

User Manual
English

Portavo® 904(X) PH



Return of products under warranty

Please contact our Service Team before returning a defective device.

Ship the cleaned device to the address you have been given.

If the device has been in contact with process fluids, it must be decontaminated/ disinfected before shipment. In that case, please attach a corresponding certificate, for the health and safety of our service personnel.



Disposal

Please observe the applicable local or national regulations concerning the disposal of “waste electrical and electronic equipment”.

Registered trademarks

The following names are registered trademarks. For practical reasons they are shown without trademark symbol in this manual.

- Calimatic®
- Memosens®
- Paraly®
- Portavo®
- Sensocheck®
- Sensoface®

Package Contents	6
Documentation	7
Overview of the Portavo 904(X) PH	8
Value-Added Features	9
Protective Cover	10
Hook	10
Display	11
Keypad	12
Start-Up	13
Inserting the Batteries	13
Batteries for Application in Hazardous Locations	14
Connecting a Sensor	15
Switching On the Meter	16
Icons	16
Configuring	17
Calibrating	18
Measuring	25
Switching the Measured Value Display	25
Adjusting the Temperature	25
Data Logger	26
Operating Modes of the Data Logger (Logger Type)	27
Data Logger Menu	29
Configuring the Data Logger	30
Starting the Data Logger using CONT	31
Starting the Data Logger using START	31
Displaying the Logger Data	32
Stopping the Data Logger	33
Clearing the Data Logger	33
Clock	34

Option 001 SOP	35
Option 002 Temperature Calibration	36
Enabling Options / TAN Input	37
Passcodes for CONF and CAL	38
Sensor Verification (Memosens).....	39
Paraly SW 112 Software	39
Error Codes and Device Messages.....	40
“Sensoface” Messages.....	41
Error Messages	42
Product Line	43
Accessories	43
pH Sensors	44
Knick CaliMat Buffer Solutions	45
Specifications.....	46
Index.....	50

Check the shipment for transport damage and completeness.

The package of the Portavo 904(X) PH includes:

- The Portavo 904(X) PH incl. 4 AA batteries and premounted quiver
- Carrying strap
- Quickstart instructions in various languages
- Specific test report
- Safety instructions
- Certificates
- Data carrier with detailed user manuals and Paraly SW 112 software
- USB cable, 1.5 m

Specific Test Report

CD-ROM

Complete documentation:

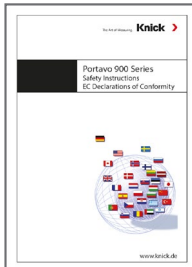
- User manuals in different languages
- Safety Information
- Certificates
- Quickstart guides



Safety Instructions

In official EU languages and others.

- EC Declarations of Conformity



Certificates

- IECEx
- ATEX



Quickstart Guides

Installation and first steps:

- Operation
- Menu structure
- Calibration
- Error messages and recommended actions



Various languages on CD-ROM and on our website:
www.knick.de

The Portavo 904(X) PH is a portable pH meter. A plain-text line on the high-contrast LCD screen makes operation virtually self-explanatory. The device variant 904 X PH is available for applications in hazardous locations up to Zone 0.

The meter stands out by the following features:

- Use of digital Memosens sensors
- Memosens sensors and DIN pH sensors can be used on one device.
- A detachable quiver protects the sensor and prevents it from drying out. Furthermore, it can be used for calibration.

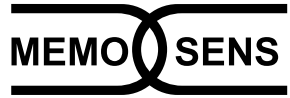


- The rugged housing is made of a high-performance polymer. It provides high impact resistance and dimensional stability even when exposed to extreme moisture.
- Scratch-proof clear glass display, perfectly readable even after years
- Very long operating times with one set of batteries (4 x AA) or use of a Li-ion battery for reliable operation even at high or very low operating temperatures (Li-ion battery not suited for Portavo 904 X PH for application in a hazardous location)
- Data logger with 5000 values
- Micro USB port for communication with Paraly SW 112 software for data evaluation of digital sensors (Memosens)
- Sensoface icons provide single-glance information on the sensor condition (page 41)
- Calibration with "Calimatic" automatic buffer recognition (page 18)
- Manual calibration by entering individual buffer values
- Real-time clock and indication of battery charging level
- At measuring temperatures from -20 to +100 °C the temperature detector can be automatically identified.

Value-Added Features

Memosens

The Portavo 904 can communicate with Memosens sensors. When these digital sensors are connected to the meter, they are automatically identified and indicated by the logo shown on the right. Furthermore, Memosens allows the storage of calibration data, which will be available and can still be used when the sensor is connected to another Memosens-capable device.



Sensoface

Sensoface provides quick information on the sensor condition. The three "smiley" faces as shown on the right represent the sensor condition during measurement and after a calibration. When the condition deteriorates, an "INFO ..." message gives a hint to the cause.



Automatic calibration with Calimatic

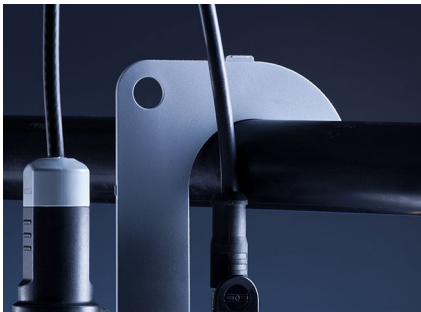
Calimatic is a very convenient method for pH calibration with automatic buffer recognition. You only have to select the buffer set with the buffers used. The buffers can then be used in any order.

As delivered, this calibration method is preset. It can be adjusted or disabled in the configuration menu.



Protective Cover

The front of the meter is protected by a cover, which can be completely flipped over and secured to the back for operation. A label on the inner side of the cover explains the control functions and device messages.



Hook

A fold-out hook on the back allows suspending the meter. This leaves your hands free for the actual measurement. The **rating plate** is located beneath the hook.

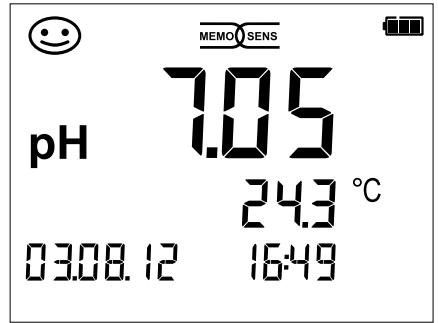


Protective Cover and Hook Combined

Cover and hook can be joined together to form a benchtop stand allowing comfortable and fatigue-free working at a lab bench or desk.

Display

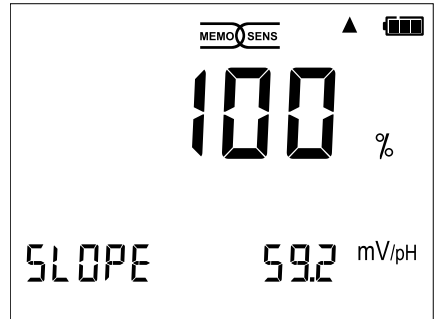
The meter has a three-line display for representing alphanumeric information such as measurement and calibration data, temperatures and date/time. Additional information is provided by means of icons (Sensoface, battery icon, etc.). Some typical displays are shown here.



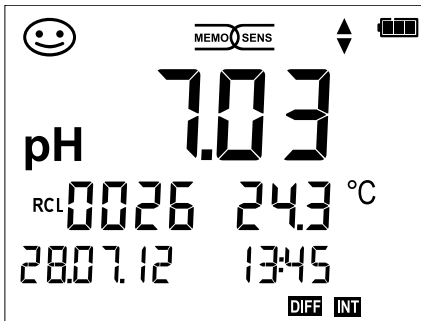
Measuring
(display of measured value, temperature, date and time)



Calibration – step 1



End of calibration
(display of slope)



Logger data
(display of measured value, memory location, temperature, date and time)



Clock
(display of hours and minutes, seconds and date).



Keypad

The keys of the membrane keypad have a noticeable pressure point.

They have the following functions:

- on/off** Switches the meter on and displays the device and calibration data (see Start-Up)
- meas** Switches the meter on / Activates measuring mode / Stops the data logger
- cal** Starts calibration
- set** Activates configuration / Confirms entries
- clock** Displays time and date, allows setting the clock using **set**
- RCL** View stored values
- STO** Holds and saves a measured value, allows setting and starting the logger by pressing **set** (page 26)
- ▲**
▼ When this icon is displayed, you can use the arrow keys for navigation.

Check the shipment for transport damage and completeness (see Package Contents).

NOTICE!

Do not operate the device when one of the following conditions applies:

- the device shows visible damage
- the device fails to perform the intended function
- prolonged storage at temperatures above +70 °C / +158 °F
- severe transport stresses

In this case, a professional routine test must be performed.

This test should be carried out at our factory.

Precautions for application in hazardous locations



WARNING!

- Only open the battery compartment of the Portavo 904 X outside the hazardous location.
 - Never try to open the device. If a repair should be required, return the device to our factory.
 - Never use the USB port within the hazardous location.
-

Inserting the Batteries







With four AA batteries, the Portavo has an operating time of over 1000 h.

Open the battery compartment on the rear of the device. Be sure to observe the correct polarity when inserting the batteries (see markings in the battery chamber). Close the battery compartment cover and screw it handtight.

A special lithium-ion battery (ZU 0925) suited to the battery compartment is available for the Portavo 904. Only this battery type can be charged directly from the USB port.

Note: Not available for the Portavo 904 X (device variant for applications in hazardous locations).

A battery icon in the display indicates the battery power level:

	Icon fully filled	Batteries at full capacity
	Icon partially filled	Battery capacity is sufficient
	Icon empty	Battery capacity not sufficient; calibration is possible, no logging
	Icon blinks	Max. 10 operating hours remaining, measurement is still possible NOTICE! It is absolutely necessary to replace the batteries.



WARNING!

When using the Portavo 904 X (device variant for applications in hazardous locations) in a hazardous location, only the battery types listed below may be used.



IECEx

The batteries must be from the same manufacturer and of identical type and capacity.

Never use new and used batteries together (see also Control Drawing 209.009-110).

Batteries for Application in Hazardous Locations

Batteries (4x each)	Temp. class	Ambient temperature range
Duracell MN1500	T4	$-10\text{ °C} \leq T_a \leq +40\text{ °C}$
Energizer E91	T3	$-10\text{ °C} \leq T_a \leq +50\text{ °C}$
Power One 4106	T3	$-10\text{ °C} \leq T_a \leq +50\text{ °C}$
Panasonic Pro Power LR6	T3	$-10\text{ °C} \leq T_a \leq +50\text{ °C}$

Connecting a Sensor

The Portavo 904(X) PH provides several connections so that many types of sensors can be used for measurement. Note that only **one** sensor may be connected to the meter at a time.

The meter automatically recognizes a connected Memosens sensor and switches accordingly. Memosens is signaled in the display.

Separate temperature probe

Note: Temperature measurement using a separate temperature probe is only possible when no Memosens sensor is connected.

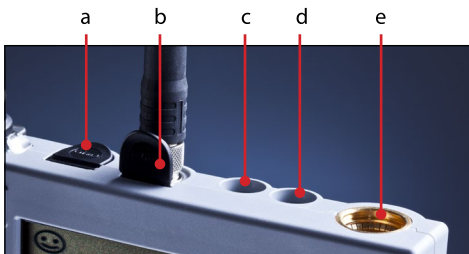
After power-on, a separate temperature probe is automatically recognized.

When you want to replace the temperature probe, you must switch off the meter and then switch it on again.

NOTICE!

Always make sure that a sensor is connected to the meter before starting measurement.

Explanation: The analog pH input of the Portavo is an electrometer amplifier with an extremely high-impedance. When the sensor is not in contact with the medium or not connected to the meter, electric charges on the input can generate arbitrary, stable pH or mV values which will be shown in the display.



Connections

- a - Micro USB port
- b - M8, 4 pins for Memosens sensors
- c - Temperature probe GND
- d - Temperature probe
- e - pH socket (DIN 19 262)

Memosens sensors have a **cable coupling**, which allows convenient replacement of sensors while the cable remains connected to the meter. The connecting cable is connected to socket **b** (M8, 4 pins for Memosens sensors).



WARNING! Explosion Hazard

NEVER use digital Memosens sensors without Ex approval in a hazardous location! For these applications, you must use Memosens sensors with Ex approval. These sensors, as well as the hazardous-area cables, are marked by an orange-red ring.



Switching On the Meter

When you have connected the sensor, you can switch the meter on by pressing the **on/off** or **meas** key.



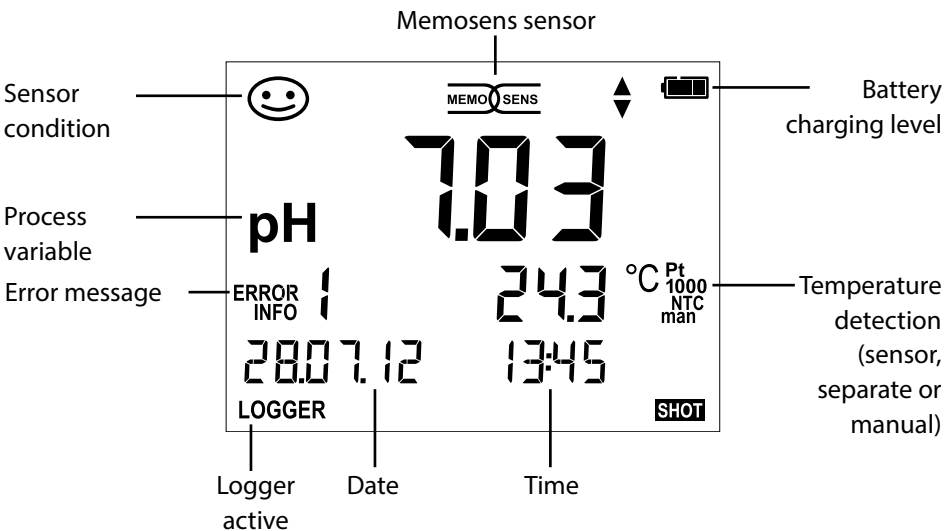
When the meter is switched on with the **on/off** key, first a self test is performed and then the calibration data and settings are displayed before the meter switches to measuring mode.

When the meter is switched on with the **meas** key, it immediately switches to measuring mode.

Depending on the connected sensor and the specific measuring task, several steps for configuration and calibration must be performed as described on the following pages.

Icons

Important information about the state of the device:





pH Configuration

Prior to measurement, a configuration should be performed to match the connected sensor and the desired measurement performance.

Furthermore, you can select the suitable calibration method.

The following table gives you an overview. Factory settings are shown in **bold print**.

Measurement

↓ **set**

“Setup” display

Display 1	pH x.xx pH x.xxx mV
Display 2	OFF date + time date time
CAL Timer	OFF 1 ... 99 days
CAL	CALIMATIC Manual DATA INPUT (ISFET-Zero) CAL SOP (Opt.) ORP OFFSET (for pH/ORP combo sensor) TEMP. OFFSET (Opt.) FREE CAL
CAL POINTS	1 2 3 1-2-3 (for CALIMATIC, Manual, FREE CAL)
BUFFER SET (CALIMATIC, FREE CAL)	-01- Mettler-Toledo 2.00 4.01 7.00 9.21
	-02- Knick CaliMat 2.00 4.00 7.00 9.00 12.00
	-03- Ciba (94) 2.06 4.00 7.00 10.00
	-04- NIST technical 1.68 4.00 7.00 10.01 12.46
	-05- NIST standard 1.679 4.006 6.865 9.180
	-06- HACH 4.01 7.00 10.01 12.00
	-07- WTW techn. buffers 2.00 4.01 7.00 10.00
	-08- Hamilton 2.00 4.01 7.00 10.01 12.00
	-09- Reagecon 2.00 4.00 7.00 9.00 12.00
	-10- DIN 19267 1.09 4.65 6.79 9.23 12.75
	-U1- loadable via Paraly SW 112 (User)
Auto OFF	OFF / 0.1h / 1h / 6h / 12h
Temp Unit	°C / °F
Time Format	24h / 12h
Date Format	dd.mm.yy mm.dd.yy
TAN TEMP CAL	(TAN input required, option; see page 37)
TAN SOP	(TAN input required, option; see page 37)
Setup Code	OFF (0000) 0001 ... 9999 (with 001-SOP option only)
Cal. Code	OFF (0000) 0001 ... 9999 (with 001-SOP option only)
Default	NO YES (reset to factory settings) Note: All data logger entries will be deleted.

Select using arrow keys, confirm by pressing **set**.

- ▲ This icon prompts you to select a menu item using the arrow keys –
- ▼ the selection is confirmed by pressing **set**.

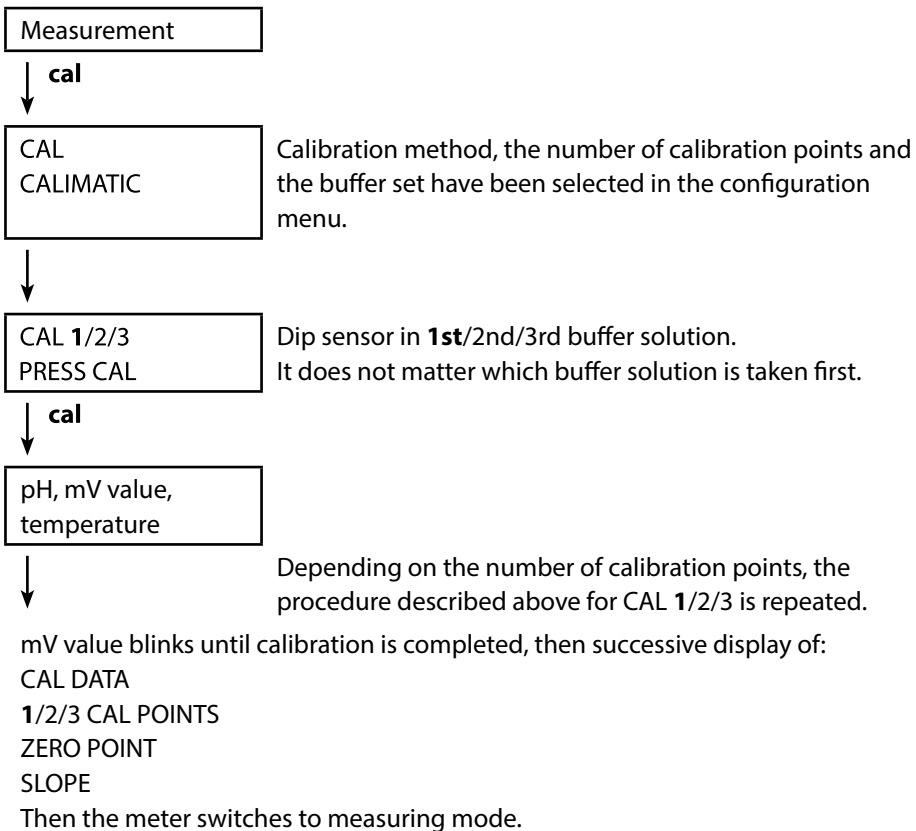


CALIMATIC Calibration

(Calibration with automatic buffer recognition)

The calibration method is selected in the configuration menu.

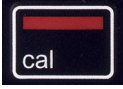
Calibration is required to adjust the sensor to the meter. It is indispensable for achieving comparable and reproducible measurement results.



Note: To abort calibration, you can press **meas** at any time.

This will be confirmed by the "CAL ABORTED" display message.

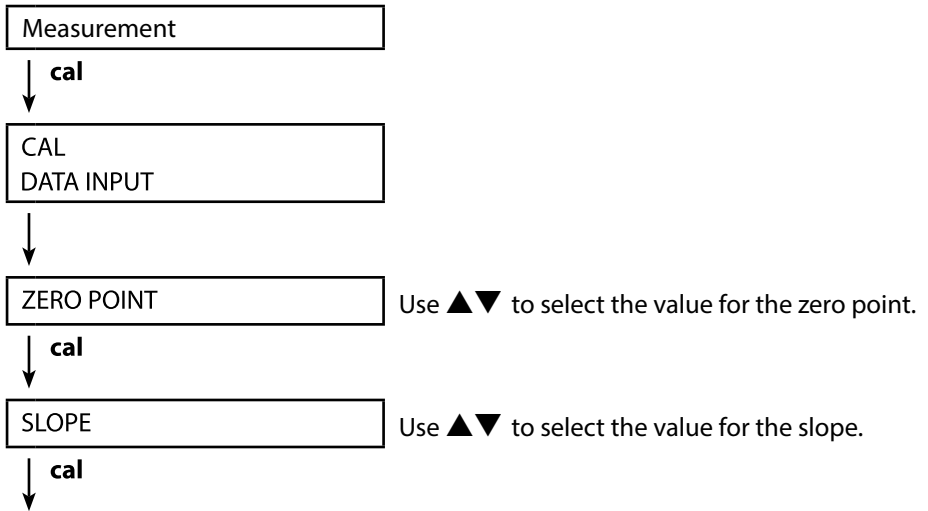
Exception: When you have selected "CAL POINTS 1-2-3" and the first calibration step has been completed, the calibration process cannot be stopped any more.



DATA INPUT Calibration

(Calibration by entering known sensor values)

The calibration method is selected in the configuration menu.



The calibration data will be displayed successively:

Date and time

ZERO POINT

SLOPE

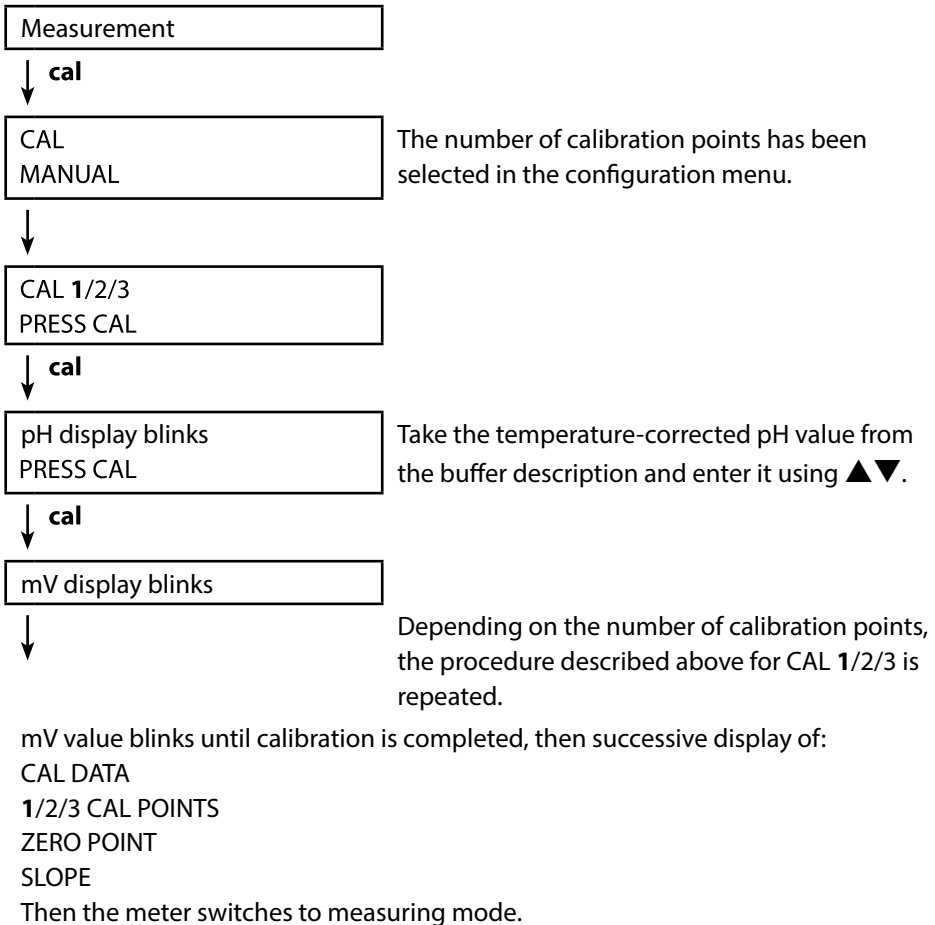
Then the meter switches to measuring mode.

Note: To abort calibration, you can press **meas** at any time.



MANUAL Calibration

The calibration method is selected in the configuration menu.



Note: To abort calibration, you can press **meas** at any time. This will be confirmed by the "CAL ABORTED" display message. Exception: When you have selected "CAL POINTS 1-2-3" and the first calibration step has been completed, the calibration process cannot be stopped any more.



CAL SOP Calibration

(Option, must have been configured in Paraly SW 112 software)

Option 001 SOP (Standard Operating Procedure) meets specific requirements of the pharmaceutical and biotechnological industries.

In the Paraly SW 112 software, you specify which buffers are to be used in which sequence. You can combine buffer solutions from different buffer sets.

Please note that the minimum distance allowed between two buffer solutions is $\Delta 2$ pH.

SOP calibration allows you to:

- use up to 3 buffers for adjustment
- use a 4th point for verification (“verification buffer”)
- specify a maximum deviation from the verification buffer
- use buffers from different buffer sets, including a “user buffer”.

Measurement

↓ **cal**

CAL
CAL SOP blinks

Use ▲▼ to select the required calibration method (CAL SOP).

↓ **cal**

Perform the selected calibration
(see Paraly SW 112 software).



ORP OFFSET Calibration

– available with pH/ORP combo sensor connected –

Selected in the configuration menu.

Measurement

↓ cal

CAL
ORP OFFSET

↓ cal

ORP setpoint blinks

↓ cal

You can specify an offset for the ORP value measured by the sensor.

After calibration has been activated, the following values are listed in the display:

- ORP setpoint (in mV)
- temperature measured by sensor
- measured ORP value (in mV)

Use ▲▼ to adjust the value for ORP.

Calibration is performed, the offset value is indicated.
Automatic return to measuring mode.



TEMP. OFFSET Calibration (Option)

Temperature calibration (offset)

Selected in the configuration menu.

Measurement

↓ **cal**

CAL
TEMP. OFFSET

You can specify an offset for the temperature measured by the sensor.

After calibration has been activated, the following values are listed in the display:

- temperature setpoint
- temperature measured by sensor
- offset (display in K)

↓ **cal**

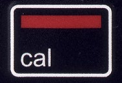
Temperature setpoint value
blinks.

Use ▲▼ to adjust the temperature setpoint value.

↓ **cal**

Calibration is performed, the offset value is indicated.

Automatic return to measuring mode.



FREE CAL Calibration

(Free selection of calibration method)

FREE CAL calibration is selected in the configuration menu.

Measurement

↓ cal

CAL
CALIMATIC blinks

↓ cal

Use ▲▼ to select the required calibration method (CALIMATIC, DATA INPUT, CAL SOP (Option), ORP OFFSET (with pH/ORP combo sensor connected), TEMP. OFFSET (Option) or MANUAL).

Perform the selected calibration as described on the previous pages.

Once you have completed all preparations, you can start with the actual measurement.

Keys for measurement

- 1) Connect the desired sensor to the meter. Some sensors require a special preparation. Please proceed according to the operating instructions for the sensor.
- 2) Switch the meter on using the **on/off** or **meas** key.
- 3) Depending on the measurement method and the sensor used, immerse the sensing part of the sensor in the medium to be measured.
- 4) Watch the display and wait for the reading to stabilize.
- 5) By pressing the **STO** key, you can hold and save a measured value (see data logger, page 26).



Measurement can also be controlled via the Paraly SW 112 software.

Switching the Measured Value Display

During measurement, you can toggle between pH and mV display by pressing the **meas** key. With a pH/ORP combo sensor connected, the display toggles between pH and ORP (rH).

Adjusting the Temperature

When you connect a sensor without temperature detector, you can manually adjust the temperature for measurement or calibration:

- 1) Press **meas** to access measuring mode.
The adjusted temperature will be displayed.
- 2) Set the desired temperature value using the ▼ or ▲ arrow.
Holding the key depressed changes the temperature value at high speed.

The Data Logger

The meter provides a data logger. **Prior to use**, it must be configured and then activated. You can choose from the following logger types:

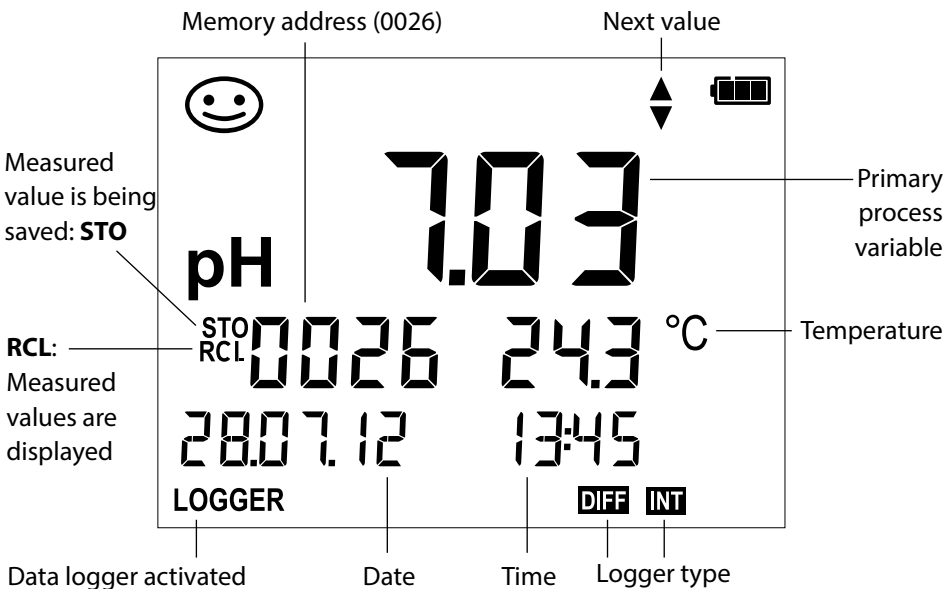
- DIFF (signal-controlled logging of measured variable and temperature)
- INT (time-controlled logging at a fixed interval)
- DIFF+INT (combined time- and signal-controlled logging)
- SHOT (manual logging by pressing the **STO** key)

The data logger records up to 5000 entries and saves them in a circular buffer. Already existing entries will be overwritten.

The following data are recorded: primary value, temperature, time stamp and device status.

The Paraly SW 112 software allows convenient management of the data logger. It is always the currently selected process variable which is recorded. The “STO” icon and the memory address is displayed briefly to indicate that an entry is being saved.

Display: Icons related to the data logger



Operating Modes of the Data Logger (Logger Type)

Manual logging when logger is activated (SHOT)

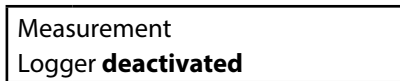
In this mode, a measured value is recorded when the **STO** key is pressed.



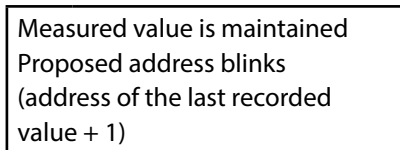
↓ **STO**

The measured value is saved to the address of the last recorded value + 1

Manual logging when logger is deactivated



↓ **STO**



If desired: Select start address using ▲▼.

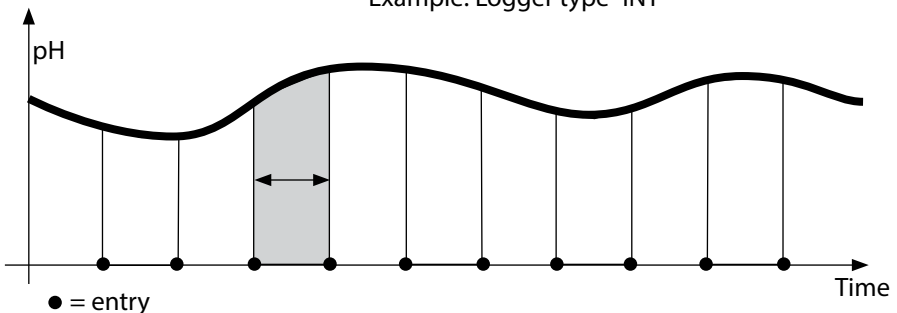
↓ **STO**

Measured value is saved to the desired address (e.g. for overwriting an incorrect measurement).

Interval (INT)

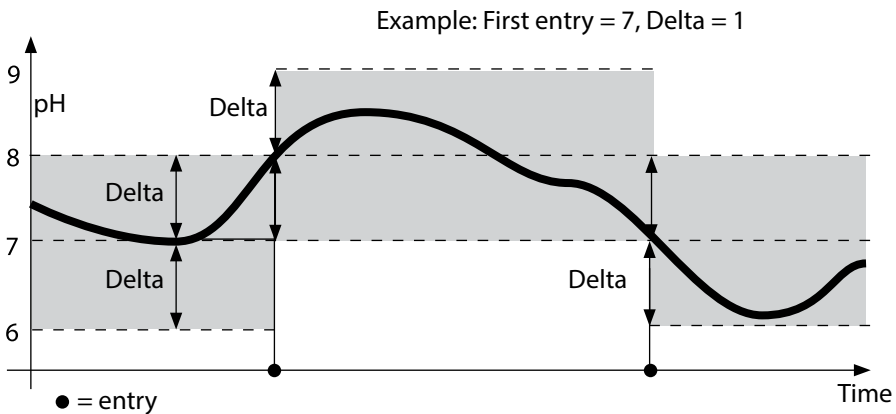
In this mode, the measured values are cyclically recorded.

Example: Logger type "INT"



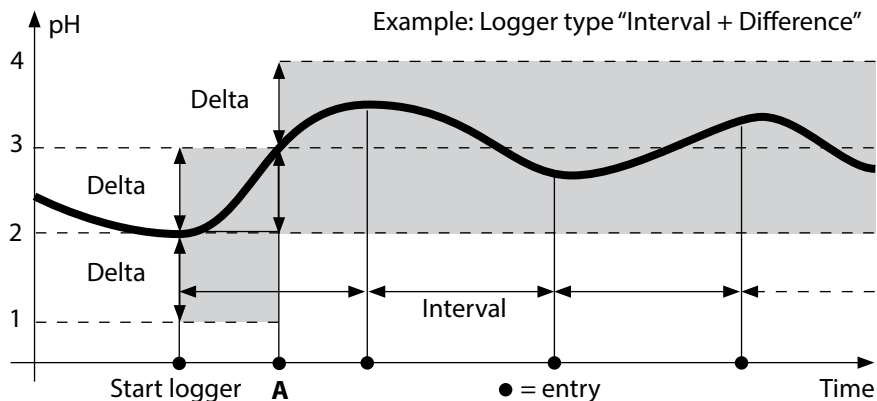
Difference (DIFF)

When the delta range (process variable and/or temperature) related to the last entry is exceeded, a new entry is created and the delta range is displaced upwards or downwards by the delta value. The first entry is automatically created when the data logger is started.



Difference + Interval combined (DIFF+INT)

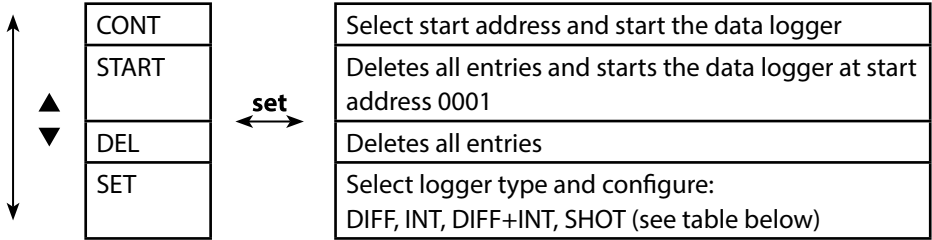
When the delta range related to the last DIFF entry is exceeded, a new entry is created (example: entry **A**) and the delta range is displaced upwards or downwards by the delta value. As long as the measured value remains within the delta range, logging is performed at the preset interval. The first DIFF entry is automatically created when the data logger is started.



Data Logger Menu

Logger display

Select using arrow keys, confirm by pressing **set**.



Overview of data logger menu (default in bold print)

Logger type	DIFF	Delta pH / mV	OFF / pH 0.01... 14.00 / pH 1.00 OFF / 1... 1000 mV / 1 mV
		Delta °C / °F	OFF / 0.1 ... 50.0 °C / 1.0 °C OFF / 0.1 ... 90 °F / 1.0 °F
	INT	Interval	h:mm:ss 0:00:01 ... 9:59:59 / 0:01:00
	DIFF+INT	DIFF	See logger type DIFF
		INT	See logger type INT
	SHOT	Currently selected process variable is recorded	

Configuring the Data Logger

Prerequisite: The data logger is stopped (press **meas**).

Measurement

↓ **STO**

Measured value is maintained

↓ **set**

Logger: CONT blinks

↓ ▼

Logger: START blinks

↓ ▼

Logger: DEL blinks

↓ ▼

Logger: SET blinks

↓ **set**

Logger: Current logger type
blinks

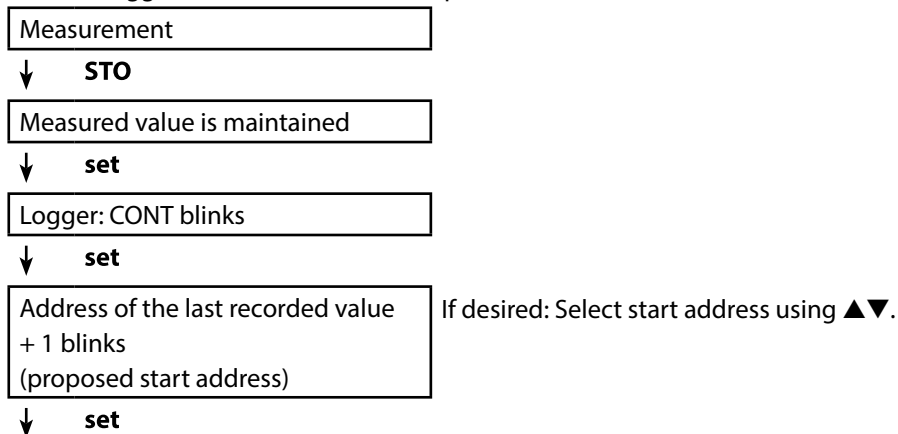
Select desired logger type using ▲▼:
DIFF, INT, DIFF+INT or SHOT.

↓ **set**

Select the appropriate parameters using ▲▼ and confirm each selection by pressing **set**. When configuration is finished, CONT blinks. You can start the data logger by selecting START or CONT (see page 31).

Starting the Data Logger using CONT

Prerequisite: Data logger is configured. Every time the meter has been switched off, the data logger must be restarted (exception: SHOT).



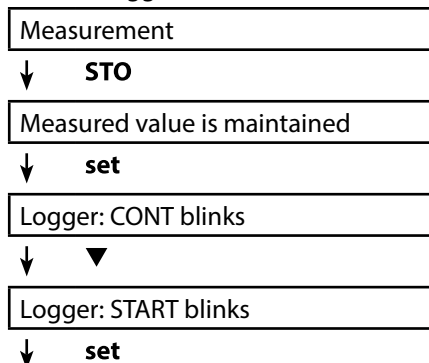
The measured value is saved to the selected start address (exception: SHOT).

“... FREE MEMORY” is displayed.

“LOGGER” and “active logger type” icons are displayed.

Starting the Data Logger using START

Prerequisite: Data logger is configured. All existing entries are deleted. The start address for saving the values is 0001. Every time the meter has been switched off, the data logger must be restarted (exception: SHOT).



All entries will be deleted. “5000 FREE MEMORY” is displayed.

“LOGGER” and “active logger type” icons are displayed.

Displaying the Logger Data

Pressing the **RCL** key displays all stored values. The Paraly SW 112 software allows convenient management of the data logger.

Measurement

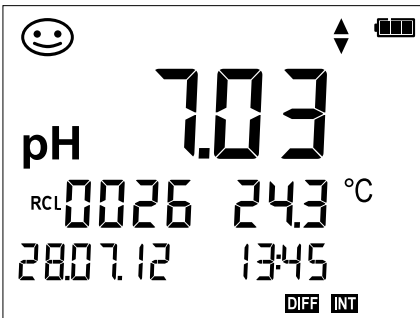
RCL

The "RCL" icon and the last recorded value is displayed.

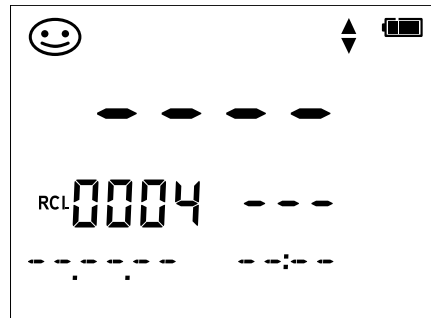
Use ▲▼ to select the desired address. Empty memory locations will also be displayed.

RCL or meas

Return to measurement



Example:
Measured value stored at location
0026



Example:
Empty memory location 0004

Stopping the Data Logger

You can stop the data logger at any time by pressing the **meas** key.

Measurement, logger **activated**



meas

Data logger is stopped. "LOGGER" and "active logger type" icons are no longer displayed. It is still possible to hold a measured value by pressing **STO** and send it to any desired address.

Clearing the Data Logger

Selecting "DEL" deletes all data records.

Measurement



STO

Measured value is maintained



set

Logger: CONT blinks



▼

Logger: START blinks



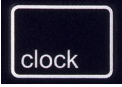
▼

Logger: DEL blinks
PRESS SET



set

All stored data are deleted.
"0000 DELETED" is displayed.



Press the **clock** key to access the clock mode. Date and time will be displayed in the format as set in the configuration menu.

To set the clock, proceed as follows:

Display of
time+date

↓ **set**

Hour display blinks
SET HOUR



Set value.

↓ **set**

Minute display blinks
SET MINUTE



Set value.

↓ **set**

Second display blinks and
shows 00

set

Clock is started, the seconds count up.

↓ **set**

Year display blinks
SET YEAR



Set value.

↓ **set**

Month display blinks
SET MONTH



Set value.

↓ **set**

Day display blinks
SET DAY



Set value.

↓ **set**

Display of
corrected time+date

Option 001 SOP

Option 001 SOP (Standard Operating Procedure) meets specific requirements of the pharmaceutical and biotechnological industries. It comprises:

1. SOP Cal

In the Paraly SW 112 software, you specify which buffers are to be used in which sequence. You can combine buffer solutions from different buffer sets.

Please note that the minimum distance allowed between two buffer solutions is $\Delta 2$ pH.

SOP calibration allows you to:

- use up to 3 buffers for adjustment
- use a 4th point for verification (“verification buffer”)
- specify a maximum deviation from the verification buffer
- use buffers from different buffer sets, including a “user buffer”.

2. Sensor Verification

The Paraly SW 112 software allows a sensor to be assigned to the device.

Connecting another sensor generates an error message (ERR21).

3. Conf / Cal Code

You can specify access codes for configuration and calibration on the device or via Paraly SW 112 software. On the device, the codes are entered in the configuration menu: SETUP CODE (access code for configuration) and CAL CODE (access code for calibration) – see page 17. When accessing the configuration (Setup) or calibration (Cal) menu, you will be prompted to enter these codes.

4. Temperature Calibration

(also separately available as Option 002 TEMP.CAL)

You can perform a 1-point calibration of the temperature detector included in the sensor, see following page.

Option 002 Temperature Calibration

Selecting the temperature calibration (TEMP. OFFSET)

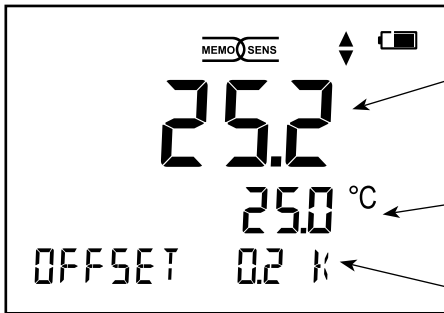
In measuring mode, press the **set** key.

- 1) Select **CAL** (calibration) and confirm by pressing **set**.
- 2) Select the **TEMP. OFFSET** calibration mode and confirm by pressing **set**.

Performing the temperature calibration (TEMP. OFFSET)

In measuring mode, press the **cal** key.

Press **cal** once more to activate the function:



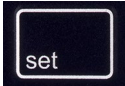
Use the ▲▼ keys to enter the reference value.

Temperature value currently measured by the sensor

Indication of currently adjusted offset value.

Press **cal** to save the reference value.

Enabling Options / TAN Input



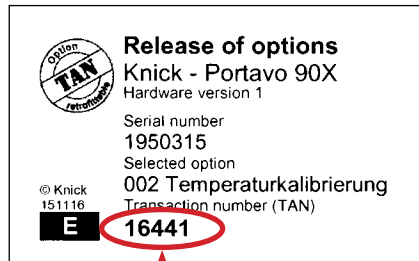
When you have bought an option, you receive a document with a code (TAN) for enabling this option on your device. Press the **set** key to access the configuration mode. Use the arrow keys to select the "TAN TEMP CAL" function, for example, where you can enter the TAN for enabling the option.

↓ **set**

TAN TEMP CAL

set Press the **set** key.

↓ **set**



Enter the TAN code:

First digit blinks.



Set value.

↓ **set**

Next digit blinks.



Set value.

↓ **set**

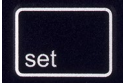
...



Set value, press **set** to save the TAN.

After correct input of the TAN, the device signals "PASS" – The option is now available.

Passcodes for CONF and CAL



With Option 001 SOP only:

Press the **set** key to access the configuration mode.

Use the arrow keys to select

“Setup Code” for setting a passcode for configuration and / or

“Cal. Code” for setting a passcode for calibration.

NOTICE!

If you lose your passcode, you will have no access to the configuration menu.

You can also use the Paraly SW 112 software for resetting the passcode.

↓ **set**

Setup code

set Press the **set** key.

↓ **set**

First digit blinks.



Set value.

↓ **set**

Next digit blinks.



Set value.

↓ **set**

...



Set value, press **set** to save the configuration passcode.

When accessing the configuration menu, you will be prompted to enter the passcode.

If you want to specify a passcode for accessing the calibration menu, select “Cal. Code” and proceed as described above.

The Paraly SW 112 software supplements the Portavo series. It allows convenient management of the data that have been acquired by the meters as well as simple and clear configuration of the meters. Paraly SW 112 starts automatically when the Portavo USB port is connected to the computer.

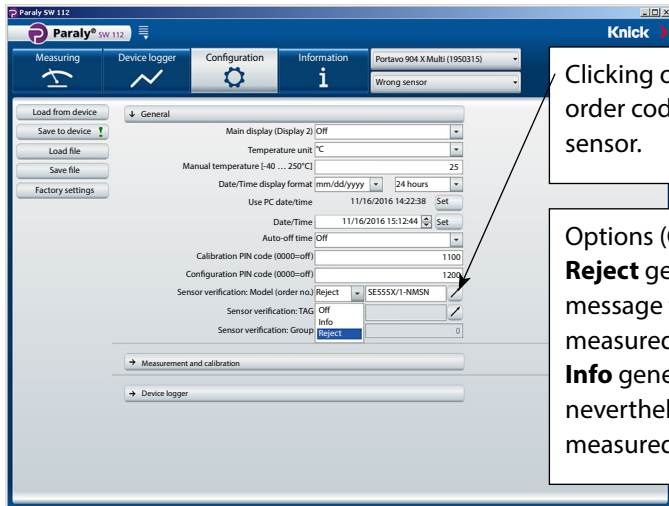
The Paraly SW 112 software stands out by the following features:

- Intuitive Windows user interface
- Easy configuration and management of several meters
- Display of device and sensor information
- Configuration of individual buffer sets
- Convenient management and evaluation of the data logger
- Export function for Microsoft Excel
- Print function
- Updating the device software

Sensor Verification (Memosens)

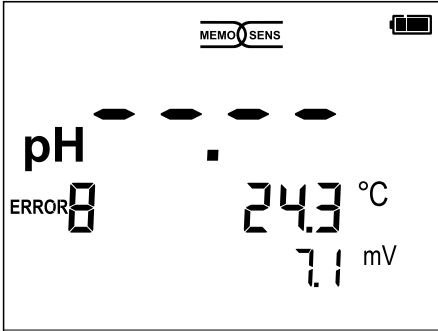
(With Option 001 SOP, adjustable only via software)

The “Sensor Verification” function allows you to assign a particular Memosens sensor to the device – all other sensors will be rejected and the “ERR21” error message will be generated. This function is activated via the Paraly SW 112 software:

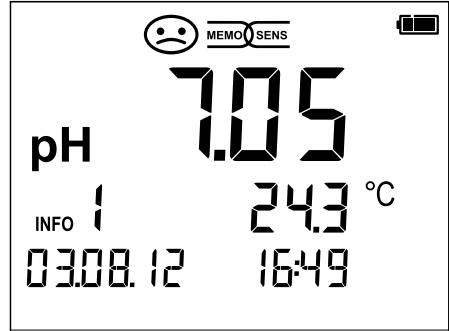


Note: A detailed user manual for the Paraly SW 112 software can be found on the included data carrier.

Error messages are indicated as "ERROR ..." on the display. Information on the sensor condition is indicated by the "Sensoface" icon (friendly, neutral, sad) possibly accompanied by an info message ("INFO ...").



Example of an error message:
ERROR 8 (identical calibration media)



Example of a "Sensoface" message:
INFO 1 (cal timer expired)

Sensoface (the "smiley" icon) provides information on the sensor condition (maintenance request). Measurement can still be performed. After a calibration, the corresponding Sensoface icon (friendly, neutral, sad) is shown together with the calibration data. Otherwise, Sensoface is only visible in measuring mode.

The most important error messages and "Sensoface" info messages are shown on the inside of the protective cover. A complete list of messages and their meanings is provided in the following tables.



“Sensoface” Messages

The “Sensoface” icon provides information on the sensor condition:

Sensoface Meaning



Sensor is okay





Calibrate the sensor soon




Calibrate or replace the sensor

The “neutral” and “sad” Sensoface icons are accompanied by an “INFO ...” message to give a hint to the cause of deterioration.

Sensoface	Message	Cause
	INFO 1	Calibration timer
	INFO 3	Sensocheck
	INFO 5	Zero / Slope
	INFO 6	Response time
	INFO 7	ISFET: Operating point (asymmetry potential)
	INFO 8	ISFET: Leakage current
	INFO 9	ORP offset

Error Messages

The following error messages can be shown in the display.

Message	Cause	Remedy
 blinks	Battery empty	Replace batteries
ERROR 1	pH value out of range	Check whether the measurement conditions correspond to the adjusted measuring range.
ERROR 2	ORP value out of range	
ERROR 3	Temperature value out of range	
ERROR 4	Sensor zero point too high/low	Thoroughly rinse the sensor and recalibrate. If this does not help, replace the sensor.
ERROR 5	Sensor slope too high/low	
ERROR 8	Calibration error: Identical buffers	Use a buffer solution with a different nominal value before starting the next calibration step.
ERROR 9	Calibration error: Buffer unknown	Make sure that you use the same buffer set as configured.
ERROR 10	Cal media interchanged	Repeat calibration.
ERROR 11	Measured value unstable Drift too high	Leave the sensor in the liquid until the temperature is stable. If this does not help, replace the sensor.
ERROR 14	Time and date invalid	Set time and date
ERROR 18	Configuration invalid	Restart, reset to factory settings (Setup: DEFAULT YES), configure and calibrate. If this does not help, send in the device for repair.
ERROR 19	Factory settings error	Device defective, send it in.
ERROR 21	Sensor error (Memosens) or Sensor verification message	Connect an operational Memosens sensor. With sensor verification activated in Paraly SW 112, this error message indicates that an unassigned sensor was connected.
ERROR 25	Buffer distance (user-defined buffer table)	Re-enter the buffer table.

Accessories

Item	Order No.
Robust field case (for meter, sensor, various small parts and user manual)	ZU 0934
Replacement quiver (5 units)	ZU 0929
Memosens lab cable, M8, 4 pins	CA/MS-001XFA-L
Li-ion battery	ZU 0925

Please visit our website for more information on our product range: www.knick.de

pH Sensors

Please visit our website for more information on our product range: www.knick.de

Temperature detectors

Note: When a Memosens sensor is connected, the temperature detector of the Memosens sensor is used. When no Memosens sensor is connected, the Portavo 904(X) PH can be used as a temperature meter.

Pt1000 temperature detector

ZU 6959

Memosens sensors have a **cable coupling**, which allows convenient replacement of sensors while the cable remains connected to the meter.



Knick CaliMat Buffer Solutions

Ready-to-use quality pH buffer solutions

pH value (20 °C)	Quantity	Order No.
2.00 ± 0.02	250 ml	CS-P0200/250
4.00 ± 0.02	250 ml	CS-P0400/250
	1000 ml	CS-P0400/1000
	3000 ml	CS-P0400/3000
7,00 ± 0,02	250 ml	CS-P0700/250
	1000 ml	CS-P0700/1000
	3000 ml	CS-P0700/3000
9.00 ± 0.02	250 ml	CS-P0900/250
	1000 ml	CS-P0900/1000
	3000 ml	CS-P0900/3000
12.00 ± 0.05	250 ml	CS-P1200/250
Buffer sets		
Set 4.00	3 x 250 ml	CS-PSET4
Set 7.00	3 x 250 ml	CS-PSET7
Set 9.00	3 x 250 ml	CS-PSET9
Set 4.00, 7.00, 9.00	250 ml each	CS-PSET479
KCl solution	250 ml	ZU 0960

pH/mV input	pH socket, DIN 19 262 (13/4 mm)	
pH range	-2 ... 16	
Decimal places *)	2 or 3	
	Input resistance	1 x 10 ¹² Ω (0 ... 35 °C)
	Input current	1 x 10 ⁻¹² A (at RT, doubles every 10 K)
Measuring cycle	Approx. 1 s	
Measurement error ^{1,2,3)}	< 0.01 pH, TC < 0.001 pH/K	
mV range	-1300 ... +1300 mV	
Measuring cycle	Approx. 1 s	
Measurement error ^{1,2,3)}	< 0.1 % meas. val. + 0.3 mV, TC < 0.03 mV/K	
Temperature input	2 x 4 mm dia. for integrated or separate temperature detector	
Measuring ranges	NTC30 temp detector	-20 ... +120°C
	Pt1000 temp detector	-40 ... +250°C
Measuring cycle	Approx. 1 s	
Measurement error ^{1,2,3)}	< 0.2 K (Tamb = 23 °C); TC < 25 ppm/K	
Memosens pH input	M8 socket, 4 pins, for Memosens lab cable	
Display ranges ⁴⁾	pH	-2.00 ... +16.00
	mV	-2000 ... +2000 mV
	Temperature	-50 ... +250 °C
Memosens pH input ISFET	M8 socket, 4 pins, for Memosens lab cable	
Display ranges ⁴⁾	pH	-2.00 ... +16.00
	mV	-2000 ... +2000 mV
	Temperature	-50 ... +250 °C
Memosens ORP input	M8 socket, 4 pins, for Memosens lab cable	
Display ranges ⁴⁾	mV	-2000 ... +2000 mV
	Temperature	-50 ... +250 °C
Sensor standardization ²⁾	ORP calibration (zero adjustment)	
Permissible calibration range	ΔmV (offset)	-700 ... +700 mV

*) User-defined

1) According to EN 60746-1,
at nominal operating conditions

2) ± 1 count

3) Plus sensor error

4) Ranges depending on Memosens sensor

Sensor standardization *)	pH calibration	
Operating modes *)	CALIMATIC	Calibration with automatic buffer recognition
	MANUAL	Manual calibration with entry of individual buffer values
	DATA INPUT	Data entry of zero and slope
Calimatic buffer sets *)	-01- Mettler-Toledo	2.00/4.01/7.00/9.21
	-02- Knick CaliMat	2.00/4.00/7.00/9.00/12.00
	-03- Ciba (94)	2.06/4.00/7.00/10.00
	-04- NIST technical	1.68/4.00/7.00/10.01/12.46
	-05- NIST standard	1.679/4.006/6.865/9.180
	-06- HACH	4.01/7.00/10.01/12.00
	-07- WTW techn. buffers	2.00/4.01/7.00/10.00
	-08- Hamilton	2.00/4.01/7.00/10.01/12.00
	-09- Reagecon	2.00/4.00/7.00/9.00/12.00
	-10- DIN 19267	1.09/4.65/6.79/9.23/12.75
	-U1- (User)	loadable via Paraly SW 112
Permissible calibration range	Zero point	6 ... 8 pH
	With ISFET:	-750 ... +750 mV
	Operating point (asymmetry)	
	Slope	approx. 74 ... 104 %
	(possibly restricting notes from Sensoface)	
Calibration timer *)	Interval 1 ... 99 days, can be switched off	
Sensoface	Provides information on the sensor condition	
Evaluation of	zero/slope, response, calibration interval	

*) User-defined

Connections	1 x pH socket, DIN 19 262 2 x 4-mm socket for separate temperature detector 1 x M8 socket, 4 pins, for Memosens lab cable 1 x Micro USB-B for data transmission to PC Portavo 904 X: Be sure to observe the safety instructions when using the USB port.
Display	LCD STN 7-segment display with 3 lines and icons
Sensoface	Status indication (friendly, neutral, sad)
Status indicators	Battery power level, logger
Notices	Hourglass
Keypad	[on/off], [cal], [meas], [set], [▲], [▼], [STO], [RCL], [clock]
Data logger	With up to 5000 memory locations
Recording	Manual, interval- or event-controlled
Communication	USB 2.0
Profile	HID, driverless installation
Usage	Data exchange and configuration via Paraly SW 112 software
Diagnostics functions	
Sensor data (Memosens only)	Manufacturer, sensor type, serial number, operating time
Calibration data	Calibration date, zero, slope
Device self-test	Automatic memory test (FLASH, EEPROM, RAM)
Device data	Device type, software version, hardware version
Data retention	Parameters, calibration data > 10 years
EMC	EN 61326-1 (General Requirements)
Emitted interference	Class B (residential area)
Immunity to interference	Industry EN 61326-2-3 (Particular Requirements for Transmitters)
Explosion protection	Portavo 904 X
	Global IECEx Ex ia IIC T4/T3 Ga
	Europe ATEX II 1 G Ex ia IIC T4/T3 Ga
	USA, Canada IS Class I, Division 1, Groups A,B,C,D, T4 / T3, Ta = 40 °C / 50 °C; Entity; Type 4X IS Class I, Zone 0, AEx ia IIC T4 / T3, Ta = 40 °C / 50 °C; Entity; Type 4X
	For electrical parameters and further specifications, see Control Drawing No. 209.009-110

RoHS conformity	According to directive 2011/65/EC		
Power supply			
Portavo 904	Batteries: 4 x AA alkaline or 4 x NiMH (rechargeable) or 1 x Li-ion battery, USB chargeable		
Portavo 904 X	4 x AA batteries For battery types, see Control Drawing No. 209.009-110		
Operating time	Approx. 1000 h (alkaline)		
Nominal operating conditions			
Ambient temperature	-10 °C ... +55 °C		
Ambient temperature 904 X	-10 °C ≤ Ta ≤ +40 °C	T4	Duracell MN1500
	-10 °C ≤ Ta ≤ +50 °C	T3	Energizer E91
	-10 °C ≤ Ta ≤ +50 °C	T3	Power One 4106
	-10 °C ≤ Ta ≤ +50 °C	T3	Panasonic Pro Power LR6
Transport/ Storage temperature	-25 ... +70 °C		
Relative humidity	0 ... 95 %, short-term condensing allowed		
Housing			
Material	PA12 GF30 (silver gray RAL 7001) + TPE (black)		
Protection	IP 66/67 with pressure compensation		
Dimensions	Approx. (132 x 156 x 30) mm		
Weight	Approx. 500 g		

0000 DELETED (“data deleted” display) 33

A

AA batteries 13
Access codes 38
Accessories 43
Activating the logger 31
Analog pH input 15
Arrow keys 12
ATEX 7
Automatic pH calibration (Calimatic) 18

B

Batteries for application in hazardous locations 14
Battery capacity 14
Battery charge indicator 8
Battery compartment 13
Battery icon 14
Battery replacement 13
Battery types 14
Benchtop stand 10
Buffer sets 45
Buffer solutions (Knick CaliMat) 45
Buttons 12

C

Cable coupling 44
Cal. Code 38
Calibration, CALIMATIC 18
Calibration, CAL SOP (Option) 21
Calibration, DATA INPUT 19
Calibration, FREE CAL 24
Calibration, MANUAL 20
Calibration, TEMP. OFFSET (Option) 23
CaliMat buffer solutions 45
Calimatic automatic calibration 18
Calimatic, description 9

- cal key 12
- CAL SOP calibration 21
- Cal SOP (Option 001) 35
- Carrying case (accessory) 43
- CD-ROM 7
- Certificates 7
- Charge level of batteries 14
- Clearing the datalogger 33
- Clock 34
- clock key 12
- Configuration (pH) 17
- Configuring the data logger 30
- Connecting a sensor 15
- Connecting cable for Memosens 15
- Connections 15
- Connection, USB (battery) 13
- Continuous recording of measured values 27
- Control buttons 12
- CONT, starting the data logger 31
- Cyclic recording of measured values 27

D

- Data input (calibration) 19
- Data logger 26
- Data logger, activating 31
- Data logger, clearing 33
- Data logger configuration 30
- Data logger icons 26
- Data logger menu 29
- Data logger, stopping 33
- Data memory 26
- Data of the meter 46
- Date 34
- Deleting data logger entries 33
- Delta range (data logger) 28
- Device configuration 17
- Device messages 40

Device properties 8, 9
Difference (data logger mode) 28
Difference+Interval (data logger mode) 28
Display 11
Display icons 16
Displaying the data logger 26
Displaying the time and date 34
Display, switching between measured values 25
Disposal 3
Documentation 7
Duracell MN1500 battery 14

E

EC Declarations of Conformity 7
Energizer E91 battery 14
ERR21 (error message for sensor verification) 39
ERROR (error codes) 42
Error messages 40
Error messages, overview 42

F

Features 8
Field case (accessory) 43
FREE CAL, free selection of calibration method 24

H

Hanging up the meter 10
Hazardous-area application 8
Hazardous location, batteries 14
Holding the measured value 27
Hook 10
Hours, display 34

I

Icons for data logger 26
Icons in display 16
IECEX 7
INFO messages 41
Inserting the batteries 13

Interrupting the data logger 33
Interval (data logger mode) 27
Introduction 8

K

Keypad 12
Knick CaliMat buffer solutions 45

L

Li-ion battery (accessory) 43
Lithium-ion battery (start-up) 13
Logger 26
Logger, activating 31
Logger data, deleting 33
Logger data, viewing 32
Logger display 32
Logger type (data logger modes) 27

M

Manual calibration 20
Manual logging 27
meas key 12
Measured-value recording 27
Measured values, switching the display 25
Measuring 25
Memory for measured values 26
Memosens 9
Memosens connecting cable 15
Memosens lab cable (accessory) 43
Memosens sensors 15
Menu of data logger 29
Menu structure of configuration 17
Menu structure of data logger 29
Messages 40
Micro USB port 15
Minutes, display 34

O

- on/off key 12
- Operating modes of the data logger 27
- Option 001 SOP 35
- Option 002 TEMP. OFFSET 36
- Options, overview 35
- Options, TAN input 37
- Order numbers (accessories) 43
- ORP OFFSET calibration 22
- Overview 8
- Overview of configuration 17
- Overview of error messages 42

P

- Package contents 6
- Panasonic Pro Power LR6 battery 14
- Paraly SW 112 software 39
- Parameter setting, data logger 30
- Parameter settings (configuration) 17
- Passcodes 38
- pH buffer solutions 45
- pH configuration 17
- pH sensor 15
- pH socket, DIN 19 262 15
- Portavo 904 X 13
- Ports 15
- Power-on 16
- Power One 4106 battery 14
- Product features 8
- Product line 43
- Product presentation 8
- Protective cover 10

Q

- Quickstart guides 7

R

- Rating plate 10
- RCL, displaying the logger data 32
- RCL key 12
- Real-time clock 8
- Rechargeable battery, Li-ion 13
- Recorded data, display 32
- Redox calibration 22
- Reference numbers (accessories) 43
- Registered trademarks 3
- Replacement quiver (accessory) 43
- Replacing the batteries 14
- Reset to factory settings (Default) 17
- Return of products under warranty 3

S

- Safety instructions 7
- Saving the currently measured value 27
- Scope of delivery 43
- Seconds, display 34
- Sensoface 9
- Sensoface messages 41
- Sensor connection 15
- Sensors 15
- Sensor verification (Memosens) 39
- Sensor without temperature detector 25
- set key 12
- Setting the configuration data 17
- Setting the data logger 30
- Setting the time and date 34
- Setup code 38
- Setup (configuration) 17
- SHOT (data logger mode) 27
- Smiley face (icon) 9
- Software, Paraly SW 112 39

- SOP calibration 21
- SOP, Option (Standard Operating Procedure) 35
- Specifications 46
- Specific test report 7
- Start address (data logger) 27
- Starting the data logger using CONT 31
- Starting the data logger using START 31
- START, starting the data logger 31
- Start-up 13
- STO key 12
- STO, manual logging 27
- Stopping the data logger 33
- Structure of data logger 29
- Suspending the meter 10
- Switching on the meter 16
- Switching the measured value display 25
- Symbols in the display 16

T

- T3, temperature class 14
- T4, temperature class 14
- Table of error messages 42
- Table view of configuration 17
- TAN input 37
- Technical data 46
- Temperature calibration (TEMP. OFFSET) 23
- Temperature class 14
- Temperature detectors, product line 44
- Temperature, manual adjustment 25
- Temperature probe, connection 15
- TEMP. OFFSET (option) 36
- Trademarks 3
- Triangle icons 12

U

USB port 15

USB port (battery) 13

USB port, micro 8

V

Value-added features 9

Viewing logger data 32

Viewing recorded data 32

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