only if method type = **Interval**. | - |
| Print after each interval | Activates printing out the result after each interval.<br>Only if method type = **Interval**. | Active I Inactive |
| Temperature correction | Defines the relationship between conductivity, temperature and ion concentration.<br>**Linear**: Use for the temperature correction of medium and highly conductive solutions.<br>**Non-linear**: Use for natural water (only for temperature between 0…36 °C). The measured conductivity at the sample temperature is corrected to the defined reference temperature (20 °C or 25 °C).<br>**Off**: The conductivity value at the current temperature is displayed.<br>**Pure water**: An optimized type of temperature algorithm is used for **Measurement type** = **Conductivity** or **Resistivity**.<br>Displayed if **Measurement type** = **Conductivity**, **TDS** or **Resistivity** is selected. | Linear I Non-linear I Off I Pure water |
| α-coefficient | Defines the factor for the linear dependency.<br>Displayed if **Cond.mode** = **Conductivity**, **TDS** or **Resistivity** in combination with **Temperature correction** = **Linear** is selected. | 0.00…10.00 |
| Reference temperature | The conductivity reading will be directly corrected to the set reference temperature.<br>If **Measurement type** = **Conductivity** or **Resistivity** in combination with **Temperature correction** = **Pure water** is selected a reference temperature of 25 °C is automatically set.<br>Displayed if **Measurement type** = **Conductivity**, **TDS** or **Resistivity** in combination with **Temperature correction** = **Linear** is selected. | 20°C I 25°C |
| TDS factor | To calculate the TDS value, the conductivity will be multiplied with this factor.<br>Displayed if **Conductivity** = **TDS** is selected. | 0.00…10.00 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |

| | | |
|---|---|---|
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |
| Threshold | Activates thresholds to be monitored, with optionally finding an endpoint of the measurement upon exceeding a threshold. | Active I Inactive |
| Lower threshold | Defines the value for the threshold.<br>Displayed if **Threshold** is activated. | - |
| Upper threshold | Defines the value for the threshold.<br>Displayed if **Threshold** is activated. | - |
| Endpoint when threshold exceeded | Defines that the endpoint is reached when the threshold value is exceeded.<br>Displayed if **Threshold** is activated. | Active I Inactive |
| Condition | A logical condition can be defined. The method function is executed or not on the result (true or false) of the calculation. | Active I Inactive |
| Formula | Here you can enter a formula whose result (true or false) will determine the execution of the method function.<br>Displayed if **Condition** is activated. | - |

**See also**


- Endpoint criteria ▸ Page 110
- Formula Syntax ▸ Page 117


## 8.7.18 Measure (Incremental)

In this method function the endpoint type, endpoint criteria and other important parameters are determined. You can also define whether stirring takes place during the measurement or not.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Unit | Defines the unit for ion. | mmol/L I mg/L I ppm I % I pX |
| Decimal places | Defines the number of digits for the displayed measurement result. The displayed decimal places depend on the selected unit. | 1 I 2 I 3 I 4 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |

| | | |
|---|---|---|
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |

**See also**

Endpoint criteria ▸ Page 110

## 8.7.19 Measure (Sensor test)

In this method function endpoint type and endpoint criteria are determined. You can also define whether stirring takes place during the measurement or not.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |

| | | |
|---|---|---|
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |

**See also**

Endpoint criteria ▶ Page 110

## 8.7.20 Measure (Blank)

In this method function you can define the measuring units and resolution as well as endpoint type and criteria for BOD determination in blank. You can also define whether stirring takes place during the measurement or not.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor selected for this method. | - |
| DO unit | Defines the unit for single DO measurement. | mg/L I ppm |
| BOD unit | Defines the unit for BOD result. | mg/L |
| DO resolution | Defines the number of digits for the displayed DO result. | 1 I 2 I 3 |
| BOD resolution | Defines the number of digits for the calculated BOD value. | 1 I 2 I 3 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Stir | Activates the stirrer. | Active I Inactive |

| | | |
|---|---|---|
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |

**See also**

Endpoint criteria ▶ Page 110

## 8.7.21 Measure (Seeded blank)

In this method function you can define the measuring units and resolution as well as endpoint type and criteria for BOD determination in seeded blank. You can also define whether stirring takes place during the measurement or not.

| Parameter | Description | Values |
|---|---|---|
| DO unit | Defines the unit for single DO measurement. | mg/L I ppm |
| BOD unit | Defines the unit for BOD result. | mg/L |
| DO resolution | Defines the number of digits for the displayed DO result. | 1 I 2 I 3 |
| BOD resolution | Defines the number of digits for the calculated BOD value. | 1 I 2 I 3 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |

**See also**

Endpoint criteria ▶ Page 110

## 8.7.22 Measure (Standard)

In this method function you can define the measuring units and resolution as well as endpoint type and criteria for BOD determination in the standard solution (solution with well-defined BOD value). You can also define whether stirring takes place during the measurement or not.

| Parameter | Description | Values |
|---|---|---|
| DO unit | Defines the unit for single DO measurement. | mg/L I ppm |
| BOD unit | Defines the unit for BOD result. | mg/L |
| DO resolution | Defines the number of digits for the displayed DO result. | 1 I 2 I 3 |
| BOD resolution | Defines the number of digits for the calculated BOD value. | 1 I 2 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |

**See also**

Endpoint criteria ▸ Page 110

## 8.7.23 Measure (BOD)

In this method function you can define the measuring units and resolution as well as endpoint type and criteria. You can also define whether stirring takes place during the measurement or not.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor selected for this method. | - |
| DO unit | Defines the unit for single DO measurement. | mg/L I ppm |
| BOD unit | Defines the unit for BOD result. | mg/L |
| DO resolution | Defines the number of digits for the displayed DO result. | 1 I 2 I 3 |
| BOD resolution | Defines the number of digits for the calculated BOD value. | 1 I 2 I 3 |
| Endpoint type | Defines how the endpoint of the measurement is to be terminated. | Automatic I Manual I Timed |

| | | |
|---|---|---|
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| Endpoint time | Period of time [s] until the endpoint of the measurement is reached.<br>Displayed if **Endpoint type** = **Timed**. | 5…1000000 |
| dE | Defines the measured value interval. As soon as the change in the measured value over the time period dt is less than dE, the measured value will be acquired. This occurs within the defined time interval.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | - |
| dt | Defines the time component for dE. dt>tmin and tmax>dt.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…600 |
| tmin | Earliest possible time for the measured value acquisition.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| tmax | Latest possible time for the measured value acquisition.<br>**Note**<br>The measurement ends after the time defined, even if the stability criteria of dE and dt are not fulfilled.<br>Displayed if **Endpoint type** = **Automatic** and **Endpoint criteria** = **User-defined**. | 1…100000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |

**See also**

Endpoint criteria ▸ Page 110

## 8.7.24 Calibration analysis

In this method function the limits for accepting a calibration can be entered.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Min. slope | Defines the lower limit for the slope, in [%].<br>Displayed if **Measurement type** = **pH**, **Ion** or **Dissolved Oxygen**. | 10…200 |
| Max. slope | Defines the upper limit for the slope, in [%].<br>Displayed if **Measurement type** = **pH**, **Ion** or **Dissolved Oxygen**. | 10…200 |
| Min. offset | Defines the lower limit for the offset, in [mV].<br>Displayed if **Measurement type** = **pH** or **Ion**. | -2000…2000 |
| Max. offset | Defines the upper limit for the offset, in [mV].<br>Displayed if **Measurement type** = **pH** or **Ion**. | -2000…2000 |
| Min. cell constant | Defines the lower limit for the cell constant [$cm^{-1}$].<br>Displayed if **Measurement type** = **Conductivity**. | 0…100 |
| Max. cell constant | Defines the upper limit for the cell constant [$cm^{-1}$].<br>Displayed if **Measurement type** = **Conductivity**. | 0…100 |
| Interrupt outside limits | Activates to interrupt the measurement when exceeding the limits. | Active I Inactive |
| Display actual pH and temp. values | Activates the option to display additional values in the results.<br>Displayed if **Measurement type** = **pH**. | Active I Inactive |

### 8.7.25 Sensor evaluation

In this method function you can set calibration limits and test measurement limits for sensors in the method type sensor test.

| Parameter | Description | Values |
|---|---|---|
| Sensor name | Information on the sensor name selected for the method. | - |
| Calibration limits | Activates the parameters to set the limits. | Active I Inactive |
| Min. slope | Defines the lower limit for the slope, in [%].<br>Displayed if **Calibration limits** is activated. | 10…200 |
| Max. slope | Defines the upper limit for the slope, in [%].<br>Displayed if **Calibration limits** is activated. | 10…200 |
| Min. offset | Defines the lower limit for the offset, in [mV].<br>Displayed if **Calibration limits** is activated. | -2000…2000 |
| Max. offset | Defines the upper limit for the offset, in [mV].<br>Displayed if **Calibration limits** is activated. | -2000…2000 |
| Max. drift | Define values for maximum drift during the 5 minutes drift test, in [mV].<br>Displayed if **Calibration limits** is activated. | 0…2000 |
| Test meas. limits | Activate to set a tolerance value and to determine interruption of the method if the sensor is outside limits. | Active I Inactive |
| Tolerance | Define values for maximum difference between measured and theoretical value, in [pH].<br>Displayed if **Test meas. limits** is activated. | 0.01…1.00 |

### 8.7.26 Analysis (Blank)

In this method function different limiting parameters for the BOD blank determination can be selected and modified in order to create related warnings, entries in the report, suspension of measurement or even interruption of measurement. The method function has three parts: **Analysis (base)**, **Analysis (follow)**, and **Analysis results**.

**Analysis (base)**

| Parameter | Description | Values |
|---|---|---|
| Temperature limits | Defines if temperature limits are applied. | Active I Inactive |
| Max. temperature | Defines the upper temperature limit.<br>Displayed if **Temperature limits** is activated. | 5…40 °C |
| Min. temperature | Defines the lower temperature limit.<br>Displayed if **Temperature limits** is activated. | 5…40 °C |
| Action when outside limits | Defines the behavior in case the temperature is outside the limits.<br>Displayed if **Temperature limits** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the temperature is outside the limits.<br>Displayed if **Temperature limits** is activated. | Active I Inactive |
| Max. DO limit | Defines if an upper limit for oxygen content in the measurement (**Base**) is applied. | Active I Inactive |
| Max. DO | Defines the upper oxygen content limit, in [%].<br>Displayed if **Max. DO limit** is activated. | 90…200 |

| | | |
|---|---|---|
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Max. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Max. DO limit** is activated. | Active I Inactive |
| Min. DO limit | Defines if a lower limit for oxygen content in the measurement (**Base**) is applied. | Active I Inactive |
| Min. DO | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. DO limit** is activated. | 0.1…7.0 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Active I Inactive |

**Analysis (follow)**

| Parameter | Description | Values |
|---|---|---|
| Time tolerance limit | Defines if a time tolerance between base and follow measurement is applied | Active I Inactive |
| Time tolerance | Defines the time tolerance to full days between measurement **Base** and **Follow**, in [h].<br>Example: a time tolerance of 3 hours is applied. The measurement **Base** is done at 10:00 a.m. The measurement **Follow** must be started at any later day between 7:00 a.m. and 1:00 p.m.<br>Displayed if **Time tolerance limit** is activated. | 0.1…12.0 |
| Action when outside limits | Defines the behavior in case the time tolerance exceeds the limit.<br>Displayed if **Time tolerance limit** is activated. | Disable start I Save and warn |

**Analysis results**

| Parameter | Description | Values |
|---|---|---|
| Max. BOD limit of bottle | Defines if an upper limit for the BOD value per bottle is applied. | Active I Inactive |
| Max. BOD | Defines the upper oxygen content limit, in [mg/L].<br>Displayed if **Max. BOD limit of bottle** is activated. | 0.1…15.0 |
| Action when outside limits | Defines the behavior in case the BOD value is below the limit.<br>Displayed if **Max. BOD limit of bottle** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the BOD value drops below the limit.<br>Displayed if **Max. BOD limit of bottle** is activated. | Active I Inactive |

**Action when outside limits**

The following table explains the different actions when limits are exceeded.

| | |
|---|---|
| **Save and report** | The measured data is saved and marked as outside limit; the method proceeds with the next bottle. |
| **Repeat** | The measured data is discarded and the last measurement must be repeated. This happens for infinite times if the limits are not met, except the task is interrupted. |
| **Skip bottle** | The measured data is discarded; the method proceeds with the next bottle. |
| **Interrupt** | The running task is terminated. |

### 8.7.27 Analysis (Seeded blank)

In this method function different limiting parameters for the BOD seeded blank determination can be selected and modified in order to create related warnings, entries in the report, suspension of measurement or even interruption of measurement. The method function has three parts: **Analysis (base)**, **Analysis (follow)**, and **Analysis results**.

**Analysis (base)**

| Parameter | Description | Values |
|---|---|---|
| Temperature limits | Defines if temperature limits are applied. | Active I Inactive |
| Max. temperature | Defines the upper temperature limit.<br>Displayed if **Temperature limits** is activated. | 5…40 °C |
| Min. temperature | Defines the lower temperature limit.<br>Displayed if **Temperature limits** is activated. | 5…40 °C |
| Action when outside limits | Defines the behavior in case the temperature is outside the limits.<br>Displayed if **Temperature limits** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the temperature is outside the limits.<br>Displayed if **Temperature limits** is activated. | Active I Inactive |
| Max. DO limit | Defines if an upper limit for oxygen content in the measurement (**Base**) is applied. | Active I Inactive |
| Max. DO | Defines the upper oxygen content limit, in [%].<br>Displayed if **Max. DO limit** is activated. | 90…200 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Max. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Max. DO limit** is activated. | Active I Inactive |
| Min. DO limit | Defines if a lower limit for oxygen content in the measurement (**Base**) is applied. | Active I Inactive |
| Min. DO | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. DO limit** is activated. | 0.1…7.0 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Active I Inactive |

### Analysis (follow)

| Parameter | Description | Values |
|---|---|---|
| Time tolerance limit | Defines if a time tolerance between base and follow measurement is applied | Active I Inactive |
| Time tolerance | Defines the time tolerance to full days between measurement **Base** and **Follow**, in [h].<br>Example: a time tolerance of 3 hours is applied. The measurement **Base** is done at 10:00 a.m. The measurement **Follow** must be started at any later day between 7:00 a.m. and 1:00 p.m.<br>Displayed if **Time tolerance limit** is activated. | 0.1…12.0 |
| Action when outside limits | Defines the behavior in case the time tolerance exceeds the limit.<br>Displayed if **Time tolerance limit** is activated. | Disable start I Save and warn |
| Min. DO limit | Defines if a lower limit for oxygen content in the measurement (**Follow**) is applied. | Active I Inactive |
| Min. DO | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. DO limit** is activated. | 0.1…15.0 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Active I Inactive |

### Analysis results

| Parameter | Description | Values |
|---|---|---|
| Min. BOD limit of bottle | Defines if a lower limit for the BOD value per bottle is applied | Active I Inactive |
| Min. BOD | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. BOD limit of bottle** is activated. | 0.3…15.0 |
| Limit applied to | Defines if the min. BOD limit is applied to the BOD calculated from measurement (**Base** and **Follow**) or correction coming from a BCV method are included.<br>Displayed if **Min. BOD limit of bottle** is activated. | Corrected BOD value I Uncorrected BOD value |
| Action when outside limits | Defines the behavior in case the BOD value drops below the limit.<br>Displayed if **Min. BOD limit of bottle** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the BOD value drops below the limit.<br>Displayed if **Min. BOD limit of bottle** is activated. | Active I Inactive |
| $O_2$ depletion limits | Defines if limits oxygen depletion are applied. The oxygen depletion is the ratio of oxygen that is gone between measurement **Base** and **Follow**. | Active I Inactive |
| Min. $O_2$ depletion | Defines the lower oxygen depletion limit, in [%]<br>Displayed if **$O_2$ depletion limits** is activated. | 0…100 |
| Max. $O_2$ depletion | Defines the upper oxygen depletion limit, in [%].<br>Displayed if **$O_2$ depletion limits** is activated. | 0…100 |

| | | |
|---|---|---|
| Action when outside limits | Defines the behavior in case the correction factor exceeds the limits.<br>Displayed if **$O_2$ depletion limits** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the correction factor exceeds the limits.<br>Displayed if **$O_2$ depletion limits** is activated. | Active I Inactive |

**Action when outside limits**

The following table explains the different actions when limits are exceeded.

| | |
|---|---|
| **Save and report** | The measured data is saved and marked as outside limit; the method proceeds with the next bottle. |
| **Repeat** | The measured data is discarded and the last measurement must be repeated. This happens for infinite times if the limits are not met, except the task is interrupted. |
| **Skip bottle** | The measured data is discarded; the method proceeds with the next bottle. |
| **Interrupt** | The running task is terminated. |

## 8.7.28 Analysis (Standard)

In this method function different limiting parameters for the BOD standard determination can be selected and modified in order to create related warnings, entries in the report, suspension of measurement or even interruption of measurement. The method function has three parts: **Analysis (base)**, **Analysis (follow)**, and **Analysis results**.

| Parameter | Description | Values |
|---|---|---|
| Temperature limits | Defines if temperature limits are applied. | Active I Inactive |
| Max. temperature | Defines the upper temperature limit.<br>Displayed if **Temperature limits** is activated. | 5…40 °C |
| Min. temperature | Defines the lower temperature limit.<br>Displayed if **Temperature limits** is activated. | 5…40 °C |
| Action when outside limits | Defines the behavior in case the temperature is outside limits.<br>Displayed if **Temperature limits** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the temperature is outside the limits.<br>Displayed if **Temperature limits** is activated. | Active I Inactive |
| Max. DO limit | Defines if an upper limit for oxygen content in the measurement (**Base**) is applied. | Active I Inactive |
| Max. DO | Defines the upper oxygen content limit, in [%].<br>Displayed if **Max. DO limit** is activated. | 90…200 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Max. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Max. DO limit** is activated. | Active I Inactive |
| Min. DO limit | Defines if a lower limit for oxygen content in the measurement (**Base**) is applied. | Active I Inactive |
| Min. DO | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. DO limit** is activated. | 0.1…7.0 |

| | | |
|---|---|---|
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Active I Inactive |

**Analysis (follow)**

| Parameter | Description | Values |
|---|---|---|
| Time tolerance limit | Defines if a time tolerance between base and follow measurement is applied | Active I Inactive |
| Time tolerance | Defines the time tolerance to full days between measurement **Base** and **Follow**, in [h].<br>Example: a time tolerance of 3 hours is applied. The measurement **Base** is done at 10:00 a.m. The measurement **Follow** must be started at any later day between 7:00 a.m. and 1:00 p.m.<br>Displayed if **Time tolerance limit** is activated. | 0.1…12.0 |
| Action when outside limits | Defines the behavior in case the time tolerance exceeds the limit.<br>Displayed if **Time tolerance limit** is activated. | Disable start I Save and warn |
| Min. DO limit | Defines if a lower limit for oxygen content in the measurement (**Follow**) is applied. | Active I Inactive |
| Min. DO | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. DO limit** is activated. | 0.1…15.0 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Active I Inactive |

**Analysis results**

| Parameter | Description | Values |
|---|---|---|
| Min. BOD limit of bottle | Defines if a lower limit for the BOD value per bottle is applied | Active I Inactive |
| Min. BOD | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. BOD limit of bottle** is activated. | 0.3…15.0 |
| Limit applied to | Defines if the min. BOD limit is applied to the BOD calculated from measurement (**Base** and **Follow**) or correction coming from a BCV method are included.<br>Displayed if **Min. BOD limit of bottle** is activated. | Corrected BOD value I Uncorrected BOD value |
| Action when outside limits | Defines the behavior in case the BOD value drops below the limit.<br>Displayed if **Min. BOD limit of bottle** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the BOD value drops below the limit.<br>Displayed if **Min. BOD limit of bottle** is activated. | Active I Inactive |

| | | |
|---|---|---|
| Seed correction limits | Defines if limits for the seed correction factor are applied. The seed correction factor is that ratio of the calculated BOD that originates from the added seed and not from the standard. This option is only useful if values from a seeded blank determination are available. | Active I Inactive |
| Min. correction factor | Defines the lower correction factor limit.<br>Displayed if **Seed correction limits** is activated. | 0.1…9.9 |
| Max. correction factor | Defines the upper correction factor limit.<br>Displayed if **Seed correction limits** is activated. | 0.1…9.9 |
| Action when outside limits | Defines the behavior in case the correction factor exceeds the limits.<br>Displayed if **Seed correction limits** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the correction factor exceeds the limits.<br>Displayed if **Seed correction limits** is activated. | Active I Inactive |
| BOD limits of standard | Defines if limits for the BOD of the sample (calculated over all bottles) are applied. | Active I Inactive |
| Max. BOD | Defines the upper BOD limit, in [mg/L].<br>Displayed if **BOD limits of standard** is activated. | 0.1…1000 |
| Min. BOD | Defines the lower BOD limit, in [mg/L].<br>Displayed if **BOD limits of standard** is activated. | 0.1…1000 |
| Action when outside limits | Defines the behavior in case the sample BOD exceeds the limits.<br>Displayed if **BOD limits of standard** is activated. | Save and report I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the sample BOD exceeds the limits.<br>Displayed if **BOD limits of standard** is activated. | Active I Inactive |

**Action when outside limits**

The following table explains the different actions when limits are exceeded.

| | |
|---|---|
| **Save and report** | The measured data is saved and marked as outside limit; the method proceeds with the next bottle. |
| **Repeat** | The measured data is discarded and the last measurement must be repeated. This happens for infinite times if the limits are not met, except the task is interrupted. |
| **Skip bottle** | The measured data is discarded; the method proceeds with the next bottle. |
| **Interrupt** | The running task is terminated. |

## 8.7.29 Analysis (BOD)

In this method function different limiting parameters can be selected and modified in order to create related warnings, entries in the report, suspension of measurement or even interruption of measurement. The method function has three parts: **Analysis (base)**, **Analysis (follow)**, and **Analysis results**.

**Analysis (base)**

| Parameter | Description | Values |
|---|---|---|
| Temperature limits | Defines if temperature limits are applied. | Active I Inactive |
| Max. temperature | Defines the upper temperature limit.<br>Displayed if **Temperature limits** is activated. | 5…40 °C |
| Min. temperature | Defines the lower temperature limit.<br>Displayed if **Temperature limits** is activated. | 5…40 °C |

| | | |
|---|---|---|
| Action when outside limits | Defines the behavior in case the temperature is outside limits.<br>Displayed if **Temperature limits** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the temperature is outside the limits.<br>Displayed if **Temperature limits** is activated. | Active I Inactive |
| Max. DO limit | Defines if an upper limit for oxygen content in the measurement (**Base**) is applied. | Active I Inactive |
| Max. DO | Defines the upper oxygen content limit, in [%].<br>Displayed if **Max. DO limit** is activated. | 90…200 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Max. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Max. DO limit** is activated. | Active I Inactive |
| Min. DO limit | Defines if a lower limit for oxygen content in the measurement (**Base**) is applied. | Active I Inactive |
| Min. DO | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. DO limit** is activated. | 0.1…7.0 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Active I Inactive |

**Analysis (follow)**

| Parameter | Description | Values |
|---|---|---|
| Time tolerance limit | Defines if a time tolerance between base and follow measurement is applied | Active I Inactive |
| Time tolerance | Defines the time tolerance to full days between measurement **Base** and **Follow**, in [h].<br>Example: a time tolerance of 3 hours is applied. The measurement **Base** is done at 10:00 a.m. The measurement **Follow** must be started at any later day between 7:00 a.m. and 1:00 p.m.<br>Displayed if **Time tolerance limit** is activated. | 0.1…12.0 |
| Action when outside limits | Defines the behavior in case the time tolerance exceeds the limit.<br>Displayed if **Time tolerance limit** is activated. | Disable start I Save and warn |
| Min. DO limit | Defines if a lower limit for oxygen content in the measurement (**Follow**) is applied. | Active I Inactive |
| Min. DO | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. DO limit** is activated. | 0.1…15.0 |
| Action when outside limits | Defines the behavior in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Save and report I Repeat I Skip bottle I Interrupt |

| | | |
|---|---|---|
| Show instruction | Defines if an automatically generated instruction will be displayed in case the oxygen content exceeds the limit.<br>Displayed if **Min. DO limit** is activated. | Active I Inactive |

**Analysis results**

| Parameter | Description | Values |
|---|---|---|
| Min. BOD limit of bottle | Defines if a lower limit for the BOD value per bottle is applied | Active I Inactive |
| Min. BOD | Defines the lower oxygen content limit, in [mg/L].<br>Displayed if **Min. BOD limit of bottle** is activated. | 0.1…15.0 |
| Limit applied to | Defines if the min. BOD limit is applied to the BOD calculated from measurement (**Base** and **Follow**) or correction coming from a BCV method are included.<br>Displayed if **Min. BOD limit of bottle** is activated. | Corrected BOD value I Uncorrected BOD value |
| Action when outside limits | Defines the behavior in case the BOD value drops below the limit.<br>Displayed if **Min. BOD limit of bottle** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the BOD value drops below the limit.<br>Displayed if **Min. BOD limit of bottle** is activated. | Active I Inactive |
| Seed correction limits | Defines if limits for the seed correction factor are applied. The seed correction factor is that ratio of the calculated BOD that originates from the added seed and not from the sample. This option is only useful if check values from a BCV method are available. | Active I Inactive |
| Min. correction factor | Defines the lower correction factor limit.<br>Displayed if **Seed correction limits** is activated. | 0.1…9.9 |
| Max. correction factor | Defines the upper correction factor limit.<br>Displayed if **Seed correction limits** is activated. | 0.1…9.9 |
| Action when outside limits | Defines the behavior in case the correction factor exceeds the limits. Find more details further below.<br>Displayed if **Seed correction limits** is activated. | Save and report I Repeat I Skip bottle I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the correction factor exceeds the limits.<br>Displayed if **Seed correction limits** is activated. | Active I Inactive |
| BOD limits of sample | Defines if limits for the BOD of the sample (calculated over all bottles) are applied. | Active I Inactive |
| Max. BOD | Defines the lower BOD limit, in [mg/L].<br>Displayed if **BOD limits of sample** is activated. | 0.01 … 1000000 |
| Min. BOD | Defines the upper BOD limit, in [mg/L].<br>Displayed if **BOD limits of sample** is activated. | 0.01 … 1000000 |
| Action when outside limits | Defines the behavior in case the sample BOD exceeds the limits.<br>Displayed if **BOD limits of sample** is activated. | Save and report I Interrupt |
| Show instruction | Defines if an automatically generated instruction will be displayed in case the sample BOD exceeds the limits.<br>Displayed if **BOD limits of sample** is activated. | Active I Inactive |

**Action when outside limits**

The following table explains the different actions when limits are exceeded.

| | |
|---|---|
| **Save and report** | The measured data is saved and marked as outside limit; the method proceeds with the next bottle. |
| **Repeat** | The measured data is discarded and the last measurement must be repeated. This happens for infinite times if the limits are not met, except the task is interrupted. |
| **Skip bottle** | The measured data is discarded; the method proceeds with the next bottle. |
| **Interrupt** | The running task is terminated. |

## 8.7.30 Instruction

In this method function you can enter a text which will be displayed on the screen and you can set the conditions when the text will disappear. There are two possibilities either the text disappears after a predefined period of time or after confirmation.

| Parameter | Description | Values |
|---|---|---|
| Instruction | Text that will be displayed on the screen. Formula symbols can be used. | - |
| Continue after | There are two possibilities either the text disappears after a predefined period of time or after confirmation. | Confirmation I Time span |
| Time | Defines the period of time for the text to disappear.<br>Displayed if **Continue after** = **Time span**. | - |
| Condition | A logical condition can be defined. The method function is executed or not on the result (true or false) of the calculation. | Active I Inactive |
| Formula | Here you can enter a formula whose result (true or false) will determine the execution of the method function.<br>Displayed if **Condition** is activated. | - |

**See also**

Formula Syntax ▸ Page 117

## 8.7.31 Wait/Stir

In this method function you can set a period of time for a pause before the next method function starts. You can define to stir during the waiting period.

| Parameter | Description | Values |
|---|---|---|
| Wait time | Time [s] the method waits or the stirrer is activated. | 1…1000000 |
| Stir | Activates the stirrer. | Active I Inactive |
| Stirring speed | Defines the stirring speed.<br>Displayed if **Stir** is activated. | 10%…100% |
| Instruction | Activates the option to display a text on the screen, after the waiting / stirring time has elapsed. | Active I Inactive |
| Text | Enter a text which will be displayed on the screen. Formula symbols can be used.<br>Displayed if **Instruction** is activated. | - |
| Condition | A logical condition can be defined. The method function is executed or not on the result (true or false) of the calculation. | Active I Inactive |
| Formula | Here you can enter a formula whose result (true or false) will determine the execution of the method function.<br>Displayed if **Condition** is activated. | - |

**See also**

Formula Syntax ▸ Page 117

## 8.7.32 Calculation

In this method function you can enter a calculation based on the results of your measurement. You can also set result limits and determine to interrupt the measurement when exceeding the limits.

| Parameter | Description | Values |
|---|---|---|
| Name | Defines the name of the calculation. | - |
| Unit | Enter the unit that will be displayed for the calculation. | - |
| Formula | Enter a calculation based on the results of your measurement. | - |
| Decimal places | Defines the number of digits for the displayed measurement result. | 1 … 6 |
| Result limits | Defines whether limits should be observed for the result. If this function is activated, there will be a message in the record if the result falls outside the defined limits. | Active I Inactive |
| Lower limit | Defines the lower result limit.<br>Appears only if **Result limits** is activated. | $-10^8$ … $10^8$ |
| Upper limit | Defines the upper result limit.<br>Appears only if **Result limits** is activated. | $-10^8$…$10^8$ |
| Interrupt outside limits | Activates to interrupt the measurement when exceeding the limits. | Active I Inactive |

**See also**

Formula Syntax ▸ Page 117

## 8.7.33 Report

The details for creating a report, printing or exporting data can be defined here.

| Parameter | Description | Values |
|---|---|---|
| Print | Defines if data will be printed to the connected printer. | Active I Inactive |
| Print format | **Summary**: Covers most important data related to date, time, user name, sample ID, sensor name, value, temperature, results, endpoint type and most important parameters according to the settings of the measurement type.<br>**User-defined**: Allows to define which information to include. | Summary I User-defined |

**Selectable parameters if User-defined is activated**

| Parameter | Description | Values |
|---|---|---|
| Measured values | Interval and endpoint values or calibration results can be exported or printed. | Active I Inactive |
| Raw values | Raw values of the measurements can be exported or printed. | Active I Inactive |
| Calculated results | Results of method function **Calculation** can be exported or printed. For method type **Sensor Test** the findings of method function **Sensor evaluation** is exported or printed; for method type **Incremental** it is the final sample concentration. | Active I Inactive |
| Status | The overall status of the analysis can be exported or printed. | Active I Inactive |
| Date/Time | The date and time of analysis execution can be exported or printed. | Active I Inactive |
| User name | The name of the user who performed the analysis can be exported or printed. Avoid names longer than 10 characters in case of printing with a compact printer. | Active I Inactive |

| | | |
|---|---|---|
| Sensor name | The name of the used sensor can be exported or printed. Avoid names longer than 10 characters in case of printing with a compact printer. | Active I Inactive |
| Sensor details | The sensor serial number, last calibration date, temperature sensor name, and further sensor details can be exported or printed. | Active I Inactive |
| Sample ID | The sample ID can be exported or printed. For **BOD** and **BCV** method type the bottle ID is used. Avoid IDs longer than 10 characters in case of printing with a compact printer. | Active I Inactive |
| Sample details | Further sample details can be exported or printed. For **Calibration** and **Sensor Test** the buffers or standards are used; for method type **Incremental** the ion ratio, standard additions and standard volume. For method types **BOD** and **BCV** the sample volume, seed volume, salinity, and further values are used. | Active I Inactive |
| Method data | The method ID and measurement types can be exported or printed. | Active I Inactive |
| Measurement details | The measurement parameters like temperature capture, temperature correction, interval time, stirrer speed, calibration mode, number of BOD bottles, and so on can be exported or printed. | Active I Inactive |
| Endpoint | The measurement endpoint settings can be exported or printed. | Active I Inactive |
| Endpoint criteria | Defines the parameters for the endpoint criteria.<br>**Strict**: Value varies less than 0.03 mg/L during the last 20 seconds.<br>**Standard**: Value varies less than 0.08 mg/L during the last 20 seconds.<br>**Fast**: Value varies less than 0.08 mg/L during the last 10 seconds.<br>Displayed if **Endpoint type** = **Automatic** is selected. | Strict I Standard I Fast I User-defined |
| Instrument data | The instrument ID and serial number, module type and serial number, and last radio clock synchronization time can be exported or printed. | Active I Inactive |

**See also**


- Printer ▸ Page 31
- Header and footer ▸ Page 38
- Printing analysis data ▸ Page 116


## 8.7.34 Auxiliary instrument

In this method function you can define data which is sent to an auxiliary instrument or to wait for incoming data from an auxiliary instrument and how to treat that data.

| Parameter | Description | Values |
|---|---|---|
| Control type | Type of connection to the auxiliary instrument. | USB-RS232 |
| Name | Defines which of the auxiliary instruments defined in the setup is used. | List of auxiliary instruments |
| Send out sequence | Defines if the method sends data to the auxiliary instrument. | Active I Inactive |

| | | |
|---|---|---|
| Output sequence | Defines the string which is sent out. Besides text also raw values embracketed with % signs can be used. To send a specific ASCII character, the format \xxx must be used with x = digits, e.g. \010 for a line break.<br>Displayed if **Send out sequence** is activated. | - |
| Wait for input sequence | Defines if the method waits for incoming data from an auxiliary instrument. | Active l Inactive |
| Maximum time | Defines the duration which the methods waits at maximum to get an input sequence.<br>Displayed if **Wait for input sequence** is activated. | 0…1000000 s l infinite |
| Input sequence | Defines the exact input sequence for which the method is waiting.<br>Displayed if **Wait for input sequence** is activated and **Input sequence with results** is deactivated. | - |
| Input sequence with results | Defines if the input sequences contains information that is to be stored in raw value AuxInstr. If activated, for example measurement results of the auxiliary instrument can be used later in the method.<br>Displayed if **Wait for input sequence** is activated. | Active l Inactive |
| Start sequence | Defines the beginning of the incoming data and hence allows to start the separation into results at a specific position.<br>Displayed if **Wait for input sequence** and **Input sequence with results** are activated. | - |
| Total length | Defines the total length of the incoming data. The separation into results does not start before this number of characters are received. Additional characters are cut off. The total length must be at least the sum of the lengths of each result.<br>Displayed if **Wait for input sequence** and **Input sequence with results** are activated. | 1…1000 |
| Number of results | Defines how many results are extracted from the incoming data string. Displayed if Wait for input sequences and Input sequence with results are activated.<br>For each result, a "Start position" and "Max. length" has to be defined. The instrument tries to identify a number in that section and stores it in the respective AuxInstr value; other characters are ignored. | 1…10 |
| Condition | A logical condition can be defined. The method function is executed or not on the result (true or false) of the calculation. | Active l Inactive |
| Formula | Here you can enter a formula whose result (true or false) will determine the execution of the method function.<br>Displayed if **Condition** is activated. | - |

**See also**


- Configuration ▸ Page 72
- Accessories ▸ Page 125
- Formula Syntax ▸ Page 117

## 8.8 Endpoint criteria

| Measurement type | Endpoint criteria | | |
|---|---|---|---|
| | **Strict** | **Standard** | **Fast** |
| **pH** or **Redox** | Value varies less than 0.03 mV during the last 8 seconds or 0.1 mV for the last 20 seconds. | Value varies less than 0.1 mV during the last 6 seconds. | Value varies less than 0.6 mV during the last 4 seconds. |
| **Ion** | Value varies less than 0.03 mV for the last 8 seconds or 0.08 mV for the last 20 seconds. | Value varies less than 0.08 mV for the last 8 seconds. | Value varies less than 0.3 mV for the last 4 seconds. |
| **Conductivity** | Value varies less than 0.4% during the last 8 seconds. | Value varies less than 0.6% during the last 6 seconds. | Value varies less than 0.8% during the last 4 seconds. |
| **Dissolved Oxygen** | Value varies less than 0.03 mg/L during the last 20 seconds. | Value varies less than 0.08 mg/L during the last 20 seconds. | Value varies less than 0.08 mg/L during the last 10 seconds. |

# 9 Series

**Navigation: Home > Series**

Defining and using series support you in performing identical analysis sequences for several samples. Serial measurement can be carried out with METTLER TOLEDO methods or with user-defined methods. Verify that a user-defined method is composed before you set the parameters for a series. Series can be defined in combination with the following method types.

- **Measurement**
- **Interval**

A maximum number of 9 samples per series can be defined, Rondolino can be used to run the series. A maximum of 60 series can be stored in the instrument. You can create shortcuts for series. Series can be created, modified and deleted.

## 9.1 Creating series

**Note**

Verify that a method is defined suitable to the series you want to create.

**Navigation: Home > Series > New**

| Parameter | Description | Values |
|---|---|---|
| Series ID | According to the headline of the screen, the **Series ID** is entered automatically starting with S and consecutive number. | - |
| Method ID | Opens the list of METTLER TOLEDO Methods and user-defined methods. | - |
| Method type | Information on type of measurement. | Measurement I Interval |
| Number of samples | Defines the number of samples for the series. | - |
| Default sample ID | Defines an ID for the default sample. | - |

1 Enter a series ID and confirm with [**OK**].
**Note**
If you enter the **Series ID** of an existing series, a pop-up window opens with the information that the series ID already exists!
Tap [**Overwrite**] to use the identical series ID for a new series.
- or -
Tap [**Cancel**] and change the series ID.

2 Select a method ID.

3 In **Number of samples**, select the number you want to use and confirm with [**OK**].

4 If desired, enter the ID in **Default sample ID**.

5 Tap [**Save**].

➡ Now you have created a series. A dialog with the series ID as title of the newly created series is displayed.

**Note**

- A maximum of 60 series can be stored at the instrument. If the maximum number of series is reached the [**New**] button is disabled. You have to delete minimum one series before you can create new series

## 9.2 Creating shortcuts for series

**Navigation: Home > Series**

Shortcuts can be placed on the **Home screen** and constitute links to executable series. Shortcuts can only be created from the **Start analysis** screen using the [**AddToHome**] button. The administration of shortcuts takes place in the **Setup** menu, see Shortcuts. This chapter describes how a user can create shortcuts to start a series from the home screen.

1 Select a series from the list.
   ➡ **Series ID** is displayed.
2 Tap [**Start**].
   ➡ **Start analysis** is displayed.
3 Tap [**AddToHome**].
   ➡ **Shortcut parameters** is displayed.
4 If desired, enter a meaningful **Description**, that will be displayed in the shortcut.
5 Select **Immediate start**, to create a direct shortcut.
6 Tap the list field **Homescreen position**.
   ➡ **Select location for shortcut** is displayed.
7 Select a free position.
8 Tap [**Save**]

➡ The shortcut is displayed on the selected position of the home screen.

**Note**

With direct shortcuts a series can be started immediately. Shortcuts lead to the **Start analysis** screen from where you can start the serial analysis.

## 9.3 Modifying series

You can modify series by changing the sdample ID. You can insert or delete samples.

### 9.3.1 Change single sample ID

**Navigation: Home > Series**

1 Select a series.
   ➡ **Series ID** is displayed.
2 Tap the sample to be modified.
   ➡ **Series item** is displayed.
3 Change the sample ID and confirm with [**OK**].
4 Confirm with [**OK**].
5 To modify additional sample ID's, repeat previous steps.
6 To finish and store entries, tap [**Save**].

### 9.3.2 Insert samples

**Navigation: Home > Series**

1 Select a series.
   ➡ **Series ID** is displayed.
2 Tap [**Insert**].
   ➡ Arrow-shaped **Insert** buttons are displayed.
3 Tap [**Insert**] at the position where you want to insert one or more samples.
   ➡ **Series item** is displayed.
4 Enter a sample ID and confirm with [**OK**].
5 Enter the number to be inserted in **Number of samples** and confirm with [**OK**].
6 Confirm with [**OK**].
7 To finish and store entries, tap [**Save**].

**Note**

- A maximum of 9 samples per series can be stored.

### 9.3.3 Delete samples

**Navigation: Home > Series**

1 Select a series.
   ➡ **Series ID** is displayed.
2 Tap the sample to be deleted.
   ➡ **Series item** is displayed.
3 Tap [**Delete**].
   ➡ The sample has been deleted without confirmation or warning.
4 To delete additional samples, repeat previous steps.

## 9.4 Delete series

**Navigation: Home > Series**

1 Tap the series to be deleted.
   ➡ **Series ID** is displayed.
2 Tap [**Delete**].
   ➡ An Information screen opens with the warning that shortcuts which refer to the series will also be deleted.
3 Tap [**Delete**].
   ➡ The series has been deleted.
4 To delete additional series, repeat previous steps.

# 10 Results

**Navigation: Home > Results**

**Results** on the **Home screen** opens the analysis list. The results of the most recent 250 analyses consisting of analysis status, analysis data, user-defined calculations, information on the analysis and statistical data of series are found. The performed analyses are listed in chronological order, with the newest analysis at the top of the list. If the maximum number of possible analysis entries is reached, the oldest entry will be deleted.

The analysis list as a whole can be deleted, single analysis can be deleted as well. You can print or transfer data of single entries if the corresponding printer settings are done. Statistics are available only for series.

**Note**

- Discontinued analyses are not included in the list.

Opening the analysis list leads to the status view automatically. You can switch between the analysis list including data concerning the status of the measurements and the analysis list concerning the results of the measurements. Tapping the [**Results**] button switches immediately to the result view. Return to the status view with **Status**.

**See also**


- Peripherals ▸ Page 30
- Errors in the analysis sequences ▸ Page 57


## 10.1 Statuses of measurements

**Navigation: Home > Results**

The status view of the analysis list is displayed and contains the following information:

- **Date**
- **Type**
- **Method/Series ID**
- **Status**

The following designations characterize the type of measurement.

- DM: **Direct measurement**
- DC: **Direct calibration**
- MS: method type **Measurement**
- CAL: method type **Calibrate**
- INC: method type **Incremental**
- INT: method type **Interval**
- S: **Series**
- ST: method type **Sensor Test**
- BCV: Method type BCV
- BOD: Method type BOD

**Note**

- For **Direct measurement** and **Direct calibration** no method ID is displayed.
- For sample series, a single entry is shown in the analysis list.

Executed analyses can have the following status.

- **OK**
  - Measurement proceeded flawlessly.
- **OK***

  Corresponds to the status **OK** with one of the following restrictions:
  - Sensor has expired.

– Limits were set and exceeded but **Interrupt outside limits** was disabled.
The task was not interrupted.

- **Error**
  – The user tapped [**Terminate**] and finished the analysis before the end of the method was reached.
  The task was interrupted.
- **Failed**
  – Limits were set and exceeded and **Interrupt outside limits** was enabled.
  The task was interrupted.

## 10.2 Results of analysis

**Navigation: Home > Results > Results**

The result view of the analysis list is displayed and contains the following information:

- **Date**
- **Type**
- **Sample**
- **Result**

**Note**

- Listed series do not show **Result** or **Sample** in this view.
- For additional information on the results of series, see [Viewing single analysis data ▸ Page 116]

## 10.3 Statistics

[**Results**] includes statistical calculations based on the measurement results of series.

**Navigation: Home > Results > Series > Statistics**

Statistics are displayed with the following parameters:

- **Results**, measurement results
- **Mean**, average of all measurement results
- **SD**, standard deviation of all measurement results
- **Min. , Max.**, minimum and maximum measurement result

## 10.4 Deleting all analysis

**Navigation: Home > Results**

You can delete the complete content of the analysis list.

– Tap [**Delete all**].

➡ The analysis list is emptied.

## 10.5 Deleting single analysis

**Navigation: Home > Results**

1 Tap the relevant analysis on the analysis list.
2 Tap [**Delete**].
3 Tab again [**Delete**] to confirm the deletion.

➡ The analysis has been deleted, the entry is deleted from the analysis list.

## 10.6 Viewing single analysis data

**Navigation: Home > Results**

Single analysis data or series data can be reviewed.

1 Tap the relevant analysis on the analysis list.

2 Tap **Measurement data**, **Settings**, **Sample** or **Resources**.

➡ **Measurement data** includes endpoint values of all measurements as well as calculated values including limits. For calibrations it includes the calibration results. Click on any measurement result to see the status, endpoint information, and raw value.

➡ Click on **Data (Interval)** to see the timed interval readings for interval measurement analysis.

➡ **Settings** includes all important method parameters like method ID, temperature capture, calibration mode and so on.

➡ **Sample** includes the sample IDs and comments. For calibrations it includes the buffer/standard group.

➡ **Resources** includes date and time, user name, sensor name, module type and so on.

**See also**

Peripherals ▸ Page 30

## 10.7 Printing analysis data

**Navigation: Home > Results**

Single analysis data or series data can be printed or transferred to an USB stick. The printer used is defined in **Setup** > **Hardware** > **Peripherals** > **Printer**.

1 Tap the relevant analysis on the analysis list.

2 Tap [**Print**].

3 Select the **Print format**.

4 If **User-defined** is selected in **Print format**, activate the types of data to be printed.

5 Tab [**OK**] to print.

**Print format**

- **Summary** prints only the most important data.
- **User-defined** provides the selection what data to print.
- **According to method** will re-print exactly the data that was printed during method execution.

**Note**

- For additional information on the content of print-outs, see method function **Report**.

**See also**

Report ▸ Page 107

# 11 Formula Syntax

The formula syntax enables you to formulate criteria and conditions to evaluate the results of your analysis.

Formulas can be entered under the method function Calculation or whenever the tickbox Condition is selected within the appropriate method function:

- **Measure**
- **Measure (Incremental)**
- **Measure (Interval)**
- **Measure (Temperature)**
- **Calculation**
- **Wait/Stir**

## 11.1 Formula symbols

**The following symbols are available under the measure function**

| Symbol | Description |
|---|---|
| U | May be used for method function **Measure**, **Measure (Incremental)**, **Calculation** and **Measure (Interval)**.<br>Analysis value at the time when the endpoint is taken, all value corrections are included. The unit depends on the settings in method function **Measure**, **Measure (Interval)**, **Measure (Temperature)** or **Measure (Incremental)**. |
| E | May be used for method function **Measure**, **Measure (Interval)** and **Measure (Temperature)**.<br>Analysis value at the time when the endpoint is taken without value corrections. Units are mV for pH, ion and Redox and Ω for conductivity. |
| UST | May be used for method function **Measure**, **Measure (Interval)** and **Measure (Temperature)**.<br>Analysis values at the start of an analysis, all value corrections are included. The unit depends on the settings in method function **Measure** or **Measure (Interval)**. |
| T | May be used for method function **Measure**, **Measure (Incremental)**, **Measure (Interval)** and **Measure (Temperature)**.<br>Temperature at the time when the endpoint is taken. |
| t | May be used for method function **Measure**.<br>Time period from the start of an analysis until the endpoint is taken. Unit is "s". |
| P | May be used for method function **Measure** and **Measure (Interval)**. Barometric pressure at the time when the endpoint is taken. Only available for the **Dissolved Oxygen** parameter |

**The following symbols for raw results are generally available**

| Symbol | Description |
|---|---|
| E1-Ex | The number following the result refers to a specific measurement type in method function **Configuration**. |
| R1…Rx | Fix marker for all results. |
| AuxInstr | Results created by method function **Auxiliary instrument**. |
| TAB[Tablename()] | Fix marker to calculate tables.<br>The value in round brackets is the input value 'x' of the table, and the completed and calculated fix marker is the output value 'y' of the table. |

Square brackets listed in the above tables refer to table names and for indexing the method function **Measure** with a method (e.g. E1[1], E1[2]…).

**The following symbols for raw results are available for BOD calculations**

| Symbol | Description |
|---|---|
| U | Average BOD value generated after the follow measurement of the last bottle of a sample or check value is taken, including also seed or blank correction. The unit is always mg/L |
| EB | BOD value of a bottle generated after each follow measurement by subtracting base value and seeded blank or blank. The unit is always mg/L |
| E | DO value generated after a measurement has been end-pointed. Temperature, salinity and barometric pressure corrections included. The unit is always mg/L. |
| UST | DO values at the start of an analysis, temperature, salinity and barometric pressure corrections included. The unit is mg/L. |
| T | Temperature at the time when the endpoint is taken during the DO measurement. |
| t | Time period from the start of a DO measurement until the endpoint is taken. Unit is seconds. |
| P | Barometric pressure at the time when the endpoint is taken during the DO measurement. |
| e | Elapsed days. Time interval between endpoint of base and follow measurement The unit is days. First bottle of base measurement to first bottle follow measurement. |

The number following a one of the above listed raw results (U1 = Blank, U2 = seeded Blank, U3 = Standard) refers to a specific check value in MF_Configuration. The number in brackets following the result EB[1], EB[2] refers to the bottle numbers. The index 1 (E[1]1, E[2]1 …) after the bracket indicates a base measurement, whereas the index 2 (E[1]2, E[2]2 …) stands for a follow measurement.

**The following mathematical operators are available**

| Symbol | Description |
|---|---|
| + | Addition |
| - | Subtraction |
| * | Multiplication |
| / | Division |

**The following comparison operators are available**

| Symbol | Description |
|---|---|
| > | Greater than |
| >= | Greater than or equal to |
| = | Numerical equality |
| <= | Less than or equal to |
| < | Less than |
| ..<..<.. | In the range of |
| <> | Not equal to |

**The following logical operators are available**

| Symbol | Description |
|---|---|
| and | Conjunction |
| or | Disjunction |
| true/false | Condition |

**The following mathematical formulas are available**

| Symbol | Description |
|---|---|
| lg() | Logarithm base 10 |
| ln() | Logarithm base e |

| Symbol | Description |
|---|---|
| pw() | Exponentials base 10 |
| ex() | Exponential base e |
| sq() | Square |
| sr() | Square root |

## 11.2 Creating formulas

Raw results, symbols and mathematical formulas can either be entered directly or taken from the proposal list. If a value is selected from the proposal list, it will be entered at the cursor position.

## 11.3 Examples

### 11.3.1 Formula in method function calculation

| Formula | Description |
|---|---|
| U1[2], also possible: R1 = U[2] | Second result of a single channel measurement |
| E3[1], also possible: R1 = E3 | First non-corrected result of third channel |
| EB1[2] | BOD value in second blank bottle (BCV method type) |
| P2[3]2 | Barometric pressure of third bottle of seeded blank in follow step (BCV method type) |
| UST1[1]-U1[1]<br>- also possible -<br>UST-U | Difference between initial and final reading of single channel measurement |
| (T1+T2)/2 | Average temperature of channel 1 and 2 in first measurement |
| First calculation: t[1]+t[2]<br>Second calculation: R1+t[3] | Total measuring time of two and three measurements of single channel measurement |
| U-EB[5] | Difference between average BOD value and BOD value in fifth sample bottle |
| U-TAB[Buffer pH 7.00(T)] | Difference between measured and theoretical pH value at measured temperature in pH buffer 7.0 |
| lg(U) | Logarithm (base 10) of result |
| AuxInstr2 | Second result of third method function **Auxiliary instrument** in the method. |

### 11.3.2 Formula in conditions

The corresponding method function is only executed if formula is true.

**Examples for formula in Conditions**

| Formula | Description |
|---|---|
| U[3]>=100 | Third result is greater or equal to 100 |
| 1.0<R1<1.2 | Result R1 is between 1.0 and 1.2 |
| T[1]<>T[2], also possible: T-T[2]<>0 | First and second temperature are different |
| e<7 | Less than 7 days between base and follow measurement of BOD analysis |

## 11.4 Formula symbols in text

Formula symbols in text In the instruction texts of method functions **Sample verification**, **Instruction** and **Wait/ Stir**, formula symbols can be used as placeholders for values. Each symbol has to be bracketed with the % signs.

Example: %U% is used to insert the results of the first measurement in the method. %R1% will show the result of the first calculation. %t[2]% will show the duration of the second measurement.

Beside the formula symbols above, the following placeholders can be used in method functions **Sample verification** and **Instruction**.

**Examples for formula in Conditions**

| Symbol | Description |
|---|---|
| MethodID | **Method ID** of the running method. |
| SampleID | **Sample ID** from either method function Sample, the start analysis screen or the series parameters. |
| Comment | **Sample comments** from either method function **Sample** or the start analysis screen. |

# 12 News, Tasks and Online Display

If an analysis is started, the online display is shown. If a task is already running and a new analysis is started, the task list with the waiting tasks can be displayed. Tapping the [**News**] button provides information concerning the peripheral devices connected to the instrument.

## 12.1 News

In case of disconnected PnP resources, exceeded calibration limits etc. the [**News**] button opens a screen with additional information about these issues.

The [**News**] button is located in the top left-hand corner of the **Home screen**. The color of the symbol indicates if the list is empty (grey) or not (white).

Tap the [**News**] button to see the content of news. The list contains entries about connected and disconnected external devices, sensors with expired life span and if the radio clock synchronization process is finished. All information is listed in chronological order.

When a new device is added, the life span of a sensor exceeds or the radio clock finished synchronization, the [**News**] button flashes.

**Note**

- The maximum number of news entries in the list is 30. If the capacity of the news list is fully exploited, the oldest message will be overwritten. If you switch the instrument off and on again, all old news will be cleared.
- The news list can be cleared manually with [**Remove all**].

## 12.2 Tasks

Each execution of a calibration, measurement, method or series is a task. Tasks are always processed in sequence. Each task is listed in the task list and receives a number, based on the chronological order of its start.

For tasks, the following rules must be observed:

- It is allowed to start several identical measurements.
- Methods can also be started when a calibration or direct measurement is running. They will be queued.
- Starting a direct measurement in which more than one module is involved will be listed as one task in the task list.
- It is not possible to start several direct calibrations via **Calibrate**.
- It is not possible to start several direct measurements via **Read**.

**Tasks** is located in the top right-hand corner of the **Home screen**. It is activated, as soon as at least one task is lined up.

By tapping **Tasks** you switch to the **Online screen** or, if several tasks were started, the task list.

Status display of the **Tasks** button:

| | |
|---|---|
| **Blue** | No task is lined up. |
| **Yellow** | A task is running right now. |
| **Yellow/blue blinking** | A task is waiting for user interaction. |
| **Orange** | The task list is interrupted and no task is running. |

**Note**

- Direct calibration via [**Calibrate**] and direct measurement via [**Read**] can only be started when no other task is running. In case a task is running, [**Read**] and [**Calibrate**] are deactivated.

The task list offers the following options:

| | |
|---|---|
| Show **Online display** | By tapping the list entry of the ongoing task, the online display is shown. |

| | |
|---|---|
| [**Interrupt**] | By tapping the button **Interrupt**, the processing of the tasks is interrupted. The ongoing task is carried out to completion. |
| [**Resume**] | By tapping **Resume** you can continue the processing of the task. |
| [**Remove all**] | This button is only visible, when the task list is interrupted and no tasks are running.<br>By tapping this button all lined up tasks will be removed. |
| Move tasks | Tap a task.<br>By changing the number, you can move the task. |
| Delete individual tasks | Tap a task.<br>By tapping **Remove** the task is deleted from the list. |

## 12.3 Online display

The online display shows the status and readings of the currently running analysis. The data is updated every 0.5 seconds, for conductivity and dissolved oxygen every second.

The **Title bar** at the top of the online screen shows:

- **Method ID** and name
  - If you started a direct measurement: **DM: Direct Measure**
  - If you started a direct calibration: **DC: Direct Calibration**
- **News** for opening a screen including information about connected and disconnected devices and exceeded life span.
- **Tasks** for showing an ongoing task and to open a screen including the task list.

The **Status bar**, located below the **Title bar**, shows the following information:

- Three squares indicating the used modules.
- Name of the method function that is running.
- A timer to indicate how long the method function is running.

A maximum of three **Data fields** can be shown. The number depends on the number of used modules. If two or three Data fields are shown, **Switch view** allows to toggle between full information and large digits.

**Note**

- Depending on the analysis different parameters are shown in the **Data field**, the commands on the button below the data field vary.

# 13 Maintenance and Care

Do not open the housing of the instrument; it does not contain any parts that can be maintained, repaired or replaced by the user. If you experience problems with your instrument, contact your authorized METTLER TOLEDO dealer or service representative.

▸ www.mt.com/contact

## 13.1 Cleaning the Instrument

**NOTICE**

**Danger of damage to the instrument due to inappropriate cleaning agents!**

The housing is made of acrylonitrile butadiene styrene/polycarbonate (ABS/PC). This material is sensitive to some organic solvents, such as toluene, xylene and methyl ethyl ketone (MEK). If liquids enter the housing they can damage the instrument.

1 Use only water and a mild detergent to clean the housing.

2 Wipe off any spills immediately.

3 The instrument is IP54 splash water proof: Do not immerse the instrument in liquid.

- The instrument is turned off and disconnected from the electrical outlet.

– Clean the housing of the instrument using a cloth dampened with water and a mild detergent.

## 13.2 Maintenance of electrodes

The instrument monitors the condition of the attached pH electrodes.

Slope: 95-105%
and offset: ± (0-20) mV
Electrode is in good condition

Slope: 90-94%
or offset: ± (20-35) mV
Electrode needs cleaning

Slope: 85-89%
or offset: ± (>35) mV
Electrode is defective or too old

When cleaning, always follow the instructions in the manual of the electrodes used. Make sure the pH electrode is always kept filled with the appropriate filling solution. For maximum accuracy, any filling solution that may have "crept" and encrusted the outside of the electrode should be removed with deionized water. Always store the electrode according to the manufacturer's instructions and do not allow it to dry out.

If the electrode slope falls rapidly, or if the response becomes sluggish, the following procedures may help. Try one of the following, depending on your sample.

| Problem | Action |
|---|---|
| Fat or oil build-up | Either rinse the membrane with soap solution or acetone/ethanol or shortly soak the tip of the electrode in hot water. When rinsed with organic solvent, place the membrane overnight in 0.1 mol/L HCl. |
| pH electrode membrane has dried out | Soak the tip of the electrode overnight in 0.1 mol/L HCl.<br>If this procedure has no effect, soak the tip of the electrode for a few minutes in reactivation solution for pH electrodes. |
| Protein build-up in the diaphragm of a pH electrode | Remove deposits by soaking the electrode in an HCl/pepsin solution. |
| Silver sulfide contamination of pH electrode | Remove deposits by soaking the electrode in a thiourea solution. |

Run a new calibration after treatment.

**Note**

- Cleaning and filling solutions should be handled with the same care as that given to toxic or corrosive substances.

- The condition of the pH electrode can also be checked, using the provided METTLER TOLEDO method Sensor Test.

## 13.3 Transporting the instrument

Note the following instructions when transporting the instrument to a new location:

- Transport the instrument with care to avoid damage! The instrument may be damaged if not transported correctly.
- Unplug the instrument and remove all connected cables.
- Remove the electrode arm.
- To avoid damage to the instrument when transporting it over long distances, please use the original packaging.
- If the original packaging is no longer available, choose packaging that will ensure safe handling.

## 13.4 Disposal

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties, the content of this regulation must also be related.

# 14 Accessories

| Accessories | Order No. |
|---|---|
| SevenExcellence™ pH/mV module | 30034472 |
| SevenExcellence™ conductivity module | 30034473 |
| SevenExcellence™ pH/Ion module | 30034471 |
| SevenExcellence™ DO/BOD module | 30034474 |
| SevenExcellence™ blank module | 30034475 |
| SevenExcellence™ protective film (2 pcs.) | 30041155 |
| uPlace™ electrode arm, complete with base and extension | 30019823 |
| SevenExcellence™ semi-transparent cover | 30041154 |
| InMotion sample changer bundle: Flex base and 100 mL rack (18 samples) | 30094120 |
| Rondolino sample changer, complete for SevenExcellence™ | 51302888 |
| Rondolino USB-TTL box | 30046261 |
| Magnetic stirrer uMix™ | 30040002 |
| Compact Stirrer Kit (stirrer incl. 2 propeller stirrer and adapter cable) | 30115728 |
| Compact Stirrer adapter cable | 30098212 |
| Disposable beakers for InMotion and Rondolino (PP, 100 mL, 1400 pcs.) | 00101974 |
| PowerShower™ | 51108219 |
| LogStraight™ fingerprint reader | 51192107 |
| Barcode reader | 21901297 |
| USB cable for barcode reader | 21901309 |
| Printer USB-P25 | 11124301 |
| **EasyDirect pH** PC software | - |
| USB A-B cable 1.8 m for **EasyDirect pH** software (not included with **EasyDirect pH** software) | 51191926 |
| Adapter for auxiliary instruments (USB-RS232 adapter) | 51105856 |

| Buffers and standards | Order No. |
|---|---|
| pH 4.01 buffer sachets, 30 x 20mL | 51302069 |
| pH 4.01 buffer solution, 6 x 250mL | 51350018 |
| pH 7.00 buffer sachets, 30 x 20mL | 51302047 |
| pH 7.00 buffer solution, 6 x 250mL | 51350020 |
| pH 9.21 buffer sachets, 30 x 20mL | 51302070 |
| pH 9.21 buffer solution, 6 x 250mL | 51350022 |
| pH 10.01 buffer sachets, 30 x 20mL | 51302079 |
| pH 10.00 buffer solution, 6 x 250mL | 51350024 |
| Rainbow (box of each, 10 x 20 mL, 4.01/7.00/9.21) | 51302068 |
| Rainbow (box of each, 10 x 20 mL, 4.01/7.00/10.01) | 51302080 |
| 10 µS/cm conductivity standard solution, 250 mL | 51300169 |
| 84 µS/cm conductivity standard solution, 250 mL | 51302153 |
| 500 µS/cm conductivity standard solution, 250 mL | 51300170 |
| 1413 µS/cm conductivity standard solution, 30 x 20 mL | 51302049 |
| 1413 µS/cm conductivity standard solution, 6 x 250 mL | 51350096 |
| 12.88 mS/cm conductivity standard solution, 30 x 20 mL | 51302050 |
| 12.88 mS/cm conductivity standard solution, 6 x 250 mL | 51350098 |
| Zero oxygen tablets (24 pcs.) | 51300140 |

| pH sensors with fixed cable | Order No. |
|---|---|
| InLab® Expert Pro-ISM, rugged 3-in-1 pH sensor, PEEK shaft, ATC | 30014096 |

| ISM® sensors with MultiPin™ head | Order No. |
|---|---|
| InLab® Routine Pro-ISM, 3-in-1 pH sensor, glass shaft, ATC, refillable | 51344055 |
| InLab®Micro Pro-ISM, 3-in-1 pH sensor, glass shaft, 5 mm shaft diameter, ATC, refillable | 51344163 |
| InLab® Power Pro-ISM, 3-in-1 pH sensor, glass shaft, ATC, pressurized SteadyForce™ reference system | 51344211 |
| InLab® Pure Pro-ISM, 3-in-1 pH sensor, glass shaft, immovable glass sleeve, ATC, refillable | 51344172 |
| InLab® Science Pro-ISM, 3-in-1 pH sensor, glass shaft, movable glass sleeve, ATC, refillable | 51344072 |
| InLab® Solids Pro-ISM, 3-in-1 pH sensor, glass shaft, open junction, sharp membrane, ATC | 51344155 |
| Electrode cable 1.2 m, BNC/RCA-MultiPin™ | 30281896 |
| Electrode cable 3 m, BNC/RCA-MultiPin™ | 30281897 |
| ATC probe, temperature sensor | 12997876 |

| Digital ISM® pH sensors with diagnostic functions | Order No. |
|---|---|
| InLab® Smart Pro-ISM, 3-in-1 pH sensor, glass shaft, ATC, pressurized SteadyForce™ reference system | 30027775 |
| Cable InLab® Digital, 1.2 m | 30027776 |

| Conductivity sensors with fixed cable | Order No. |
|---|---|
| InLab® 731-ISM, 4-electrode graphite conductivity sensor, ATC | 30014092 |
| InLab® 741-ISM, 2-electrode steel conductivity sensor, ATC | 30014094 |
| InLab® Trace, high-accuracy sensor for low conductivities, ATC | 30014097 |
| Flow-Cell for InLab® Trace | 30014098 |
| InLab® Trace Kit (Sensor and Flow-Cell) | 30014099 |

| Polarographic Dissolved Oxygen sensors with fixed cable | Order No. |
|---|---|
| InLab® 605-ISM-2 m | 51344611 |
| InLab® 605-ISM-5 m | 51344612 |
| InLab® 605-ISM-10 m | 51344613 |

| Optical Dissolved Oxygen sensors with fixed cable | Order No. |
|---|---|
| InLab® OptiOx, 1.8 m | 51344621 |
| InLab® OptiOx, 5 m | 51344622 |
| InLab® OptiOx, 10 m | 51344623 |

| OptiOx parts | Order No. |
|---|---|
| OptiOx replacement cap | 51344630 |
| OptiOx calibration tube | 51344631 |
| OptiOx protective guard | 51344632 |
| OptiOx BOD adapter | 51344633 |

| Solutions | Order No. |
|---|---|
| HCl/Pepsin solution (removes protein contamination), 1 x 250 mL | 51350100 |
| Thiourea solution (remove silver sulfide contamination), 1 x 250 mL | 51350102 |
| Reactivation solution for pH electrodes, 1 x 25 mL | 51350104 |
| InLab Storage solution, 1 x 250 mL | 30111142 |

# 15 Technical Data

## 15.1 SevenExcellence™

| | | |
|---|---|---|
| **Screen** | Color TFT | |
| **Interfaces** | RS232, USB A, USB B, Ethernet | |
| **Ambient conditions** | Ambient temperature | 5 °C to 40 °C |
| | Relative humidity | 5% to 80% (non-condensing) |
| | Overvoltage category | Class II |
| | Pollution degree | 2 |
| | Range of application | For indoor use only |
| | Maximum operating altitude | Up to 2000 m |
| **Dimensions** | Width | 235 mm |
| | Depth | 188 mm |
| | Height | 75 mm |
| **Weight** | Basic device | 1120 g |
| | 1 module | 111 - 130 g |
| **Power rating instrument** | Input voltage | 12 V ⎓ |
| | Power consumption | 10 W |
| **Power rating AC adapter** | Line voltage | 100 - 240 V ~ ±10 % |
| | Input frequency | 50/60 Hz |
| | Input current | 0.3 A |
| | Output voltage | 12 V ⎓ |
| | Output current | 0.84 A |
| **Materials** | Housing | ABS/PC |
| | Expansion units | ABS/PC |
| | Electrode arm | ABS/PC |
| | Touch panel | Tempered glass |

## 15.2 pH/mV module

| | | | |
|---|---|---|---|
| **Sensor inputs** | **Digi** | Mini-LTW digital sensors | |
| | **ISFET** | Mini-DIN ISFET sensor | |
| | **ATC int** | RCA (Cinch) NTC30k | |
| | **pH** | BNC mV/pH sensors, Impedance >$3 \cdot 10^{12}$ Ω | |
| **pH mode** | | | |
| | **pH** | **mV** | **Temperature °C** |
| **Measurement range** | -2.000…20.000 | ± 2000.0 | -30.0…130.0 |
| **Resolution** | 0.001/0.01/0.1 | 0.1 | 0.1 |
| **Limits of error** | ± 0.002 | ± 0.1 mV (-1000… +1000 mV)<br>± 0.2 mV (> ±1000 mV) | 0.0…100.0 °C: ±0.1<br>-30.0…0.0 °C: ±0.3<br>100.0…130.0 °C: ±0.3 |
| **Relative mV** | - | Yes | - |
| **Temperature compensation** | Automatic | -30.0 °C…130.0 °C | |
| | Manual | -30.0 °C…130.0 °C | |
| **ISFET mode** | | | |
| | **pH** | **Temperature °C** | |
| **Measurement range** | 0.000…14.000 | -30.0…130.0 | |
| **Resolution** | 0.001/0.01/0.1 pH | 0.1 | |
| **Limits of errors** | ± 0.05 pH | 0.0…100.0 °C: ±0.1<br>-30.0…0.0 °C: ±0.3<br>100.0…130.0 °C: ±0.3 | |

## 15.3 Conductivity module

| | | |
|---|---|---|
| **Sensor inputs** | **Digi** | Mini-LTW digital sensors |
| | **ATC ext** | RCA (Cinch) NTC30k or PT1000 |
| | **Cond** | Mini-DIN conductivity sensors |
| **Conductivity mode** | Measurement range | 0.001…999999 µS/cm |
| | | 0.001…2000 mS/cm |
| | | 0.001…200 S/m |
| | | 0.001…200000 mS/m |
| | | 0.1…999999 µS/m |
| | Resolution | 0.001…1 µS/cm, mS/cm |
| | | 0.0001…0.1 S/m, µS/m, mS/m |
| | Limits of errors | ± 0.5% of measured value |
| **TDS mode** | Measurement range | 0.001…1000 ppt, g/L |
| | | 0.001…999999 mg/L, ppm |
| | TDS Factor | 0.00…10.00 |
| | Resolution | 0.0001…1 ppt, g/L |
| | | 0.001…1 mg/L, ppm |
| | Limits of errors | ± 0.5% of measured value |
| **Salinity mode** | Measurement range | 0.0…80 psu, ppt |
| | Resolution | 0.01…0.1 psu, ppt |
| | Limits of errors | ± 0.5% of measured value |
| **Resistivity mode** | Measurement range | 0.01…100 MΩ·cm |
| | | 0.01…999999 Ω·cm |
| | Resolution | 0.0001…1 MΩ·cm |
| | | 0.01…1 Ω·cm |
| | Limits of errors | ± 0.5% of measured value |
| **Temperature capture** | Temperature compensation | Automatic: -30 °C…130 °C |
| | | Manual: -30 °C…130 °C |
| | Limits of errors | 0.0…100.0 °C: ±0.1<br>-30.0…0.0 °C: ±0.3<br>100.0…130.0 °C: ±0.3 |

## 15.4 pH/Ion module

| | | | |
|---|---|---|---|
| **Senor inputs** | **Digi** | Mini-LTW digital sensors | |
| | **ATC ext** | RCA (Cinch) NTC30k or PT1000 | |
| | **ref** | Reference electrode | |
| | **ATC int** | RCA (Cinch) NTC30k | |
| | **pH** | BNC mV/pH sensors, Impedance >$3 \cdot 10^{12}$ Ω | |
| **Ion mode** | | | |
| | **Ion** | **Temperature °C** | |
| **Measurement range** | 0…999 999 mg/L, ppm | -30.0…130.0 | |
| | 0…100 mol/L, % | | |
| | 0…100000 mmol/L | | |
| | -2.000…20.000 pX | | |
| **Resolution** | 0.001…1 mg/L, ppm, mmol/L, pX | 0.1 | |
| | 0.0001…100 mol/L, % | | |
| **Limits of error** | ± 0.5 % of measured value | 0.0…100.0 °C: ±0.1<br>-30.0…0.0 °C: ±0.3<br>100.0…130.0 °C: ±0.3 | |
| **pH mode** | | | |
| | **pH** | **mV** | **Temperature °C** |
| **Measurement range** | -2.000…20.000 | ± 2000.0 | -30.0…130.0 |
| **Resolution** | 0.001/0.01/0.1 | 0.1 | 0.1 |
| **Limits of error** | ± 0.002 | ± 0.1 | 0.0…100.0 °C: ±0.1<br>-30.0…0.0 °C: ±0.3<br>100.0…130.0 °C: ±0.3 |
| **Relative mV** | - | yes | - |
| **Temperature compensation** | Automatic | -30.0 °C…130.0 °C | |
| | Manual | -30.0 °C…130.0 °C | |

## 15.5 DO/BOD module

| | | |
|---|---|---|
| **Sensor inputs** | **Digi** | Mini-LTW digital sensors |
| | **ATC ext** | RCA (Cinch) NTC30k or PT1000 |
| | **ATC int** | RCA (Cinch) NTC22k |
| | **DO** | BNC DO sensors |
| **Dissolved oxygen** | | |
| | **Optical sensor (digital)** | **Polarographic sensor (analog)** |
| **Measuring range** | 0.000...50 mg/L (ppm) | 0.000…99 mg/L (ppm) |
| **Resolution** | 0.001/0.01/0.1 | 0.001/0.01/0.1 |
| **Limits of error** | ± 0.1 mg/L from 0…8 | ± 0.5% |
| | ± 0.2 mg/L from 8…20 | |
| | ± 10% from 20…50 | |
| **Units** | mg/L, ppm | mg/L, ppm |
| **DO Saturation** | | |
| | **Optical sensor (digital)** | **Polarographic sensor (analog)** |
| **Measuring range** | 0.0…500% | 0.0...600% |
| **Resolution** | 0.0001/0.001/0.01/0.1 | 0.0001/0.001/0.01/0.1 |
| **Temperature** | | |
| | **Optical sensor (digital)** | **Polarographic sensor (analog)** |
| **Measuring range** | 0.0 °C…50.0 °C | 0.0 °C…60.0 °C |
| **Resolution** | 0.1 °C | 0.1 °C |
| **Limits of error** | ± 0.1 °C | ± 0.1 °C |
| **Pressure** | | |
| | **Optical sensor (digital)** | **Polarographic sensor (analog)** |
| **Measuring range** | 500 to 1100 mbar | 500 to 1100 mbar |
| **Resolution** | 1 | 1 |
| **Limits of error** | ± 1 mbar | ± 1 mbar |
| **General** | | |
| | **Optical sensor (digital)** | **Polarographic sensor (analog)** |
| **Calibration points** | 2 | 2 |
| **Pressure compensation** | automatic / manual | automatic / manual |
| **Pressure units** | mbar, hPa, mmHg, atm | mbar, hPa, mmHg, atm |

# 16 Appendix

## 16.1 Predefined buffers & standards

### Buffer Sets

**METTLER TOLEDO Europe (Ref. 25°C)**

| T [°C] | 2.00 | 4.01 | 7.00 | 9.21 | 11.00 |
|---|---|---|---|---|---|
| 0.0 | 2.03 | 4.01 | 7.12 | 9.52 | 11.90 |
| 5.0 | 2.02 | 4.01 | 7.09 | 9.45 | 11.72 |
| 10.0 | 2.01 | 4.00 | 7.06 | 9.38 | 11.54 |
| 15.0 | 2.00 | 4.00 | 7.04 | 9.32 | 11.36 |
| 20.0 | 2.00 | 4.00 | 7.02 | 9.26 | 11.18 |
| **25.0** | **2.00** | **4.01** | **7.00** | **9.21** | **11.00** |
| 30.0 | 1.99 | 4.01 | 6.99 | 9.16 | 10.82 |
| 35.0 | 1.99 | 4.02 | 6.98 | 9.11 | 10.64 |
| 40.0 | 1.98 | 4.03 | 6.97 | 9.06 | 10.46 |
| 45.0 | 1.98 | 4.04 | 6.97 | 9.03 | 10.28 |
| 50.0 | 1.98 | 4.06 | 6.97 | 8.99 | 10.10 |
| 55.0 | 1.98 | 4.08 | 6.98 | 8.96 | - |
| 60.0 | 1.98 | 4.10 | 6.98 | 8.93 | - |
| 65.0 | 1.98 | 4.13 | 6.99 | - | - |
| 70.0 | 1.99 | 4.16 | 7.00 | 8.88 | - |
| 75.0 | 1.99 | 4.19 | 7.02 | - | - |
| 80.0 | 2.00 | 4.22 | 7.04 | 8.83 | - |
| 85.0 | 2.00 | 4.26 | 7.06 | - | - |
| 90.0 | 2.00 | 4.30 | 7.09 | 8.79 | - |
| 95.0 | 2.00 | 4.35 | 7.12 | 8.77 | - |

**METTLER TOLEDO USA (Ref. 25°C)**

| T [°C] | 1.68 | 4.01 | 7.00 | 10.01 |
|---|---|---|---|---|
| 0.0 | 1.67 | 4.01 | 7.12 | 10.32 |
| 5.0 | 1.67 | 4.01 | 7.09 | 10.25 |
| 10.0 | 1.67 | 4.00 | 7.06 | 10.18 |
| 15.0 | 1.67 | 4.00 | 7.04 | 10.12 |
| 20.0 | 1.68 | 4.00 | 7.02 | 10.06 |
| **25.0** | **1.68** | **4.01** | **7.00** | **10.01** |
| 30.0 | 1.68 | 4.01 | 6.99 | 9.97 |
| 35.0 | 1.69 | 4.02 | 6.98 | 9.93 |
| 40.0 | 1.69 | 4.03 | 6.97 | 9.89 |
| 45.0 | 1.70 | 4.04 | 6.97 | 9.86 |
| 50.0 | 1.71 | 4.06 | 6.97 | 9.83 |
| 55.0 | 1.72 | 4.08 | 6.98 | - |
| 60.0 | 1.72 | 4.10 | 6.98 | - |
| 65.0 | - | 4.13 | 6.99 | - |
| 70.0 | 1.74 | 4.16 | 7.00 | - |
| 75.0 | - | 4.19 | 7.02 | - |
| 80.0 | 1.77 | 4.22 | 7.04 | - |
| 85.0 | - | 4.26 | 7.06 | - |
| 90.0 | 1.79 | 4.30 | 7.09 | - |
| 95.0 | 1.81 | 4.35 | 7.12 | - |

**METTLER TOLEDO Verification buffers (Ref. 25°C)**

| T [°C] | 5.00 | 8.00 |
|---|---|---|
| 0.0 | 5.04 | 8.07 |
| 5.0 | 5.03 | 8.06 |
| 10.0 | 5.02 | 8.07 |
| 15.0 | 5.01 | 8.04 |
| 20.0 | 5.00 | 8.02 |
| **25.0** | **5.00** | **8.00** |
| 30.0 | 5.01 | 7.98 |
| 35.0 | 5.01 | 7.95 |
| 40.0 | 5.03 | 7.94 |
| 45.0 | 5.05 | 7.91 |
| 50.0 | 5.06 | 7.90 |
| 55.0 | 5.08 | 7.89 |
| 60.0 | 5.11 | 7.86 |
| 65.0 | 5.14 | 7.88 |
| 70.0 | 5.17 | 7.87 |
| 75.0 | 5.20 | 7.86 |
| 80.0 | 5.23 | 7.85 |
| 85.0 | 5.26 | 7.86 |
| 90.0 | 5.29 | 7.87 |
| 95.0 | 5.32 | 7.87 |

**MERCK (Ref. 20°C)**

| T [°C] | 2.00 | 4.00 | 7.00 | 9.00 | 12.00 |
|---|---|---|---|---|---|
| 5.0 | 2.01 | 4.05 | 7.07 | 9.16 | 12.41 |
| 10.0 | 2.01 | 4.03 | 7.05 | 9.11 | 12.26 |
| 15.0 | 2.00 | 4.02 | 7.02 | 9.05 | 12.10 |
| **20.0** | **2.00** | **4.00** | **7.00** | **9.00** | **12.00** |
| 25.0 | 2.00 | 3.99 | 6.98 | 8.95 | 11.88 |
| 30.0 | 2.00 | 3.98 | 6.98 | 8.91 | 11.72 |
| 35.0 | 2.00 | 3.98 | 6.96 | 8.88 | 11.67 |
| 40.0 | 2.00 | 3.98 | 6.95 | 8.85 | 11.54 |
| 45.0 | 2.00 | 3.98 | 6.95 | 8.82 | 11.44 |
| 50.0 | 2.00 | 3.98 | 6.95 | 8.79 | 11.33 |

**DIN(19266)/NIST (Ref. 25°C)**

| T [°C] | 1.679 | 4.005 | 6.865 | 9.180 | 12.454 |
|---|---|---|---|---|---|
| 0.0 | 1.666 | 4.000 | 6.984 | 9.464 | - |
| 5.0 | 1.668 | 3.998 | 6.951 | 9.395 | 13.207 |
| 10.0 | 1.670 | 3.997 | 6.923 | 9.332 | 13.003 |
| 15.0 | 1.672 | 3.998 | 6.900 | 9.276 | 12.810 |
| 20.0 | 1.675 | 4.000 | 6.881 | 9.225 | 12.627 |
| **25.0** | **1.679** | **4.005** | **6.865** | **9.180** | **12.454** |
| 30.0 | 1.683 | 4.011 | 6.853 | 9.139 | 12.289 |
| 35.0 | 1.688 | 4.018 | 6.844 | 9.102 | 12.133 |
| 37.0 | - | 4.022 | 6.841 | 9.088 | - |
| 38.0 | 1.691 | - | - | - | 12.043 |
| 40.0 | 1.694 | 4.027 | 6.838 | 9.068 | 11.984 |
| 45.0 | - | - | - | - | 11.841 |
| 50.0 | 1.707 | 4.050 | 6.833 | 9.011 | 11.705 |

**DIN(19267) (Ref. 25°C)**

| T [°C] | 1.09 | 4.65 | 6.79 | 9.23 | 12.75 |
|---|---|---|---|---|---|
| 0.0 | 1.08 | 4.67 | 6.86 | 9.48 | - |
| 10.0 | 1.09 | 4.66 | 6.84 | 9.37 | 13.37 |
| 20.0 | 1.09 | 4.65 | 6.80 | 9.27 | 12.96 |
| **25.0** | **1.09** | **4.65** | **6.79** | **9.23** | **12.75** |
| 30.0 | 1.10 | 4.65 | 6.78 | 9.18 | 12.61 |
| 40.0 | 1.10 | 4.66 | 6.76 | 9.09 | 12.29 |
| 50.0 | 1.11 | 4.68 | 6.76 | 9.00 | 11.98 |
| 60.0 | 1.11 | 4.70 | 6.76 | 8.92 | 11.69 |
| 70.0 | 1.11 | 4.72 | 6.76 | 8.88 | 11.43 |
| 80.0 | 1.12 | 4.75 | 6.78 | 8.85 | 11.19 |
| 90.0 | 1.13 | 4.79 | 6.80 | 8.82 | 10.99 |

**JJG119 (Chinese) (Ref. 25°C)**

| T [°C] | 1.680 | 4.003 | 6.864 | 9.182 | 12.460 |
|---|---|---|---|---|---|
| 0.0 | 1.668 | 4.006 | 6.981 | - | 13.416 |
| 5.0 | 1.669 | 3.999 | 6.949 | 9.391 | 13.210 |
| 10.0 | 1.671 | 3.996 | 6.921 | 9.330 | 13.011 |
| 15.0 | 1.673 | 3.996 | 6.898 | 9.276 | 12.820 |
| 20.0 | 1.676 | 3.998 | 6.879 | 9.226 | 12.637 |
| **25.0** | **1.680** | **4.003** | **6.864** | **9.182** | **12.460** |
| 30.0 | 1.684 | 4.010 | 6.852 | 9.142 | 12.292 |
| 35.0 | 1.688 | 4.019 | 6.844 | 9.105 | 12.130 |
| 37.0 | 1.694 | 4.022 | 6.839 | - | 12.069 |
| 40.0 | 1.694 | 4.029 | 6.838 | 9.072 | 11.975 |
| 45.0 | 1.700 | 4.042 | 6.834 | 9.042 | 11.828 |
| 50.0 | 1.706 | 4.055 | 6.833 | 9.015 | 11.697 |
| 55.0 | 1.713 | 4.070 | 6.834 | 8.990 | 11.553 |
| 60.0 | 1.721 | 4.087 | 6.837 | 8.968 | 11.426 |
| 70.0 | 1.739 | 4.122 | 6.847 | 8.926 | - |
| 80.0 | 1.759 | 4.161 | 6.862 | 8.890 | - |
| 90.0 | 1.782 | 4.203 | 6.881 | 8.856 | - |
| 95.0 | 1.795 | 4.224 | 6.891 | 8.839 | - |

**Technical (Ref. 25°C)**

| T [°C] | 2.00 | 4.01 | 7.00 | 10.00 |
|---|---|---|---|---|
| 0.0 | 2.03 | 4.01 | 7.12 | - |
| 5.0 | 2.02 | 4.01 | 7.09 | 10.65 |
| 10.0 | 2.01 | 4.00 | 7.06 | 10.39 |
| 15.0 | 2.00 | 4.00 | 7.04 | 10.26 |
| 20.0 | 2.00 | 4.00 | 7.02 | 10.13 |
| **25.0** | **2.00** | **4.01** | **7.00** | **10.00** |
| 30.0 | 1.99 | 4.01 | 6.99 | 9.87 |
| 35.0 | 1.99 | 4.02 | 6.98 | 9.74 |
| 40.0 | 1.98 | 4.03 | 6.97 | 9.61 |
| 45.0 | 1.98 | 4.04 | 6.97 | 9.48 |
| 50.0 | 1.98 | 4.06 | 6.97 | 9.35 |
| 55.0 | 1.98 | 4.08 | 6.98 | - |
| 60.0 | 1.98 | 4.10 | 6.98 | - |
| 65.0 | 1.98 | 4.13 | 6.99 | - |
| 70.0 | 1.99 | 4.16 | 7.00 | - |
| 75.0 | 1.99 | 4.19 | 7.02 | - |
| 80.0 | 2.00 | 4.22 | 7.04 | - |
| 85.0 | 2.00 | 4.26 | 7.06 | - |
| 90.0 | 2.00 | 4.30 | 7.09 | - |
| 95.0 | 2.00 | 4.35 | 7.12 | - |

**JIS Z 8802 (Japanese) (Ref. 25°C)**

| T [°C] | 1.679 | 4.008 | 6.865 | 9.180 |
|---|---|---|---|---|
| 5.0 | 1.668 | 3.999 | 6.951 | 9.395 |
| 10.0 | 1.670 | 3.998 | 6.923 | 9.332 |
| 15.0 | 1.672 | 3.999 | 6.900 | 9.276 |
| 20.0 | 1.675 | 4.002 | 6.881 | 9.225 |
| **25.0** | **1.679** | **4.008** | **6.865** | **9.180** |
| 30.0 | 1.683 | 4.015 | 6.853 | 9.139 |
| 35.0 | 1.688 | 4.024 | 6.844 | 9.102 |
| 40.0 | 1.694 | 4.035 | 6.838 | 9.068 |
| 45.0 | 1.700 | 4.047 | 6.834 | 9.038 |
| 50.0 | 1.707 | 4.060 | 6.833 | 9.011 |

**Standard Groups**

**International (Ref. 25°C)**

| T [°C] | 10 µS/cm | 84 µS/cm | 500 µS/cm | 1413 µS/cm | 12.88 mS/cm |
|---|---|---|---|---|---|
| 5.0 | 6.13 | 53.02 | 315.3 | 896 | 8.22 |
| 10.0 | 7.10 | 60.34 | 359.6 | 1020 | 9.33 |
| 15.0 | 7.95 | 67.61 | 402.9 | 1147 | 10.48 |
| 16.0 | 8.15 | 69.25 | - | - | - |
| 17.0 | 8.36 | 70.89 | - | - | - |
| 18.0 | 8.56 | 72.52 | - | - | - |
| 19.0 | 8.77 | 74.16 | - | - | - |
| 20.0 | 8.97 | 75.80 | 451.5 | 1278 | 11.67 |
| 21.0 | 9.18 | 77.44 | - | - | - |
| 22.0 | 9.38 | 79.08 | - | - | - |
| 23.0 | 9.59 | 80.72 | - | - | - |
| 24.0 | 9.79 | 82.36 | - | - | - |
| **25.0** | **10.00** | **84.00** | **500.0** | **1413** | **12.88** |
| 30.0 | 11.03 | 92.19 | 548.5 | 1552 | 14.12 |
| 35.0 | 12.14 | 100.92 | 602.5 | 1696 | 15.39 |
| 40.0 | 13.29 | 109.21 | - | - | - |
| 45.0 | 14.44 | 118.05 | - | - | - |
| 50.0 | 15.55 | 126.80 | - | - | - |

**Chinese (Ref. 25°C)**

| T [°C] | 146.5 µS/cm | 1408 µS/cm | 12.85 mS/cm | 111.3 mS/cm |
|---|---|---|---|---|
| 15.0 | 118.5 | 1141.4 | 10.455 | 92.12 |
| 18.0 | 126.7 | 1220.0 | 11.163 | 97.80 |
| 20.0 | 132.2 | 1273.7 | 11.644 | 101.70 |
| **25.0** | **146.5** | **1408.3** | **12.852** | **111.31** |
| 35.0 | 176.5 | 1687.6 | 15.353 | 131.10 |

**Japanese Standards (Ref. 20°C)**

| T [°C] | 1330 µS/cm | 133.0 µS/cm | 26.6 µS/cm |
|---|---|---|---|
| 0.0 | 771.40 | 77.14 | 15.428 |
| 5.0 | 911.05 | 91.11 | 18.221 |
| 10.0 | 1050.70 | 105.07 | 21.014 |
| 15.0 | 1190.35 | 119.04 | 23.807 |
| **20.0** | **1330.00** | **133.00** | **26.600** |
| 25.0 | 1469.65 | 146.97 | 29.393 |
| 30.0 | 1609.30 | 160.93 | 32.186 |
| 35.0 | 1748.95 | 174.90 | 34.979 |

**Saturated NaCl (Ref. 25°C)**

| T [°C] | 251.3 mS/cm |
|---|---|
| 5.0 | 155.5 |
| 10.0 | 177.9 |
| 15.0 | 201.5 |
| 20.0 | 226.0 |
| **25.0** | **251.3** |
| 30.0 | 277.4 |
| 35.0 | 304.1 |

**METTLER TOLEDO ION (Ref. 25°C)**

| T [°C] | 0.1 mg/L | 1 mg/L | 10 mg/L | 100 mg/L | 1000 mg/L |
|---|---|---|---|---|---|
| 20.0 | 0.1 | 1 | 10 | 100 | 1000 |
| 25.0 | 0.1 | 1 | 10 | 100 | 1000 |
| 30.0 | 0.1 | 1 | 10 | 100 | 1000 |

## 16.2 METTLER TOLEDO tables

**METTLER TOLEDO Europe (Ref. 25°C)**

| T [°C] | 2.00 | 4.01 | 7.00 | 9.21 | 11.00 |
|---|---|---|---|---|---|
| 0.0 | 2.03 | 4.01 | 7.12 | 9.52 | 11.90 |
| 5.0 | 2.02 | 4.01 | 7.09 | 9.45 | 11.72 |
| 10.0 | 2.01 | 4.00 | 7.06 | 9.38 | 11.54 |
| 15.0 | 2.00 | 4.00 | 7.04 | 9.32 | 11.36 |
| 20.0 | 2.00 | 4.00 | 7.02 | 9.26 | 11.18 |
| **25.0** | **2.00** | **4.01** | **7.00** | **9.21** | **11.00** |
| 30.0 | 1.99 | 4.01 | 6.99 | 9.16 | 10.82 |
| 35.0 | 1.99 | 4.02 | 6.98 | 9.11 | 10.64 |
| 40.0 | 1.98 | 4.03 | 6.97 | 9.06 | 10.46 |
| 45.0 | 1.98 | 4.04 | 6.97 | 9.03 | 10.28 |
| 50.0 | 1.98 | 4.06 | 6.97 | 8.99 | 10.10 |
| 55.0 | 1.98 | 4.08 | 6.98 | 8.96 | - |
| 60.0 | 1.98 | 4.10 | 6.98 | 8.93 | - |
| 65.0 | 1.98 | 4.13 | 6.99 | - | - |
| 70.0 | 1.99 | 4.16 | 7.00 | 8.88 | - |
| 75.0 | 1.99 | 4.19 | 7.02 | - | - |
| 80.0 | 2.00 | 4.22 | 7.04 | 8.83 | - |
| 85.0 | 2.00 | 4.26 | 7.06 | - | - |
| 90.0 | 2.00 | 4.30 | 7.09 | 8.79 | - |
| 95.0 | 2.00 | 4.35 | 7.12 | 8.77 | - |

**Purified Water (EP/Ch.P.)**

| T [°C] | µS/cm | T [°C] | µS/cm |
|---|---|---|---|
| 0 | 2.4 | 60 | 8.1 |
| 10 | 3.6 | 70 | 9.1 |
| 20 | 4.3 | 75 | 9.7 |
| 25 | 5.1 | 80 | 9.7 |
| 30 | 5.4 | 90 | 9.7 |
| 40 | 6.5 | 100 | 10.2 |
| 50 | 7.1 | | |

**USP645 Stage 1**

| T [°C] | µS/cm | T [°C] | µS/cm |
|---|---|---|---|
| 0 | 0.6 | 54.99 | 1.9 |
| 4.999 | 0.6 | 55 | 2.1 |
| 5 | 0.8 | 59.99 | 2.1 |
| 9.999 | 0.8 | 60 | 2.2 |
| 10 | 0.9 | 64.99 | 2.2 |
| 14.99 | 0.9 | 64 | 2.4 |
| 15 | 1.0 | 69.99 | 2.4 |
| 19.99 | 1.0 | 70 | 2.5 |
| 20 | 1.1 | 74.99 | 2.5 |
| 24.99 | 1.1 | 75 | 2.7 |
| 25 | 1.3 | 79.99 | 2.7 |
| 29.99 | 1.3 | 80 | 2.7 |
| 30 | 1.4 | 84.99 | 2.7 |
| 34.99 | 1.4 | 85 | 2.7 |
| 35 | 1.5 | 89.99 | 2.7 |
| 39.99 | 1.5 | 90 | 2.7 |
| 40 | 1.7 | 94.99 | 2.7 |
| 44.99 | 1.7 | 95 | 2.9 |
| 45 | 1.8 | 99.99 | 2.9 |
| 49.99 | 1.8 | 100 | 3.1 |
| 50 | 1.9 | | |

**Water for Injection Stage 1**

| T [°C] | µS/cm | T [°C] | µS/cm |
|---|---|---|---|
| 0 | 0.6 | 54.99 | 1.9 |
| 4.999 | 0.6 | 55 | 2.1 |
| 5 | 0.8 | 59.99 | 2.1 |
| 9.999 | 0.8 | 60 | 2.2 |
| 10 | 0.9 | 64.99 | 2.2 |
| 14.99 | 0.9 | 64 | 2.4 |
| 15 | 1.0 | 69.99 | 2.4 |
| 19.99 | 1.0 | 70 | 2.5 |
| 20 | 1.1 | 74.99 | 2.5 |
| 24.99 | 1.1 | 75 | 2.7 |
| 25 | 1.3 | 79.99 | 2.7 |
| 29.99 | 1.3 | 80 | 2.7 |
| 30 | 1.4 | 84.99 | 2.7 |
| 34.99 | 1.4 | 85 | 2.7 |
| 35 | 1.5 | 89.99 | 2.7 |
| 39.99 | 1.5 | 90 | 2.7 |
| 40 | 1.7 | 94.99 | 2.7 |
| 44.99 | 1.7 | 95 | 2.9 |
| 45 | 1.8 | 99.99 | 2.9 |
| 49.99 | 1.8 | 100 | 3.1 |
| 50 | 1.9 | | |

**Water for Injection Stage 3**

| T [°C] | µS/cm | T [°C] | µS/cm |
|---|---|---|---|
| 5.0 | 4.7 | 6.1 | 2.4 |
| 5.1 | 4.1 | 6.2 | 2.5 |
| 5.2 | 3.6 | 6.3 | 2.4 |
| 5.3 | 3.3 | 6.4 | 2.3 |
| 5.4 | 3.0 | 6.5 | 2.2 |
| 5.5 | 2.8 | 6.6 | 2.1 |
| 5.6 | 2.6 | 6.7 | 2.6 |
| 5.7 | 2.5 | 6.8 | 3.1 |
| 5.8 | 2.4 | 6.9 | 3.8 |
| 5.9 | 2.4 | 7.0 | 4.6 |
| 6.0 | 2.4 | | |

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