Measuring Mode

After the operating voltage has been connected, the analyzer auto-
matically goes to "Measuring" mode. To call the measuring mode from
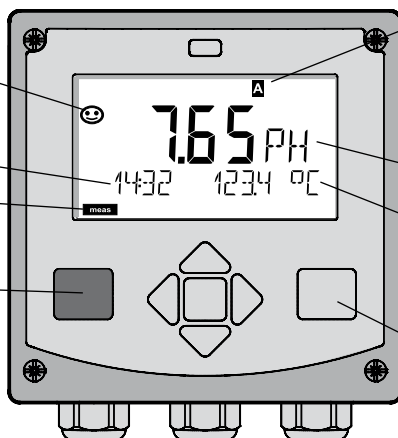another operating mode (e.g. Diagnostics, Service):
Hold **meas** key depressed (> 2 s).

Sensoface indicator
(sensor status)

Time

Mode indicator
(measuring)

Hold **meas** key
depressed
for calling the
measuring mode
(pressing it once
more switches the
display

Active
parameter set
(configuration)

Process
variable

Temperature

enter key

In measuring mode the display indicates:
• Measured value and time (24/12 h AM/PM) as well as temperature in
  °C or °F (formats selected during configuration)
By pressing the **meas** key in measuring mode you can view the
following displays (for approx. 60 sec):
• Measured value and selection of parameter set A/B (if configured)
• Measured value and tag (point of measurement designation
  – entered during configuration)
• Time and date

Pressing the **enter** key shows the output currents. They are displayed
as long as **enter** is held depressed, then the measured-value display
will return after 3 sec.

⚠ The analyzer must be configured for the respective measure-
ment task!

Keypad

Key	Function
meas	• Return to last menu level • Directly to measuring mode (press > 2 s)
info	• Retrieve information • Show error messages

enter	• Configuration: Confirm entries,
	  next configuration step
	• Calibration:
	  Continue program flow
	• Measuring mode: Display output current

Arrow keys up / down	• Measuring mode: Call menu • Menu: Increase/decrease a numeral • Menu: Selection
Arrow keys left / right	• Measuring mode: Call menu • Menu: Previous/next menu group • Number entry: Move between digits

Sensocheck, Sensoface Sensor Monitoring

Sensocheck continuously monitors the sensor and its wiring.
Sensocheck can be switched on/off (default: off).

Sensoface provides information on the sensor condition.
Asymmetry potential, slope, and response time are evaluated
during calibration. The three Sensoface indicators provide
the user with information on wear and required maintenance
of the sensor.

Selecting the Mode / Entering Values

To select the operating mode:

1) Hold **meas** key depressed (> 2 s) (measuring mode).
2) Press any arrow key: the selection menu appears
3) Select operating mode using left / right arrow key
4) Press **enter** to confirm the selected mode

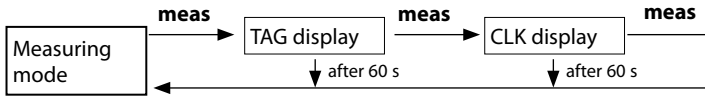Selection menu

Selected mode (blinks)
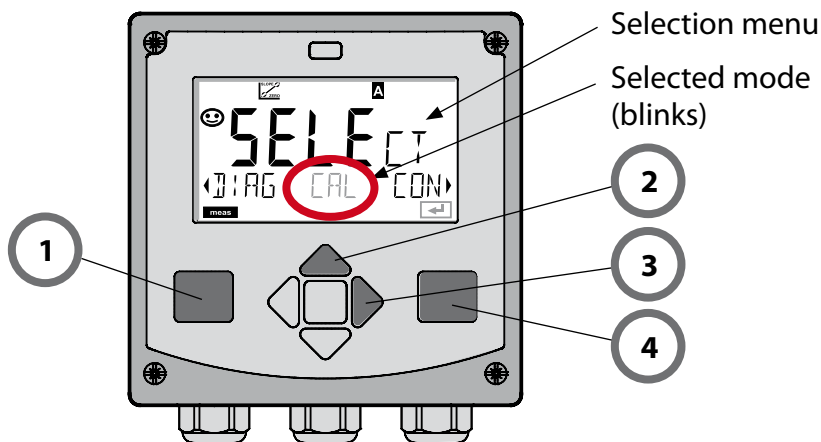
To enter a value:

5) Select numeral: left / right arrow key
6) Change numeral: up / down arrow key
7) Confirm entry with **enter**
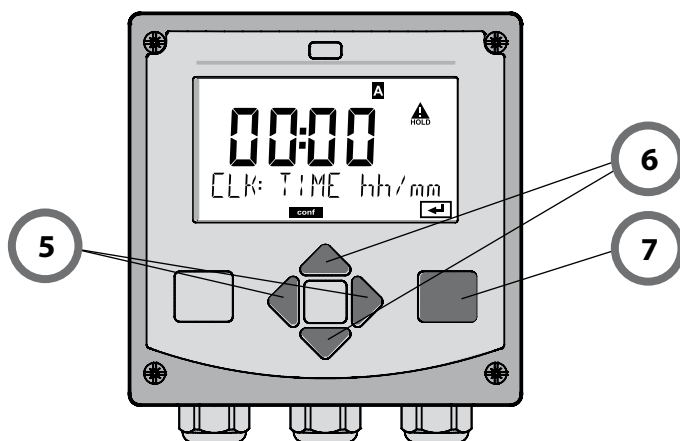
Operating Modes / Functions

meas → TAG display → **meas** → CLK display → **meas**

Measuring mode

after 60 s   after 60 s

Pressing any arrow key opens the selection menu.
Select the menu group using the left/right arrow keys.
Press **enter** to open a menu. Press **meas** to return.

DIAG		
	CALDATA	Display of calibration data
	SENSOR	Display of sensor data
	SELFTEST	Self test: RAM, ROM, EEPROM, module
	LOGBUCH	100 events with date and time
	MONITOR	Display of measured values (mV_pH, mV_ORP, RTD, resistances of glass electrode, reference electrode)
	VERSION	Display of software version, model designation, serial number

HOLD	
	Manual activation of HOLD mode, e.g. for sensor replacement. The signal outputs behave as configured (e.g. last measured value, 21 mA)

CAL		
	CAL_PH	pH adjustment (as configured)
	CAL_ORP	ORP adjustment
	P_CAL	Product calibration
	ISFET-ZERO	Zero adjustment
	CAL_RTD	Adjustment of temperature probe

CONF		
	PARSET A	Configuring parameter set A
	PARSET B	Configuring parameter set B

SERVICE		
(Access via code, factory setting: 5555)	MONITOR	Display of measured values for validation (simulators)
	OUT1	Current source, output 1
	OUT2	Current source, output 2
	RELAIS	Relay test
	CONTROL	Controller: manual specification of controller output
	IRDA	Activating the IrDA interface
	CODES	Specifying access codes for operating modes
	DEFAULT	Reset to factory setting
	OPTION	Enabling an option via TAN

Overview of Configuration

The configuration steps are assigned to different menu groups.
With the left/right arrow keys you can jump between the individual menu groups.
Each menu group contains menu items for setting the parameters.
Pressing **enter** opens a menu item. The values are edited using the arrow keys. Pressing **enter** confirms/stores the settings.
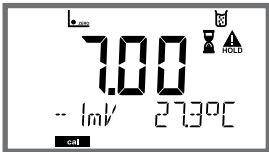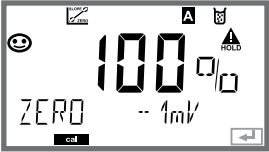Return to measurement: Hold **meas** key depressed (> 2 s).
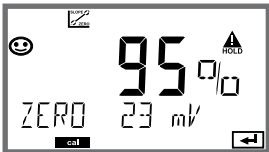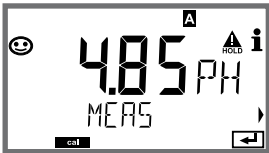
Select menu group	Menu group	Code	Display	Select menu item
	Sensor selection	SNS:	ConF SENSOR	**enter**
		Menu item 1		**enter**
		⋮		**enter**
		Menu item ...		**enter**
	Current output 1	OT1:	ConF OUT1	**enter**
▶	Current output 2	OT2:	ConF OUT2	
▶	Compensation	COR:	ConF CORRECTION	
▶	Alarm mode	ALA:	ConF ALARM	◀
▶	Setting the clock	CLK:	ConF CLOCK	◀
▶	Point of measurement	TAG:	ConF TAG	

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Automatic Calibration (Calimatic)

The AUTO calibration mode and the type of temperature detection are selected during **configuration**. Make sure that the buffer solutions used correspond to the configured buffer set. Other buffer solutions, even those with the same nominal values, may demonstrate a different temperature response. This leads to measurement errors.

Display	Action	Remark
☺SELEᴄᴛ ◁ᴅɪᴀɢ ᴄᴀʟ ᴄᴏɴ▷ meas	Select Calibration. Proceed with **enter.**	
CAL ◁ ᴄᴀʟ_ᴘʜ ▷ cal	Ready for calibration. Hourglass blinks. Select calibration method: CAL_PH Proceed with **enter.**	Display (3 sec) Now the device is in HOLD mode.
CAL 1 142.1 27.3°C cal	Remove the sensor and temperature probe, clean them, and immerse them in the first buffer solution (in any order). Start with **enter**	When manual input of temperature has been configured, the temp value in the display blinks and can be edited using the arrow keys.
CAL 1 -- -- -- cal	Buffer recognition. While the "hourglass" icon is blinking, the sensor and temperature probe remain in the first buffer solution.	The response time of the sensor and temperature probe is considerably reduced when the sensor is first moved about in the buffer solution and then held still.
7.00 --- ʙᴜꜰꜰᴇʀ --- cal	Buffer recognition terminated, the nominal buffer value is displayed, then zero point and temperature.	

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Display	Action	Remark
	Stability check. The measured value [mV] is displayed, "CAL2" and "enter" are blinking. Calibration with the first buffer is terminated. Remove the sensor and temp probe from the first buffer solution and rinse them thoroughly. **Use the arrow keys to select:** • END (1-point cal) • CAL2 (2-point cal) • REPEAT Proceed with **enter.**	Please note: Stability check can be stopped after 10 sec (by pressing **enter**). However, this reduces calibration accuracy. Display for 1-point cal: Sensoface is active. End with **enter**
	2-point calibration: Immerse sensor and temperature probe in the second buffer solution. Start with **enter**	The calibration process runs as for the first buffer.
	Retract sensor and temp probe out of second buffer, rinse off, re-install. Proceed with **enter.**	The slope and asymmetry potential of the sensor (based on 25 °C) are displayed.
	Use the arrow keys to select: • MEAS (end) • REPEAT Proceed with **enter.** End: HOLD is deactivated with delay.	When 2-point cal is ended:

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Product Calibration (pH)

Calibration by sampling (one-point calibration).
During product calibration the sensor remains in the process.
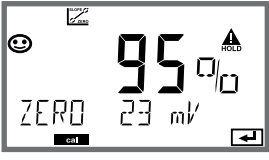The measurement process is only interrupted briefly.

Procedure:
1) The sample is measured in the lab or directly on the site using a portable meter. To ensure an exact calibration, the sample temperature should correspond to the measured process temperature.
   During sampling the device saves the currently measured value and then returns to measuring mode. The "calibration" mode indicator blinks.
2) In the second step you enter the measured sample value in the device. From the difference between the stored measured value and entered sample value, the device calculates the new asymmetry potential.

If the sample is invalid, you can take over the value stored during sampling. In that case the old calibration values are stored. Afterwards, you can start a new product calibration.

Display	Action	Remark
CAL P_CAL	Select product calibration. Proceed with **enter.**	If an invalid code is entered, the device returns to measuring mode.
CAL PRODUCT STEP 1	Ready for calibration. Hourglass blinks. Select calibration method: P_CAL Proceed with **enter.**	Display (3 sec) Now the device is in HOLD mode.
4.73 PH STORE VALUE	Take sample and save value. Proceed with **enter.**	Now the sample can be measured in the lab.

Display	Action	Remark
4.73 PH 1323 27.4°C meas cal	The device returns to measuring mode.	From the flashing CAL mode indicator you see that product calibration has not been terminated.
CAL PRODUCT STEP 2 cal	Product calibration step 2: When the sample value has been determined, open the product calibration once more (P_CAL).	Display (3 sec) Now the device is in HOLD mode.
4.87 PH 2 LAB VALUE cal	The stored value is displayed (blinking) and can be overwritten with the measured sample value. Proceed with **enter.**	
95 % ZERO 23 mV cal	Display of new asymmetry potential (based on 25°C). Sensoface is active. To end calibration: Select MEAS, **enter**	To repeat calibration: Select REPEAT, then **enter**
End of calibration	After end of calibration, the outputs remain in HOLD mode for a short time.	

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Error Messages

Error	Info text (is displayed in case of fault when the Info key is pressed)	Problem Possible causes
ERR 99	DEVICE FAILURE	**Error in factory settings** EEPROM or RAM defective This error message only occurs in the case of a total defect. The device must be repaired and recalibrated at the factory.
ERR 98	CONFIGURATION ERROR	**Error in configuration or calibration data** Configuration or calibration data defective; completely reconfigure and recalibrate the device.
ERR 97	NO MODULE INSTALLED	**No module** Please have the module replaced in the factory.
ERR 96	WRONG MODULE	**Wrong module** Please have the module replaced in the factory.
ERR 95	SYSTEM ERROR	**System error** Restart required. If error still persists, send in the device for repair.
ERR 01	NO SENSOR	**pH sensor *** Sensor defective Sensor not connected Break in sensor cable
ERR 02	WRONG SENSOR	**Wrong sensor ***
ERR 03	CANCELED SENSOR	**Sensor devaluated ***

Error	Info text (is displayed in case of fault when the Info key is pressed)	Problem Possible causes
ERR 04	SENSOR FAILURE	**Failure in sensor ***
ERR 05	CAL DATA	**Error in cal data ***
ERR 10	ORP RANGE	**ORP display range exceeded** < -1999 mV or > 1999 mV
ERR 11	PH RANGE	**pH display range exceeded** < -2 or > 16
ERR 12	MV RANGE	**mV range**
ERR 13	TEMPERATURE RANGE	**Temperature range violation**
ERR 15	SENSOCHECK GLASS-EL	**Sensocheck glass**
ERR 16	SENSOCHECK REF-EL	**Sensocheck ref.**
ERR 60	OUTPUT LOAD	**Load error**
ERR 61	OUTPUT 1 TOO LOW	**Output current 1** < 0 (3.8) mA
ERR 62	OUTPUT 1 TOO HIGH	**Output current 1** > 20.5 mA
ERR 63	OUTPUT 2 TOO LOW	**Output current 2** < 0 (3.8) mA
ERR 64	OUTPUT 2 TOO HIGH	**Output current 2** > 20.5 mA
ERR 69	TEMP. OUTSIDE TABLE	**Temperature** value outside table
ERR 100 ...255	VOID PARAMETER	**Invalid parameter**

*) ISM® sensors