Manual
SPI Mobile

Versie V1.01 concept

Contents

General information

The SPI Mobile is an innovative and versatile device for water analysis, specifically designed for use in swimming pool water. This advanced device quickly and accurately measures key parameters:

- Free available chlorine
- Total chlorine
- pH
- Hydrogen peroxide

This manual is intended for all SPI Mobile users, such as pool staff, installers, laboratories, etc. Read this manual carefully to ensure proper use of the device. Ensure the manual is accessible to every user. If you encounter any problems, please contact your dealer.

Warranty limitation

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1. Introduction

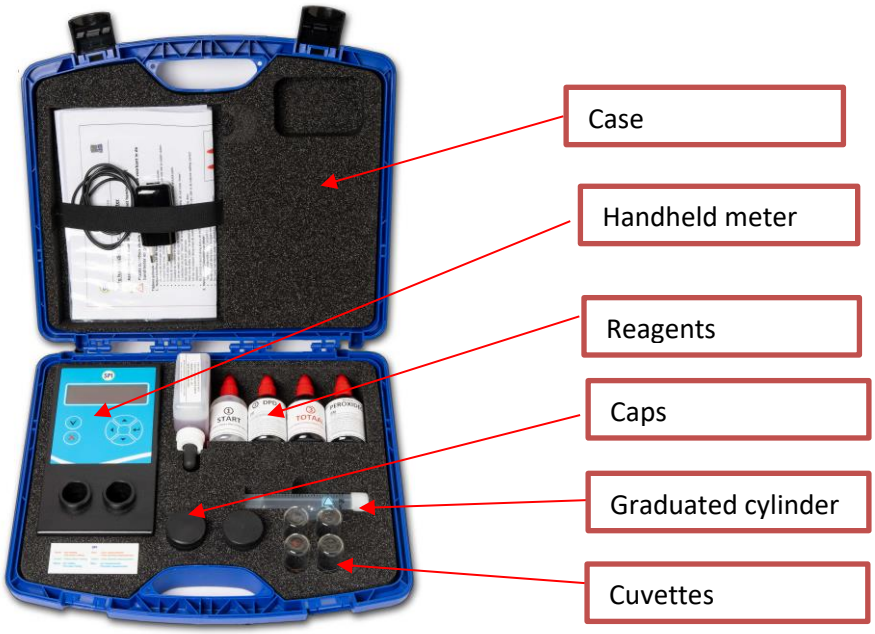
1.1 General description of the SPI Mobile

The SPI Mobile handheld meter is a device for measuring chlorine, pH, and peroxide levels. The device operates on the colorimetric principle and therefore complies with the ISO standard 7393/2. It is specifically designed for field use. Its compact design and built-in rechargeable battery make it very easy to use.
The device features:

- Clear graphic display (adjustable)
- Splashproof keypad
- Rechargeable battery with USB-C charger
- Dual measuring shaft
- Digital sensors
- Bi-color LED with diffuser
- Automatic shut-off after 20 minutes

De SPI Mobile handheld meter is supplied in a case and consists of:

- 2 caps
- 4 cuvettes (two red, one blue and one green)
- reagents :
  - 50 ml Start
  - 50 ml DPD 1
  - 50 ml Totaal 2
  - 50 ml Peroxide color
  - 100ml Phenol red
- 1x 30ml graduated cylinder
- 1 manual
- 1 net adapter and USB-C charging cable



1.2 General warnings

- The handheld meter has a splash-proof keypad but is not completely waterproof. Prevent water from entering the test chambers. This can cause malfunctions.
- After measuring ensure that the cuvettes are rinsed with water.
- Store the cuvettes dry and clean when not in use.
- Return used cuvettes to their original location in the case to prevent damage. This can disrupt the measurement.

Use of reagent
De SPI Mobile uses liquid reagents.

- The measuring liquids are chemical products, so handle them with care.
- Immediately wipe up any spilled liquid with kitchen paper. Do not leave any reagent residue on the device. This will discolour over time.
- Reagents should preferably be stored in a cool, dark place and clearly labelled.
- Dispose of reagents as chemical waste.

1.3 Technical specifications

The handheld meter is suitable for measuring the following parameters:

- Free available chlorine
- Total chlorine
- pH
- Hydrogen peroxide

Specifications of the parameters to be measured:

Measurements	Method	Range	Accuracy
VBC	DPD	0-2 mg/l	+/- 0.03 mg/l
Tot. Cl	DPD	0-2 mg/l	+/- 0.03 mg/l
pH	Phenol red	6.8- 8.0 pH	+/- 0.1 pH
Peroxide	Peroxide color	0-10 ppm	+/- 0.1 mg/l
Peroxide	Peroxide color	15-100 ppm*	+/- 5 mg/l

*The accuracy of the peroxide measurement decreases above 50 mg/l. Therefore, we recommend a ½ dilution above 50 mg/l.
These accuracies are based when you take care of all procedures described in this manual.

During the measurement, results may be affected by light. Always use the two caps to seal the cuvettes during the measurement procedure.

- Environment: 5-40°C
- Battery: 5V/3700mAh, approximately 80 hours of measurement
- Connection: USB-C (for charging and data communication)
- Dimensions (device): 195 x 105 x 35mm, 440 grams
- Dimensions (case): 350 x 310 x 85mm
- Auto-off: 20 min.
- Language: Dutch, English, French

2. Operation

2.1 Keyboard explanation

All actions can be performed using the keyboard. Navigate through the menu structure using the navigation arrows. The table below explains the six keys in more detail.

Key	Description
(▲)	cursor up
(▼)	cursor down
(◀)	a step back
(↵)	"Enter" confirm the selection
(✓)	3sec. = “ON” / short = Confirm selection, save measurement during measurement
(×)	3sec. = “OFF” / short = Cancel selection

Turn the meter on by briefly pressing (✓)**.**
Turn the meter off by briefly pressing **(×).**

2.2 Selecting a choice

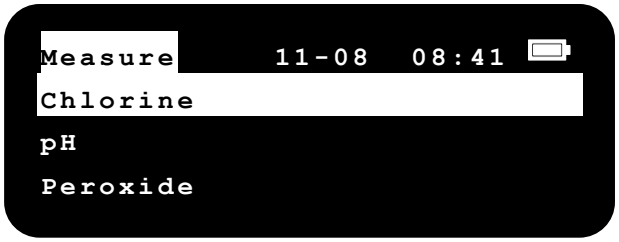
You can make selections in the various menus by moving the selection bar with one of the navigation keys **(▲)** and **(▼)**.

Confirm the selection by pressing 'enter' key **(↵)** or **(✓)** . In the example above, we have chosen to go to the **[History]** menu. You can go back one screen using the **(◀)** or (×) key.

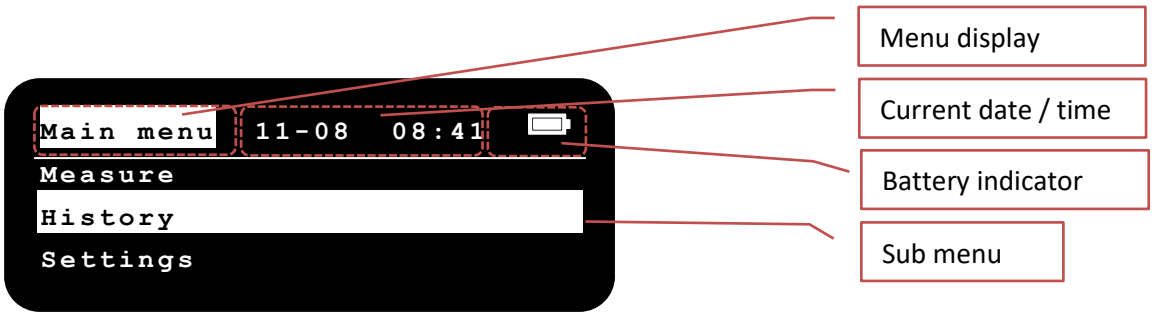
The next chapter explains the different menus in more detail.

3. Menu structure

Turn on the meter by pressing [V] for 3 seconds. The meter will start up with the SPI logo and go directly to the [Measure] menu. This allows you to quickly start a measurement.



To navigate to the main menu, press **(◀) .** The meter jumps to the menu below:



The main menu allows you to select all important functions of the SPI Mobile and contains three submenus. Move the cursor **(▲)** / **(▼)** up or down to navigate through the different submenus. The main menu consists of three submenus.

Menu	Explanation
Measure	Measuring chlorine, pH or peroxide
History	History logbook of measurements
Settings	Setting the date/time, display brightness and language

3.1 Measure

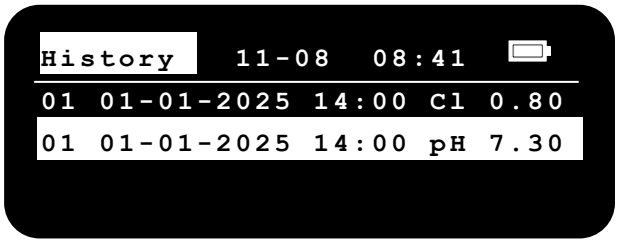
The **[Measure]** menu shows the parameters that can be measured with the device:

- Chlorine
- pH
- Peroxide

Move the cursor **(▲)** / **(▼)** up or down to navigate through the different menus

3.2 History

The **[History]** menu displays the saved measurement data, including the date and time. The logbook contains the last 100 saved measurement points.



Move the cursor **(▲)** / **(▼)** up or down to cycle through the different measurements.

3.2 Settings

The **[Settings]** menu displays all user parameters that can be configured:

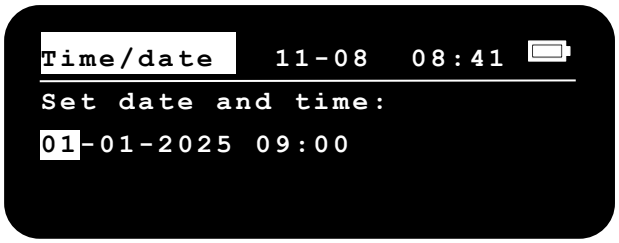
- Time & Date
- Brightness
- Language

Move the cursor **(▲)** / **(▼)** up or down to navigate through the different menus

3.3.1 Time & date settings

Choose the option **[time & date]** to set the date and time correctly.

The following screen will appear:



The date display is: *dd-mm-yyyyj* and for the time : *hh:mm*.

1. Use **(◀)** / **(↵)** to navigate between the day, month, and year.
2. Change the day, month, or year with **(▲)** / **(▼)**.
3. If all values are set correctly, confirm the settings with **(✓)**.
4. The display returns to the **[Settings]** menu.

Remark : If the change does not need to be implemented, press **(◀)** or (×) key to return to the menu **[Settings].**

3.3.2 Brightness

Select the **[brightness]** option to adjust the display's readability. Reducing the brightness saves energy consumption.

The bar on the screen indicates the display brightness.
Use **(▲)** / **(▼)** or **(◀)** / **(↵)** to adjust the brightness up or down, and confirm the settings with **(✓)**.

Note : If the change does not need to be implemented, press **(◀)** or (×) key to return to the menu **[Settings].**

3.3.3 Language

Select the **[Language]** option to set the language of the handheld meter.

Use **(▲)** / **(▼)** to adjust the language confirm with **(✓)**.

Note : If the change does not need to be implemented, press **(◀)** or (×) key to return to the menu **[Settings].**

4. Measure

4.1 Measuring chlorine

Turn on the meter by pressing **(✓)** for 3 seconds, the meter starts up with the SPI logo and goes directly to the **[Measure]** menu.

Select the desired parameter **[CHLORINE]** with [↑] and [↓] and press 'enter' key **(↵)** or **(✓)**. Perform the relevant measurement step by step according to one of the procedures below.

Zero calibration:

1. Select the desired parameter **[CHLORINE]** with [↑] and [↓] and press 'enter' key **(↵)** or **(✓)**.
2. The meter shows **'Zero press [V]'** on the display.
3. Take two empty, clean cuvettes with a red mark and rinse them with the water to be measured.
4. Fill these two cuvettes with the water to be measured (blank) up to the first mark from the bottom of the cuvette.
5. Carefully dry the outside of the cuvette.
6. Place the cuvettes in both measuring channels with the mark facing you.
7. Then place the cap on both measuring channels.
8. Now press the **[V]** key to perform the zero calibration. The meter shows 'Zero...' on the display and after a few seconds '0.00' appears. The zero point has been set.

Note: If the zero point cannot be created, see Chapter 7 for tips and troubleshooting.

Measure free available chlorine:

1. Leave the cuvette in measuring channel 1 (with cap).
2. Remove the cuvette from measuring channel 2 and empty it.
3. Add 5 drops of "Start."
4. Add 5 drops of "DPD1."
5. Fill the cuvette to the first graduation mark (from the bottom) with the water to be measured.
6. Carefully dry the outside of the cuvette.
7. Place the cuvette in measuring channel 2 with the mark facing you.
8. Place the cap on measuring channel 2.
9. Read the value on the display within 10 seconds.

Measure total chlorine :

1. Leave the cuvette in measuring chamber 1 (with cap).
2. Rinse a cuvette with the green marking with the water to be measured.
3. Add 5 drops of "Total 2."
4. Add the (purple) solution of free chlorine you just measured.
5. Carefully dry the outside of the cuvette.
6. Place the cuvette in measuring chamber 2 with the mark facing you.
7. Place the cap on measuring chamber 2.
8. Press **(↵)** to start the timer and read the value on the display after 2 minutes.

Select the desired parameter **[pH]** with [🡅] and [🡇] and press 'enter' key **(↵)** or **(✓)**. Perform the relevant measurement step by step according to one of the procedures below.

4.2 Measure pH

Turn on the meter by pressing **(✓)** for 3 seconds, the meter starts up with the SPI logo and goes directly to the **[Measure]** menu.

Select the desired parameter **[pH]** with [🡅] and [🡇] and press 'enter' key **(↵)** or **(✓)**. Perform the relevant measurement step by step according to one of the procedures below.

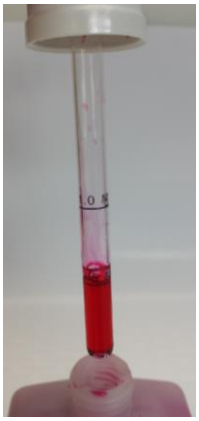
Zero calibration:

1. Select the desired parameter **[pH]** with [🡅] and [🡇] and press 'enter' key **(↵)** or **(✓)**.
2. The meter shows **'Zero press [V]'** on the display.
3. Take two empty, clean cuvettes with a red mark and rinse them with the water to be measured.
4. Fill these two cuvettes with the water to be measured (blank) up to the first mark from the bottom of the cuvette.
5. Carefully dry the outside of the cuvette.
6. Place the cuvettes in both measuring channels with the mark facing you.
7. Then place the cap on both measuring channels.
8. Now press the **[V]** key to perform the zero calibration. The meter shows 'Zero...' on the display and after a few seconds **'Low'** appears. The zero point has been set.

Note: If the zero point cannot be created, see Chapter 7 for tips and troubleshooting.

Measuring pH:

1. Leave the cuvette with red marking in measuring channel 1 (with cap).
2. Fill the included measuring cup with 25 ml of water to be measured (Photo 1).
3. Use the pipette take 0.5 ml of Phenol Red liquid from the 100 ml Phenol Red bottle (Photo 2).
4. Add this 0.5 ml of Phenol Red to the measuring cup (Photo 3).
5. Screw the cap on the measuring cup (Photo 4).
6. Gently turn the measuring cup three times to ensure good mixing (Photo 5). Then fill the cuvette with the blue marking to the first graduation mark (from the bottom) with the liquid from the measuring cup (Photo 6).
7. Carefully dry the cuvette on the outside.
8. Place the cuvette in channel 2 with the cap with the mark facing you.
9. Read the value on the display (within 10 seconds)

					
Foto 1	***Foto 2***	***Foto 3***	***Foto 4***	***Foto 5***	***Foto 6***

Note:

If the measurement falls outside the meter's range, the meter will display the following:
[High] if the pH is > 8.0 (red)
[Low] if the pH is < 6.8 (yellow)

In this case, use a pH electrode to determine the correct pH value.

6.5 Measure peroxide

Turn on the meter by pressing **(✓)** for 3 seconds, the meter starts up with the SPI logo and goes directly to the **[Measure]** menu.

Zero calibration:

1. Select the desired parameter **[PEROXIDE]** with [🡅] and [🡇] and press 'enter' key **(↵)** or **(✓)**.
2. The meter shows **'Zero press [V]'** on the display.
3. Take two empty cuvettes (one red marking and one with blue marking)and rinse them with the water to be measured.
4. Fill these two cuvettes with the water to be measured (blank) up to the first mark from the bottom of the cuvette.
5. Carefully dry the outside of the cuvette.
6. Place the cuvettes in both measuring channels with the mark facing you.
7. Then place the cap on both measuring channels.
8. Now press the **[V]** key to perform the zero calibration. The meter shows **'Zero...'** on the display and after a few seconds '0.00' appears. The zero point has been set.

Note: If the zero point cannot be created, see Chapter 7 for tips and troubleshooting.

Measuring peroxide:

1. Leave the cuvette in measuring channel 2 (with cap).
2. Remove the cuvette from measuring channel 1 and empty it.
3. Add 5 drops of "Peroxide color."
4. Fill the cuvette to the first graduation mark (from the bottom) with the water to be measured.
5. Carefully dry the outside of the cuvette.
6. Place the cuvette in measuring channel 1 with the mark facing you.
7. Place the cap on measuring channel 1.
8. Read the value on the display within 10 seconds.

5. Measurement errors and error messages

5.1 Preventing measurement errors

1. Insert the cuvette correctly into the measurement channels. Always align the colored markings with the "number" on the measurement channels.
2. The outer walls of the cuvettes must be clean and dry before doing a measurement. Fingerprints, drops, or condensation on the glass must be avoided.
3. Cuvettes must be thoroughly cleaned after each measurement. Do not use cleaning agents; use only a dry cloth.
4. Scratched or damaged cuvettes must be replaced.
5. Always use the caps to protect the measurement channels from incoming light.
6. Temperature fluctuations can cause condensation in the measurement channels, which can lead to incorrect measurements. Allow the meter to acclimatize if necessary.
7. Ensure the measurement channels remain dry. Ingress of moisture can damage the electronics.
8. After use, remove the cuvettes from the measurement channels and always rinse them clean.
9. Have the hand meter checked and calibrated annually. Contact your dealer for this.

5.2 Error messages

Low	Measurement is lower than the measuring range
High	Measurement is higher than the measuring range
L CH zero	Sensor sees no light, check measuring channel 1
R CH zero	Sensor sees no light, check measuring channel 2
Meter won't turn on 	The battery needs to be charged. Connect the included power adapter with the USB-C cable. Once the meter is charging, the plug symbol will appear on the display. A full charge takes approximately 8 hours.

Note: If the hand meter is defective and the above tips do not provide a solution, please contact your dealer.

6. Safety measures

The reagents included are chemical products. Observe the following safety precautions:

- R/36/37/38 Irritating to eyes, respiratory system, and skin.
- S2 Keep out of reach of children.
- S20 Do not eat or drink when using.
- S45 In case of accident or if you feel unwell, consult a doctor immediately.

- Avoid contact with eyes and skin.
- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- If swallowed, seek medical advice immediately.

7. Disposal/ environment

The handheld meter contains materials that can be reused or recycled. To reduce environmental waste, a discarded meter can be returned to the dealer.

8. Spareparts and accessories

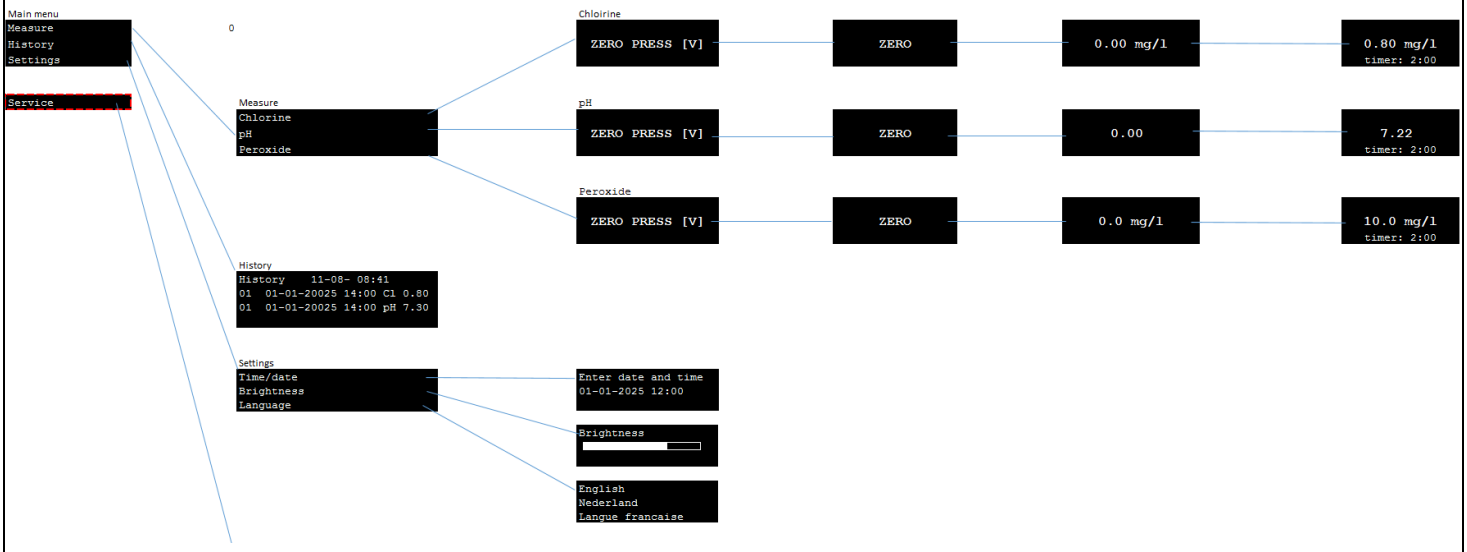
8.1 Spare parts

Article	Description
3530210	Cuvette blue for handheld meter
3530211	Cuvette red for handheld meter
3530212	Cuvet green for handheld meter
3530200	Case, incl. foam rubber insert (renewed)
9920543	Measuring cup for SPI handheld meter D141 30ml
3530306	Peroxidecolor liquid 50ml
3599050	Start liquid 50ml
3599051	Totaal 2 liquid 50ml
3599082	DPD liquid 50ml
3599183	Phenol Red liquid 100ml + pipette

8.2 Accessories

Image	Article	Description
	3599050	Start for handheld meter 50 ml
	3504005	Start for handheld meter 1 ltr
	**3599082**	DPD for handheld meter 50 ml
	3504002	DPD A+B for handheld held meter 1 ltr
	3599051	Totaal 2 for handheld held meter 50 ml
	3504004	Totaal 2 for handheld held meter 1 ltr
	**3599183**	Phenol red for handheld meter 100 ml
	3504006	Phenol red for handheld meter 500 ml
	3530306	Peroxide color for handheld meter 50 ml
	3530308	Peroxide color for handheld meter 1 ltr
	9920543	Measuring cup for handheld meter
	3530033	Cap for handheld meter
	3530215	Cuvethouder voor SPI handheld meter
	3613300	Sampling bottle 300 ml
	3599310	SPI 170 brush for cleaning measuring cell (set of 4 pieces)

Appendix A : Menu structure



Notes

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