



PTM40/PLF40

pH-ORP-ISE/conductivity meter

Important notes:

The operating manual is part of the product. Before initial operation of the unit, please carefully read and observe the operating instructions and keep it. For safety reasons the unit may only be used for the purposes described in these present operating instructions. Please also observe the operating instructions for the units to be connected

All specifications in this instruction manual are guidance values which are valid at the time of printing. However, for technical or commercial reasons or in the necessity to comply with the statutory stipulations of various countries, Xylem Analytics Germany GmbH may perform additions to the unit without changing the described properties.


TABLE OF CONTENTS

1	Technical Specifications of the meter PTM40/PLF40.....	4
1.1	Intended Use.....	4
1.2	User qualification	4
1.3	Specifications.....	4
1.4	Warning and safety information	5
2	Set up and Commissioning	6
2.1	Scope of delivery	6
2.2	Unpacking and Setup	6
2.3	Power supply	6
3	Device description.....	7
3.1	Measuring inputs	7
3.2	Controls.....	8
3.3	Display	8
3.4	Menu structure	9
3.5	Password protection	10
4	Configuration of basic settings.....	10
4.1	Configuration of the backlight and the contrast	10
4.2	Configuration of the password	10
4.3	Configuration of the clock	11
4.4	Configuration of the language.....	11
4.5	Configuration of the switch-off time	11
5	Data logger.....	11
5.1	Menu structure	12
5.2	Interval	12
5.3	Automatic	12
6	Info	12
6.1	General	12
6.2	Menu structure	13
7	Data communication / printer	13
7.1	PC-Software „STMLabReader“	13
7.2	Serial data output via ASCII.....	13
7.3	Serial data output via Printer CITIZEN CT-S280.....	14
8	Meter PTM40	14
8.1	Areas of use PTM40	14
8.2	Composition PTM40	14
8.3	Configuration PTM40.....	15
8.3.1	Basic settings	15
8.3.2	Configuration of the fixed temperature	15


8.3.3	Configuration of the sensor type	15
8.4	Calibration method pH	16
8.4.1	Menu structure.....	16
8.4.2	Calibration	16
8.5	Calibration method ORP	18
8.5.1	Menu structure.....	18
8.5.2	Calibration	18
8.6	Calibration method ISE	19
8.6.1	Menu structure.....	19
8.6.2	Calibration	19
9	Meter PLF40	20
9.1	Areas of use PLF40	20
9.2	Composition PLF40	20
9.3	Configuration PLF40	20
9.3.1	Basic settings	20
9.3.2	Configuration of the fixed temperature	20
9.3.3	Configuration of the measuring range „M range“	21
9.4	Calibration method Conductivity	21
9.4.1	Menu structure.....	21
9.4.2	Calibration	21
10	Scope of delivery.....	23
11	Accessories	23
12	Maintenance.....	24
13	Guarantee	24
14	Recycling and Disposal.....	24
15	Service and Returns.....	25


Notes about Instructions for Use

These instructions for use are intended to show you the proper and safe handling of the product.
For the highest possible safety you must adhere to the listed safety and warning notes in these manual!

The pictograph  has the following meaning:

- Warning of a general danger.
- No-compliance results (can result) in injury or material damage.

 Important information for the use of the device.

 Refers to another part of the operating manual.

Status at time of printing


Advanced technology and the high quality of our products are guaranteed by a continuous development.
This may result in differences between this operating manual and your product. We cannot exclude mistakes.
We are sure you understand that no legal claims can be derived from the information, illustrations and descriptions.

The German version is the original version and binding in all specifications.

1 Technical Specifications of the meter PTM40/PLF40



1.1 Intended Use

The meter PTM40/PLF40 is intended for the measurement and documentation of analysis parameters while adhering to the technical specifications. Any use beyond this purpose - as well as your own modifications or expansions - is not in conformity with prohibited.

 When you connect the meter to electro-chemical sensors, their limited product life and natural wear and tear must be taken into consideration, as these can lead to malfunctions of the meter. The user must take the appropriate measures to limit the dangerous effects of such malfunctions

1.2 User qualification


The meter was developed for measurements in analysis technology. It is assumed, based on their professional training and experience, that the operator/user and the maintenance personnel are familiar with the specifications of analysis meters, can handle chemicals in a safe manner, e.g. during maintenance work on the electrodes/sensors and that they can estimate the hazards caused by these. The operator must ensure that the national laws and guidelines regarding occupational safety, accident prevention and handling of chemicals are adhered to.

 **Please observe the general** (see  chapter 1.4) **and all in the text additionally placed warnings and safety notes!**

1.3 Specifications

Translation of the legally binding German version

(Release: 21. November 2017)

CE sign:  EMC compatibility according to the Council Directive: 2004/108/EG;
applied harmonized standards: EN 61326-1:2006
Low-voltage directive according to the Council Directive 2006/95/EG
Testing basis EN 61 010, Part 1

Contry of origin: Germany, Made in Germany

General information (PTM40/PLF40)

Housing:

Material: Aluminum desk housing IP 40/DIN EN 60529
Dimensions: 145 x 185 x 55 mm (W x H x D)
Weight: approx. 750 g (incl. power supply and stand)

Display: graphic LCD display, 128 x 64 pixels, backlight

USB Interface: USB with „Interface HMG USB“, galvanically isolated

Data logger: stores up to 4,000 data sets (date, time, main measured value, secondary measured value, measuring temperature)

EMV: as per EN 61326; class B


Climate: Ambient temperature: 0 ... + 55 °C for operation
Ambient temperature: - 25 ... + 65 °C for storage and transport
Humidity: max. <95 % (no condensation)

Ambient conditions:

 Do not used in hazardous locations!

Power supply:

By external power supply 5 V DC of 100 - 240 V; 50/60 Hz; power input: 5 Watt

 Use only the power supply (Mo. VER05US050-JA; input 100-240 V~; 50/60 Hz; 0.18 A; output 5 V DC; 1 A max.; class II)!

PTM40

Measurement value:	pH -2.00...16.00; -2000...2000 mV; Temperature: -10.0...100.0 °C; ISE 0...30000 ppm
Resolution:	0.01 pH; 1 mV; 1 ppm; 0.1 °C
Temp. compensation:	automatic with Pt 1000 or fixed temperature
Accuracy:	pH ± 0.01 (± 2 pH units around the calibration point), U [mV] ± 0.3 ; T [°C] ± 0.1 (0...100 °C)
Connections:	BNC, 2x banana plug (4 mm), 4-pin interface USB port
Calibration:	Direct input (rise, asymmetry) Temperature offset Two-point / Three-point Automatic (Two-point / Three-point)

The PTM40 offers the following buffer sets for automatic calibration:

NBS standard buffering solution as per DIN 19266:	pH value at 25 °C	1.68 / 4.01 / 6.86 / 9.18 / 12.45
Technical buffering solution as per DIN 19267:	pH value at 25 °C	1.09 / 3.06 / 4.65 / 6.79 / 9.23
Merck buffering solution:	pH value at 20 °C	4.00 / 7.00 / 9.00
Mettler Toledo buffering solution:	pH value at 25 °C	1.679 / 4.003 / 7.002 / 10.013

PLF40

Measurement value:	0...200.0 μ S/cm; 0...2000 μ S/cm; 0...20.00 mS/cm; 0...500.0 mS/cm; 0...20 μ S/cm ZK 0,1; 0...20 μ S/cm ZK 0,01; 0...200 μ S/cm ZK 0,1; automatic measuring range switching
TDS:	0...200 mg/l; 0...2000 mg/l; 0...20 g/l; 0...500 g/l
Salinität:	0...70 g/kg; Temperature: -10.0...100.0 °C
Resolution:	0.1 μ S; 1 μ S; 0.01 mS; 0.1 mS; 0.1 °C
Temp. compensation:	automatic with NTC or fixed temperature
Accuracy:	± 1 digit, ± 0.5 % of measuring range, T [°C] ± 0.1 (5...50 °C)
Connections:	8-pin flange plug, 4-pin interface USB port
Calibration:	Direct input (cell constant, temperature compensation, cable offset, TDS factor) Temperature offset One-point Automatic

1.4 Warning and safety information

The meter PTM40/PLF40 has the protection class III.


It was manufactured and tested according to DIN EN 61 010, Part 1, „**Protective Measures for electronic measurement devices and control devices**” and has left the factory in an impeccable condition as concerns safety technology. In order to maintain this condition and to ensure safe operation, the user should observe the notes and warning information contained in the present operating instructions. Development and production is done within a system which meets the requirements laid down in the DIN EN ISO 9001 standard.



For reasons of safety, the meter PTM40/PLF40 and the power supply (VER05US050-JA) must be opened by authorised persons only; this means, for instance, that work on electrical equipment must only be performed by qualified specialists. **In the case of nonobservance of these provisions the titrator and the power supply may constitute a danger: electrical accidents of persons or fire hazard!** Moreover, in the case of unauthorised intervention in the titrator or the power supply, as well as in the case of negligently or deliberately caused damage, the warranty will become void.



Prior to switching the device on it has to be ensured that the operating voltage matches the mains voltage. The operating voltage is indicated on the power supply. **Nonobservance of this provision may result in damage to the titrator and the power supply, or in personal injury or damage to property!**


 **If it has to be assumed that safe operation is impossible, the meter has to be put out of operation and secured against inadvertent putting to operation!** Switch the meter off, pull plug of the mains cable out of the power supply, and remove the meter from the place of work.


Examples for the assumption that a safe operation is no longer possible,


- if the package is damaged,
- if the meter shows visible damages,
- if the power supply (VER05US050-JA) shows visible damages,
- if the meter does not function properly,
- if liquid has penetrated into the casing.
- if the meter has been altered technologically or if unauthorized personnel tried or succeeded to open the instrument as attempt to repair it.

In case that the user operates such a device, all thereof resulting risks are on the user.

 The meter must not be stored or operated in humid rooms.

 **The relevant regulations regarding the handling of the substances used have to be observed:** The Decree on Hazardous Matters, the Chemicals Act, and the rules and information of the chemicals trade. It has to be ensured on the side of the user that the persons entrusted with the use of the meter are experts in the handling of substances used in the environment and in titrator or that they are supervised by specialised persons, respectively.

 Use only the sensors, sensor cables and interface cables recommended by the manufacturer. The notes and statements in the respective user manuals and data sheets apply to the use of the sensors and fittings.



 The device does not contain any components that need to be replaced and must only be opened for repair by the manufacturer's technicians.



If in doubt, please contact the supplier.

2 Set up and Commissioning

2.1 Scope of delivery

The scope of delivery is shown on the included packing list.


 There is a detailed list of the individual sets in  chapter „Scope of delivery”


 Accessories can be found in  chapter „Accessories”



2.2 Unpacking and Setup

The meter and all accessories were carefully inspected for function and size accuracy at the factory. Please make sure that you also remove all of the small additional parts from the packaging.

The meter can be set up on any even surface.

 The safety of the system, in which the device will be integrated, is the responsibility of the installer.

 If the meter is transported from a cold into a warm environment, there can be malfunctions in the device caused by condensate. In this case, you have to wait until the device temperature and the room temperature have reached a balance before you start the meter.

 The flawless function and operational safety of the meter can only be warranted under those climate conditions specified in  chapter „Specifications”.

2.3 Power supply

The meter is delivered ready to operate with a 5 V DC power supply.

! Position the power supply where it is easily accessible so that the meter can be separated from the power at any time.

Check the power supply regularly. If the power supply is damaged it must be promptly replaced by an undamaged unit.

! Use only the power supply VER05US050-JA (input 100-240 V~; 50/60 Hz; 0.18 A; output 5 V DC; 1 A max.; class II)!

3 Device description

3.1 Measuring inputs

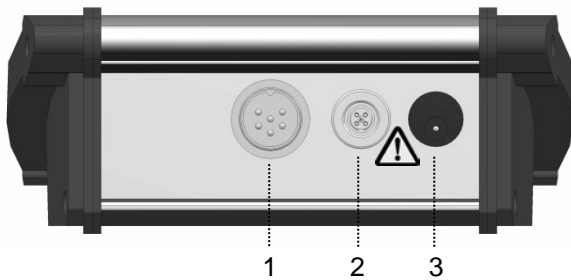


Fig. 1 PTM40/PLF40

- 1) Sensor connection
- 2) USB port
- 3) Main Supply

On the front of the meter, there are special connectors to connect the sensor and a USB interface cable.

! Use only the sensors, sensor cables and interface cables recommended by the manufacturer. The notes and statements in the respective user manuals and data sheets apply to the use of the sensors and fittings. As the measuring system is intended for the measuring of analysis parameters you must keep in mind that the sensors must be calibrated and maintained regularly.

! The measuring input must be free of potentials and must not be connected to power conducting potentials. All inputs must only be operated with the proper sensors. The direct connection of different signals is prohibited!

i In order to protect the connections from the ingress of moisture and the resulting corrosion, you should always leave the sensor plugged into the meter.

! Please note the switches when connecting to other devices (e.g. via USB interface). Internal connections in other devices (e.g. connecting GND to earth) can lead to impermissible voltage potentials that can impair the function of the meter itself or other devices or can even destroy them.

i Use only interface cable (Interface HMG USB) to transfer data from the meter to the PC. This cable is not included in the delivery and must be purchased separately (📖 chapter „Accessories“).







You will find the software here: <http://download.meinsberg.de/en/>


3.2 Controls

The meter has an intuitive clear text menu structure.



Fig. 2 PTM40

						
	CONF	LOG	ON/OFF	CAL	MEAS	INFO
Open menu	Configuration	Data logger	Switching ON/OFF	Calibration	Measuring print trigger	Information
Navigating the menu	Cursor up	Cursor down	Selection / ENTER	Cursor left	Measuring mode	Cursor right
Change / enter values	Position value +1	Position value -1	Save / confirm value	Cursor left	Measuring mode	Cursor right

 The meter is turned on by pressing (**ON/OFF**). Switching off takes place either automatically after the preset time period has elapsed or by a long (approx. 3 seconds) press of (**ON/OFF**).

3.3 Display

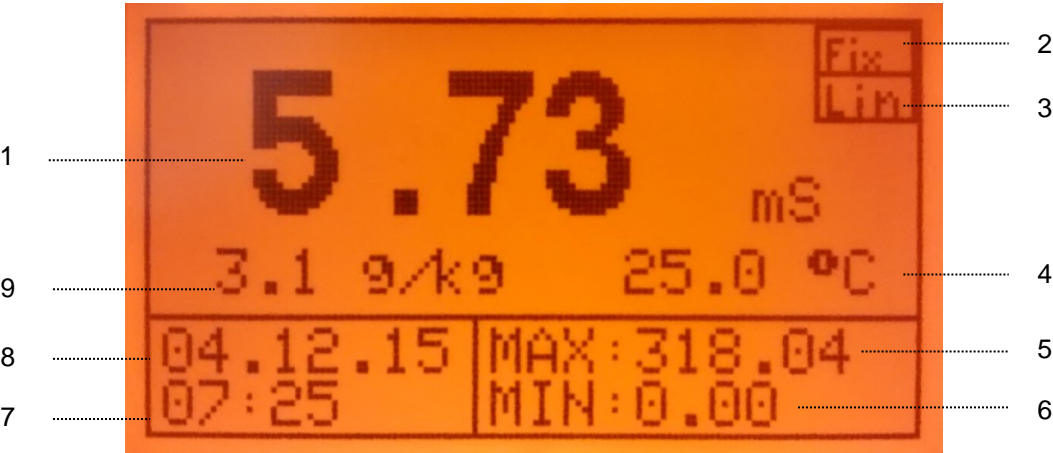
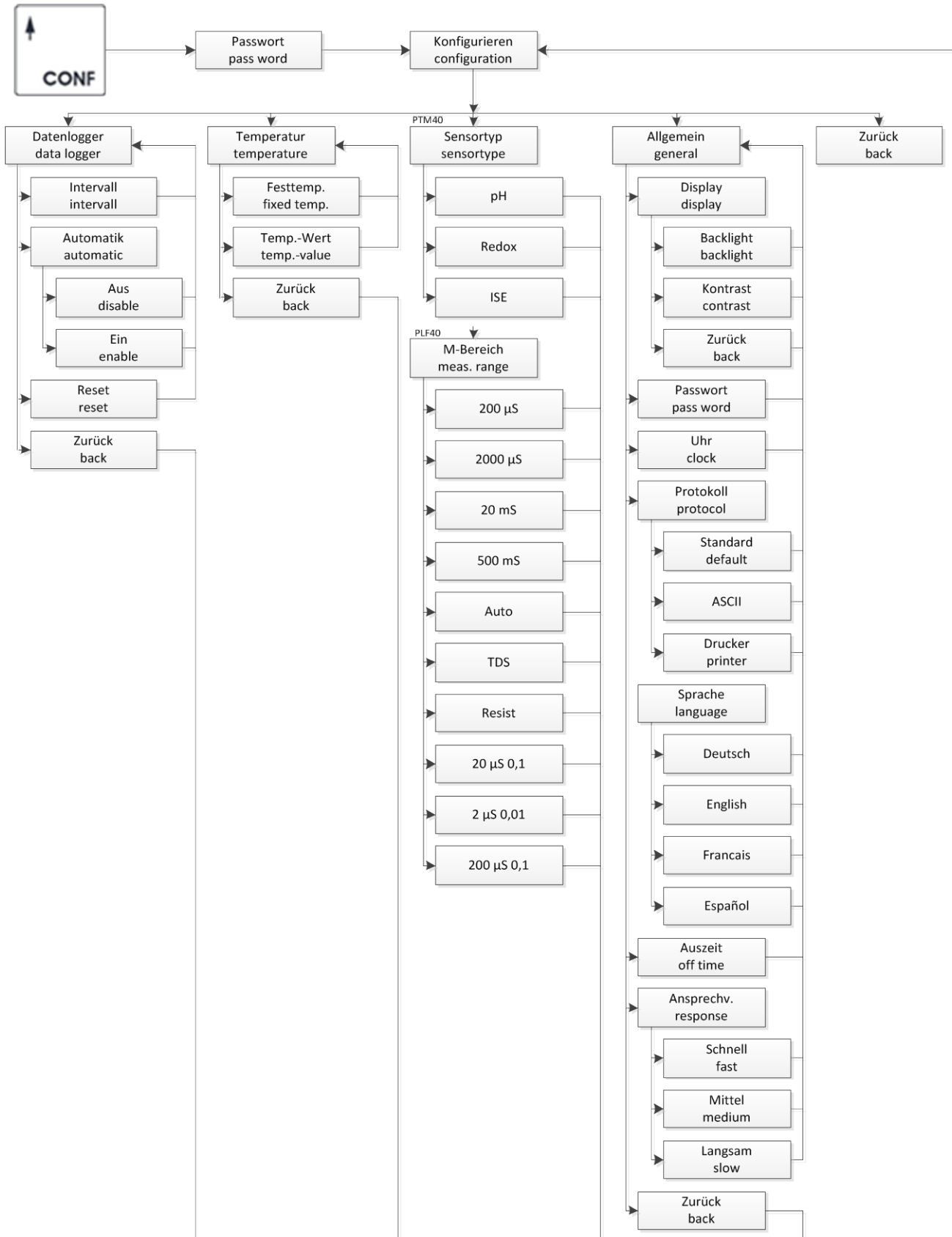


Fig. 3

- 1) Main measured value
- 2) Fixed temperature active
- 3) Temperature compensation (applies only to PLF40)


- 4) Temperature
- 5) **Min.** main measured values
- 6) **Max.** main measured values
- 7) Time
- 8) Date
- 9) Secondary measured value

3.4 Menu structure



3.5 Password protection

It's possible to protect the menu items Calibration (**CAL**) and Configuration (**CONF**) by a password. This password can be defined in the menu item (**CONF**) under „**General**“

 The password to open the individual menus is deactivated when the device is delivered!

Password = 0 (status at time of delivery)

Password > 0 (password inquiry is active – the user is asked for a password))

The password can have up to 4 digits (1 - 9999).

Password configuration:

(**CONF**) > „**General**“ > „**Password**“ > enter and repeat password.

Via (**INFO**) or (**CAL**) you select the position to change.



Via (**CONF +1**) or (**LOG -1**) you change the position.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

4 Configuration of basic settings

Via (**CONF**) you will get to the menu item „**Configuration**“ and then on to submenu item „**General**“.

 The entire structure of the menu (**CONF**) is displayed graphically in  chapter 3.4.

Under „**General**“, the following device-relevant basic settings can be configured:

Display	→	backlight and contrast
Password	→	Password
Clock	→	Clock
Reset	→	Restart device
Language	→	Language
Time OFF	→	Time until automatic switch-off
Response action	→	Filtering the measured value

4.1 Configuration of the backlight and the contrast

The backlight of the display can be switched on or off on the meter.

Configuration of the lighting:

„**General**“ > „**Display**“ > „**Backlight**“, then select **activate** / **deactivate**.

Configuration of contrast:

„**General**“ > „**Display**“ > „**Contrast**“, then select **low** - **medium** - **high**.


Via (**CONF +1**) or (**LOG -1**) you selected the desired setting.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

4.2 Configuration of the password

The menu items calibration (**CAL**) and configure (**CONF**) can be protected by a password.

 The password to open the individual menus is deactivated when the device is delivered!

Password = 0 (status at time of delivery)

Password > 0 (password inquiry is active, the user is asked for a password)

The password can have up to 4 digits (1 - 9999).

Password configuration:

(**CONF**) > „**General**“ > „**Password**“ > enter and repeat password.

Via (**INFO**) or (**CAL**) you select the position to change.

Via (**CONF +1**) or (**LOG -1**) you change the position.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

4.3 Configuration of the clock

Configuration of the clock:

„**General**“ > „**Clock**“, then make the corresponding setting.

Via (**CONF +1**) or (**LOG -1**) you selected the desired setting.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

4.4 Configuration of the language

Configuration of the language:

„**General**“ > „**Language**“, then make the corresponding setting.


Via (**CONF +1**) or (**LOG -1**) you selected the desired setting.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

4.5 Configuration of the switch-off time

You can set the time on the meter, after which the meter will be switched off automatically.

 The data logger also records while the meter is off, if the data logger has been set up for this.


Configuration of the automatic switch-off time:

„**General**“ > „**Switch-off time**“, then enter the desired switch-off time.

Via (**CONF +1**) or (**LOG -1**) you selected the desired setting.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.



 If the **switch-off time = 0** was selected, the function is deactivated!

5 Data logger

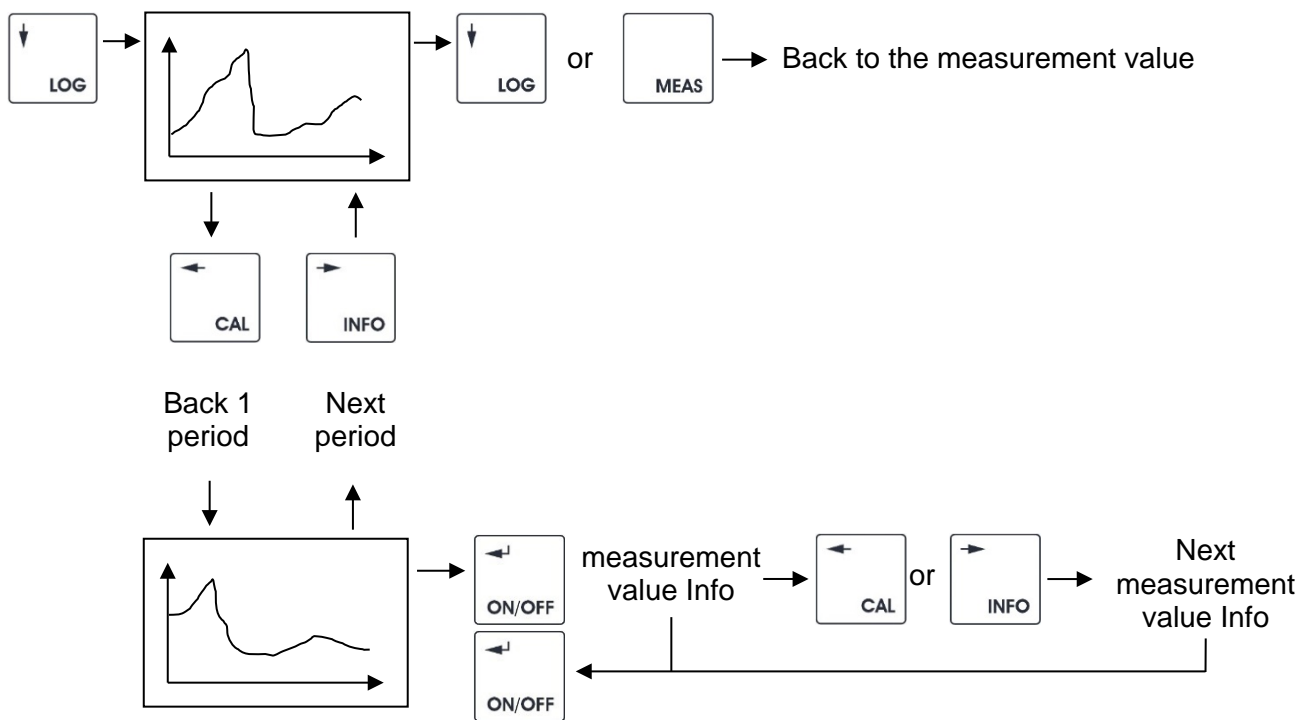
The meter has an integrated ring memory data logger with real-time clock for 4,000 data sets (date, time, main measured value, secondary measured value, measuring temperature).

The saved data can either be viewed directly on the display or read via the USB interface.

(**CONF**) will take you to the menu item „**Configuration**“ and on to the submenu item „**Data logger**“.

 The entire structure of the menu is displayed graphically in  chapter 3.4.

5.1 Menu structure



5.2 Interval

You can set up the memory intervals in the submenu point „**Interval**“.

Via (**INFO**) or (**CAL**) you select the position to change.

Via (**CONF +1**) or (**LOG -1**) you change the position.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

5.3 Automatic

You can set up the automatic function of the data logger in the submenu item „**Automatic**“.

Automatic function „**Off**“> the logger only logs while the device is switched on

Automatic function „**On**“> the logger logs with the device switched on or off
(at the same time the power supply connected)!



The correct setting of the real-time clock is required for the proper function of the data logger.



During the reading of the logger data, no further data is recorded!

6 Info

6.1 General

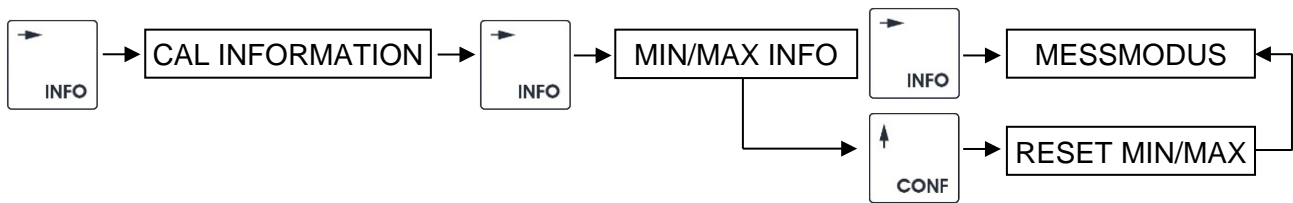
In this menu item, the first page shows the information about the current calibration values and the last calibration time (date).

The second page shows the maximum and minimum values of the main measured value and the time when these values are measured.



On this page, you can press the (**CONF**) button to reset the minimum and maximum values.

6.2 Menu structure



7 Data communication / printer

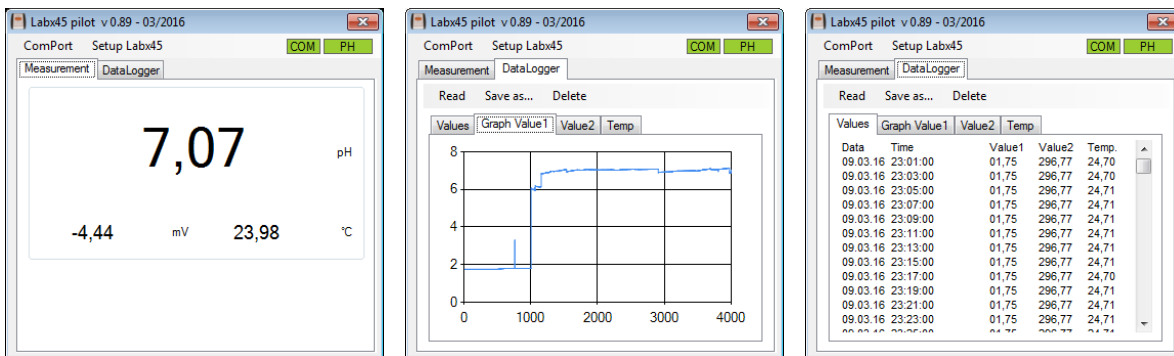
7.1 PC-Software „STMLabReader“

The reading of the data logger as well as the configuration of the measuring system can also take place via the software „STMLabReader“.

Use only interface cable (Interface HMG USB) to transfer data from the meter to the PC. This cable is not included in the delivery and must be purchased separately (chapter „Accessories“).

To use this function, press (**CONF**). This will take you to the menu item „**Configuration**“ and on to the submenus item „**protocol**“ choose „**standard**“.

You will find the software here: <http://download.meinsberg.de/en/>



7.2 Serial data output via ASCII

The current measured values can be cyclically output via the serial interface as ASCII characters.

Use only interface cable (Interface HMG USB) to transfer data from the meter to the PC. This cable is not included in the delivery and must be purchased separately (chapter „Accessories“).

To use this function, press (**CONF**). This will take you to the menu item „**Configuration**“ and on to the submenus item „**protocol**“ choose „**ASCII**“ and setup the „**cycle time**“.



The interface setting of the receiver is 4800 bauds, 1 stop bit and no parity. All output characters are in the ASCII format.

Data decription: dd mm yy hh minmin E1E1 MMMM E2E2 NNNN E3E3 TTTT

Dd	2 Byte	Day
mm	2 Byte	Month
yy	2 Byte	Year
hh	2 Byte	Hour
minmin	2 Byte	Minute
E1E1	4 Byte	Unit
MMMM	4 Byte	measured main value
E2E2	4 Byte	Unit
NNNN	4 Byte	Secondary measured value
E3E3	4 Byte	Unit
TTTT	4 Byte	temperature

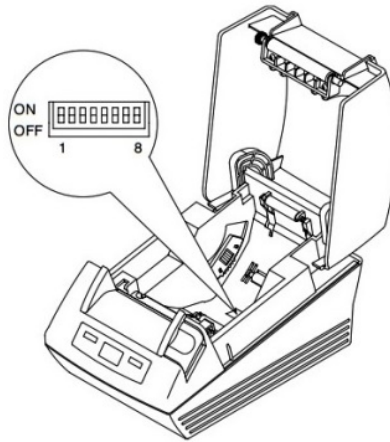
7.3 Serial data output via Printer CITIZEN CT-S280

The current measured values and the calibration information can be cyclically output via a printer.

 Use only interface cable (Interface HMG Drucker) to transfer data from the meter to the printer. This cable is not included in the delivery and must be purchased separately ( chapter „Accessories“).

To use this function, press (**CONF**). This will take you to the menu item „**Configuration**“ and on to the submenus item „**protocol**“ choose „**Printer**“ and setup the „**cycle time**“. To print the calibration information press (LOG) in the „**INFOMRATION**“ menu (2x (INFO)).

Printer configuration CITIZEN CT-S280:



Switch No.	Function	ON	OFF	Settings
1	Communication condition setting method	DIP switch setting	Internal memory setting	ON
2	Hand shake	XON/XOFF	DTR/DSR	ON
3	Bit length	7 bits	8 bits	OFF
4	Parity check	With parity	None	OFF
5	Parity selection	Even parity	Odd parity	OFF
6	Baud rate selection			ON
7				OFF
8	Reserved	–	Fixed	OFF

8 Meter PTM40

8.1 Areas of use PTM40

The pH/ORP/ISE meter is used to determine the pH value, the voltage as well as the temperature. The meter simultaneously measures the pH value, the voltage and the temperature. The PTM40 combines the advantages of a compact design with the precision and comfort of a lab meter with a high measuring accuracy, multi-function display, integrated data logger and a robust aluminum housing.

8.2 Composition PTM40

The PTM40/Set includes the meter with accessories and the pH sensor EGA142-K010-U-X. This combination meets the requirements to determine the pH value; electro-chemical process as per EN ISO 10523:2012.

The meter can be used wherever you want to measure pH values, ORP potentials or ISE concentrations as well as temperature quickly and precisely. High measuring accuracy, processor-controlled measured value processing and the versatility in connection with pH, ORP or ISE measuring chains mark the PTM40.

It is equipped with automatic temperature compensation for pH measurement as well as an adjustable reference temperature for measurements taken without a temperature sensor. In addition to the value input, an automatic as well as a manual calibration routine is available to calibrate the meter.

If an ORP single rod measuring chain is connected, the temperature-compensated and calculated ORP potential with reference to the standard hydrogen electrode as per DIN 38404 is displayed in addition to the measured ORP potential.

All Meinsberg Electrodes are available with fixed cable and connector BK. Obviously special electrodes (pH combination electrodes, redox combination electrodes or electrodes supplied from other manufacturers with BK plug) can be used in connection with PTM40. The isopotential point (25 °C) of the used electrodes must be pH

7. Platinum combination electrodes with Ag/AgCl reference system with 3 mol/l KCl electrolyte are recommended for redox potential measurements (e. g. EMC133-K010-U).
The description of the used electrode is listed in the separate instructions for use for the sensor.



8.3 Configuration PTM40

8.3.1 Basic settings

Via (**CONF**) you will go to the menu item „**Configuration**“.


 The entire structure of the menu (**CONF**) is displayed graphically in  chapter 3.4.

The following device-relevant basic settings can be configured:

data logger	→	Data logger ( chapter 5)
temperature	→	Temperature
Sensortype	→	Sensortype
general	→	General ( chapter 4)

8.3.2 Configuration of the fixed temperature

As the pH measured value is always temperature-compensated, the temperature of the measuring and calibration media must be measured or set up as a fixed temperature.

 If the fixed temperature is activated, it is used for temperature compensation.
> The message „**FIX**“ will appear in the top right side of the display.

> Configuration of the fixed temperature:

„**Temperature**“ > „**Fixed temperature**“ >, then select **activate** / **deactivate**.
„**Temperature**“ > „**Temp. value**“ >, then select the fixed temperature value.

Via (**INFO**) or (**CAL**) you select the position to change.

Via (**CONF +1**) or (**LOG -1**) you change the position.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

8.3.3 Configuration of the sensor type

3 different sensor types can be connected to the PTM40.

pH
ORP
ISE

Sensor selection:

Select „**Sensor type**“ >, then **Type**.

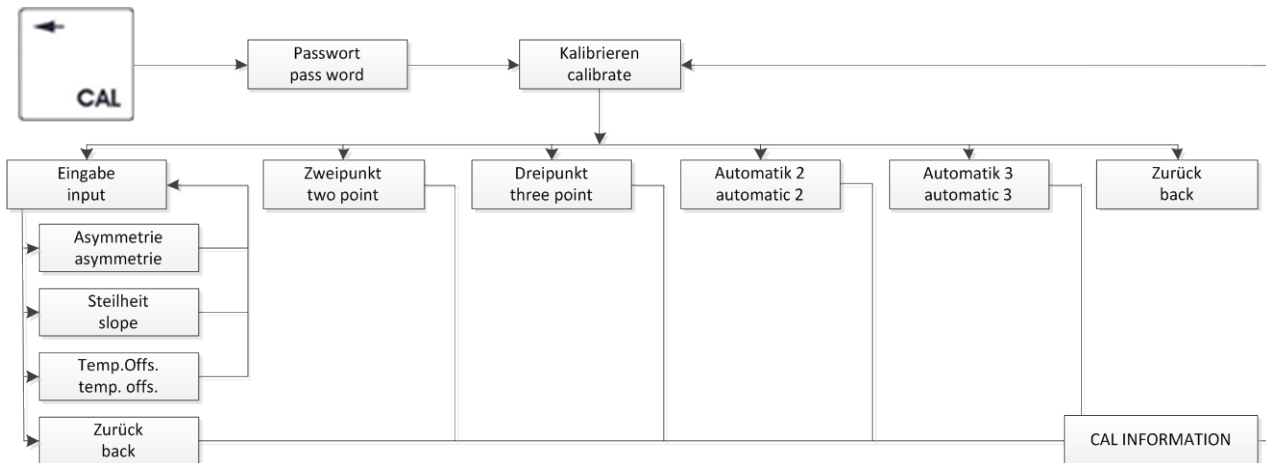
Via (**CONF +1**) or (**LOG -1**) you selected the desired setting.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

8.4 Calibration method pH

8.4.1 Menu structure



8.4.2 Calibration

Select (**CAL**) to get to the menu item „**Calibration**“ and then on to the **Calibration menu**:

> The calibration procedures for the respective sensor type are displayed.

Choose your desired calibration procedure by selecting the respective menu item.



The sensor must be thoroughly cleaned with distilled or deionized water prior to and between every measurement.

Immerse the sensor into the calibration solution and wait until a stable measured value is reached.



Ensure that the calibration medium is mixed properly and watch for the temperature balance.

8.4.2.1 Data input

Under menu item „**Input**“, you can enter and change the specific characteristics of the connected sensor, e.g. ones that were previously defined in the lab, individually.

> For this, select the respective submenu item for which the settings should be changed (**Asymmetry**, **Steepness**).

An input dialog will allow you to change the respective calibration/sensor values and their respective limits. If these are not reached or exceeded, there will be an error message, which will ask you to enter a value within these limits.

Via (**INFO**) or (**CAL**) you select the position to change.

Via (**CONF +1**) or (**LOG -1**) you change the position.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

8.4.2.2 Temperature offset

Under menu item „**Temp.Offs.**“ you can enter an offset for the temperature value.

> Select „**Temp.Offs.**“.

An input dialog allows you to set up the offset. This value can be positive or negative.

Via (**CONF +1**) or (**LOG -1**) you change the position.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

8.4.2.3 Two point calibration

> You will be prompted to immerse the sensor into the *first calibration medium* (ambient air).

Confirm this dialog with (**ON/OFF**). The currently measured values will be displayed.

If the measured values (pH + temperature!) are in a stable condition, reconfirm by pressing **(ON/OFF)**.

> You will be prompted to enter a nominal value (temperature-corrected buffer value!).

Via **(INFO)** or **(CAL)** you select the position to change.

Via **(CONF +1)** or **(LOG -1)** you change the position.

(ON/OFF) confirms and saves your setting.

(MEAS) terminates the entry dialog without transferring the value.

> You will be prompted to immerse the sensor into the *second calibration medium*.

Perform the same steps as with the first calibration solution

8.4.2.4 Three point calibration

> You will be prompted to immerse the sensor into the *first calibration medium* (ambient air).

Confirm this dialog with **(ON/OFF)**. The currently measured values will be displayed.

If the measured values (pH + temperature!) are in a stable condition, reconfirm by pressing **(ON/OFF)**.

> You will be prompted to enter a nominal value (temperature-corrected buffer value!).

Via **(INFO)** or **(CAL)** you select the position to change.

Via **(CONF +1)** or **(LOG -1)** you change the position.

(ON/OFF) confirms and saves your setting.

(MEAS) terminates the entry dialog without transferring the value.

> You will be prompted to immerse the sensor into the *second calibration medium*.

Perform the same steps as with the first calibration solution

> You will be prompted to immerse the sensor into the *third calibration medium*.

Perform the same steps as with the first calibration solution

8.4.2.5 Automatic calibration (Two and Three point)

The automatic calibration of the pH measurement is a two point calibration and requires the knowledge, which buffer solutions you would like to use for the calibration.

The PTM40 offers the following buffer sets for the calibration:

NBS standard buffer solution as per DIN 19266:	pH value at 25 °C 1.68 / 4.01 / 6.86 / 9.18 / 12.45
Technical buffer solution as per DIN 19267:	pH value at 25 °C 1.09 / 3.06 / 4.65 / 6.79 / 9.23
Merck buffering solution:	pH value at 20 °C 4.00 / 7.00 / 9.00
Laboratory buffer solution:	pH value at 25 °C 2.00 / 4.01 / 6.98 / 8.95 / 11.88

> Select the buffer set you would like to use for the calibration.

You will be prompted to immerse the sensor into the *first calibration solution*.

Confirm this dialog with **(ON/OFF)**. The currently measured values will be displayed.

If the measured values (pH + temperature!) are in a stable condition, reconfirm by pressing **(ON/OFF)**. The found buffer will be displayed, reconfirm with **(ON/OFF)**.


Immerse the sensor into the *second calibration solution*.

Perform the same steps as with the first calibration solution.

Immerse the sensor into the *third calibration solution*. (automatically three point calibration)

Perform the same steps as with the first calibration solution.


This completes the calibration process. The new calibration value will be saved in the device.

 If the calibration is faulty, an error message will be displayed (see  chapter 8.4.2.6).

8.4.2.6 Calibration error

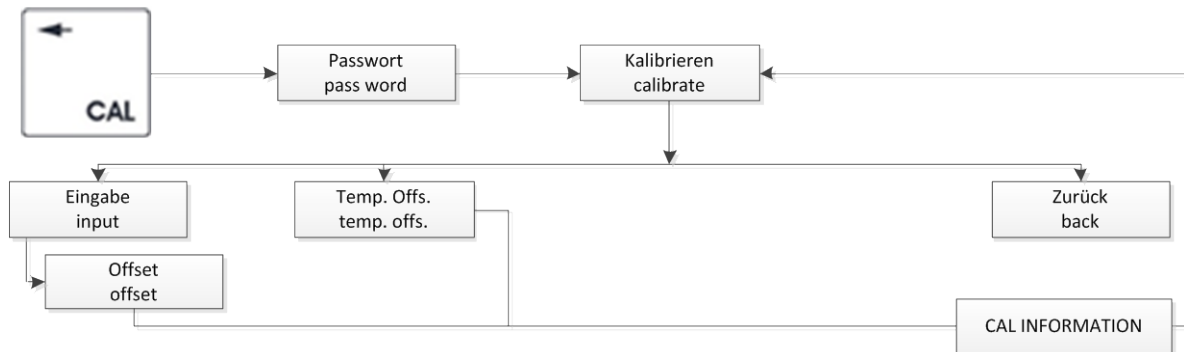
The limits for all calibration values are saved in the meter. If the entered values are outside these limits, one of the following error messages will be displayed:

„!Incorrect entry!“ or „!Calibration error!“.

 You may have to repeat the calibration, service the sensor or replace it (wear part!).

8.5 Calibration method ORP

8.5.1 Menu structure



8.5.2 Calibration


Select **(CAL)** to get to the menu item „**Calibration**“ and then on to the **Calibration menu**:

> The calibration procedures for the respective sensor type are displayed.

Choose your desired calibration procedure by selecting the respective menu item.

 **The sensor must be thoroughly cleaned with distilled or deionized water prior to and between every measurement.**

Immerse the sensor into the calibration solution and wait until a stable measured value is reached.

 Ensure that the calibration medium is mixed properly and watch for the temperature balance.

8.5.2.1 Data input

Under menu item „**Input**“ you can enter an offset for the ORP potential.

Via **(INFO)** or **(CAL)** you select the position to change.

Via **(CONF +1)** or **(LOG -1)** you change the position.

(ON/OFF) confirms and saves your setting.

(MEAS) terminates the entry dialog without transferring the value.

8.5.2.2 Temperature offset

Under menu item „**Temp.Offs.**“ you can enter an offset for the temperature value.

> Select „**Temp.Offs.**“.

An input dialog allows you to set up the offset. This value can be positive or negative.

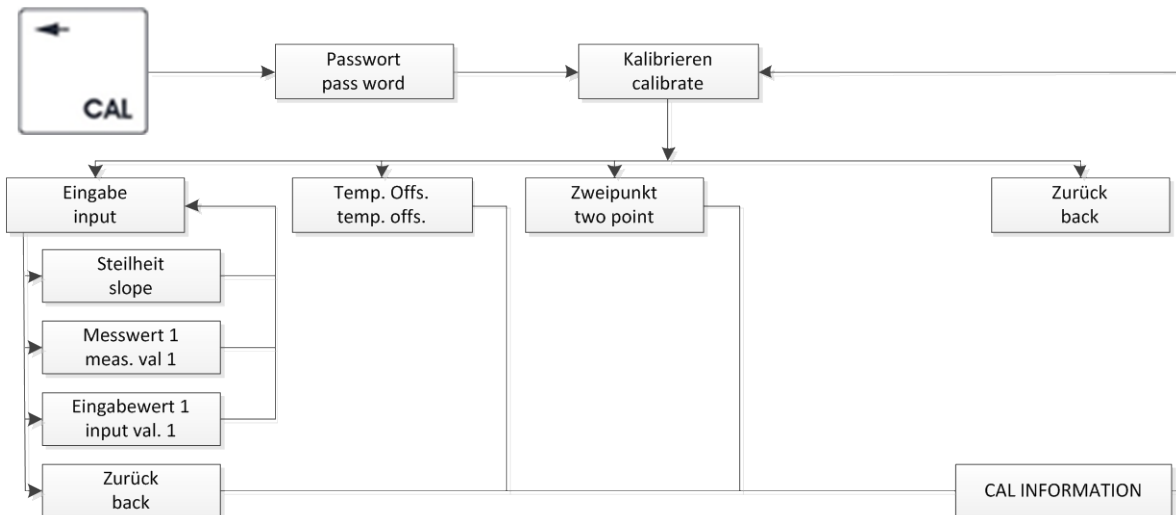
Via **(CONF +1)** or **(LOG -1)** you change the position.

(ON/OFF) confirms and saves your setting.

(MEAS) terminates the entry dialog without transferring the value.

8.6 Calibration method ISE

8.6.1 Menu structure



8.6.2 Calibration

Select **(CAL)** to get to the menu item „**Calibration**“ and then on to the **Calibration menu**:

> The calibration procedures for the respective sensor type are displayed.

Choose your desired calibration procedure by selecting the respective menu item.



The sensor must be thoroughly cleaned with distilled or deionized water prior to and between every measurement.

Immerse the sensor into the calibration solution and wait until a stable measured value is reached.



Ensure that the calibration medium is mixed properly and watch for the temperature balance.

8.6.2.1 Data input

Under menu item „**Input**“, you can enter and change the specific characteristics of the connected sensor, e.g. ones that were previously defined in the lab, individually.

> Select the respective submenu item for which the settings should be changed (**Asymmetry**, **measured value 1**, **input value 1**).

An input dialog will allow you to change the respective calibration/sensor values and their respective limits. If these are not reached or exceeded, there will be an error message, which will ask you to enter a value within these limits.

Via **(INFO)** or **(CAL)** you select the position to change.

Via **(CONF +1)** or **(LOG -1)** you change the position.

(ON/OFF) confirms and saves your setting.

(MEAS) terminates the entry dialog without transferring the value.

8.6.2.2 Temperature offset

Under menu item „**Temp.Offs.**“ you can enter an offset for the temperature value.

> Select „**Temp.Offs.**“.

An input dialog allows you to set up the offset. This value can be positive or negative.

Via **(CONF +1)** or **(LOG -1)** you selected the desired setting.

(ON/OFF) confirms and saves your setting.

(MEAS) terminates the entry dialog without transferring the value.

8.6.2.3 Two point calibration

> You will be prompted to immerse the sensor into the *first calibration medium* (ambient air).

Confirm this dialog with **(ON/OFF)**. The currently measured values will be displayed.
If the measured values (conductivity + temperature!) are in a stable condition,
reconfirm by pressing **(ON/OFF)**.

> You will be prompted to enter a nominal value (temperature-corrected buffer value!).

Via **(INFO)** or **(CAL)** you select the position to change.

Via **(CONF +1)** or **(LOG -1)** you change the position.

(ON/OFF) confirms and saves your setting.

(MEAS) terminates the entry dialog without transferring the value.

> You will be prompted to immerse the sensor into the *second calibration medium*.

Perform the same steps as with the first calibration solution

9 Meter PLF40

9.1 Areas of use PLF40

The PLF40 is used to determine electrical conductivity, salinity and temperature and combines the advantages of a compact design with the precision and comfort of a lab meter. Simultaneous conductivity, salinity and temperature measurement, high measurement accuracy, multi-functional display, integrated data logger and a robust aluminum housing mark this meter.

9.2 Composition PLF40

The PLF40/Set includes the meter with accessories and the conductivity sensor LTC0,35/23-K010-U. This combination meets the requirements to determine the conductivity; electro-chemical process as per EN 27888:1993. When connected to the sensor, the meter will capture the conductivity in μS or mS , the temperature as well as the salinity simultaneously.

All Meinsberg Conductivity Sensors are available with fixed cable and connector BK. The description of the used conductivity sensor is listed in the separate instructions for use for the sensor.



9.3 Configuration PLF40

9.3.1 Basic settings

Via **(CONF)** you will go to the menu item „**Configuration**“.


 The entire structure of the menu **(CONF)** is displayed graphically in  chapter 3.4.

The following device-relevant basic settings can be configured:

data logger	→	Data logger ( chapter 5)
temperature	→	Temperature
main value	→	main value
general	→	General ( chapter 4)

9.3.2 Configuration of the fixed temperature

The measured conductivity value can be put out temperature-compensated. For this, the temperature of the measuring and calibration media must be measured or set up as a fixed temperature.

 If the fixed temperature is activated, it is used for temperature compensation.

> The message „**FIX**“ will appear in the top right side of the display.

> Configuration of the fixed temperature:

„**Temperature**“ > „**Fixed temperature**“ >, then select **activate** / **deactivate**.
„**Temperature**“ > „**Temp. value**“ >, then select the fixed temperature value.

Via **(INFO)** or **(CAL)** you select the position to change.

Via **(CONF +1)** or **(LOG -1)** you change the position.

(ON/OFF) confirms and saves your setting.

(MEAS) terminates the entry dialog without transferring the value.

9.3.3 Configuration of the measuring range „M range“

> Configuration of the measuring range:

First select the „**M range**“, then the measuring range.

The measuring range has 7 settings on the meter.

Measuring range	Main measured variable	Secondary measured variable
200μS ¹⁾	LF	Saline
2000μS ¹⁾	LF	Saline
20mS ¹⁾	LF	Saline
500mS ¹⁾	LF	Saline
20μS ^{2) 3)}	LF	Resist
2μS ^{2) 4)}	LF	Resist
200μS ^{2) 3)}	LF	Resist

Auto > automatically selects the suitable measuring range

TDS ⁵⁾ > shows the TDS value as a secondary variable

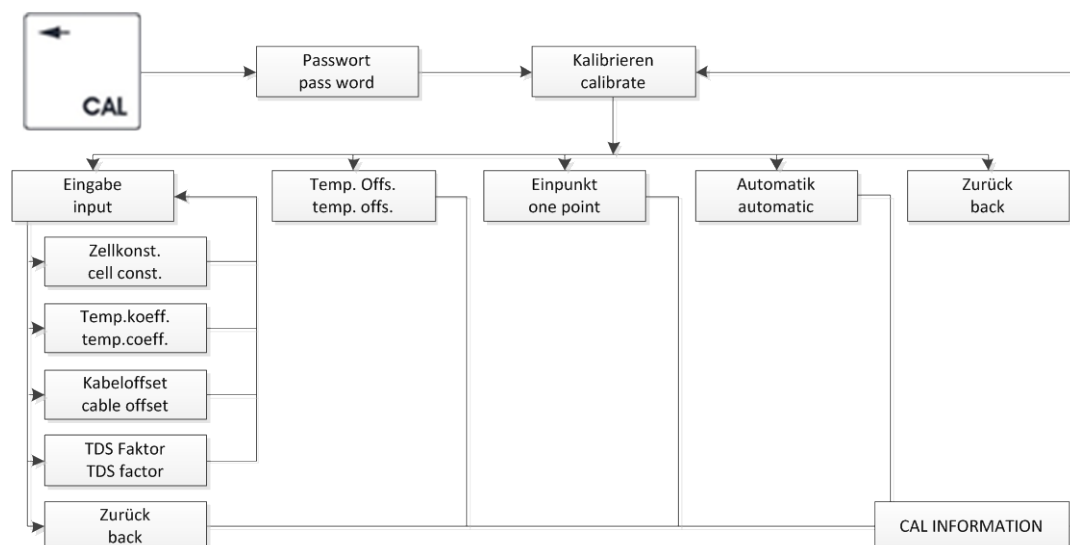
Resist.⁵⁾ > shows the resistance value as a secondary variable

- 1) Measuring range switching possible
- 2) Measuring range switching requires a special sensor (measuring ranges are purest water). This sensor must be ordered separately.
- 3) Used cell constant $0,1 \text{ cm}^{-1}$
- 4) Used cell constant $0,01 \text{ cm}^{-1}$
- 5) Measuring range switching also takes place automatically

Via (**CONF +1**) or (**LOG -1**) you selected the desired setting.
(ON/OFF) confirms and saves your setting.
(MEAS) terminates the entry dialog without transferring the value.

9.4 Calibration method Conductivity

9.4.1 Menu structure



9.4.2 Calibration


Select (**CAL**) to get to the menu item „**Calibration**“ and then on to the **Calibration menu**:

> The calibration procedures for the respective sensor type are displayed.

Choose your desired calibration procedure by selecting the respective menu item.

 **The sensor must be thoroughly cleaned with distilled or deionized water prior to and between every measurement.**

Immerse the sensor into the calibration solution and wait until a stable measured value is reached.

 Ensure that the calibration medium is mixed properly and watch for the temperature balance.

9.4.2.1 Data input

Under menu item „**Input**“, you can enter and change the specific characteristics of the connected sensor, e.g. ones that were previously defined in the lab, individually.

> Select the respective submenu item for which the settings should be changed.

Zellkonst.	→	Cell constant
nLF/LIN Tempkoef.	→	Temperature compensation + temperature coefficient
Kabeloffset.	→	Cable offset
TDS Faktor	→	TDS factor

An input dialog will allow you to change the respective calibration/sensor values and their respective limits. If these are not reached or exceeded, there will be an error message, which will ask you to enter a value within these limits.

The temperature compensation can be set as follows:

Lin:	Linear temperature compensation with adjustable temperature coefficient
nLF:	non-linear temperature compensation (for natural waters as per DIN EN 27888)
out:	For measurements without temperature compensation, the temperature coefficient must be set to „0 %/K“ under LIN.

Via (**INFO**) or (**CAL**) you select the position to change.

Via (**CONF +1**) or (**LOG -1**) you change the position.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

9.4.2.2 Temperature offset

Under menu item „**Temp.Offs.**“ you can enter an offset for the temperature value.

> Select „**Temp.Offs.**“.

An input dialog allows you to set up the offset. This value can be positive or negative.

Via (**CONF +1**) or (**LOG -1**) you selected the desired setting.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

9.4.2.3 One point calibration

The measuring signal will be calibrated at this one point by means of a defined calibration solution or with a known nominal value, e.g. via an independent procedure or a lab/field device.

> Sie werden aufgefordert, den Sensor in das Kalibriermedium zu tauchen.

Confirm this dialog with (**ON/OFF**). The currently measured value is displayed.

If the measured value is in stable condition, reconfirm the dialog box with (**ON/OFF**).

> You will be prompted to enter a nominal value.

Via (**CONF +1**) or (**LOG -1**) you selected the desired setting.

(**ON/OFF**) confirms and saves your setting.

(**MEAS**) terminates the entry dialog without transferring the value.

This completes the calibration process. The new calibration value will be saved in the device.

9.4.2.4 Automatic calibration

The automatic calibration of the conductivity sensor is a one point calibration with automatic buffer detection.

The following conductivity calibrations are archived:

0.01 N KCl: 1.41 mS/cm (25 °C)
0.1 N KCl: 12.9 mS/cm (25 °C)

> You will be prompted to immerse the sensor into the calibration medium.

Confirm this dialog with (**ON/OFF**). The currently measured values will be displayed.
If the measured values (conductivity + temperature!) are in a stable condition,
reconfirm by pressing (**ON/OFF**).


This completes the calibration process. The new calibration value will be saved in the device.

 If the calibration is faulty, an error message will be displayed (see  chapter 9.4.2.5).

9.4.2.5 Calibration error

The limits for all calibration values are saved in the meter. If the entered values are outside these limits, one of the following error messages will be displayed:

„!Incorrect entry!“ or „!Calibration error!“.

 You may have to repeat the calibration, service the sensor or replace it (wear part!).

10 Scope of delivery

PTM40/Set	Lab pH meter Power supply, Tripod pH Combination Electrode EGA142-K010-U-X 2x 50 ml buffer solution pH 4.01; 6.86 (25 °C)
PLF40/Set	Lab conductivity meter Power supply, Tripod Conductivity Cell LTC0,35/23-K010-U 50 ml calibration solution 0.1 N KCl (12.9 mS/cm at 25 °C)

11 Accessories

Tripod set TMG	adapter, rod and electrode holder for PTM40/PLF40
Power supply TMG	extended range power supply for PTM40/PLF40
Interface HMG USB	USB cable with data transfer software for PTM40/PLF40
Interface TMG Printer	USB cable with data transfer to a printer for PTM40/PLF40
pH Combination Electrode EGA142-K010-U-X	plastic shaft, gel electrolyte, 2 ceramic frits, built-in temperature sensor Pt 1000, 1 m fixed cable with 6 pole connector BK, length 120 mm, Ø 12 mm, -5...+80 °C
Conductivity Measuring Cell LTC0,35/23-K010-U	plastic shaft, sensor material graphite, cell constant 0.33 cm ⁻¹ 4-electrode technology, built-in temperature sensor Pt 1000, 1 m fixed cable with 6 pole connector BK, length 120 mm, Ø 12 mm, -5...+80 °C

12 Maintenance



The meter must never be cleaned with an aggressive solvent (such as acetone)!



Do not use stiff brushes or metal objects!



Wipe the meter down with a moist, lint-free cloth every once in a while.



For the maintenance and storage of the sensors and fittings to be connected, the notes and regulations in the respective instructions and data sheets apply.

13 Guarantee

We provide guarantee for the device described for two years from the date of purchase. This guarantee covers manufacturing faults being discovered within the mentioned period of two years. Claim under guarantee covers only the restoration of functionality, not any further claim for damages or financial loss. Improper handling/use or illegitimate opening of the device results in loss of the guarantee rights. The guarantee does not cover wear parts. The breach of glass parts is also excluded. To ascertain the guarantee liability, please return the instrument and proof of purchase together with the date of purchase freight paid or prepaid.

14 Recycling and Disposal

The meter and his packaging are manufactured as far as possible from materials which can be disposed of environmental-friendly and recycled in a technically appropriate manner.



Please note: The main printed board carries a lithium battery. Batteries should not to be disposed of with the normal domestic waste. They will be taken back and recycled or disposed of properly by the manufacturer at no cost.

If you have any question regarding disposal, please contact Sensortechnik Meinsberg.
For more information: <http://www.meinsberg.de/en/weee>

15 Service and Returns



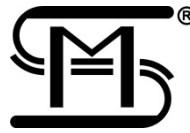
Manufacturer:

Xylem Analytics Germany GmbH

Dr.-Karl-Slevogt-Straße 1
D-82362 Weilheim
Germany

Service and Returns:

Xylem Analytics Germany Sales GmbH & Co. KG



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