GREISINGER

Member of GHM GROUP

Quick reference guide

EN

G 1500 series

pH / Redox measuring device

Members of GHM GROUP:
GREISINGER
HONSBERG
Martens
IMTRON
DeltaOHM
VAL.CO

Table of contents

1 About this documentation

1.1 Purpose of the document

- This document is intended as a quick reference option.
- It does not replace the operating manual.
- For this reason, read the operating manual before operating the product for the first time.

1.2 Legal notices

This document is entrusted to the recipient for personal use only. Any impermissible transfer, duplication, translation into other languages or excerpts from this operating manual are prohibited.

The manufacturer assumes no liability for print errors.

1.3 Further information

Software version of the product:

- V1.2 or later

Link to the complete operating manual:

http://www.greisinger.de

For the exact product name, refer to the type plate on the rear side of the product.

NOTE

For information about the software version, press and hold the ON button to switch on the product for longer than 5 seconds. The series is shown in the main display and the software version of the product is shown in the secondary display.

2 Safety

2.1 Explanation of safety symbols

DANGER

This symbol warns of imminent danger, which can result in death, severe bodily injury, or severe property damage in case of non-observance.

DANGER

This symbol indicates danger for living tissue as well as a variety of materials, which can be damaged or destroyed when coming into contact with this chemical. Caustic effect, protective equipment required!

CAUTION

This symbol warns of potential dangers or harmful situations, which can cause damage to the device or to the environment in case of non-observance.

NOTE

This symbol indicates processes, which can have a direct influence on operation or can trigger an unforeseen reaction in case of non-observance.

2.2 Foreseeable misuse

The fault-free function and operational safety of the product can only be guaranteed if applicable safety precautions and the device-specific safety instructions for this document are observed.

If these notices are disregarded, personal injury or death, as well as property damage can occur.

DANGER

Incorrect area of application!

In order to prevent erratic behaviour of the product, personal injury and property damage, the product must be used exclusively as described in the chapter Description in the operating manual.

- The product is not suitable for use in explosion-prone areas!
- The product must not be used for diagnostic or other medical purposes on patients!
- The product is not intended to come into direct contact with food. For measurement in foods, samples must be taken and discarded after the measurement!
- Not suitable for use with requirements on functional safety, e.g. SIL!

2.3 Safety instructions

DANGER

Danger of breaking the electrodes!

All electrodes contain glass parts that can cause injuries when broken. There is an elevated risk of injury in connection with measurements in foods.

- Inspect the electrode before and after the measurement!
- Always measures in samples for measurements in foods. Discard these samples after the measurement!

NOTE

This product does not belong in children's hands!

2.4 Intended use

G 1500

The product is designed for measuring the pH value in water and aqueous media by means of suitable electrodes.

G 1501

The product is designed for measuring the pH value and Redox by means of suitable electrodes in water an aqueous media. Temperature compensation takes place automatically with a connected temperature sensor.

Application examples for this are, for example, drinking water, waste water, surface water, swimming pools, fish breeding and process chemistry.

3 The product at a glance

3.1 G 1500 series

LCD Display

Front view

Top view G 1500

Top view G 1501

3.2 Display elements

Display

Battery indicator	Evaluation of the battery status
Unit display	Display of units or type of mode, min/max/hold
Main display	Measurement of the current pH value or value for min/max/hold
Auxiliary display	Corresponding temperature for the displayed pH value with unit. Measured temperatures are displayed with a decimal place, adjusted without.
Bar graph	Progress for calibration and visualisation of the electrode evaluation

3.3 Operating elements

On / Off button

Press briefly	Switch on the product
	Activate / deactivate lighting
Long press	Switch off the product
	Reject changes in a menu

Up / Down button

Press briefly	Display of the min/max value
	Change value of the selected parameter
Long press	Reset the min/max value of the current measurement
Both simultaneously	Rotate display, overhead display

Function key

Press briefly	Freeze measurement (Hold)
	Return to measurement display
	Call up next parameter
Long press, 2s	Start menu configuration, CONF appears in the display
Long press, 4s	Start automatic calibration, CAL appears in the display

3.4 Connections

BNC connection	Connection for pH electrode
	Un/locking with rotating ring on the cable plug
2x 4mm banana	Connection for temperature sensor or reference electrode

⚠ CAUTION

Ensuring water tightness!

The product guarantees protection from spray water, rain or accidental immersion in water. This protection for the plug connector is only guaranteed when plugged in. Moisture or contaminants on the contacts can result in incorrect measurement results.

- Protect contacts from soiling and moisture!
- Dry off damp plug connectors as quickly as possible!

NOTE

The temperature measurement can be influenced by conductive liquids on the banana sockets. We recommend always keeping the connections dry.

4 Measurement Basics

NOTE

To start the measurement, remove the protection cap from the electrode and rinse the shaft and the membrane with distilled water.

4.1 pH measurement

4.1.1 Explanation

The pH value describes the acidic or alkaline behaviour of an aqueous solution.
A pH value below 7 is acidic, a value above 7 is alkaline. A pH value of 7 is neutral.

The pH measurement is very precise, but also sensitive. The measured signals are very weak and high-ohmic. This is the case, in particularly in low-ion media.

NOTE

In order to detect the pH value of a solution, it should always be recorded together with the measurement temperature, because most liquids change their pH value with the temperature.

The following must be observed:

- avoid interference, electrostatic charges, etc.
- keep plug contacts clean and dry
- prevent electrodes, which do not have any special waterproof versions from extended immersion above the shaft
- calibrate electrodes sufficiently often. The can range from every hour to several weeks, depending on the electrode and the application
- Use a suitable electrode

For additional information, refer to the operating manual!

4.2 Redox measurement (ORP)

NOTE

Special redox electrodes (e.g. RS R105) are used for the redox measurement.
The pH electrodes cannot be used for redox measurement!

For additional information, refer to the operating manual!

5 Operation and maintenance

5.1 Operating and maintenance notices

NOTE

The product and electrode must be handled with care and used in accordance with the technical data. Do not throw or strike.

NOTE

Plugs and sockets must be protected from soiling.

NOTE

If the product is stored at a temperature above 50 °C, or is not used for an extended period of time, the batteries must be removed. Leaks from the batteries are avoided as a result.

NOTE

The electrode should be stored in dry rooms at a temperature between 10 °C and 30 °C. If the storage temperature range is exceeded or undercut, the electrode can be destroyed. It should always be stored wet in 3 mol/l KCl. Extended storage in distilled or deionised water will result in depletion of the reference electrolytes.

NOTE

The pH electrode included in the scope of supply should be arranged vertically upwards with the connecting cable. A slight angle of inclination does not impair the measurement.

5.2 Calibration of the pH measurement

NOTE

Rinse off the electrode with distilled or deionised water before and after placing the electrode in the buffer solution.

1. Press the *Function key* for 4 seconds to open the ***Calibration*** menu. The display shows CAL.
2. Release the *Function key*.

3. PH 7 appears in the display.
4. Place the electrode in the GPH 7.0 buffer solution.
5. The product determines the correct value automatically. If the value is determined, the display flashes and an acoustic signal is issued to indicate a change to the next calibration point.
6. If the temperature sensor is not inserted, enter the temperature of the buffer solution by pressing the *Up key* and *Down key* and confirm the entry by pressing the *Function key* again.
7. PH 4 and PH 10 alternate in the display.
8. Then, rinse the electrode with distilled or deionised water.
9. Place the electrode in the second buffer solution. The product recognises whether it is a PH 4 or PH 10 buffer solution automatically.
10. If the temperature sensor is not inserted, enter the temperature of the buffer solution by pressing the *Up key* and *Down key* and confirm the entry by pressing the *Function key* again.
11. Then, rinse the electrode again with distilled or deionised water.

After successful completion of the calibration, the assessment of the electrode condition is displayed briefly in percent. Then, the current measurement is shown in the display again. An aged or contaminated electrode, incorrect adjustment of the pressure, contamination of the platinum electrode or a damaged membrane can be the cause for a lower evaluation.

If the calibration is not completed successfully, an error message is displayed. CAL Err. appears in the display See Error and system messages [▶ 19]. Confirm the error message pressing the *Function key*. The product restarts and the standard value for the gradient is restored.

5.3 Display the electrode assessment of active calibration

Invoke the menu by pressing and holding the function key as described in chapter 7. Press the function key to access the parameter " PH.oF ". Close the menu by pressing and holding the function key (Do not change values) – the electrode assessment in percent is displayed ("----" if no valid data is available).

5.4 Battery

5.4.1 Battery indicator

For additional information, refer to the operating manual!

5.4.2 Changing battery

Only use new, high-quality and suitable alkaline batteries!

- 2x Mignon battery AA

For additional information, refer to the operating manual!

6 Operation

6.1 Opening the configuration menu

1. Press the *Function key* for 2 seconds to open the ***Configuration*** menu.
2. ConF appears in the display. Release the *Function key*.

Parameter	Values	Meaning
		
Setting the temperature		
SEt.t		(G 1500)
	-5 .. 105	Adjustable temperature value in °C, or in °F 23 .. 221 °F
SEt.t		Only without temperature sensor plugged in(G 1501)
	-5 .. 150	Adjustable temperature value in °C, or in °F 23 .. 302 °F
Setting the zero point		
PH.oF		
	Current measurement	Setting of the zero point for calibration of the pH measurement. If a calibration cannot be carried out, continue with the *function key*

Setting the gradient

PH.SL

	Current measurement	Setting of the gradient for calibration of the pH measurement. If a calibration cannot be carried out, continue with the *function key*

Input

Only (G 1501)

InP

	PH	
	ORP mV	Redox in mV, relative to silver / silver chloride - electrode
	ORP mVH	Redox in mV_H, relative to hydrogen electrode

Display unit

Unit

	°C	Temperature display in °C
	°F	Temperature display in °F

Alarms

Only (G 1501)

AL.		
	oFF	No active alarm
	on	Alarm alerting via text display, acoustic signal and flashing of the backlighting
	bEEP	Alarm alerting via text display and acoustic signal
	Li tE	Alarm alerting via text display and flashing of the backlighting
AL.Lo		Depending on the setting of the parameter value inP
	PH	0.00 .. AL.Hi
	mV	-1500 .. AL.Hi
	mV_H	-1293 .. AL.Hi
AL.Hi		Depending on the setting of the parameter value inP
	PH	AL.Lo .. 14.00
	mV	AL.Lo .. 1500
	mV_H	AL.Lo .. 1707

Shut-off time

PoFF

oFF	No automatic shut-off
15 30 60 120 240	Automatic shut-off after a selected time in minutes, during which no buttons have been pressed

Backlight

Li tE

oFF	Backlight deactivated
15 30 60 120 240	Automatic shut-off of the backlight after a selected time in seconds, during which no buttons have been pressed
on	No automatic shut off of the backlight

Factory settings

ini t

no	Use current configuration
YES	Reset product to factory settings. ini t donE appears in the display

6.2 Adjustment of the measuring input

For additional information refer to the operating manual!

7 Error and system messages

Display	Meaning	Possible causes	Remedy
(, ,)	Sensor cable defect	Cable breakage	Send in for repair
SEnS Erro	Sensor or probe defect	Defective sensor or probe	Send in for repair
	Measuring range exceeded or undercut	Measurement outside of the measuring range	
>CAL<	Error during the last calibration	Faulty calibration	Conduct a new calibration
No display, unclear characters or no response when buttons are pressed	Battery depleted	Battery depleted	Replace battery
	System error	Error in the product	Send in for repair
	Product is defective	Product is defective	
bAt	Battery depleted	Battery depleted	Replace battery
bAt Lo	Battery depleted	Battery depleted	Replace battery
CAL Err.1	Neutral buffer not allowed	Incorrect buffer solution used	Use fresh buffer solution
		Buffer solution is contaminated	Clean electrode, recalibrate
		Electrode contaminated or defective	Replace electrode
CAL Err.2	Slope is too low	Incorrect buffer solution used	Use fresh buffer solution
		Buffer solution is contaminated	Clean electrode, recalibrate
		Electrode contaminated or defective	Replace electrode

CAL Err.3	Slope is too high	Incorrect buffer solution used	Use fresh buffer solution
		Buffer solution is contaminated	Clean electrode, re-calibrate
		Electrode contaminated or defective	Replace electrode
CAL Err.4	Incorrect calibration temperature	Temperature too low or too high	Range of 0..60 °C
CAL Err.5	Time exceeded during automatic calibration	Unstable electrode signal	Stirring of the buffer solution
		Buffer solution is contaminated	Clean the electrode
			Use fresh buffer solution
			Restart calibration
Err.1	Measuring range exceeded	Measurement too high	Stay within allowable measurement range
		Incorrect electrode connected	Check electrode
		Electrode or product defect	Send in for repair
Err.2	Measuring range is undercut	Measurement too low	Stay within allowable measurement range
		Incorrect electrode connected	Check electrode
		Electrode or product defect	Send in for repair
SYS Err	System error	Error in the product	Switch product on/off
			Replace batteries
			Send in for repair

8 Technical data

G 1500

Measuring range	pH	0.00 .. 14.00 pH
Temperature compensation		-5 .. 150 °C (or 23 .. 302 °F)
Accuracy	pH (device)	± 0.02 pH ± 1 digit
Nominal temperature		25°C
Input resistance pH		ca. 10^{12} Ohm
Measuring cycle		approx. 2 measurements per second
Connections	pH	BNC connection for pH electrode
Display		3-line segment LCD, additional symbols, illuminated (adjustable white, permanent illumination)
Additional functions		Min/Max/Hold
pH calibration		Manual 1- or 2-point or automatic 2-point calibration
Housing		Break-proof ABS housing
	Protection rating	IP65 / IP67 (only with sensors identified as waterproof in the connected state for devices with BNC connection)
	Dimensions L*W*H [mm] and weight	108 * 54 * 28 mm without BNC plug 130 g, incl. battery, without electrode 190 g, incl. battery and electrode
Operating conditions		-20 to 50 °C; 0 to 95 % r.h. (temporarily 100 % r.h.)
Storage temperature		-20 to 70 °C
Current supply		2*AA battery (included in the scope of delivery)
	Current requirement/ battery life	approx. 0.7 mA, approx. 2.5 mA with lighting Service life > 3000 hours with alkaline batteries (without backlighting)
	Battery indicator	4-stage battery status indicator, Replacement indicator for depleted batteries: "BAT"
Auto-power-OFF function		The device switches off automatically if this is activated

Directives and standards	The devices conform to the following Directives of the Council for the harmonisation of legal regulations of the Member States: 2014/30/EU EMC Directive 2011/65/EU RoHS Applied harmonised standards: EN 61326-1:2013 Emission limits: Class B Immunity according to Table 2 Additional errors: < 0.5 % FS EN 50581:2012

G 1501

Measuring range		pH	Redox	Temperature
		0.00 .. 14.00 pH	-1500 .. +1500 mV 1293 .. +1707 mV_H	-5 .. 105 °C 23 .. 221 °F
Accuracy (at nominal temperature)		± 0.02 pH ± 1 digit	± 0.1% FS ± 1 Digit	± 0.3 °C
Temperature compensation		-5 .. 105 °C (or 23 .. 221 °F)		Not compensated
Input resistance		ca. 10^{12} Ohm		
Nominal temperature		25°C		
Measuring cycle		approx. 2 measurements per second		
Connections	pH, Redox	BNC connection for electrode		
	Temperature	Banana 4mm, Pt1000 2-wire		
Display		3-line segment LCD, additional symbols, illuminated (adjustable white, permanent illumination)		
Additional functions		Min/Max/Hold		
pH calibration		Manual 1- or 2-point or automatic 2-point calibration		
Housing		Break-proof ABS housing		
	Protection rating	IP65 / IP67 (only with electrodes identified as waterproof in the connected state for devices with BNC connection)		
	Dimensions L*W*H [mm] and weight	108 * 54 * 28 mm without BNC plug 130 g, incl. battery, without electrode 190 g, incl. battery and electrode		
Operating conditions		-20 to 50 °C; 0 to 95 % r.h. (temporarily 100 % r.h.)		
Storage temperature		-20 to 70 °C		
Current supply		2*AA battery (included in the scope of delivery)		
	Current requirement/ battery life	approx. 0.7 mA, approx. 2.5 mA with lighting Service life > 3000 hours with alkaline batteries (without backlight)		
	Battery indicator	4-stage battery status indicator, Replacement indicator for depleted batteries: "BAT"		
Auto-power-OFF function		The device switches off automatically if this is activated		

Directives and standards	The devices conform to the following Directives of the Council for the harmonisation of legal regulations of the Member States: 2014/30/EU EMC Directive 2011/65/EU RoHS Applied harmonised standards: EN 61326-1:2013 Emission limits: Class B Immunity according to Table 2 Additional errors: < 0.5 % FS EN 50581:2012 The device is intended for mobile use and/or stationary operation in the scope of the specified operating conditions without further limitations.

9 Service

9.1 Manufacturer

If you have any questions, please do not hesitate to contact us:

Contact

GHM Messtechnik GmbH

GHM GROUP - Greisinger

Hans-Sachs-Str. 26

93128 Regenstauf | GERMANY

Email: info@greisinger.de | www.greisinger.de

WEEE reg. no. DE 93889386