Knick

User Manual

Portavo® 904 OXY

Portable Meter

Read before installation.
Keep for future use.

www.knick.de

Repair

The meter cannot be repaired by users. For inquiries regarding repairs, please contact Knick Elektronische Messgeräte GmbH & Co. KG at www.knick.de.

Returns

Clean and securely package the product before returning it to Knick Elektronische Messgeräte GmbH & Co. KG.

If there has been contact with hazardous substances, the product must be de-contaminated or disinfected prior to shipment. The consignment must always be accompanied by a corresponding return form to prevent service employees being exposed to potential hazards.

Further information can be found at www.knick.de.

Disposal

The local codes and regulations must be observed when disposing of the product.

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6 Package Contents

Check the shipment for transport damage and completeness.
The package of the Portavo 904 OXY includes:

- Meter, incl. premounted quiver
- 4 batteries (AA)
- Carrying strap
- USB cable, 1.5 m
- Quickstart overview for attaching to the inside of the protective cover (German, English, French)
- Safety guide
- Quickstart instructions in various languages
- Test report 2.2 according to EN 10204

User manuals, the Paraly SW 112 PC software, and other product information can be downloaded from www.knick.de.

Intended Use

The Portavo 904 OXY is a portable oxygen meter. With a plain text line on a high-contrast LCD, operation is largely intuitive. The meter stands out by the following features:

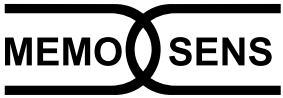
- Use of digital Memosens sensors
- A detachable quiver protects the sensor and prevents it from drying out. Furthermore, it can be used for calibration.
- The rugged housing is made of a high-performance polymer. It provides high impact resistance and dimensional stability even when exposed to extreme moisture.

- Scratch-proof clear glass display, perfectly readable even after years
- Very long operating time with one set of batteries (4x AA) or use of a Li-ion battery for reliable operation even at high or very low operating temperatures
- Data logger with 5000 values
- Micro USB port for communication with Paraly SW 112 PC software for data evaluation of digital sensors (Memosens)
- Sensoface icons provide single-glance information on the sensor condition (page 37)
- Real-time clock and indication of battery charging level

Value-Added Features

Memosens

The Portavo 904 can communicate with Memosens sensors. These digital sensors are automatically identified and the meter switches to the appropriate measurement method. When a Memosens sensor is connected to the meter, it is indicated by the logo shown on the right. Furthermore, Memosens allows the storage of calibration data, operating times, and other data, which is 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 provides additional information on the cause.

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

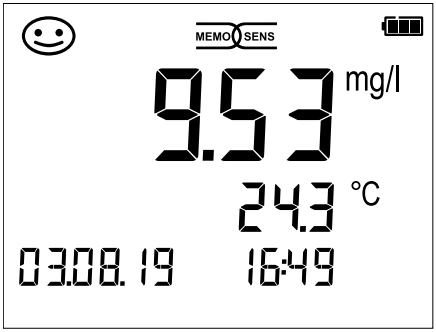
A fold-out hook on the back allows the meter to be suspended. This leaves your hands free for the actual measurement. The **nameplate** is located beneath the hook.

Protective Cover and Hook Combined

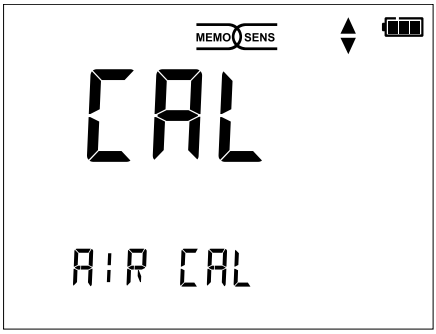
The two parts can be combined to form a benchtop stand, enabling convenient and fatigue-free work with the device at a laboratory table or desk.

Display

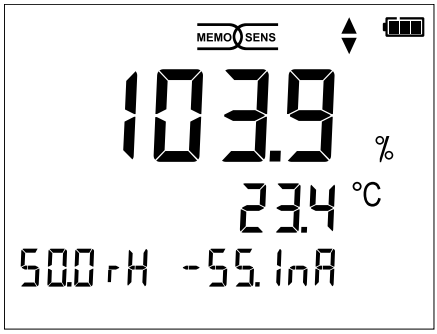
The meter has a three-line display for showing alphanumeric information such as measurement and calibration data, temperatures, and date/time. Additional information is provided by means of icons (Sensoface, battery icon, etc.).
Some typical displays are shown here.



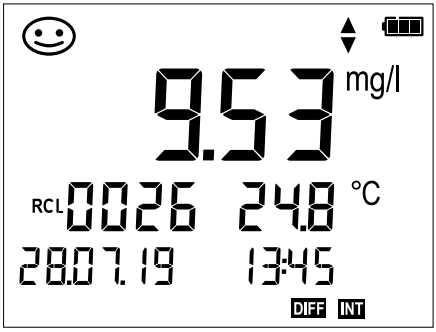
Measuring
(display of measured value, temperature, date and time)



Calibration – step 1
(calibration method: in air)



Calibration – step 2
(adjusting the relative humidity)



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 / Data logger, stopping
cal	Start 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 of the logger by pressing **set** (page 22)
▲ ▼	When this icon is displayed, you can use the arrow keys for navigation.

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

⚠ CAUTION!

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

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

In this case, a professional routine test must be performed.
This test should be carried out at our factory.

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 fasten it finger tight.

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.

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

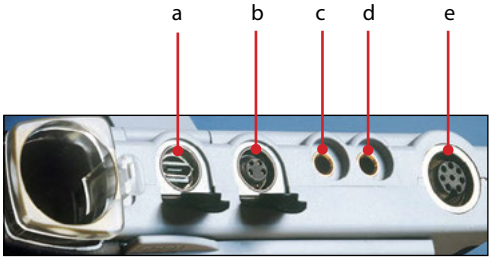
	Icon fully filled	Batteries at full capacity
	Icon partially filled	Battery capacity is sufficient
	Icon empty	Battery capacity not sufficient; calibration is possible, no logging
	Icon blinks	Max. 10 operating hours remaining, measurement is still possible ***NOTICE!*** It is absolutely necessary to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

Connecting a Sensor

The Portavo 904 OXY provides several connections so that many types of sensors can be used for measurement (see illustration below). Note that only **one** sensor may be connected to the meter at a time.
The meter recognizes the connected Memosens sensor and displays the Memosens logo.

Separate Temperature Probe

After power-on, a separate temperature probe is automatically recognized. If you want to replace the temperature probe, you must switch off the meter and then switch it on again.



Connections

a - Micro USB port
b - M8, 4 pins, for Memosens lab cable
c - Temperature probe – GND
d - Temperature detector
e - M12, 8 pins, for Memosens sensors

Memosens sensors have a cable coupling, which allows for replacement of sensors while the cable remains connected to the meter. The connecting cable is connected to socket **b** (M8, 4 pins) or **e** (M12, 8 pins).

Switching On the Meter

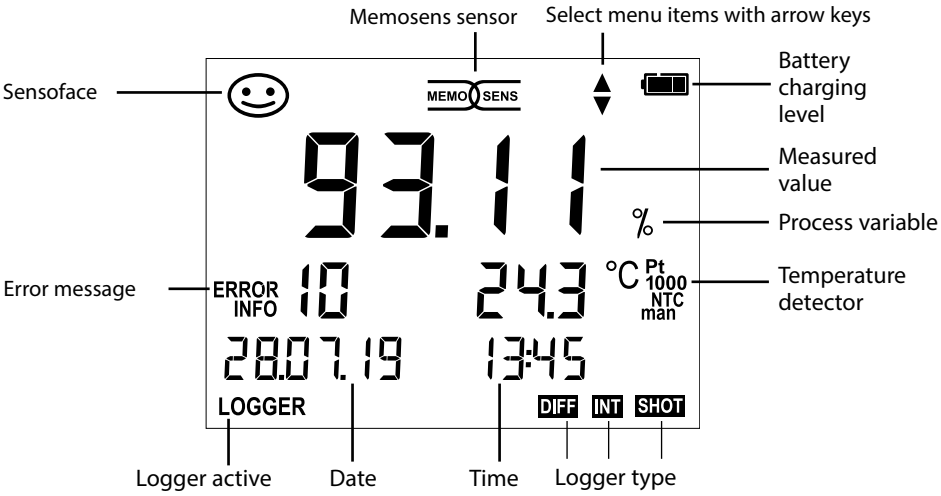
When you have connected the sensor, you can switch on the meter by pressing the **meas** or **on/off** key.
If you press **meas**, the meter immediately switches to measuring mode.

After pressing the **on/off** key, the meter displays selected sensor information, incl. adjustment data, before it 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:



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

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

MEAS MEDIUM	**LIQU** | GAS
DISPLAY 1	**Sat. %Air** | Concentration in mg/l (if MEAS MEDIUM = LIQU)
DISPLAY 2	**OFF** | date + time | date | time
HUMIDITY	0.0 … **100.0** % (if MEAS MEDIUM = GAS)
ALTITUDE	**0** … 4000 m
SALT CORRECT	**0.0** … 45.0 g/kg
CAL	**AIR CAL** | ZERO CAL | DATA INPUT | FREE CAL
CAL TIMER	**OFF** | 1 … 99 days
AUTO OFF	**OFF** | 12h | 6h | 1h | 0.1h
TEMP UNIT	**°C** | °F
TIME FORMAT	**24h** | 12h
DATE FORMAT	**DD.MM.YY** | MM.DD.YY
TAN TEMP CAL	Enter TAN to enable option (see page 32)
TAN SOP	**OFF (0000)** | 0001 ... 9999 (with option 001 SOP only, see page 33)
SETUP CODE	
CAL CODE	
LOGGER CODE	
DEFAULT	**NO** | YES (reset to factory settings) **Note**: All data logger entries will be deleted.

set ↔

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

AIR CAL Calibration

(Calibrating the slope in air)

The calibration method is selected in the configuration menu.

Measurement	
↓ **cal**	
CAL AIR CAL	Place sensor in air and wait until the measured values have stabilized.
↓	
Measured value Temperature xxx rH blinks	Use ▲▼ to set the correct relative humidity value.
↓ **cal**	
xxx nA blinks Hourglass blinks	Calibration is performed. Please wait.
↓	
CAL DATA	
↓	
Date SLOPE xxx nA	Slope calibration data is displayed.
↓	

The meter then automatically returns to measuring mode.

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

ZERO CAL Calibration

(Zero calibration with oxygen-free medium)

The calibration method is selected in the configuration menu.

Measurement

↓ **cal**

CAL
ZERO CAL

↓

xxx
nA
PRESS CAL blinks

Place sensor in oxygen-free medium (e.g., nitrogen 5.0) and wait until the measured values have stabilized.

↓ **cal**

CAL DATA

Calibration is performed.
Please wait.

↓

Date
ZERO P. xxx nA

Zero calibration data is displayed.

↓

Date
SLOPE xxx nA

Slope calibration data is displayed.

↓

The meter then automatically returns to measuring mode.

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

DATA INPUT Calibration

(Calibration by entering known sensor values)

The calibration method is selected in the configuration menu.

Measurement

↓ **cal**

CAL
DATA INPUT

↓

xx blinks
nA
ZERO POINT

Use ▲▼ to set the known value for the sensor zero point.

↓ **cal**

xxx blinks
nA
SLOPE

Use ▲▼ to set the known value for the sensor slope.

↓ **cal**

Calibration is performed. The meter then automatically returns to measuring mode.

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

TEMP. OFFSET OFFSET (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 set the temperature setpoint value.
↓ **cal**	

Calibration is performed, the offset value is indicated.
The meter then automatically returns to measuring mode.

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

FREE CAL Calibration

(Free selection of calibration method)

FREE CAL calibration is selected in the configuration menu.

Measurement

↓ **cal**

CAL
AIR CAL blinks

Use ▲▼ to set the required calibration method (AIR CAL, ZERO CAL, DATA INPUT).

↓ **cal**

Perform the selected calibration
as described on the previous pages.
The meter then automatically returns to measuring mode.

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

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 22).

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

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:

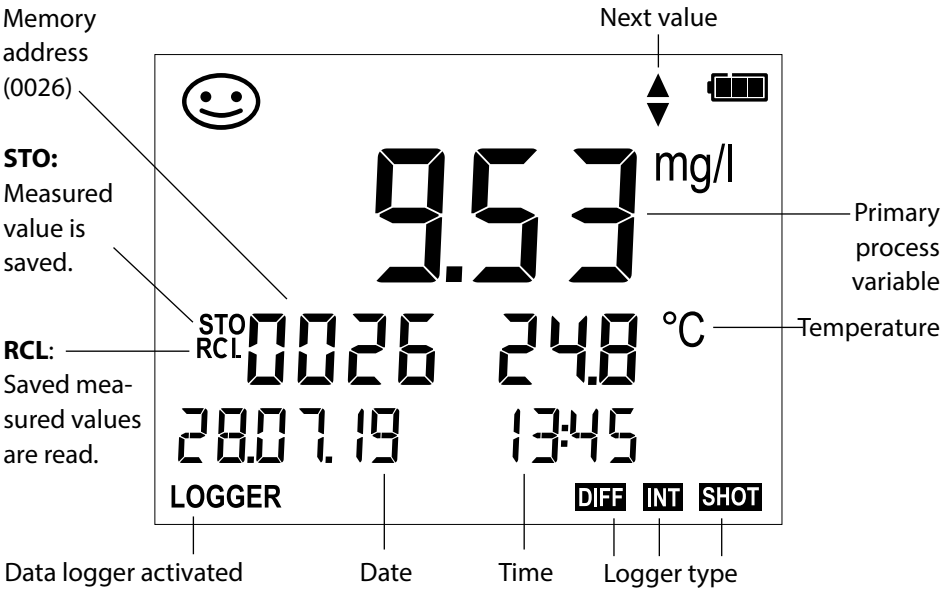
- DIFF (signal-controlled logging of measured variable and temperature)
- INT (time-controlled logging at a fixed interval)
- DIFF+INT (combined time- and signal-controlled logging)
- SHOT (manual logging by pressing the **STO** key)

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.

Option 001 SOP can be used to set up an access lock for the data logger, which in the absence of an access code allows only logger data to be displayed (see page 31).

The Paraly SW 112 PC 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 each time the **STO** key is pressed.

Measurement Logger **activated**

↓ **STO**

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

Manual Logging when Logger is Deactivated

Measurement Logger **deactivated**

↓ **STO**

Measured value is maintained Proposed address blinks (address of the last recorded value + 1)

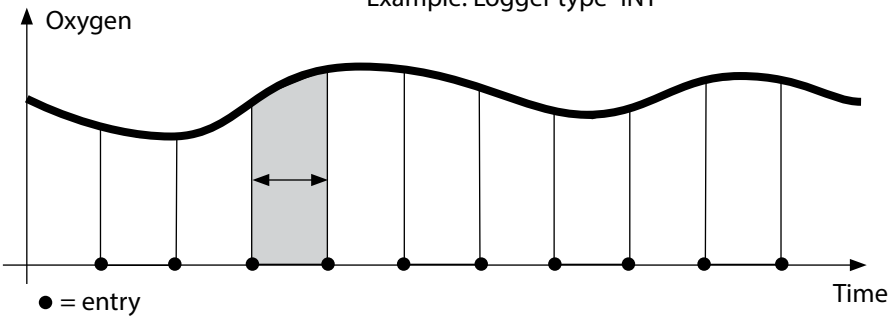
If desired: Select a start address using ▲▼ .

↓ **STO**

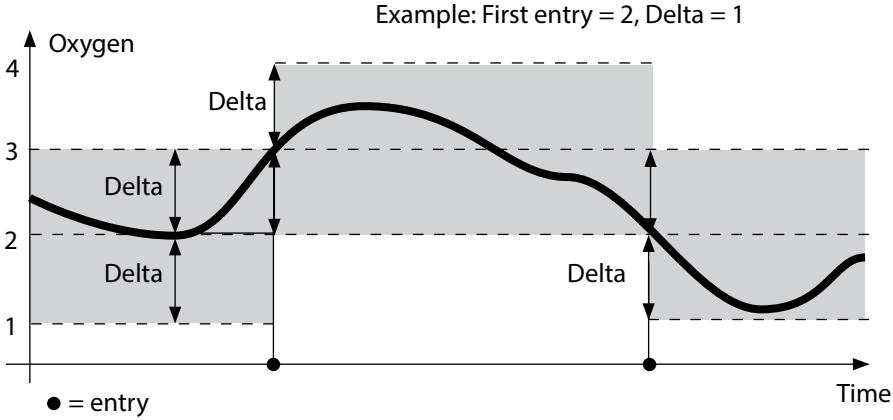
Measured value is saved to the desired address (e.g., for overwriting an incorrect measurement).

Interval (INT)
In this mode, the measured values are cyclically recorded.

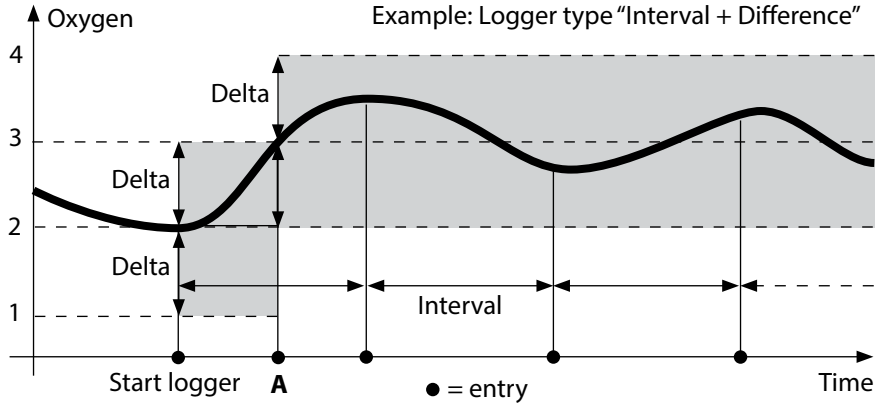
Example: Logger type "INT"



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.

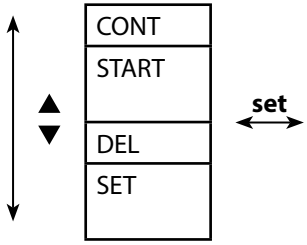


Difference + Interval Combined (DIFF+INT)
When the delta range related to the last DIFF entry is exceeded, a new entry is created (example: entry **A**) and the delta range is displaced upwards or downwards by the delta value. As long as the measured value remains within the delta range, logging is performed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



Data Logger Menu

Logger view — Select using arrow keys, confirm by pressing **set**.



CONT	Select start address and start the data logger
START	Deletes all entries and starts the data logger at start address 0001
DEL	Deletes all entries
SET	Select logger type and configure: DIFF, INT, DIFF+INT, SHOT (see table below)

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 27).

Configuring the Logger Type

Logger type	Select (default in bold print)	
DIFF [1)]	LIQU:	
	Delta % air	OFF | 0.1 … 100.0 % air | **1.0 % air**
	Delta mg/l	OFF | 0.01 … 20.00 mg/l | **1.00 mg/l**
	GAS:	
	Delta %	OFF | 0.001 … 9.999 % | **1.000 %**
	Delta °C / °F	OFF | 0.1 … 50.0 °C | **1.0 °C**
		OFF | 0.1 …100.0 °F | **1.0 °F**
INT	Interval	h:mm:ss
		0:00:01 … 9:59:59 | **0:02:00**
DIFF+INT	DIFF	See logger type DIFF
	INT	See logger type INT
SHOT	Currently selected process variable is recorded	

1) Process variables dependent on configuration, see page 15

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).

Measurement

↓ **STO**

Measured value is maintained

↓ **set**

Logger: CONT blinks

↓ **set**

Address of the last recorded value + 1 blinks
(proposed start address)

If desired: Select a start address using ▲▼.

↓ **set**

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).

Measurement

↓ **STO**

Measured value is maintained

↓ **set**

Logger: CONT blinks

↓ ▼

Logger: START blinks

↓ **set**

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 PC software allows convenient management of the data logger.

Measurement

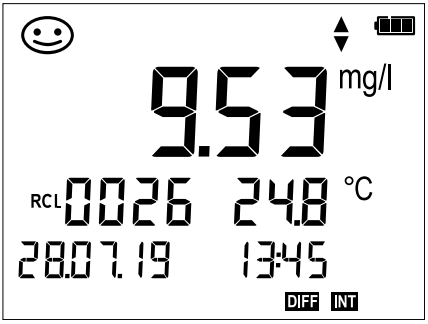
↓ **RCL**

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

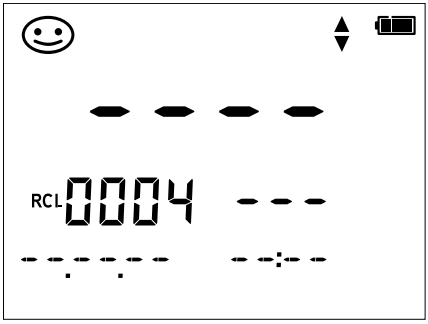
Use ▲▼ to select the desired address. Empty memory locations will also be displayed.

↓ **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 (Standard Operating Procedure)

Scope:

Sensor Verification
The Paraly SW 112 PC software allows a sensor to be assigned to the device. See the Paraly SW 112 PC software user manual.

Setup / Cal / Logger Code
Access codes can be set on the meter or using the Paraly SW 112 PC software; see page 33.
Configuration: SETUP CODE
Calibration: CAL CODE
Data logger: LOGGER CODE
Without entry of an access code, the data logger will only display logger data (**RCL**).

Temperature Calibration
(also separately available as Option 002 TEMP.CAL)

Option 002 TEMP.CAL (Temperature Calibration)

For Memosens sensors, you can perform a 1-point calibration of the internal temperature detector. See page 19 for a description.

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.

Access Codes for CONF, CAL, and Data Logger

(with Option 001 SOP only)

Press the **set** key to access the configuration mode.
Use the arrow keys to select the "SETUP CODE" function and set an access code for configuration, "CAL CODE" to set an access code for calibration, and/or "LOGGER CODE" to set an access code for the data logger.

Important Note:
If you lose the SETUP access code, system access is locked.
See the next page for more information.

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 access code.

When accessing the configuration menu, you will be prompted to enter an access code.
If you want to set a code for access to calibration or the data logger, select "CAL CODE" or "LOGGER CODE" and proceed as described above.
Note: Functions are accessible to anyone with access code "0000".

Inputting the Rescue TAN

If you lose the SETUP access code, system access is locked.
The manufacturer can generate a rescue TAN (TAN RESCUE).
For this purpose, please have the serial number of the corresponding device to hand.
If you have any questions, please contact Knick Elektronische Messgeräte GmbH & Co. KG using the contact details provided on the last page of this document.

The menu for input of the rescue TAN appears if the SETUP access code is incorrectly entered three times:

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

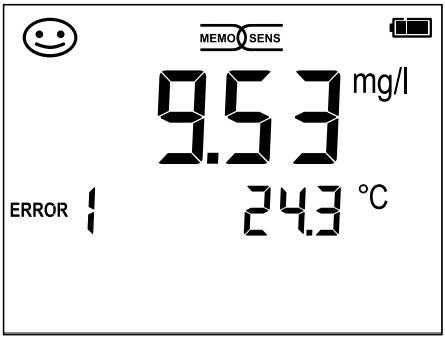
- Intuitive Windows user interface
- Easy configuration and management of several meters
- Display of device and sensor information
- Convenient management and evaluation of the data logger
- Export function for Microsoft Excel
- Print function
- Upgrade/downgrade of device firmware

Note: Prior to upgrading/downgrading the device firmware, Portavo is reset to its factory settings.
Make the following backups prior to upgrading or downgrading:

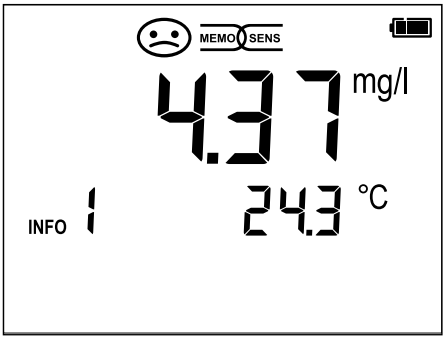
- Read out Portavo data logger.
- Save the Portavo device configuration in Paraly.

The Paraly SW 112 PC software, incl. a detailed user manual, can be downloaded from www.knick.de.

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 1 (value out of range)



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 5	Zero / Slope
	INFO 6	Response time
	INFO 8	Leakage current

Error Messages

The following error messages can be shown in the display.

Message	Cause	Remedy
 blinks	Battery empty	Replace the batteries.
ERROR 1	Value out of range	Check whether the measurement conditions correspond to the adjusted measuring range.
ERROR 3	Temperature value out of range	
ERROR 4	Zero point too high/low	Thoroughly rinse the sensor and recalibrate. If this does not help, replace the sensor.
ERROR 5	Slope too high/low	
ERROR 11	Measured value unstable Stability criterion not met	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)	Connect operational Memosens sensor.
ERROR 22	Sensor conflict	Connect only **one** sensor.

Sensors

Digital Oxygen Sensors	Order No.
Oxygen sensor with Memosens connector, 120 mm	SE715/1-MS

Accessories/Options

Item	Order No.
Robust field case (for meter, sensor, various small parts and user manual)	ZU0934
Li-ion battery	ZU0925
Replacement quiver (5 units)	ZU0929
Adapter for process sensors with Ø 12 mm and PG 13.5 thread for use with quiver	ZU0939
Sensor protection for process sensors with Ø 12 mm and PG 13.5 thread made of PVDF	ZU1121
Base stand for mounting up to 3 sensors, with base plate made of stainless steel	ZU6953
Maintenance kit for SE715/1-MS (electrolyte, 3 membrane caps)	ZU0879
Flow-through cell for SE715/1-MS oxygen sensor	ZU1014
O_2 electrolyte	ZU0565
Measuring cable with M8 connector for sensors with Memosens connector	
Length 1.5 m / 4.92 ft	CA/MS-001XFA-L
Length 2.9 m / 9.51 ft	CA/MS-003XFA-L
Measuring cable with M12 connector for sensors with Memosens connector	
Length 1.5 m / 4.92 ft	CA/MS-001XDA-L
Length 2.9 m / 9.51 ft	CA/MS-003XDA-L

Temperature Detectors	Order No.
Pt1000 temperature detector	ZU6959
Pt1000 temperature detector with angled connector	ZU0156

Note: When a Memosens sensor is connected, the temperature detector of the Memosens sensor is used. When a Memosens sensor is not connected, the Portavo can be used as a temperature meter.

TAN Options	Order No.
SOP (Standard Operating Procedure): user management, sensor verification, temperature detector adjustment in the Memosens sensor (offset correction)	SW-P001
Temperature detector adjustment in the Memosens sensor (offset correction)	SW-P002

Paraly SW112 PC software for configuration and firmware updates:
Free download from www.knick.de

Memosens input, oxygen	M8 socket, 4-pin or M12 socket, 8-pin	
Display ranges [1)]	Saturation	0.000 … 200.0 %
	Concentration	000 µg/l … 20.00 mg/l
	Gas	0.000 … 100.0 %
Temperature meas. range [1)]	-20 … 150 °C / -4 … 302 °F	
Sensor adjustment		
Operating modes *	AIR CAL	Automatic calibration in air (100 % RH)
	ZERO CAL	Zero calibration
	DATA INPUT	Data entry of zero and slope
	FREE CAL	Free selection of calibration method
Connections	1x M8 socket, 4 pins, for Memosens lab cable 1x M12 socket for Memosens lab cable 2 x 4-mm socket for separate temperature detector 1 x micro USB-B for data transmission to PC	
Display	LCD STN 7-segment display with 3 lines and icons	
Sensoface	Status display (friendly, neutral, sad)	
Status indicators	For battery condition, 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 PC software	
Diagnostic functions		
Sensor data	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	Parameter, calibration data > 10 years	
EMC	EN 61326-1 (General requirements)	
Emitted interference	Class B (residential)	
Immunity to interference	Industrial applications EN 61326-2-3 (Particular Requirements for Transmitters)	

*) User-defined
1) Ranges dependent on Memosens sensor

RoHS conformity	According to directive 2011/65/EU
Power supply	
Portavo 904	4x AA alkaline batteries or 4x rechargeable NiMH batteries 1x Li-ion battery, USB chargeable
Operating time	Approx. 500 h (alkaline)
Rated operating conditions	
Ambient temperature	-10 °C … 55 °C/ 14 … 122 °F
Transport/ Storage temperature	-25 … 70 °C/-13 … 158 °F
Relative humidity	0 … 95 %, short-term condensing allowed
Housing	
Material	PA12 GF30 (silver gray RAL 7001) + TPE (black)
Protection	IP66/67 with pressure compensation
Dimensions	Approx. 132 x 156 x 30 mm
Weight	Approx. 500 g

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The latest documents are available for download on our website
under the corresponding product description.

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