Multiparameter

MADE IN ITALY

pH 2 – pH DO

INSTRUCTION MANUAL

Index

1. Introduction 5
2. Safety Information 6
Definitions of Warning Words and Symbols 6
Additional documents providing safety information 6
Intended Use 6
Essential Requirements for Safe Use 6
Unauthorized Use 7
Maintenance of the Device 7
Responsibilities of the Instrument Owner 7
3. Instrument Specifications 7
Parameters 7
Technical Data 7
4. Instrument Description 9
Display 9
Keypad 9
5. Installation 9
Included Components 9
Commissioning 9
Power Supply Connection 9
Power On 10
Batteries Replacement 10
Instrument Transport 10
Button Functions 10
Inputs/Outputs Connections 11
Symbols and icons on the display 12
6. How the Device Works 12
Full-Screen View 13
Sleep Mode 13
7. Setup Menu 13
Setup Menu Structure 14
8. ATC – MTC Temperature Measurement 15
9. pH Parameter 16
pH parameter Setup 16
Setup Menu Structure for the pH Parameter 16
Automatic pH Calibration 18
Calibration with Manual Values 20
Perform a pH measurement 20
Sensors with DHS Technology 21

10. mV Parameter 21
11. ORP Parameter (Oxidation-Reduction Potential) 22
Setup for the ORP parameter 22
Setup Menu Structure for the ORP Parameter 22
Automatic ORP Calibration 23
12. ISE Parameter 24
ISE parameter Setup 24
Measurement with Ion-Selective Electrodes 26
13. DO Parameter (Dissolved Oxygen) 26
DO Parameter Setup 26
Setup Menu Structure 26
Information on the LDO70 Probe 27
Measurement Principle 28
Probe Storage 28
Maintenance of the LDO 70 Probe 28
Replacement of the Luminophore 28
Oxygen Sensor Calibration 28
Calibration in 100 % Air 28
Calibration with the Standard Zero Oxygen 29
Calibration Range 29
Errors reported during calibration 30
14. Measurement of Dissolved Oxygen 30
Before Starting 30
Measurement Mode 30
Performing the measurement 30
Barometric Pressure Compensation 30
15. Multiparameter Display 30
16. Data Logger Function 31
Setup for the Data Logger+ ID parameter 31
Setup Menu Structure for the Data Logger Menu 31
Use of the Automatic Data Logger 32
Example of Automatic Data Logger Mode 32
Example of Manual Data Logger Mode 33
Recall Saved Data 33
Delete Saved Data 33
17. Instrument Setup Menu 33
Setup Menu Structure for the Configuration Menu 34
18. Data Link NEX Software (for Windows 10/11) 36
Features 36
19. Warranty 37

Warranty Period and Limitations 37
20. Disposal 37

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1. Introduction

XS Instruments, globally recognized as a leading brand in the field of electrochemical measurements, has developed new lines of portable multi-parameter instruments manufactured entirely in Italy, finding the perfect balance between performance, attractive design, and ease of use.
The robustness and integrity of the case, the compact dimensions that allow for one-handed use, and the practical carrying case make these instruments ideal for measurements directly on the field.
The innovative high-definition graphic display shows all the necessary information—such as the measurement, temperature, the buffers used for the last calibration, the stability status, and GLP data—to offer the user an exceptional measurement experience.
Anyone can use these instruments thanks to the instructions that appear directly on the display. Calibration is guided step by step, and the instrument's configuration menu is multilingual, intuitive, and easy to navigate. In low-light conditions, the full-screen measurement display can be activated.
The pH2 NEX model features two channels for measuring pH-related parameters, even simultaneously; in Channel 1, the instrument measures pH, mV (pH), and ORP; while in Channel 2, in addition to the parameters mentioned above, readings can be taken using ion-selective electrodes.
The PH DO meter, on the other hand, combines the functions of a pH meter and ion meter with dissolved oxygen measurement using LDO technology.
pH measurement has a resolution of one-thousandth, and calibration can be performed using up to 5 buffers.
For ISEs, users can create, save, and recall up to 4 custom calibration curves.
In both devices, thanks to the high-performance processor, you can use the innovative MULTIVIEW function, which allows you to display up to 4 parameters simultaneously on the same screen.
Using the on-screen keyboard, you can assign identifiers to the sensor, the user, and the sample, and then save them along with the corresponding analytical data in GLP format.
Using a password to manage the most critical parameters ensures the traceability of the measured value.
The ideal solution for accurate and precise measurements is to use an *XS Instruments* device with an electrochemical sensor from the extensive *XS Sensor* range and perform calibrations using certified *XS Solution* calibration solutions.

2. Safety Information

Definitions of Warning Words and Symbols

The safety information in this manual is of the utmost importance to prevent personal injury, damage to the instrument, malfunctions, or incorrect results due to failure to comply with it. Read this manual carefully in its entirety and make sure you are familiar with the instrument before putting it into operation and starting to work with it. This manual must be kept near the instrument so that the operator can consult it when necessary. Safety instructions are indicated by warning symbols:



Warning
This symbol indicates a potential risk and warns you to proceed with caution



Warning
This symbol draws attention to a possible hazard due **to electric current**



Caution
The instrument must be used in accordance with the instructions in the user manual. Read the instructions carefully



Notice
This symbol draws attention to possible damage to the instrument or its individual parts



Notes
This symbol highlights further information and tips



Additional documents providing safety information

The following documents can provide the operator with additional information on how to work safely with the measurement system:

- operating manual for electrochemical sensors;
- safety data sheets for buffer solutions and other maintenance solutions (e.g., storage solution);
- specific product safety notes.

Intended Use

This instrument is designed exclusively for electrochemical measurements, both in the laboratory and directly in the field. Pay special attention to the technical specifications listed in the INSTRUMENT SPECIFICATIONS / TECHNICAL DATA table; any other use outside of these specifications is to be considered unauthorized. This instrument has been manufactured and tested in accordance with the EN 61010-1 safety standards for electronic instruments and left the factory in perfect technical and safety condition (see the test report included in each package). The proper functioning of the device and the operator's safety are guaranteed only if all standard laboratory safety regulations are respected and if all specific safety measures described in this manual are followed.



Essential Requirements for Safe Use

The proper functioning of the device and the operator's safety are guaranteed only if all of the following instructions are followed:

- The instrument may only be used in accordance with the specifications mentioned above;
- When using the instrument with the power supply, use only the original model. For further information, contact

your local distributor.

- The instrument must operate exclusively under the environmental conditions specified in this manual;
- The only part of the instrument that can be opened by the user is the battery compartment.

Perform any other operations only if explicitly authorized by the manufacturer.

Unauthorized Use



The instrument must not run if:

- it is visibly damaged (for example, due to transportation);
- it has been stored for a long period of time under adverse conditions (exposure to direct light, heat sources, or environments saturated with gases or vapors) or in environments with conditions different from those mentioned in this manual.

Maintenance of the Device



When used correctly and in a suitable environment, the instrument does not require any special maintenance procedures. It is recommended to occasionally clean the instrument case with a damp cloth and a mild detergent. This operation must be carried out with the instrument switched off and disconnected from the power supply, and only by qualified and authorized personnel. The housing is made of ABS/PC (acrylonitrile butadiene styrene/polycarbonate). This material is sensitive to certain organic solvents, such as toluene, xylene, and methyl ethyl ketone (MEK). If liquids enter the housing, they could damage the instrument. If the device is not used for an extended period, cover the BNC connectors with the protective cap provided. Do not open the instrument's housing: it contains no parts that can be maintained, repaired, or replaced by the user. If you encounter problems with the instrument, contact your local distributor. We recommend using only original spare parts. Contact your local distributor for further information. The use of non-original replacement parts may lead to malfunction or permanent damage to the instrument. Furthermore, the use of spare parts not guaranteed by the supplier may be dangerous for the user. For maintenance of electrochemical sensors, refer to the documentation included in their packaging or contact the supplier.

Responsibilities of the Instrument Owner



The person who owns and uses the instrument, or authorizes its use by others, is the instrument owner and, as such, is responsible for the safety of all users of the instrument and third parties. The instrument owner must inform users about the safe use of the instrument in the workplace and how to manage potential risks and must also provide the required protective equipment. When using chemicals or solvents, follow the manufacturer's safety data sheets.

3. Instrument Specifications



Parameters



pH 2 NEX: Channel 1: pH, mV, ORP, Temp / Channel 2: pH, mV, ORP, ISE, Temp



pH DO NEX: pH, mV, ORP, ISE, DO, O%, mbar, Temp



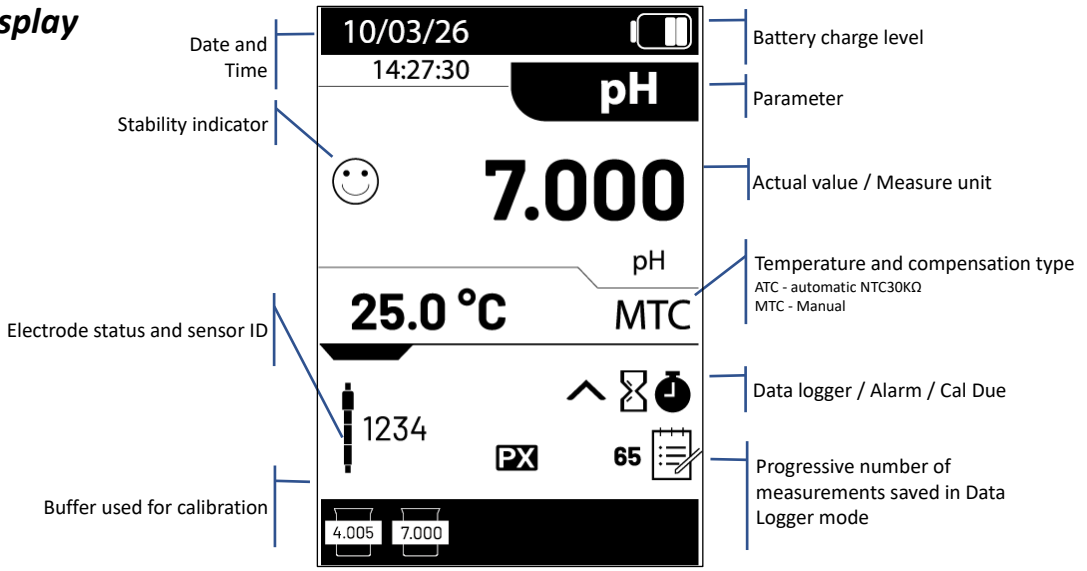
Technical Data

pH	2 x pH 2 NEX - pH DO NEX	
Measuring Range	-2…20	
Resolution / Accuracy	0.1, 0.01, 0.001 / ± 0.005	
Calibration points and recognized buffers	**AUTO:** 1…5 / USA, NIST, DIN / **CUS:** 2 user-defined values	
Buffer Indication	Yes	
Calibration report	Yes	
DHS sensor recognition	Yes (CH1)	Yes
Stability Criteria	Low – Normal – High	
MIN / MAX Value Alarms	Yes	

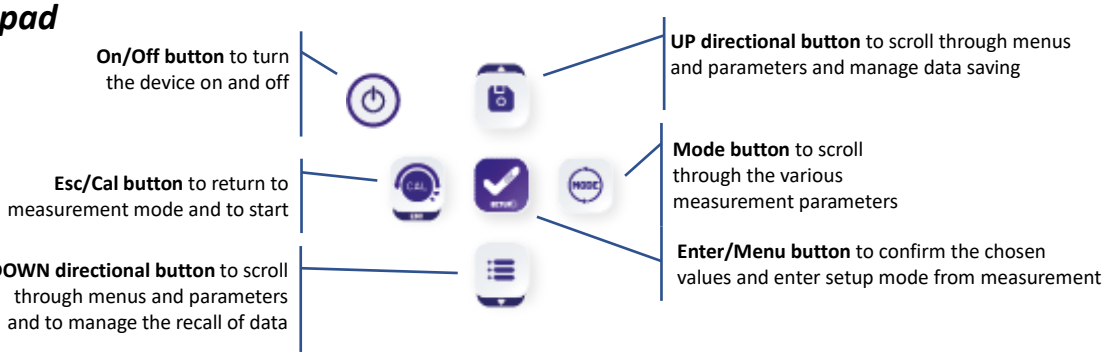
mV	2 x pH 2 NEX - pH DO NEX
Range / Resolution	Range: ± 1999 / Resolution: 0.1 / 1
ORP	**2 x pH 2 NEX - pH DO NEX**
Calibration Points	1 value / 475 mV
ISE	**1 x pH 2 NEX - pH DO NEX**
Calibration	Up to 4 user-editable calibration curves.
Calibration Type	Selection (default or custom) of the most diluted standard; remaining points x 10
Units of Measurement	mg/l – g/l – mol/l
Accuracy	0.5 % f.s. for monovalent ions / 1 % f.s. for divalent ions
DO mg/l	**pH DO NEX**
Measuring range	0.00…19.99 mg/l / 20.0…50.0 mg/l - ppm
Resolution	0.01 / 0.1
Accuracy	± 0.2 up to 10 mg/l-ppm ± 0.3 from 10 to 20 mg/l-ppm ± 5 % in the range from 20 to 50 mg/l-ppm
Calibration points	1…2 automatic
Salinity/pressure compensation	Yes, manual for salinity / automatic for pressure
DO %	**pH DO NEX**
Measuring range	0.0…199.9 % / 200…600 %
Resolution / Accuracy	0.1 / 1 % / ± 10 %
Barometric Pressure	**pH DO NEX**
Measuring range	300…1100 mbar
Resolution / Accuracy	1 mbar / 0.5 %
Temperature	**pH 2 NEX - pH DO NEX**
Measuring Range	-10.0…110.0 °C
Resolution / Accuracy	0.1 / ± 0.5 °C
Temp. compensation ATC (NTC30KΩ) and MTC	0…100 °C
Data Logger	**pH 2 NEX - pH DO NEX**
Mode	Manual / Automatic (seconds – minutes – hours)
Internal Memory	1,000 measurements with ID saving, non-volatile memory
System	**pH 2 NEX - pH DO NEX**
GLP with calibration timer	Yes
Password	Yes, numeric
Display	High-definition TFT, backlit
Simultaneous display screen	Yes, up to 4 parameters
HOLD function	Yes, on all parameters
Multilingual	Yes, 5 languages
Auto Power Off	Yes
Sleep mode	Off / 1–20 min
IP protection	IP 65
Power supply	3 x 1.5 V AA batteries / 5 V via USB cable
Sound level during standard operation	< 80 dB
Operating environmental conditions	0…+60 °C
Maximum permissible humidity	< 95 % non-condensing
Maximum operating altitude	2000 m
Instrument Dimensions	160 x 75 x 45 mm
System weight	323 g
Relevant Standard	EMC 2014/30/EU RoHS 2011/65/EU EN 61326-1 EN 61010-1

4. Instrument Description

Display



Keypad



5. Installation

Included Components



The instrument is always supplied in its own carrying case.

The version without a sensor always includes:

Instrument with batteries, USB A-C cable, 1-meter S7/BNC connection cable, NT55 temperature probe, buffer solutions in single-dose bottles and/or sachets, screwdriver, beaker, electrode holder *(for the pH DO NEX model),* quick guide, and test report. Versions with sensors already included are also available. Contact your local distributor for the most up-to-date information on the correct contents of the sales kit.

Commissioning

- The device leaves the factory ready to be used by the user.
- Batteries are already included.
- Before using for the first use, remove the insulating tab to protect the batteries.

Power Supply Connection



- In addition to batteries, the device can be powered through the mains supply;
- Check that the electrical specifications of the circuit where the instrument will be installed comply with the voltage and operating frequency of the power supply;
- connect the 5 V power supply (not included part no. 50001612) to the USB cable and the other end of the cable (Type-C) to the USB port on the side of the device;
- Connect the power supply to an electric socket that is easily accessible.

In addition to the main supply, power can also be drawn directly from a PC's USB port.

WARNING

Risk of death or serious injury due to electric shock .

Contact with live components can result in injury or death.

- **Use only the supplied cable and the original power supply.**
- **Do not allow the power supply to come into contact with liquids or be placed in a damp environment.**
- **Avoid thermal shock.**
- **All electrical cables and connections must be kept away from moisture or liquids.**
- **Check that the cables and plugs are not damaged; if they are, replace them.**
- **Do not cover the power supply or place it inside any containers while in use.**

Power On

Switch on the system by pressing the  button. The display initially shows the NEX logo along with the device model and software version. Next, settings for the most important parameters and any information regarding the DHS sensor appear.



Batteries Replacement

The device operates on 3 x 1.5 V AA batteries. To replace them:

1. switch off the device;
2. turn the device over so the display is facing down, making sure to protect the display and keypad with a cloth;
3. using the screwdriver provided, unscrew the 4 screws on the cover;
4. slide the cover off, the screws are captive;
5. remove the 3 used batteries and insert the new ones. Ensure the polarity is correct;
6. Reinsert the cover and tighten the 4 screws.



Instrument Transport

The instrument is always supplied with a dedicated carrying case. Use only the original case to transport the instrument. If you need to purchase a replacement, visit or contact your local distributor.

Button Functions

Button	Pressure	Function
	Short	Press to switch the device on or off.
	Short	In measurement mode, press to scroll through the different parameters: • **pH 2 NEX**: pH1/mV1 → pH1 → mV1 → ORP1 → pH2 → mV2 → ORP2 → ISE2 → MultiView • **pH DO NEX**: pH → mV → ORP → ISE → DO → O% → mbar → MultiView
	Short	In calibration, setup, or memory recall modes, press to return to measurement mode.
	Long press (3s)	In measurement mode, press and hold to start calibration.
	Short	In measurement mode, press to enter setup. In the setup menus, press to select the desired program and/or value. During calibration, press to confirm the value.
	Long press (3s)	In measurement mode, press and hold to access full-screen display. Press again to return to the standard display.
	Short	In the setup menus and submenus, press to scroll. In the setup submenus, press to change the value. In memory recall mode, press to scroll through the saved values. In MTC and customer calibration modes, press to change the value. : In measurement mode, press to save the data (Manual Data Logger) or to

		start and stop recording (Automatic Data Logger). : In measurement mode, press to recall saved data.
	Long press (3s)	In measurement mode, hold down button to adjust the temperature in MTC mode (manual compensation, without a probe). When the value begins to flash, the user can adjust the temperature by entering the correct value. Then confirm with .

IMPORTANT:

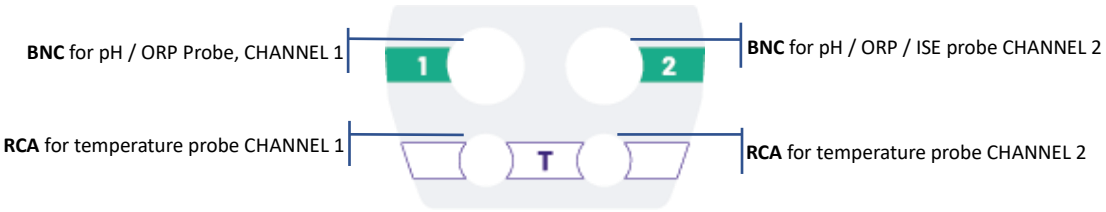
- When Sleep mode is active (by default after one minute of inactivity), press any button to reactivate the display backlight.
- Only at this point do the buttons regain their function.

Inputs/Outputs Connections

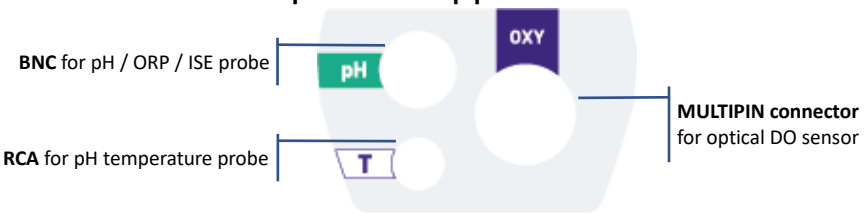
Use only original accessories guaranteed by the manufacturer.

If necessary, contact your local distributor. The BNC connectors are protected by a plastic cap at the time of delivery. Remove the cap before connecting the probes.

pH 2 NEX top panel



pH DO NEX top panel



SIDE PANEL



READ THE MANUAL BEFORE CONNECTING PROBES OR PERIPHERALS

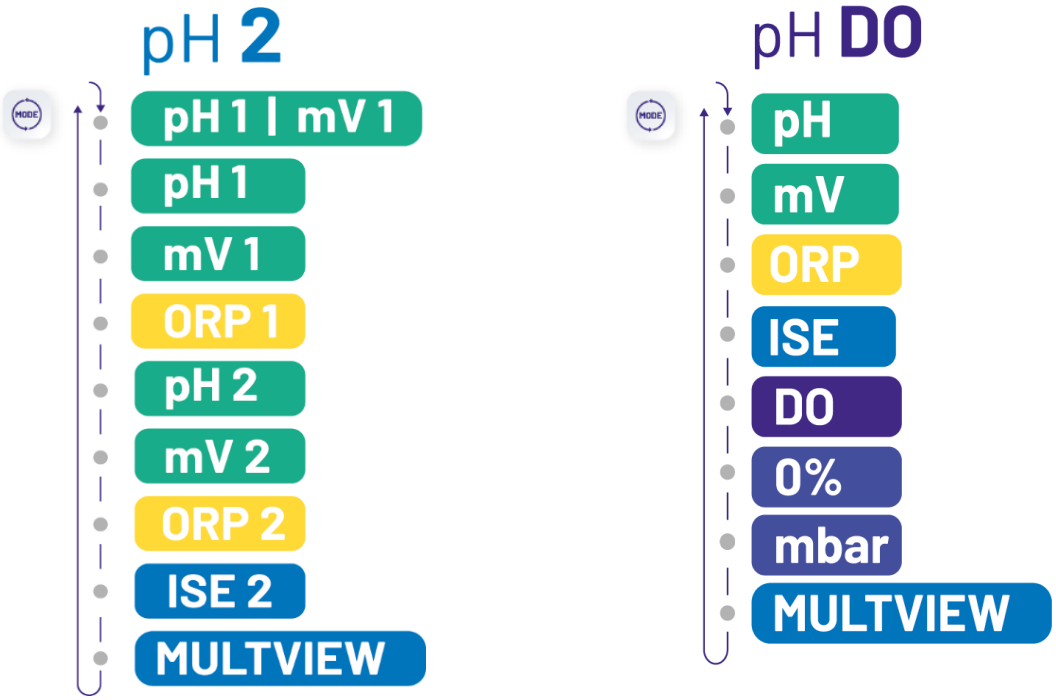
Symbols and icons on the display

Symbol	Description	Symbol	Description
65	Number of measurements stored in Data Logger mode in the instrument's memory for the current parameter.		FIXED: MIN/MAX alarm for pH set. FLASHING: MIN/MAX alarm for pH in operation.
PX	pH/ORP calibration performed with a simulator.		FIXED: Automatic Data Logger set. FLASHING: Automatic Data Logger in operation.
	FIXED: Calibration deadline date set for that parameter. FLASHING: Calibration deadline active for that parameter.		Password entered.
1234	Sensor ID and status.		Battery charge indicator.
	Measurement stability indicator.	HOLD	HOLD mode; reading locked when stable.

6. How the Device Works

- After switching on, the instrument enters measurement mode with the last parameter used.
- **To scroll through the different parameter screens, press the** **button**; the current measurement parameter is shown in the bar at the top right of the display.

Sequence of parameters in measurement mode:

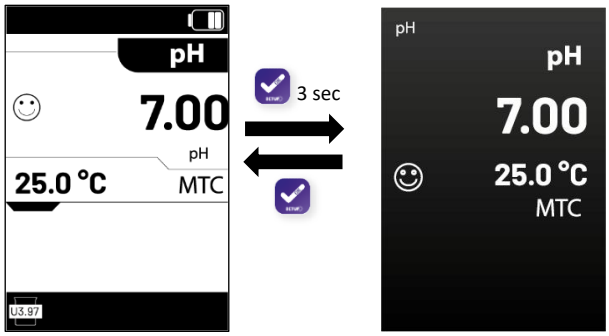


Note: *Pressing the* *button after the last parameter causes the instrument to automatically restart from the first.*

IMPORTANT: On the pH 2 NEX instrument, the numbers "1" and "2" indicate the channel from which the signal originates.

Full-Screen View

To obtain a clearer view of the measured value, in measurement mode (excluding the pH / mV and MultiView screens), press and hold the button for 3 seconds to activate full-screen view.
Press again to return to the standard view.

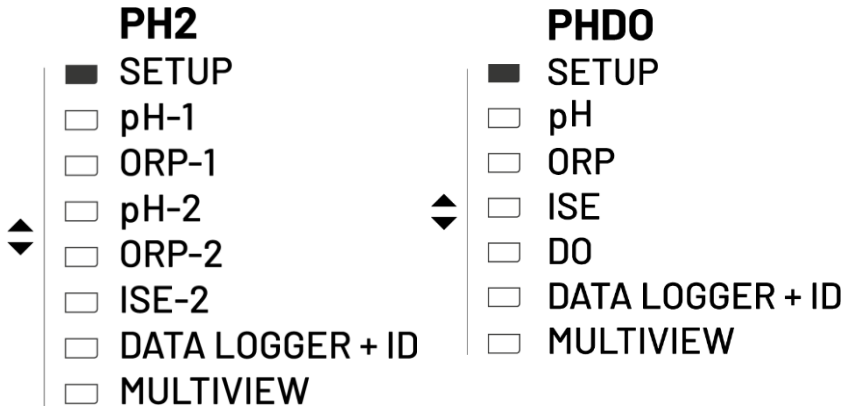


Sleep Mode

When Sleep Mode is active (*see the **Instrument Configuration Menu** section*), the display brightness is reduced to a minimum, significantly conserving battery power. To exit Sleep Mode and return the display to normal brightness, press any button. Once the display brightness is restored, the buttons resume their normal functions (*see the **Button Functions** section*).

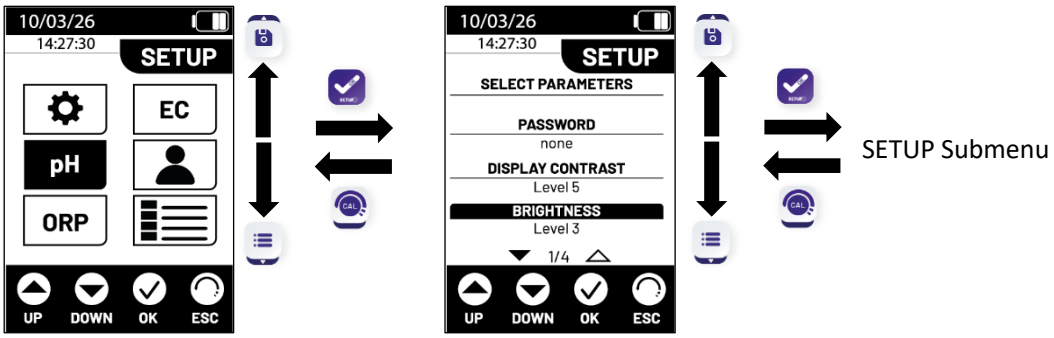
7. Setup Menu

- In measurement mode, press the button to enter **SETUP** mode, select the parameter you wish to change using the directional buttons, and confirm with .



- Within the selected menu, move between the different programs using the directional buttons and press the button to access the submenu you want to edit.
- **Use the and buttons to select the desired option or change the numerical value, then confirm with .**
- Press the button to return to the previous menu.
- In menus where the alphanumeric keyboard appears on the display for entering IDs, move the cursor using the , , , and buttons, and press to confirm the character.
- Press the ESC buttons, respectively, to exit without saving and to exit after confirming the entered identifier.

In the pH 2 NEX instrument setup, menus ending with the number 1 manage parameters on channel 1, while those ending with the number 2 manage parameters on channel 2.



IMPORTANT: *The alphanumeric keypad for entering IDs is NOT a touchscreen; use the appropriate buttons (see the* ***"Button Functions"*** *section).*

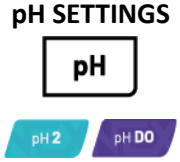
Setup Menu Structure

GENERAL SETTINGS



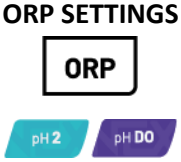
SELECT PARAMETERS
PASSWORD
DISPLAY CONTRAST
BRIGHTNESS
SLEEP MODE
READING WITH HOLD
DATE FORMAT
DATE SETTINGS
TIME SETTINGS
CALIBRATION DUE MODE
TEMPERATURE MEASUREMENT UNIT
SELECT LANGUAGE
AUTO OFF
RESET SETTING

pH SETTINGS



CALIBRATION BUFFER SELECTION
RESOLUTION
CALIBRATION DATA
SET CALIBRATION DUE
SET STABILITY CRITERIA
SET ALARMS
PROBE ID
PX SIM CALIBRATION
TEMPERATURE CALIBRATION
RESET SETTING

ORP SETTINGS



CALIBRATION DATA
SET CALIBRATION DUE
PROBE ID
PX SIM CALIBRATION
TEMPERATURE CALIBRATION
RESET SETTING

ISE SETTINGS



SELECT METHOD
METHOD ID
SET UNIT OF MEASUREMENT
TYPE
CAL VALUES
SET STABILITY
CALIBRATION DATA
SET CALIBRATION DUE
DELETE METHOD

DO SETTINGS



ZERO-POINT CAL
SALINITY COMPENSATION
CALIBRATION DATA
SET CALIBRATION DUE
PROBE ID
TEMPERATURE CAL
RESET SETTING

DATA LOGGER + ID



DATA LOGGER TYPE
DELETE MEMORY
SAMPLE ID
PROGRESS SAMPLE ID
USER ID
VIEW ID
PX SIM SN

MULTIVIEW



Select which parameters to display on the MULTIVIEW screen

8. ATC – MTC Temperature Measurement

- **ATC**: Direct measurement of the sample temperature for all parameters is carried out via NTC 30 kΩ probe, which can be either integrated into the sensor (electrode and/or cell) or external.
- **MTC**: If no temperature probe is connected, the value must be adjusted manually: hold down or until the value start flashing; then adjust it using the directional buttons; press to confirm.

***Note**: In the* **NEX pH DO** *meter, temperature compensation for the DO measurement is always automatic, as the temperature sensor is integrated into the LDO sensor and the same connector.*

9. pH Parameter

pH

pH 2 pH DO

On this series of devices, you can use pH sensors with an integrated temperature probe or connect two different sensors. Connect the pH electrode to the green BNC connector. Connect the temperature probe to the RCA/CINCH T connector below. Both the pH2 NEX meter in channel 1 and the pH DO NEX meter can also recognize the DHS sensor, an innovative electrode capable of storing calibration data so it can be used immediately on any other compatible meter. The **pH2 NEX** meter supports two separate and independent channels for pH/mV and ORP. Different calibration, setup, and reading parameters can therefore be set for the two measurement channels.
IMPORTANT: *For the* **pH 2 NEX** *meter, the sections that follow in this manual apply to both channel 1 (with the setup named* ***pH-1)*** *and channel 2 (with the setup named* ***pH-2).***
The pH menu settings for Channel 1 and Channel 2 are managed independently of one another.

pH parameter Setup

- In measurement mode, press to access the **SETUP** menu.
- Use the directional buttons and confirm with to access the **PH SETTINGS** menu pH .
- Use the or buttons to move to the program you wish to access and press to confirm.

Setup Menu Structure for the pH Parameter

The table below shows the structure of the setup menu for the pH parameter; for each program, it lists the options available to the user and the default value:

Program	Description	Options	Factory Settings
pH	CAL BUFFER SELECTION	USA – NIST – DIN – User	USA
	RESOLUTION	0.1 – 0.01 – 0.001	0.01
	CALIBRATION DATA	VIEW	VIEW
	SET CALIBRATION DUE	NO – HOURS – DAYS	NO
	SET STABILITY CRITERIA	LOW – MED – HIGH	MED
	SET ALARM	NO – MIN – MAX	NO
	PROBE ID	-	-
	PXSIM CAL	START	START
	TEMPERATURE CAL	-	-
	RESET SETTING	NO - YES	NO

CAL BUFFER SELECTION (Buffer Family Selection)

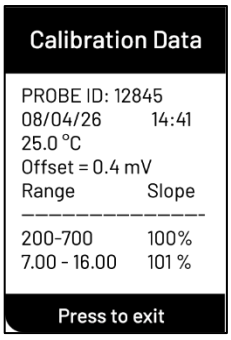
- Access this setup to select the buffer family to be used for calibrating the pH electrode for the selected measurement channel.
- By using buffers with automatic recognition**,** you can perform **1- to 5-point** calibration lines**. During calibration, press to exit and save the calibration points set so far.**
- The instrument automatically recognizes 3 buffer families (**USA**, **NIST**, and **DIN**); furthermore, the user can perform a **manual** calibration with up to 2 points using customizable values.
- **USA** buffers: 1.68 - 4.01 - 7.00* - 10.01 - 12.45 - Default setting -
- **NIST** buffers: 1.68 - 4.00 - 6.86* - 9.18 - 12.46
- **DIN** buffers: 1.68 – 4.01 - 6.86* - 9.18 - 12.45

**The neutral point is always required as the first point.*

- In measurement mode, a series of beakers at the bottom left corner of the display, each containing the buffer value, indicates the solutions used for the last calibration, whether automatic or manual.

RESOLUTION (Measurement Resolution)
Access this menu to select the desired resolution for the pH reading on the selected measurement channel:

- **0.1**
- **0.01** – default setting –
- **0.001**



CALIBRATION DATA (Calibration data for pH parameter)
Access this menu to view information about the most recent calibration performed on the selected measurement channel. The display shows a report containing the following information regarding the currently active calibration: PROBE ID (or DHS model and batch) / CALIBRATION DATE / CALIBRATION TIME / TEMPERATURE / OFFSET / SLOPE % FOR EACH RANGE.
***Note**: The instrument only accepts calibrations with pH electrodes having a Slope % between 80 – 120 %.*

SET CALIBRATION DUE (Select pH Calibration Due Date)
Access this menu to set a calibration deadline for the selected measurement channel; this option is essential in GLP protocols.

- By default, no calibration deadline is set. Use the arrow buttons to select the hours or days that must elapse between two calibrations and confirm with .
- When a calibration deadline is set, the icon appears on the display in measurement mode.
- When the calibration has expired, the icon starts to flash.

In the **GENERAL SETTING** menu**,** under → **CALIBRATION DUE MODE,** the user can choose whether, when the calibration expires.

- Display only the alert that calibration has expired (flashing icon) but continue to display the measurements on the screen.
- Block the measurement until a new calibration is performed.

***Note:** In both cases, when the calibration has expired, data is not saved when using the data logger.*

SET STABILITY CRITERIA (pH Measurement Stability Criteria)
To ensure a reading is accurate, it is recommended to wait for the measurement to stabilize, as indicated by the icon. Access this menu to change the measurement stability criterion for the selected channel:

- **LOW**: Select this option to display the stability icon even under conditions of low stability. Readings within 1.2 mV.
- **MEDIUM**—default setting—readings within 0.6 mV.
- **HIGH**: Select this option to display the stability icon only when the measurement is highly stable. Readings within 0.3 mV.

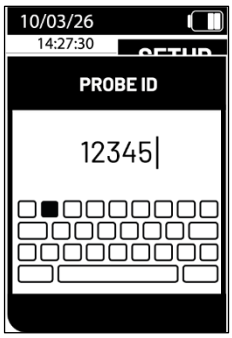
***Note:** In the **GENERAL SETTING** menu, under **-> READING WITH HOLD,** the user can choose to freeze the reading on the display once stability is reached.*

SET ALARMS (Settings Threshold Alarm)

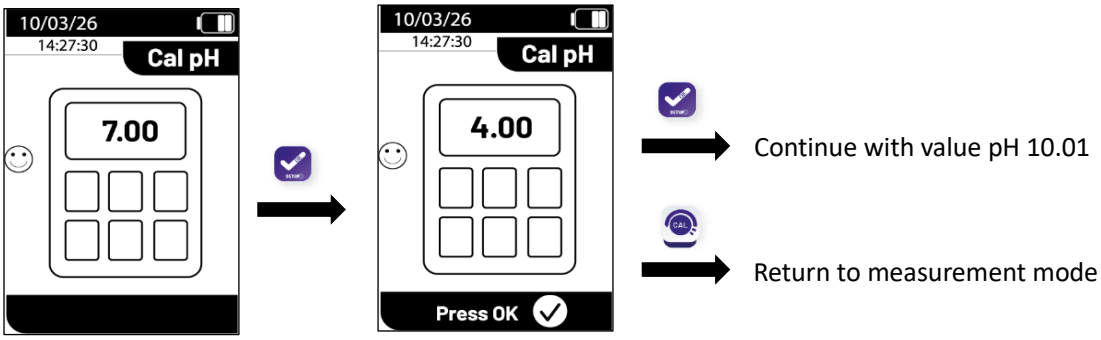
- Access this menu to set a threshold alarm for the minimum and/or maximum pH value in the selected measurement channel.
- This option is indicated by a fixed icon on the display: MIN MAX . When the threshold value is exceeded, the corresponding icon begins to flash.

PROBE ID (Probe ID)
Access this menu to set a pH probe identifier for the selected measurement channel. Maximum length allowed: 5 alphanumeric characters. Use the , , , and buttons to navigate the alphanumeric keypad.

Press the button to confirm the selected character. Use the **ENTER** button to confirm the assigned identifier; use the **ESC** button to exit without saving.



PXSIM CAL (Automatic Calibration with Simulator)
Access this setup menu to start calibrating the selected measurement channel using the **XS PX SIM** pH / mV simulator (part no. 50111312—contact your local distributor for information). The instrument automatically requests the values pH 7.00 / pH 4.01 / pH 10.01. Use the low-impedance simulator, connected with the appropriate BNC / BNC cable, to perform automatic calibration. Press to move to the next value, and to save the calibrated values up to that point and return to measurement mode.



The PX icon next to the beakers indicates that the calibration was performed using a simulator rather than a pH electrode.

Note: *In the* **DATA LOGGER + ID** *menu (* **-> PX SIM SN),** *you can enter the serial number of the simulator used for calibration. The simulator's serial number is the same for both measurement channels for pH, mV, and ORP.*

TEMPERATURE CAL (Temperature Probe Calibration)
All instruments in this series are pre-calibrated to ensure accurate temperature readings. However, if there is a noticeable difference between the measured and the actual temperature (usually due to a probe malfunction), you can adjust the offset by ± 5 °C on the selected RCA measurement channel. After connecting the temperature probe, use the and buttons to correct the temperature offset value, then confirm with .

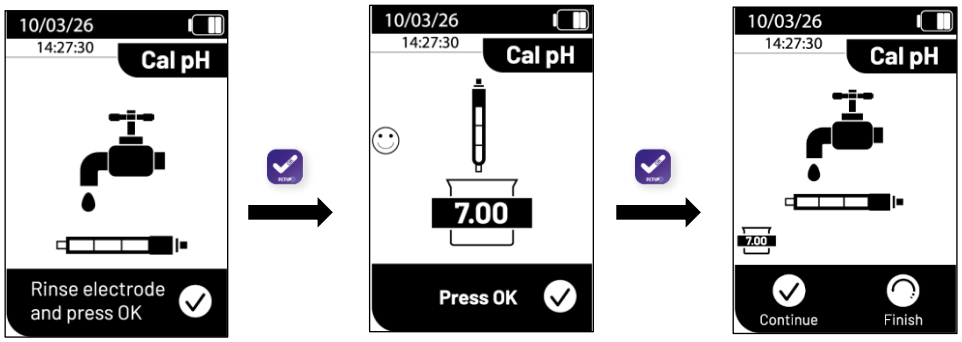
RESET SETTINGS (pH Parameter Reset)

If the instrument is not performing optimally or incorrect calibrations have been carried out, press the button to **select "YES"** and reset all parameters in the pH menu of the selected measurement channel to their default settings.
IMPORTANT: *Resetting factory settings does* ***NOT*** *delete stored data.*

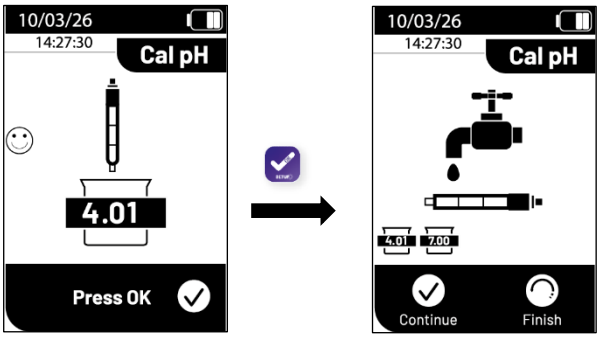
Automatic pH Calibration

Example of three-point calibration on the pH 2 NEX using USA-type buffers (7.00 / 4.01 / 10.01) in measurement channel 1.

- In **pH-1** measurement mode, press and hold the button for 3 seconds to enter calibration mode. Rinse the electrode with distilled water and gently dab it with a paper towel .
- Press and dip the electrode in the pH 7.00 buffer (as indicated by the beaker icon on the display)
- When the icon appears, confirm the first point by pressing the button. The actual measured value flashes on the display, and then the pH 7.00 beaker icon 7.00 appears in the bottom left corner, indicating that the instrument is calibrated to the neutral point.



- Remove the electrode, rinse it with distilled water, and gently dab it with a paper towel .
- Press to continue calibration and dip the electrode in the pH 4.01 buffer. All pH values that the instrument can recognize will scroll through the beaker.
- When the beaker stabilizes at pH 4.01 and the icon appears, confirm by pressing the button. The actual measured value flashes on the display, and then the icon for the pH 4.01 beaker appears next to the pH 7.00 beaker, indicating that the instrument is calibrated in the acid range.



For a two-point calibration curve, press to complete the calibration process and return to measurement mode.

- Remove the electrode, rinse it with distilled water, and gently dab it with paper towels .
- Press to continue the calibration and dip the electrode in the pH 10.01 buffer. All pH values that the instrument can recognize will scroll through the beaker.
- When the beaker stabilizes at pH 10.01 and the icon appears, confirm by pressing the button.
  The transition from an acidic to a basic pH may take a few seconds longer to stabilize. The actual measured value flashes on the display; subsequently, the pH 10.0 beaker icon appears next to the pH 7.00 and pH 4.01 beakers, indicating that the instrument is also calibrated in the alkaline range.
- Although the device can accept two additional calibration values, stop and confirm this three-point calibration curve by pressing .

Note: *Electrode calibration is essential for the quality and accuracy of a measurement. Therefore, ensure that the buffers used are new, uncontaminated, and at the same temperature. To ensure accurate results, the instrument manufacturer recommends using* ***XS Solution*** *buffer solutions and* ***XS Sensor*** *pH electrodes. Contact your local distributor to obtain these.*

WARNING: *Before proceeding with calibration, carefully consult the safety data sheets for the substances involved:*
Calibration buffer solutions.
pH electrode storage solution.
Filling solution for pH electrodes.
Carefully reading the safety data sheets for the solutions used helps eliminate residual risks associated with skin contact, ingestion, inhalation, or eye contact with these solutions, which may cause possible but unlikely minor harm.

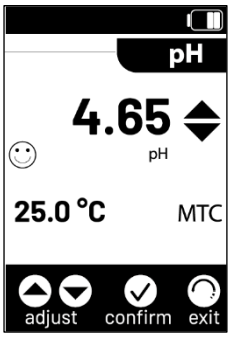
Calibration with Manual Values

Example of calibration on the pH 2 NEX using two values, pH 6.79 and pH 4.65 (DIN 19267), in measurement channel 1.

- Access the **pH SETTINGS – 1** menu (pH) and select **CAL BUFFER SELECTION -> User;** return to measurement mode and switch to **pH – 1** mode.
- Hold down the button for 3 seconds to enter calibration mode.
- Rinse the electrode with distilled water and gently dab it with a paper towel.
- Press and dip the electrode in the first buffer solution (e.g., pH 6.79).
- Wait for the pH value on the display to stabilize; when the icon appears, use the and buttons to adjust the value by entering the buffer value.

Note: *Verify the buffer value according to the temperature.*

- When the icon reappears, press the button to confirm the first point; the actual measured value will flash on the display, and the beaker icon will appear with the buffer value entered (the letter "U" stands for **"user value, entered** manually").
- Remove the electrode, rinse it with distilled water, and gently dab it with a paper towel.
- Press to continue calibration and dip the sensor in the next buffer (e.g., pH 4.65).
- Wait for the pH value on the display to stabilize; when the icon appears, use the and buttons to adjust the value by entering the buffer value.
- When the icon reappears, press the button to confirm the second calibration point; the actual measured value will flash on the display.
- Once the second calibration point is complete, the process ends automatically with the calibration report being displayed. Press to return to measurement mode.



Note*: If you are using manual temperature compensation (MTC), update the value before calibrating the instrument.*

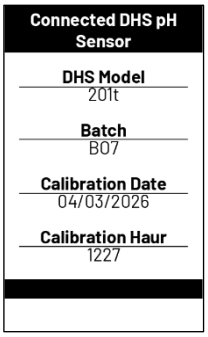
Perform a pH measurement

In measurement mode, press the button to scroll through the parameter screens until you select **pH** (for pH DO NEX), **pH – 1,** or **pH – 2** (for pH 2 NEX). See ***the "How the device works"*** section:

- Connect the electrode to the instrument's pH/ORP BNC connector (green band) in the desired measurement channel.
- Connect the temperature sensor to the corresponding RCA connector. If the user is not using an electrode with a built-in temperature probe or an external NTC30KΩ probe, it is recommended to manually update the temperature value (MTC).
- Remove the electrode from its tube, rinse with distilled water, and gently dab it with a paper towel.
- Check for and remove any air bubbles present in the membrane bulb by shaking it vertically (as you would with a clinical thermometer). If present, open the side cap.
- Immerse the electrode in the sample while gently agitating it.
- Consider the measurement accurate only when the stability icon appears. To eliminate any errors due to user interpretation, you can use the "HOLD" function (see the **GENERAL SETTINGS** → **READING WITH HOLD** section), which allows you to lock the reading as soon as it stabilises.
- Once the measurement is complete, rinse the electrode with distilled water and store it in the appropriate storage solution (STORAGE). Never store the sensors in any type of water or in a dry state.
- When using measurement channel 1, you can simultaneously view the pH and mV values; this is a useful option for checking the sensor's status.

IMPORTANT: *The graphical representation of the electrode at the bottom left corner of the display indicates the quality of the current calibration. The closer the slope is to 100%, the more "fuller" the electrode will be. Always keeping the buffers used for calibration visible on the display, along with the ability to view calibration data at any time or set an expiration date, are useful tools for obtaining accurate measurements. The use of the wide range of XS Sensor electrodes is preferred and is the solution recommended by the manufacturer for highly accurate analyses. Carefully read the instructions and recommendations for use and maintenance, which are always included inside the XS Sensor electrode packages.*

Sensors with DHS Technology



Available as an option on the **pH 2 NEX** *instrument on measurement channel* ***1****.*

Electrodes equipped with DHS technology can save a calibration curve in their memory. The calibrated sensor is automatically recognized by any instrument capable of for DHS recognition, which then acquires its calibration.

- Connect the DHS electrode to the instrument's BNC and RCA connectors on channel 1.
- The device automatically recognizes the chip, and the DHS sensor calibration report—including the ID and batch number—appears on the display.
- Once the DHS electrode is recognized, the active calibration on the instrument becomes that of the sensor.
- The DHS icon next to the sensor symbol on the display indicates that the connection was successful.
- If the calibration is satisfactory (check the calibration data in the pH menu -> Calibration Data), the electrode is ready to begin measurements. If not, recalibrate the electrode; the data will be updated automatically.
- The DHS electrode calibrated with a pH 2 NEX or pH DO NEX device is ready for use on any pH meter capable of DHS recognition, and vice versa.
- When the electrode is disconnected, a message on the display informs the user that the sensor has been deactivated; the instrument reverts to its previous calibration, and no data is lost!
- The DHS electrode does not require batteries, and if used with pH meters that do not support chip recognition, it functions like a standard analog electrode.

Note*: As this is a digital pH measurement, consider the readings accurate only when measuring within the* ***pH*** *parameter.*

IMPORTANT: *On the pH 2 NEX instrument, the DHS sensor works exclusively for* ***measurement channel 1****.*
In measurement mode, keep the ***pH-1*** *screen active to start calibration; to change settings, access the* ***pH-1*** *setup menu instead****.***

10. mV Parameter

pH 2 pH DO

The **pH 2 NEX** meter manages two different and independent channels for **pH/mV** and ORP. Different calibration, configuration, and reading parameters can therefore be set for the two measurement channels.

IMPORTANT: *For the* **pH 2 NEX** *meter, the sections that follow in this manual apply to both Channel 1 and Channel 2.*

- In measurement mode, press MODE and scroll to the **mV** parameter.
- The display shows the pH sensor's reading in mV.
- Consider the reading accurate only when the stability icon appears.

Note*: This measurement is recommended for assessing the sensor's efficiency.*

11. ORP Parameter (Oxidation-Reduction Potential)

ORP

pH 2 pH DO

On this series of devices, ORP sensors can be used to measure the oxidation-reduction potential.
Connect the Redox electrode to the green BNC connector; if necessary, connect the temperature probe to the green RCA/CINCH Temp connector. You can calibrate the sensor offset by performing an automatic calibration at a predefined point. The instrument automatically recognizes the **475 mV / 25 °C Redox** solution; contact your local distributor to purchase it. **The instrument can correct the sensor offset by ± 75 mV.** The **pH 2 NEX** instrument supports two separate and independent channels for pH/mV and **ORP.** Different calibration, setup, and reading parameters can therefore be set for the two measurement channels.
IMPORTANT: *For the* **pH 2 NEX** *meter, the sections that follow in this manual apply to both Channel 1 (with the setup named* ***ORP-1)*** *and Channel 2 (with the setup named* ***ORP-2).***
The ORP menu settings for Channel 1 and Channel 2 are managed independently of one another.

Setup for the ORP parameter

- In measurement mode, press to access the **SETUP** menu.
- Use the arrow buttons and confirm with to access the **ORP SETTINGS** menu .
- Use the arrow buttons to navigate to the program you wish to access, then press .

Setup Menu Structure for the ORP Parameter

The table below shows the structure of the setup menu for the ORP parameter; for each program, the options available to the user and the default value are shown:

Program	Description	Options	Factory Settings
ORP	CALIBRATION DATA	VIEW	VIEW
	SET CALIBRATION DUE	NO – HOURS – DAYS	NO
	PROBE ID	-	-
	PXSIM CAL	START	START
	TEMPERATURE CAL	-	-
	RESET SETTING	NO – YES	NO

CALIBRATION DATA (Calibration data for ORP parameter)
Access this menu to view information about the last calibration performed on the selected measurement channel. The display shows a report with the following information regarding the currently active calibration: PROBE ID USED / CALIBRATION DATE / CALIBRATION TIME / TEMPERATURE / OFFSET.

SET CALIBRATION DUE (Select ORP Calibration Due Date)
Access this menu to set a calibration deadline for the selected measurement channel; this option is essential in GLP protocols:

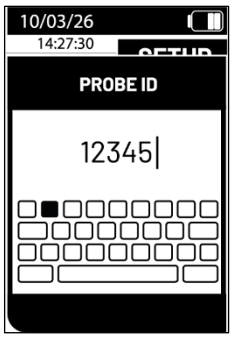
- By default, no calibration deadline is set. Use the arrow buttons to select hours or days that must elapse between two calibrations and confirm by pressing .
- When a calibration deadline is set, the icon appears on the display in measurement mode.
- When the calibration has expired, the icon begins to flash.

In the **GENERAL SETTINGS** menu**,** under → **CALIBRATION DUE MODE,** the user can choose what happens when the calibration expires:

- Display only the alert that calibration has expired (flashing icon) but continue to show the measurements on the display.
- Lock the measurement until a new calibration is performed.

Note: *In both cases, if the calibration has expired, data will not be saved when using the data logger.*

PROBE ID (Probe ID)



Access this menu to set an ORP probe ID for the selected measurement channel. Maximum length allowed: 5 alphanumeric characters. Use the buttons , , , and to navigate the alphanumeric keypad. Press the button to confirm the selected character. Use the **ENTER** button to confirm the assigned ID; use the **ESC** button to exit without saving.

PXSIM CAL (Automatic Calibration with Simulator)

Access this setup menu to start calibrating the selected measurement channel using the **XS PX SIM** pH/mV simulator (part no. 50111312—contact your local distributor for information). The instrument automatically requests a value of 475 mV. Use the low-impedance simulator, connected with the appropriate BNC / BNC cable, to perform automatic calibration. Press to confirm and return to measurement mode. The PX icon indicates that calibration was performed using a simulator rather than an ORP electrode.

Note: *In the* **DATA LOGGER + ID** *menu (* **-> PX SIM SN),** *you can enter the serial number of the simulator used for calibration. The simulator's serial number is unique for both measurement channels for pH, mV, and ORP.*

TEMPERATURE CAL (Temperature Probe Calibration)

All instruments in this series are pre-calibrated to ensure accurate temperature readings. However, if there is a noticeable difference between the measured and actual temperature (usually due to a probe malfunction), you can adjust the offset by ± 5 °C on the selected RCA measurement channel. After connecting the temperature probe, use the and buttons to correct the temperature offset value and confirm with .

RESET SETTINGS (Reset of the ORP Parameter)

If the instrument is not working optimally or incorrect calibrations have been performed, press the button to confirm **"YES"** and reset all parameters in the ORP menu for the selected measurement channel to their default settings.

IMPORTANT: *Restoring factory settings does* ***NOT*** *delete stored data.*

Automatic ORP Calibration

Automatic calibration on pH 2 NEX using a 475 mV solution on measurement channel 1.

- In **ORP-1** measurement mode, press and hold the button for 3 seconds to enter calibration mode.
- Rinse the electrode with distilled water and gently dab it dry with a paper towel.
- Press and dip the electrode in the 475 mV Redox buffer solution.
- When the icon appears, confirm by pressing .
- The actual measured value flashes on the display, and then the calibration report appears.
- Press the button to return to measurement mode.

CAUTION: *Before proceeding with sensor calibration, carefully consult the safety data sheets for the substances involved:*

- *Redox standard solutions.*
- *Redox electrode storage solution.*
- *Filling solution for Redox electrodes.*

IMPORTANT: *The ability to immediately access and manage all information regarding sensor calibration and status allows the user to work while maintaining high-quality standards. The use of ORP XS Sensor electrodes is preferred and is the solution recommended by the manufacturer to obtain highly accurate analyses. The manufacturer offers a wide range of sensors to cover various fields of application.*

12. ISE Parameter

ISE

pH 2 pH DO

ISE sensors can be used on channel 2 of the pH2 NEX instrument and on the pH DO multiparameter. The user can create and subsequently recall up to 4 different calibration curves. The instrument automatically requires the concentrations of the calibration standards by multiplying the most dilute value set by the user by 10. For each calibration curve, the user must enter: Method Name / Unit of Measurement / Valence / Most Dilute Standard / Endpoint Type.

ISE parameter Setup

- In measurement mode, press to access the **SETUP** menu.
- Use the arrow buttons and confirm with to access the **ISE SETTINGS** menu .
- Use the directional buttons to move to the program you want to access, then press .

Program	Description	Options	Factory Settings
ISE	SELECT METHOD	EMPTY 1 – 2 – 3 – 4	EMPTY 1
	METHOD ID	SET NAME	-
	MEASURING UNIT	mg/l – g/l – mol/l	mg/l
	TYPE	MONOVALENT - BIVALENT	MONOVALENT
	CAL VALUES	STANDARD – SET LOW STANDARD	STANDARD 0.1
	SET STABILITY CRITERIA	STABILITY - SECONDS	STABILITY
	CALIBRATION DATA	VIEW	VIEW
	SET CALIBRATION DUE	NO – HOURS – DAYS	NO
	RESET SETTING	NO – Actual Method - YES	NO

SELECT METHOD (Select which method to load)

- Access this setup to select which method to load.
- The instrument can store and later recall up to 4 customizable methods. By default, the methods are empty:
  - **Empty 1** - default setting -
  - **Empty 2**
  - **Empty 3**
  - **Empty 4**
- **To set up a method, configure the options in the following menus.**

The phrase “SETUP MENU ASSOCIATED WITH **SELECT METHOD”** in the following sections means that the menu’s settings and content vary depending on the selected method.

METHOD ID (Method Identifier)

SETUP MENU ASSOCIATED WITH **SELECT METHOD.**

Access this setup to assign an identifier to the selected ISE method.

***Note**: It is recommended to use the ion being quantified as the METHOD ID, followed by the corresponding probe used.*

Maximum length allowed: 5 alphanumeric characters. Use the buttons , , , and to move through the alphanumeric keyboard. Press the button to confirm the selected character. Press the **ENTER** button to confirm the assigned identifier; press the **ESC** button to exit without saving.

MEASURING UNIT (Unit of Measurement for ISE Method)

SETUP MENU ASSOCIATED WITH **SELECT METHOD.**

Access this setup to select which unit of measurement to use for the selected ISE method

- **mg/l** - default setting -
- **g/l**
- **mol/l**

TYPE (Ion Valence Selection)
SETUP MENU ASSOCIATED WITH **SELECT METHOD.**
Access this setup to select the valence of the ion being analysed:

- **Monovalent** – default setting –
- **Bivalent**

CAL VALUES (Select the most diluted standard for calibration)
SETUP MENU ASSOCIATED WITH **SELECT METHOD.**
The calibration curve automatically requested by the instrument consists of concentrations obtained by multiplying the previous value by 10. Access this setup to select the most diluted value from which to start the calibration curve:

- **Standard**: Select the most diluted value from a set of predefined values: 0.1 / 1 / 10 / 100 / 1000 – default setting 0.1.
- **Set low standard**: Use the arrow buttons and then confirm with to set the most diluted standard to a value of your choice.

IMPORTANT*: The instrument requires at least two calibration points to be performed.*
Example: The user sets **MEASURING UNIT -> mg/l** and **CAL VALUES -> Standard -> 1.**
The values required during calibration will therefore be 1 mg/l – 10 mg/l – 100 mg/l – 1,000 mg/l – 10,000 mg/l; with the option to stop and save the calibration after the 10 mg/l value.

SET STABILITY CRITERIA (Select the stability criterion)
SETUP MENU ASSOCIATED WITH **SELECT METHOD.**
Access this menu to choose which stability criterion to use during calibration and measurement**:**

- **Stability** – default setting – corresponds to the "medium" stability criterion for the pH parameter.
- **Seconds (0…180):** Use the arrow buttons to select the number of seconds after which the device locks the reading. When this option is selected, a countdown appears on the display; once the countdown ends, the reading is locked. To restart the timer, press .

CALIBRATION DATA (Calibration data for ISE parameters)
SETUP MENU ASSOCIATED WITH **SELECT METHOD.**
Access this menu to view information about the last calibration performed on the selected measurement channel. The display shows a report with the following information regarding the currently active calibration: METHOD / CALIBRATION DATE / CALIBRATION TIME / SLOPE % FOR EACH RANGE.

SET CALIBRATION DUE (Select ISE Calibration Deadline)
Access this menu to set a calibration deadline; this option is essential in GLP protocols:

- By default, no calibration deadline is set. Use the arrow buttons to select the hours or days that must elapse between two calibrations and confirm by pressing .
- When a calibration deadline is set, the icon appears on the display in measurement mode.
- When the calibration has expired, the icon begins to flash.

Note: *If the calibration has expired, data will not be saved during save operations.*
IMPORTANT: *Only the "One-time alert" mode applies to the ISE parameter. It is not possible to lock the measurement (see* ***the "GENERAL SETTINGS"*** *section,* ***→ CALIBRATION DUE MODE****).*

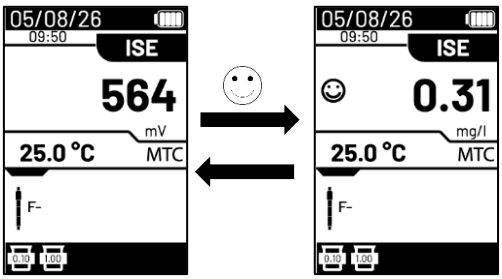
RESET SETTINGS (Reset the ISE parameter)
If the instrument is not working optimally or incorrect calibrations have been performed, use this setup menu to restore the ISE settings to their defaults:

- **ACTUAL METHOD**: Select this option to reset only the method currently in use.
- **YES**: Select this option to restore all methods to their factory settings.

IMPORTANT: *Restoring factory settings does* ***NOT*** *delete stored data.*

Measurement with Ion-Selective Electrodes

- Access the ISE setup menu to load and verify the desired method, as well as the corresponding calibration and instrument parameters.
- Connect the ISE sensor to the CHANNEL 2 BNC connector for the **pH 2 NEX** device or to the BNC connector on the **pH DO NEX** instrument
- During the measurement, the display shows the reading in mV until stability is reached.
- Once the reading stabilizes, the analyte concentration appears on the display with the unit of measurement selected by the user.



IMPORTANT: *If the device is not calibrated in measurement mode, only the mV reading will be displayed.*

13. DO Parameter (Dissolved Oxygen)

OXY

pH DO

The pH DO meter can measure dissolved oxygen using an **optical** sensor. The dissolved oxygen measurement can be expressed as concentration or saturation; using the button, the user can freely switch between both measurement types. This device allows for the measurement and display of ambient atmospheric pressure; this data is used to automatically compensate the measurement. It is also possible to compensate for salinity by manually entering the value. To use the optical sensor, connect the sensor's MULTIPIN-6 directly to the instrument's connector and tighten the ring nut. The temperature probe is built-in, so measurement and compensation for this parameter will always be active.

DO Parameter Setup

- In measurement mode, press to access the **SETUP** menu.
- Use the directional buttons and confirm with to access the **DO SETTINGS** menu OXY.
- Use the or buttons to move to the program you want to access and press to confirm.

Setup Menu Structure

The table below shows the structure of the setup menu for the DO - OXY parameter. For each program, the options available to the user and the default value are listed:

Program	Description	Options	Factory Settings
OXY	ZERO-POINT CAL.	START	START
	SALINITY COMPENS.	0.0 – 70.0	0.0
	CALIBRATION DATA	VIEW	VIEW
	SET CALIBRATION DUE	NO – HOURS – MINUTES	NO
	PROBE ID	-	-
	TEMPERATURE CAL	-	NO
	RESET SETTINGS	NO - YES	NO

ZERO-POINT CAL. (Calibration with Standard Zero %)

Access this setup to start calibrating the 0 % DO value. Once the procedure is complete, the 0.0% beaker icon appears on the display in measurement mode.

Note: *0 % DO Standard (Code 50010292) — contact your local distributor for information.*

SALINITY COMPENS. (Manual Salinity Compensation)
The salinity of the sample being measured affects the partial pressure of dissolved oxygen. For an accurate measurement, you must set the sample's salinity value. When measuring oxygen in saltwater or seawater samples, it is important to correct the measurement by setting the approximate salinity value of the sample. The default setting is 0 ppt. To change it, access the **SALINITY COMPENS.** parameter in the setup menu and set the desired value between 0.0 and 70.0 ppt. **The average salinity of seawater is 35 ppt.**

CALIBRATION DATA (Calibration data for the DO parameter)
Access this menu to view information about the most recent calibration performed for the DO parameter. The display shows a report with the following information regarding the currently active calibration: PROBE ID USED / CALIBRATION DATE / CALIBRATION TIME / TEMPERATURE / OFFSET % / SLOPE %.

SET CALIBRATION DUE (Select DO Calibration Deadline)
Access this menu to set a calibration deadline for the DO parameter; this option is essential in GLP protocols:

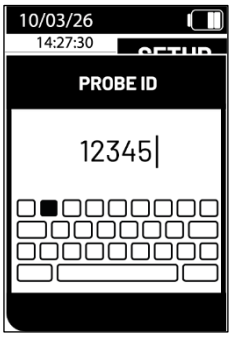
- By default, no calibration deadline is set. Use the arrow buttons to select the hours or days that should elapse between two calibrations and confirm by pressing .
- When a calibration deadline is set, the icon appears on the display in measurement mode.
- When the calibration has expired, the icon begins to flash.

In the **GENERAL SETTING** menu, → **CALIBRATION DUE MODE,** the user can choose what happens when the calibration expires:

- Display only the alert that calibration has expired (flashing icon) but continue to display the measurements on the screen.
- Lock the measurement until a new calibration is performed.

Note: *In both cases, when the calibration has expired, data is not saved when using the data logger.*

PROBE ID (Probe ID)
Access this menu to set an ID for the LDO probe being used. Maximum length allowed: 5 alphanumeric characters. Use the buttons , , , and to move over the alphanumeric keyboard. Press the button to confirm the selected character. Use the **ENTER** button to confirm the assigned ID; use the **ESC** button to exit without saving.



TEMPERATURE CAL (Temperature Probe Calibration)
All instruments in this series are pre-calibrated for accurate temperature readings. However, if there is a noticeable difference between the measured and the actual temperature (usually due to a sensor malfunction), you can adjust the offset by ± 5 °C. After connecting the sensor, use the and buttons to correct the temperature offset value and confirm with .

RESET SETTINGS (DO Parameter Reset)

If the instrument is not working optimally or incorrect calibrations have been performed, press the button to **select "YES"** and restore all parameters in the DO–OXY menu to their default settings.
IMPORTANT: *Restoring factory settings does **NOT** erase stored data.*

Information on the LDO70 Probe

The LDO70 probe uses optical luminescence technology to measure dissolved oxygen in water. This type of probe has many advantages over the classic polarographic sensor, including:

- Zero polarization time; the instrument is ready for use as soon as it is turned on.
- No sample shaking is required, as there is no oxygen consumption.
- No electrolyte inside the membrane.
- No interference with other gases (e.g., CO_2).
- Reduced maintenance time.

- Fast response time.
- Accurate even with small sample volumes.
- Stable and precise measurements even at low levels of dissolved oxygen.



Measurement Principle

A chemical substance called **a LUMINOPHORE** has been attached to an oxygen-permeable membrane. Inside the sensor, a light source emits a pulsating blue light that is reflected by the luminophore onto an internal photocell. When oxygen permeates through the membrane and comes into contact with the luminophore, it modifies the blue light in proportion to the partial pressure of oxygen. This variation is detected by the photocell, which generates a proportional electrical signal.

Probe Storage

When the probe is not in use, store it in the protective cap provided, which contains a sponge moistened with distilled water. This keeps the membrane protected and hydrated, ready for use.

Maintenance of the LDO 70 Probe

If the instrument does not calibrate or the reading does not stabilize, perform maintenance on the probe as follows:

1) Check that the luminophore is clean; if necessary, wash it with plenty of water.
2) The luminophore must be intact, undamaged, and free of holes.
3) Unscrew the luminophore and check that the interior is dry, free of condensation, and free of leaks. If condensation or water ingress is present, check the integrity of the luminophore's O-ring seal and replace it if necessary. Dry thoroughly with paper towels and screw the luminophore back on, ensuring a tight seal. After maintenance, perform calibration.

***Note**: If the probe still does not calibrate after maintenance, replace the luminophore with a new one.*

Replacement of the Luminophore

The efficiency of the luminophore decreases with wear until the instrument can no longer calibrate; in this case, it must be replaced. To replace the luminophore, proceed as follows:

1) Unscrew the luminophore.
2) Check the integrity of the probe's interior.
3) Replace the O-ring with the new one supplied with the new luminophore.
4) Screw on the new luminophore, ensuring a tight seal.

After replacing the luminophore, perform the calibration.

Oxygen Sensor Calibration

The polarographic sensor is an active sensor whose response changes with wear and aging; therefore, it must be calibrated regularly in air.

Calibration in 100 % Air

Routine calibration is performed in 100 % air. Switch on the instrument by pressing the button, immerse the probe in water, and wait for the 10-minute polarization time. Next, dry the probe thoroughly with paper towels and proceed as follows:

- Place the probe in the air with the membrane facing down and wait 2 minutes. Then connect the sensor to the device.

- In measurement mode, press the button to enter calibration mode. The display will show the message “Rinse electrode and press OK”; confirm. The device will search for a DO (%) value of 100 %. Leave the sensor in the air, in a vertical position with the membrane facing down.
- When the signal is stable, the stability icon will appear. Press the button as indicated by the message. The actual measured value will flash on the display, and the instrument will show the calibration data. Press any button to return to the main menu, and the beaker icon will appear in the bottom left corner, indicating that the instrument is calibrated to a DO value of 100 %.

Calibration with the Standard Zero Oxygen

Normally, it is sufficient to calibrate the instrument at 100 % air, as explained above. However, in some cases, it may also be necessary to calibrate at 0 %, for example when:

- You replace the probe with a new one.
- The probe has been unused for an extended period (more than a month).
- A complete sensor maintenance is performed.
- The instrument does not calibrate to 100 %; in this case, calibrate to 0 % first.
- The instrument is not measuring correctly.

To calibrate to 0%, **proceed as follows**: **Before proceeding, perform maintenance on the DO 7 probe** (section 13). Turn on the instrument, immerse the probe in water, and wait for the 10-minute polarization time. Next, dry the probe thoroughly with paper towels and proceed as follows:

- Place the probe in the Standard Zero Oxygen and wait 5 minutes.
- In measurement mode, press the button, enter the OXY menu, and confirm again by pressing the button.
- Press again to confirm entry into **the “ZERO POINT CAL”** submenu. The display will show the message “Rinse electrode and press OK”; confirm. The device will search for a DO (%) value of 0 %. Leave the sensor in the air, in a vertical position with the membrane facing down.
- Gently swirl the probe in the standard solution and check for any air bubbles under the membrane; remove them by moving the sensor.
- When the signal is stable, the stability icon will appear.
- Confirm the value by pressing .
- The actual measured value flashes on the display, and the instrument will show the calibration data. Press any button to return to the main menu.
- In the lower left corner, the “0.0” beaker icon will appear, indicating that the instrument has been calibrated to a DO value of 0 %.

CAUTION: *Before proceeding with calibration, carefully review the safety data sheets for the substances involved:*



- *Standard Zero Oxygen Calibration Solutions.*

Note: *The Zero Oxygen Standard solution is for SINGLE USE ONLY! After use, contact your local dealer to purchase more.*

Also perform the 100 % air calibration. This procedure remains in memory even after the device is turned off.

Calibration Range

The time interval between two calibrations (100 % in air) depends on the type of sample, the sensor’s efficiency, and the desired accuracy; generally, the instrument must be calibrated at least once a week, but for greater accuracy, it is advisable to calibrate the instrument more frequently.

The instrument must be recalibrated if any of the following conditions apply:

- New probe, or one that has not been used for a long time.
- After sensor maintenance.

Errors reported during calibration

- **NOT STABLE:** The button was pressed while the signal was still unstable. Wait for the icon to appear to confirm the point.
- **WRONG BUFFER**: The point at which calibration is being performed is incorrect.
- **SLOPE OUT OF RANGE**: The slope of the sensor's calibration line is outside the acceptable range of 80–120%.
- **CALIBRATION TOO LONG:** The calibration has exceeded the time limit; only the points calibrated up to that point will be kept.

14. Measurement of Dissolved Oxygen

Before Starting

To minimize measurement errors and achieve the highest possible accuracy, follow these rules before beginning:

- the sensor must be calibrated;
- the sensor must be in a vertical position with the membrane facing down;
- remove the protective cap;
- the probe must be at the same temperature as the sample to analyse; if necessary, leave the probe immersed in the sample until thermal equilibrium is reached.

Measurement Mode

This instrument can operate in two measurement modes:

- **Dissolved DO saturation** expressed in %.
- **Dissolved DO concentration** expressed in mg/l.
- **Barometric pressure.**

During measurement, press the button to change the unit of measurement.

Performing the measurement

Remove the sensor's protective cap, rinse the sensor with distilled water; dab it dry with a paper towel and immerse it in the solution to be analysed. Gently stir and wait until the value stabilizes; when the icon appears on the display, take the reading.

Barometric Pressure Compensation

Since the measurement of the partial pressure of dissolved oxygen is also linked to barometric pressure, this instrument—thanks to its built-in barometric sensor—is able to compensate for even the slightest variation.

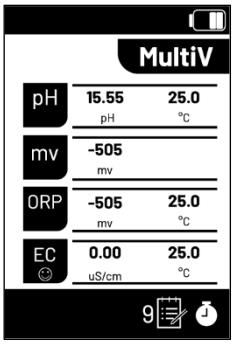
To view the barometric pressure detected by the instrument, press the button during the measurement and scroll through the measurement parameters: DO (%) ↔ DO (mg/l) ↔ mbar.



15. Multiparameter Display

pH 2 pH DO

Up to 4 parameters can be displayed simultaneously on the screen, at the user's discretion.



- In measurement mode, press to access the **SETUP** menu**.**
- Use the arrow buttons and confirm with to access the **MULTIVIEW** menu.
- The display shows a list of all parameters supported by the instrument. Use the and buttons to scroll and to select them. The user can select up to 4 parameters.

- Press to return to measurement mode and use to move to the **MultiView** screen.
- For each selected parameter, the corresponding temperature (ATC or MTC) is also displayed, along with / HOLD as a stability indicator.

16. Data Logger Function

pH 2 pH DO

This series of devices can record values in GLP format to the instrument's internal memory.
For each value, you can also associate the IDs of the sensor, the user, and the sample being analyzed.
The instrument can store up to 1,000 measurements in total. Once the memory is full, the values are NOT overwritten. In measurement mode, the number of measurements stored for that parameter appears next to the notepad icon 65 . You can then recall and view the values on the display or download them to a PC using the dedicated software.
If you have the option to work while directly connected to a PC, the data is automatically saved in the software without any memory limitations. Recordings can be captured **manually** (MANUAL) or **automatically at preset intervals** (HOURS – MINUTES – SECONDS).
PC Connection: *Connect the USB cable included in each package to the USB port on the side panel of the instrument and the other end to a COM port on the computer. Use only the USB cable supplied with each instrument.*



Setup for the Data Logger+ ID parameter

- In measurement mode, press to access the **SETUP** menu.
- Use the directional buttons and confirm with to access the **DATA LOGGER + ID** menu .
- Use the directional buttons to move to the program you want to access, then press **.**

Setup Menu Structure for the Data Logger Menu

The table below shows the structure of the setup menu for Data Logger mode; for each program, the options available to the user and the default value are listed:

Program	Description	Options	Factory Settings
	DATA LOGGER TYPE	MANUAL – SECONDS – HOURS – MINUTES	MANUAL
	DELETE MEMORY	YES – NO	NO
	SAMPLE ID	-	-
	PROGRESS SAMPLE ID	YES – NO	NO
	USER ID	-	-
	VIEW ID	VIEW	VIEW
	PX SIM SN	-	-

DATA LOGGER TYPE (Recording Type)
Access this menu to select the data acquisition mode:

- **MANUAL**: **Data is acquired only when the user presses the button.**
- **SECONDS – MINUTES – HOURS: Set an interval for automatic data acquisition.**

Use the directional buttons to move from MANUAL to SECONDS, MINUTES, or HOURS. Press to enter, then use the and buttons to change the acquisition time. Confirm the setting by pressing .

DELETE MEMORY (Clear Memory)

Access this setup menu and confirm **"YES"** by pressing to delete all data stored in the instrument's internal memory.

SAMPLE ID

Access this menu to set an identifier for the sample being analysed. Maximum length allowed: 6 alphanumeric characters. Use the , , , and buttons to navigate the alphanumeric keyboard. Press the button to confirm the selected character. Use the **ENTER** button to confirm the assigned identifier; use the **ESC** button to exit without saving.

PROGRESS SAMPLE ID (Sample ID in progressive mode)

Access this setup menu and confirm YES with to increment the SAMPLE ID by one each time you save.
Example: SAMPLE ID: ABCDEF / **PROGRESS SAMPLE ID: YES**
Save 1: ABCDEF 1
Save 2: ABCDEF 2
Save 3: ABCDEF 3
Etc…
Note: *The sequence continues until you change the SAMPLE ID or select NO for the PROGRESS SAMPLE ID.*

USER ID

Access this menu to set a user ID. Maximum length: 5 alphanumeric characters. Use the , , , and buttons to navigate the alphanumeric keyboard. Press the button to confirm the selected character. Press the **ENTER** button to confirm the assigned ID; press the **ESC** button to exit without saving.

VIEW ID

Press the button to view all entered IDs (pH / ORP / DO Probes _ Sample _ User)
During the data-saving process, the identifiers corresponding to the parameter are saved along with the analytical data.

PX SIM SN (Serial Number for PX SIM Simulator)

Access this setup menu to optionally enter the serial number of the pH/mV simulator used for automatic pH and ORP calibrations (PX SIM Calibration). Use the directional buttons to select the number and confirm with . The serial number is recorded in the calibration report.
Note: *In the pH 2 NEX instrument, with the exception of probe IDs that are associated with the measurement channel, the remaining IDs are unique*.

Use of the Automatic Data Logger

When measuring, press the button to start and stop automatic recording. When automatic data saving is active, the icon flashes on the display. When instead it is set but not active, the icon on the screen remains steady. When the total number of values reaches 1,000, an alert appears indicating that memory is full. Data is not overwritten.
Note: *Scrolling through the parameters pauses data logging.*

Example of Automatic Data Logger Mode

Example: Automatic pH recording to internal memory every 2 minutes on channel 1 of the pH2 NEX instrument.

- Access the **LOG SETTING** setup menu (**).**
- Enter the **DATA LOGGER TYPE** menu and use the directional buttons to move to **MINUTES**. Press the button again and use the and buttons to change the number of minutes. Confirm with . Return to measurement mode and go to the **pH-1** screen.

- The icon is permanently displayed in the bottom row of the screen, indicating that an automatic frequency data logger has been set up. Press to start recording; the icon begins to flash, indicating that data is being saved. The number next to the notepad icon indicates how much data has been saved for that parameter: 65 .
- Press again to stop recording.

***Note**: Automatic recording is paused when you change the measurement parameter.*

Example of Manual Data Logger Mode

Example of recording a DO value in mg/l in manual mode on the pH DO meter.

- Access the **LOG SETTING** setup menu .
- Enter the **DATA LOGGER TYPE** menu**,** press , and use the arrow buttons to select **MANUAL.**
- Confirm with and return to measurement mode, then go to the **DO** screen**.**
- Press to save the value. The number next to the notepad icon indicates how much data has been saved for that parameter 65 .

Recall Saved Data

- In measurement mode for the parameter of interest (*make sure the correct measurement channel is selected on the PH 2 NEX instrument*), press to enter **RECALL MEMORY** mode and view the data stored for that specific parameter on the display.
- Use the and buttons to scroll through the various data pages.
- **Press to view the IDs associated with the saved data.**
- Press to return to measurement mode.

***Note**: If data is saved while the calibration has expired, no values will be recorded.*

- When retrieving data stored in Multiview mode, a separate screen is reserved for each acquisition. The values displayed will be those active at the time of saving. **Press to view the IDs associated with the saved data.**

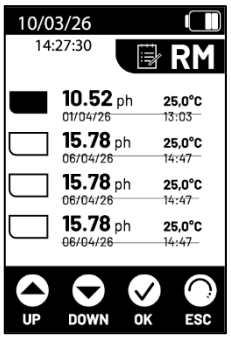
Delete Saved Data

- To delete data stored in the instrument's memory, access the **DELETE MEMORY** setup menu and select **YES.**

17. Instrument Setup Menu

pH 2 pH DO

- In measurement mode, press to access the **SETUP** menu.
- Use the arrow buttons and confirm with to access the **GENERAL SETTINGS** menu**.**
- Use the arrow buttons to move to the program you want to access, then press **.**



Setup Menu Structure for the Configuration Menu

The table below shows the structure of the setup menu for the instrument's general settings; for each program, the options available to the user and the default value are listed:

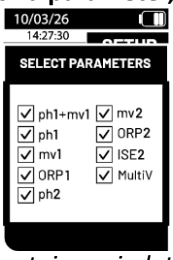
Program	Description	Options	Factory Settings
	SELECT PARAMETERS	YES – NO for each parameter	YES
	PASSWORD	NEW PASSWORD	-
	DISPLAY CONTRAST	LEVEL 1…9	LEVEL 5
	BRIGHTNESS	OFF – LEVEL 1…4	LEVEL 2
	SLEEP MODE	OFF – ON (1…20 min)	ON (1 min)
	READING WITH HOLD	YES – NO	NO
	DATE FORMAT	yyyy/mm/dd – mm/dd/yyyy – dd/mm/yyyy	dd/mm/yyyy
	DATE SETTINGS	-	-
	TIME SETTING	-	-
	CALIBRATION (DUE MODES)	LOCK - ALERT	ALERT
	TEMPERATURE UNIT	°C - °F	°C
	SELECT LANGUAGE	ENG – ITA – FRA – ESP – DEU	ENG
	AUTO OFF	YES - NO	NO
	RESET SETTING	YES - NO	-

SELECT PARAMETERS

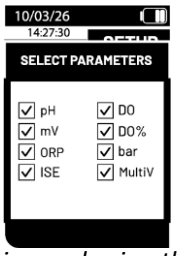
Access this menu to select which parameters to display or hide in measurement mode.
By default, no parameters are hidden:

- Use the button to check the boxes next to the parameters you want to keep active and display in measurement mode.
- **If you uncheck a parameter, it will NOT be displayed in measurement mode**.

pH 2 NEX:



pH DO NEX:



Example: *For a certain period, the user is only interested in viewing and using the pH and mV parameters and the MultiView screen. Access the* **"SELECT** *PARAMETERS" menu and use the button to uncheck the remaining parameters. Return to measurement mode by pressing ESC.*

PASSWORD (Password Management)

Use this setup menu to enable, enter, or disable the password:

- The active password is indicated on the display by the icon.
- The password is required to perform the following tasks:
  - calibrating the device;
  - deleting saved data;
  - change the device's date and time;
  - change or disable the calibration expiration date;
  - change the CALIBRATION DUE MODE menu;
  - reset the settings for various parameters;
  - In the ISE parameter, a password is required to access the method setup menus.

- The password consists of 4 numeric characters. Use the and buttons to change the number and move to the next field by pressing .
- **To disable the password, enter "0 0 0 0" as the new password.**

***Note**: If the password is lost, contact Technical Support.*

DISPLAY CONTRAST (Display Contrast Management)
Access this setup menu to adjust the 9 display contrast levels:
Level 1 (low contrast) **-> Level 9** (high contrast).
The default setting is a medium contrast level (level 5).

BRIGHTNESS (Display Brightness Control)
Access this setup menu to adjust the 5 display brightness levels:
Off (no brightness) **-> Level 4** (maximum brightness).
The instrument is set by default to a medium brightness level (level 2).
***Note**: For outdoor use, especially on sunny days, it is recommended to set the brightness to "Off."*

SLEEP MODE (Display Mode with Minimum Brightness)
Access this setup menu to manage the device's standby mode:
- **OFF**: Sleep mode disabled; brightness always on.
- **ON (1…20 min)**: Use the directional buttons to select the minutes of keyboard inactivity before standby mode activates. By default, it activates after one minute.

***Note:** Standby mode affects only the display brightness. All other instrument functions continue to operate normally (e.g., data logging). To exit standby mode and return the display to normal brightness, press any button.*

READING WITH HOLD (Activating the HOLD Function)
Access this setup menu to enable or disable the **HOLD** stability criterion:
- **NO**: -default option- The reading is not held.
- **YES**: When this option is enabled, the measurement is locked on the display as soon as it reaches stability. To unlock it and restart the measurement until the next stability is reached, press .

Note:** The HOLD function is automatically disabled if the ISE parameter is set **to SET STABILITY CRITERIA** -> **SECONDS.

DATE FORMAT
Access this setup menu to change the date format:
- **yyyy/mm/dd**
- **mm/dd/yyyy**
- **dd/mm/yyyy** – default option –

DATE SETTING

Access this setup menu to update the device's date. Use the arrow buttons to change the year, confirm with , and repeat the same process for the month and day.

TIME SETTING
Access this setup menu to update the device's time. Use the directional buttons to adjust the hour, confirm with , and repeat the same process for the minutes and seconds.

CALIBRATION DUE MODE
Access this setup menu to manage the effects of the calibration due date (*see the* **"SET CALIBRATION DUE"** *section for the various parameters*):
- **Lock measurement:** The values are no longer displayed, preventing the user from working until a new calibration is performed.

Note: *This option does not apply to the calibration expiration in the ISE parameter.*

- **One-time alert:** The icon flashes as an alert on the display until a new calibration is performed; the user can keep working.

Important: *In both cases, you cannot save the data.*

TEMPERATURE UNIT (Temperature measurement unit)
Access this setup menu to select the temperature unit of measurement. Use:

- **°C** -default-
- **°F**

SELECT LANGUAGE
Access this setup menu to select the device's operating language:

- **English** – default option –
- **Italian**
- **French**
- **Spanish**
- **German**

AUTO OFF (Auto-Shutdown)
Access this setup menu to enable or disable the instrument's auto-shutdown:

- **YES:** The instrument switches off automatically after **20 minutes** of inactivity.
- **NO** – default option – The instrument remains on at all times, even when not in use.

Note: *The instrument's auto-shutdown is disabled when data is being recorded in automatic data logger mode ( ).*

RESET SETTING (General Reset)
Access this setup menu to restore the instrument to its factory settings.
IMPORTANT: *Restoring factory settings does not delete stored data.*

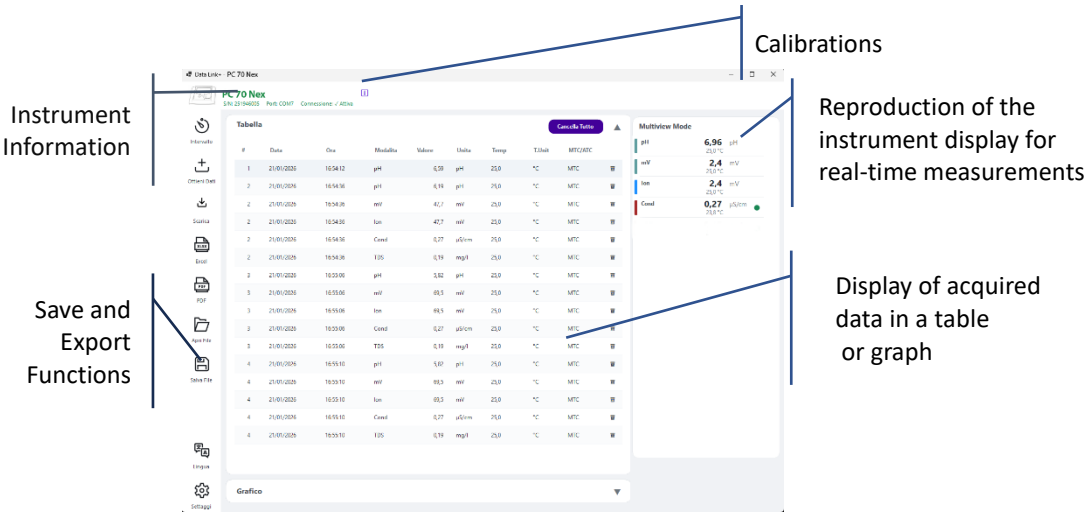
18. Data Link NEX Software (for Windows 10/11)

You can connect the pH2 NEX and PH DO NEX instruments to a PC and then use the Data Link NEX software (and later versions) to download data, log data directly to the PC, and export files to XLS (Excel) and PDF formats. The software can be downloaded for free from the website (make sure to install the drivers correctly):

- https://www.giorgiobormac.com/it/download-software_Download.htm.
- Connect the USB cable included in each package to the USB port on the side panel of the instrument and the other end to a COM port on the computer.
- Use only the USB cable supplied with each instrument.
- Launch the program and then switch on the instrument.

Features

- **Download**: The data saved in the instrument's memory is downloaded to the PC and displayed in a table for processing.
- **Get Data**: Instant acquisition of a value (equivalent to the Manual Data Logger option).
- **Interval**: Automatic acquisition at a set frequency.
- **Clear All**: Clears the data in the table.
- **Export to Excel** / **Export to PDF:** Exports all data displayed on the Data Link NEX screen to PDF and Excel.
- **Save to File** / **Open from File**: Saves the data in the table and allows you to reload it for processing or to continue recording.
- **Select Language**: Set the interface language (Eng – Ita – Deu – Esp – Fra – Por).
- **Table** / **Graph**: display modes for acquired data and their corresponding IDs. The graphs are organized by parameter and can be printed separately.



***Note**: The screenshots shown in this manual may not match the version of the instrument you purchased.*

19. Warranty



Warranty Period and Limitations

- The manufacturer of this device offers the end user of the new device a three-year warranty from the date of purchase, provided the device is maintained and used in accordance with best practices.
- During the warranty period, the manufacturer will repair or replace defective components.
- This warranty applies only to the electronic components and does not apply if the product has been damaged, used incorrectly, exposed to radiation or corrosive substances, if foreign materials have entered the product, or if modifications not authorized by the manufacturer have been made.

20. Disposal



This equipment is subject to regulations for electronic devices.
Dispose of it in accordance with applicable local regulations.