

HedoN

Electronic Developments B.V.

Soluble Salt Meter (SSM) Model HED7263902 User Manual




Firmware version 2.07
SSMLink version 1.03


TABLE OF CONTENT

1.	Introduction	2
2.	Specifications & Approvals	3
3.	SSM Description	5
4.	The SSM Kit	6
5.	Getting Started	7
5.1	Charging the Battery	7
5.2	Navigating the Menu	9
5.3	Turning the SSM on/off	9
5.4	Making Connections	10
5.5	Disconnecting	10
6.	SSM Setup	11
6.1	Adjusting the Date/Time Settings	11
6.2	Adjusting SSM Settings	11
6.3	Adjusting Measurement Settings	11
6.4	About	11
7.	Cleaning the SSM	12
7.1	Cleaning	12
7.2	Cleaning deposits on the sensors	15
8.	Data Control	16
8.1	Create a batch	16
8.2	Select a batch	17
8.3	View a Batch	17
9.	Taking a Reading	18
9.1	Taking a reading	18
9.2	Flush SSM	20
10.	Validation	20
10.1	The standard conductivity solution	21
10.2	Priming the SSM	21
10.3	Preparing a clean surface	22
10.4	Validation	22
11.	SSM Maintenance and Care	25
11.1	Packing Up	25
11.2	Service	25
11.3	Replacing the battery	26
11.4	Replacing the seal	26
11.5	Caring for Your SSM	27
12.	Troubleshooting Guide	28
13.	Warning	30
14.	Warranty	31
15.	Service and Repair	31

1. Introduction

This user manual covers information on the use of the Soluble Salt Meter (SSM). Please read the information carefully and observe all warnings and notes strictly in order to get the best out of your SSM.

In this manual, a warning sign  identifies conditions and actions that may influence the readings or could damage the SSM.

An info  sign identifies information that user should pay attention to.

2. Specifications & Approvals

Standards	Equivalent to ISO Standard 8502-9 (Field method for the conductometric determination of water-soluble salts; The Bresle method) in accordance with NACE SP0508-2008.
Measurement Area	1250 mm ² (circular) fixed footprint
Attachment Method	Magnetic with silicone seal (no effect on surface quality; proven to seal over deep pits)
Water Injection Method	Automated, with simple press of 3 ml fixed volume dispenser
Dose	3 ± 0.05 ml
Measurement Process Steps	5
Total Process Time	60 seconds (measurement to measurement)
Measurement Range	0-100 µS/cm
Measurement Resolution	1 µS/cm
Measurement Accuracy	± 3 µS/cm
Temperature Correction	Automated (except in the actual temperature mode)
Surface Temperature Range	5 – 50 °C (41 – 122 °F)
Ambient Temperature	5 – 50 °C (41 – 122 °F)
Temperature probe Accuracy	± 0,3 °C (± 0,54 °F)
Diameter of curvature:	
-Standard measuring head	>= 44 inch / 1100mm
-Measuring head 1	26 <=> 42 inch / 650 <=> 1050 mm
-Measuring head 2	14 <=> 24 inch / 350 <=> 600 mm
-Measuring head 3	8 <=> 12 inch / 200 <=> 300 mm
Readout	µS/cm or mg/m ²
Memory	Holds up to 1000 measurements (10 batches of up to 100 measurements each)
Connectivity	Via USB with PC or laptop
Power Supply	Lithium-ion rechargeable battery
IP Rating	IP54
Dimensions	21 x 10 x 8 cm Instrument only
Weight	780 gr. Instrument only

- ✓ United States Patent No. 6,946,844 was issued on 20 September 2005 covering this equipment. PCT application for additional patent is pending.
- ✓ Approved by US Navy for soluble salt determination in accordance with the Preservation Process Instruction (Core PPI).
- ✓ Tested by independent laboratories and approved by the United States Navy's Naval Sea Systems Command (NAVSEA) as an alternative method for conductivity measurements.
- ✓ Approved by the US Navy for soluble salt determination in NAVSEA Standard Item 009-32 (FY-10).

- ✓ Equivalent to ISO Standard 8502-6 *Extraction of soluble contaminants for analysis -- The Bresle method*.
- ✓ Can be used in lieu of the Bresle method with ISO Standard 8502-9 *Field method for the conductometric determination of water-soluble salts*.
- ✓ CE approved.
- ✓ Demonstrated equivalence to the ISO Standard 8502-9 "Field method for the conductometric determination of water-soluble salts" in accordance with NACE SP0508-2008.

3. SSM Description



- 1 MENU button
- 2 ENTER button
- 3 LCD screen
- 4 Green/Red LED
- 5 Piston

- 6 Silicone seal
- 7 Magnets
- 8 Plunger
- 9 Power/USB port with cover

4. The SSM Kit



Your basic SSM kit consists of:

1. Soluble Salt Meter.
2. Additional adaptor pieces (optional)
3. Bottle for deionized water.
4. 4 sachets of 84 $\mu\text{S}/\text{cm}$ standard solution.
5. 3 ml fixed volume fluid dispenser.
6. Extra seals.
7. Flexible plastic tubing to connect the SSM and dispenser.
8. Syringe for injection of validation solution.
9. Universal AC adapter (with instructions)
10. Plugs for universal AC adapter
11. USB connection cable
12. CD with manuals (not on photo)

5. Getting Started

5.1 Charging the Battery



Before using the SSM for the first time, charge the battery for 8 full hours. To charge the battery:

- 1) Plug the AC adapter into a power outlet.
- 2) Remove the protective plug from the underside of the SSM to expose the power and USB ports.
- 3) Connect power cord from AC adapter to the power port on the SSM.



When the SSM is turned on a power cord appears next to the battery indicator to indicate that the battery is charging.



When the SSM is turned off the SSM powers up when the adapter is connected to the SSM. The display of the SSM will not be turned of during charging.



Required charge time after normal use can vary; however, the battery takes no more than 8 hours to reach full capacity.



When charging, make sure that the universal adapter is set to 6V. Higher settings damages the SSM!

5.2 Changing adaptor pieces

1) To change an adaptor piece remove the 4 inbus screws and gently pull it off.

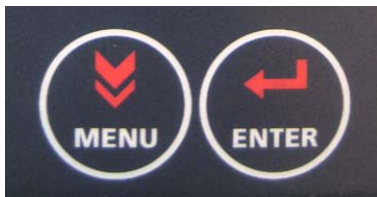


2) Put a little bit of the Vaseline from the kit on the seal as indicated below.



3) Fit the new adaptor and tighten the 4 inbus screws without using force.

5.3 Navigating the Menu



Navigating through the SSM is made simple by the use of only two buttons, *MENU* and *ENTER*. Press the *MENU* button to move down through a menu. Note that as you move through the menu options they are highlighted. Press the *ENTER* button to make a selection.

To change data entries (such as Contrast, Date/Time etc.):

- 1) Navigate through each option using the *MENU* button (current selection is highlighted).
- 2) Press *ENTER* to make the selection, the option un-highlights and slowly begin flashing to indicate that you are making changes).
- 3) Press the *MENU* button to scroll through the available settings.
- 4) Press *ENTER* to select the highlighted settings and exit the change mode.

5.4 Turning the SSM on/off

To power up the SSM, press and hold the *ENTER* button for five seconds.

After 5 seconds the LCD screen lights up and the start-up screen appears. During this start-up sequence the status indicator is red followed by green. Once the start-up is complete the Main Menu is displayed, offering four menu options: *Take reading*, *Data Control*, *Maintenance* and *Settings*. The battery life is displayed in the upper right hand corner of the display.



To turn the SSM off select *TURN OFF*



The SSM automatically turns off when no button has been pressed for 10 minutes.



In case of a low battery you see a warning prompting you to charge the battery and the SSM shuts off.



If the SSM is powered by the charger, the SSM will automatically turn on. Turning off while charging is not possible.

5.5 Making Connections

To connect the fluid dispenser for testing:

- 1) Unscrew the fluid dispenser from the bottle.
- 2) Fill the bottle with deionized water.
- 3) Screw the fluid dispenser tightly onto the bottle making sure the treads are aligned properly to prevent leakage.
- 4) Connect the flexible plastic tubing to the blue tube connector on the side of the fluid dispenser. (*the tube in the image below is not the actual length*)



- 5) Connect the other side of the flexible plastic tubing to the blue tube connector on the SSM.
- 6) Fill the dispenser by pulling upwards on the dispenser until it stops. Press the dispenser down completely to push fluid through the tubing. Repeat this procedure several times until the dispenser and tubing are completely free of air. Hold SSM over a rag or bucket as water is released from SSM chamber.

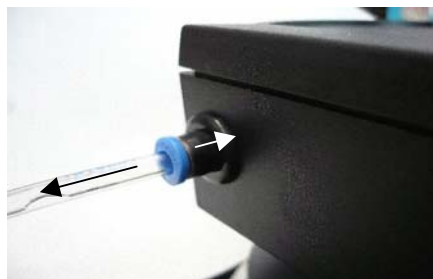


It is important to remove all air by pumping water through the tubing and out of the SSM chamber prior to testing. This helps to prevent air bubbles in test chamber which can negatively affect measurements.

5.6 Disconnecting

To disconnect the flexible plastic tube from the fluid dispenser or SSM:

- 1) Gently press the blue ring of the tube connector towards the connector. Hold the blue ring in this position while pulling the tube out of the connector



6. SSM Setup

Before your SSM is ready for use it has to be configured by making changes in the *Settings* Menu. The *Settings* Menu contains four submenu options: *Date/Time*, *Meter*, *Measurement* and *About*.

6.1 Adjusting the Date/Time Settings

The *Date/Time* menu allows the user to set the correct date, the format in which the date is displayed, and the time. The date and time can also be set with the use of SSMLink (see the SSMLink User Manual for more information).



If the SSM is powered up after a fully discharged battery, the SSM will prompt to check the date and time during the start-up sequence.



The date and time settings are used to label the data when stored in memory, it is important to check that they are set properly.

6.2 Adjusting SSM Settings

In the *Meter* menu you can:

- Adjust the contrast of the LCD display.
- Turn sound on/off.
- Set temperature units (°Fahrenheit or °Celsius).

6.3 Adjusting Measurement Settings

In the *Measurement* menu you can:

- Adjust the temperature compensation factor (default value is 2,0% per °C)
 - This factor determines the percentage by which conductivity readings are adjusted for every degree the solution being measured is above or below 25°C (77°F).
 - The default value is 2,0% per °C; however, the optimal choice of this factor varies with the composition of the solution being measured and may be adjusted by the user.
- Adjust the conductivity value of the used deionized water (in µS/cm).
 - This value is used in the calculation of the surface density in mg/m².
 - This value is the same for all batches.

6.4 About

The *About* menu displays the version of the application software, the serial number, the config and menu version. The next screen shows the total number of readings taken with the SSM, the last date of service and the last date of validation.

7. Cleaning the SSM

Each time the SSM is turned on the user is required to complete a cleaning cycle before readings can be taken. This is to ensure that subsequent readings are as accurate as possible. It is important to use a clean surface which has been rinsed with deionized water prior to continuing. You can also use a clean transparent sheet between the SSM and surface for this purpose.

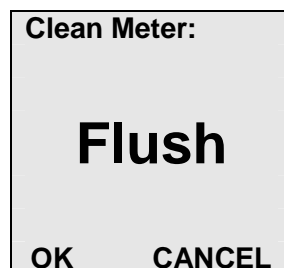
7.1 Cleaning

The cleaning process can be started by accessing the *Maintenance* menu. The procedure to clean the SSM is as follows:

- 1) Remove the protective cover.
- 2) Move the plunger back and forward by hand with a clean rag to be sure the measurement chamber can move easily.



- 3) Ensure the chamber is flush to the SSM surface (if not, the chamber may be pressed in by applying pressure to the center of the plunger with a clean rag; keep in mind that using a finger can leave grease and salty residue on the plunger which may affect measurements).
- 4) Select *Clean* (the plunger extends slightly).
- 5) The screen displays:



- 6) While holding the SSM looking at the plunger, slowly flush two 3 ml doses of deionized water into the measurement chamber by pressing on the dispenser.



Be sure to press slowly during this step to avoid water spraying from the chamber. Also be sure the plunger surface is completely covered with water.



Try to avoid water entering the shock absorber by wiping superfluous water with a rag.

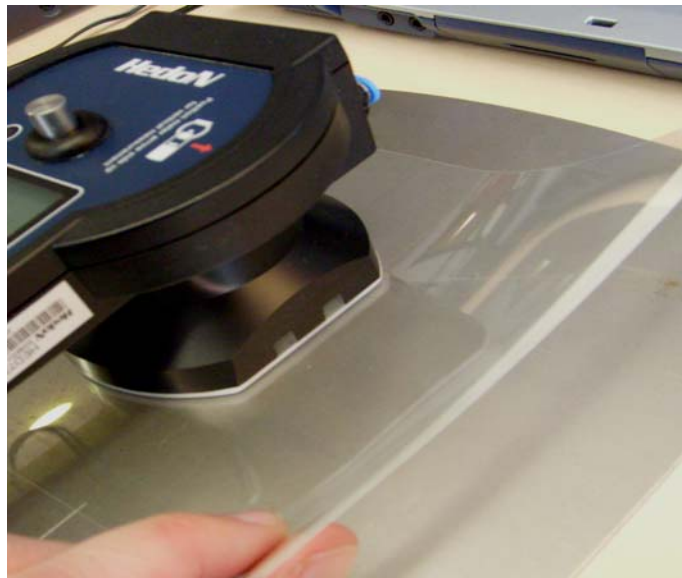
- 7) Turn the SSM over to dump the water out of the chamber (keep a rag handy).
- 8) Select *OK* when you finished the cleaning process; the plunger moves in. The Screen displays:



- 9) Fully extend the chamber by pressing on the piston. Keep the piston pressed and attach the SSM to a clean surface.

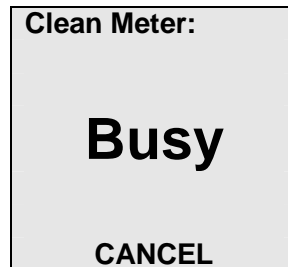


If there is no clean surface available you can use the transparent clean sheet between the SSM and the surface.



- 10) Inject 3 ml of deionized water into the measurement chamber with the fluid dispenser.
- 11) Select *OK* (the green LED flashes and the plunger begins moving through the cleaning cycle).

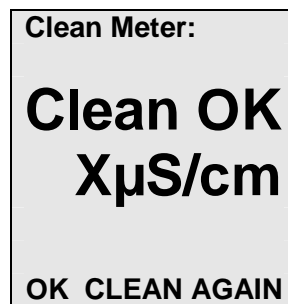
12) The screen displays:



13) Once cleaning is complete the SSM beeps.

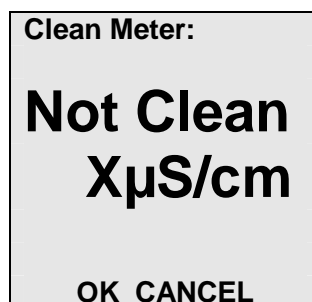
14) Remove the SSM from the surface and release the fluid from the measurement chamber.

15) If the SSM is clean, the LED indicator is green and the screen displays:



A measurement of less than 3 µS/cm above the deionized water value is acceptable. Deionized water itself has a conductivity of approx. 3 µS/cm. The value of the used deionized water can be stored in the SSM in the see chapter *Adjusting Measurement Settings*.

16) If the SSM is still dirty, the LED indicator is red and the screen displays :



Select OK to repeat the cleaning process.



Be sure to remember to clean the SSM prior to storing.



Dry the SSM, also beneath the shock absorber.

7.2 Cleaning deposits on the sensors and chamber

In case the chamber or sensors are very dirty or when there is deposit on the sensors the chamber can be cleaned. In order to reach the sensors and chamber the plunger needs to be extended. Extending the plunger can be done with the following procedure.

- 1) Remove the protective cap.
- 2) Move the piston down completely by pressing the piston extension above the display.



The next step will simulate a cleaning cycle with the big difference that it is performed in free air without fluid.

- 3) Access the *Maintenance* menu and select *Clean*.
- 4) Select *OK* when the SSM asks to flush. (you do not actually flush at this stage)
- 5) Select *OK* when the SSM asks to Attach & Inject (you do not actually attach and inject at this stage)
- 6) Wait while the SSM is busy.
- 7) The result after this step is not important at this stage.
- 8) Continue by pressing *OK*.
- 9) Access the *Maintenance* menu and select *Flush*.
- 10) The plunger extends and the inner chamber is visible.
- 11) Fully extend the plunger further by gently pulling the plunger.



Keep in mind that using a finger can leave grease and salty residue on the piston which may affect readings.

- 12) Gently wipe the sensors and chamber using a Q-tip soaked in clean-up vinegar to remove calcium and salty residues.
- 13) Gently wipe the sensors and chamber using a Q-tip soaked in a solution of a detergent and lukewarm water to remove grease.
- 14) Clean the sensors with deionized water.
- 15) Select *READY* when you finished the cleaning process; the plunger moves in.
- 16) Check the SSM with a normal cleaning procedure.

8. Data Control

The SSM supports 10 individual batches which can contain 100 readings each. Before a reading can be taken a batch has to be selected in which the SSM can store the reading.


The *Data Control* menu in the SSM shows the current selected batch and offers the choice to *Select Batch*, or *View Batch*. With *Select Batch* you can open and create batches. With *View Batch* you can check the previously saved readings.

The SSM can create and read batches. With the provided SSMLink software additional features for instance remove and label batches are possible.

8.1 Create a batch.

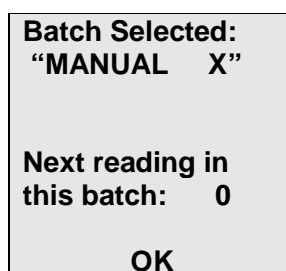
To create a batch :

- 1) Select *Select Batch* in the *Data Control* menu.
- 2) Select a batch with label : "EMPTY BATCH".
- 3) The screen displays :



Batch x does not exist.
Do you want to create a new batch?
YES NO

- 4) Select YES, the status led will turn red during initialization of the new batch.
- 5) After creating a batch the red led will turn off and the screen displays :



Batch Selected:
"MANUAL X"
Next reading in this batch: 0
OK

- 6) Select OK to turn back to the Data Control menu and to assign the next set of readings to the batch.

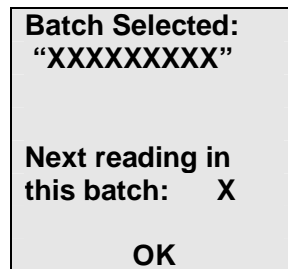


Manual created batches will have the label MANUAL X. The X will be number 1-10. Specific labels can only be made by using the SSMLink software. The SSMLink software can also create new batches. See the SSMLink User Manual for more details.

8.2 Select a batch.

To select a batch :

- 1) Select *Select Batch* in the *Data Control* menu.
- 2) Select a batch with any label other than label : "*EMPTY BATCH*".
- 3) After selecting a batch the screen displays :



- 4) The screen displays the Batch Selected and the number of the next reading in the batch.
- 5) Select *OK* to turn back to the *Data Control* menu and to assign the next set of readings to the batch.



When a selected batch is full (100 readings) the screen displays "*Batch Full! No more readings possible*". The batch will be selected but it is not possible to add new readings to it. Use the menu button to select another batch if you want to add readings. If all batches are full you can free memory space by deleting batches with the SSMLink PC program.

8.3 View a Batch

With *View Batch* you can view readings from the selected batch.

To view readings in a batch:

- 1) Select *View Batch* in the *Data Control* menu.
- 2) The SSM displays the batch label, reading number, time recorded, date recorded, conductivity, and temperature during the reading.
- 3) Select *NEXT* or *PREV* to navigate through each reading in the batch.
- 4) Select *BACK* to return to previous menu.



When a selected batch is empty the screen displays "*This batch does not contain readings*".

9. Taking a Reading

Readings are stored in batches of the SSM.

The SSM is able to take a reading when the SSM is cleaned and a batch is selected.

When no batches have been created the message “No batch selected” is displayed as soon as you want to take a reading (see the **Data Control** section for more information on how to create a new batch).

When the memory of the current batch is full the error message “*Batch Full*” is displayed (see the **Data Control** chapter to select another batch.)

If the SSM has not been cleaned before taking the first reading the message “Clean First” is displayed. See **Cleaning the SSM** chapter for more information.

9.1 Taking a reading

When all checks have passed the actual reading can be done. The process steps are as follows:

- 1) Select *Take Reading* from the main menu, the screen displays:



- 2) Move the piston down completely by pressing the piston extension above the display.
- 3) Attach the SSM gently to the surface to be measured.



The SSM can take readings on both horizontal and vertical surfaces. For vertical surfaces, hold the SSM in the direction indicated by “up” icon on the SSM.

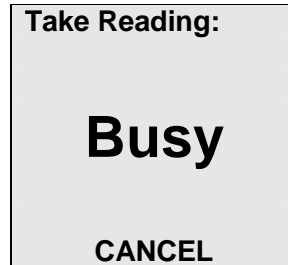
- 4) Inject 3 ml of deionized water into measurement chamber with one press of the fluid dispenser.



Be sure to fully extend and depress the fluid dispenser to ensure that exactly 3 ml of water are injected and readings are accurate.

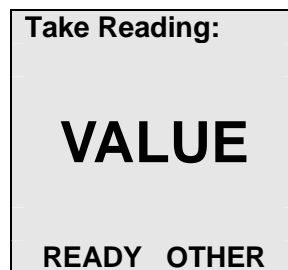
- 5) Select *OK* when done.

6) Wait while the SSM is busy, the status indicator blinks green while taking a reading.



The reading is finished the status indicator stays green and a beep can be heard.

7) The screen displays:



There are various display modes :

- 1) $\mu\text{S}/\text{cm}$ including the actual temperature in $^{\circ}\text{C}$ or $^{\circ}\text{F}$
- 2) $\mu\text{S}/\text{cm}$ temperature compensated to 25°C (77°F)
- 3) mg/m^2
- 4) mg/m^2 Bresle compensated

All Bresle patches have a background conductivity. To compensate for this $6 \text{ mg}/\text{m}^2$ is added to the readout in mode 3.



You can toggle through the various display modes by selecting *OTHER*. The SSM uses the last chosen display mode as default.

8) Select *READY* when done.



The SSM displays to flush the SSM before moving on to the next reading. See chapter Flush SSM to flush the SSM.

9.2 Flush SSM

After readings or validation the SSM displays to flush the SSM before moving on to the next step. These steps are critical to obtain accurate readings.

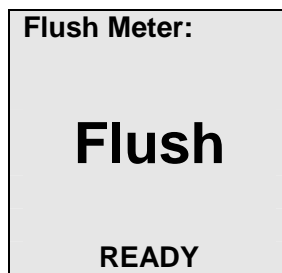
- 1) Remove the SSM from the surface and wipe the fluid from the SSM with a clean rag.
- 2) While holding the SSM looking at the plunger, slowly flush two 3 ml doses of deionized water into the measurement chamber by pressing on the dispenser.



Be sure to press slowly during this step to avoid water spraying from the chamber. Also be sure the plunger surface is completely covered with water.



Try to avoid water entering the shock absorber by wiping superfluous water with a rag.



- 3) Turn the SSM over to dump the water out of the chamber (keep a rag handy).
- 4) Select *READY* when finished; the plunger moves in.



Be sure to remember to clean the SSM prior to storing.

10. Validation

This section describes the validation procedure. Following these steps exactly is critical to the proper function of the SSM. Validation can be used to check the accuracy of the SSM. It is recommended that validation be completed whenever the SSM has been out of use for any extended period of time or daily prior to use. It is best to perform validation in a temperature controlled environment using standard conductivity solution at temperatures between 20 and 30°C (68 – 86°F).

10.1 The standard conductivity solution

With the SSM 4 sachets with 84 $\mu\text{S}/\text{cm}$ standard conductivity solution are included.



Keep the solution at room temperature.



Before use let the solution acclimatize at room temperature for two hours and do not expose it to direct sunlight. Use a sachet directly after opening it.



The validation fluid in a sachet must be used within an hour after opening.

10.2 Priming the SSM

If the SSM has not been used for an extended period and the sensors are completely dry, readings may be unstable. To prevent this, following mandatory cleaning, it may be necessary to prime the SSM prior to validating.

To prime the SSM for validation:

- 1) Ensure the chamber is flush to the SSM surface (if not, the chamber may be pressed in by applying pressure to the center of the piston with a clean rag; keep in mind that using a finger can leave grease and salty residue on the piston which may affect readings).
- 2) Using supplied syringe, draw out 10 ml of 84 $\mu\text{S}/\text{cm}$ standard conductivity solution from one of the sachets supplied.
- 3) Attach 5cm of feeder tube on one side to the SSM via the blue tube connector at the top end of the SSM and connect the syringe to the other side.
- 4) Turn the SSM chamber side up and inject validation fluid until the chamber is full.
- 5) Empty the chamber by turning the SSM over (keep a rag handy).
- 6) Fill the chamber again and let the SSM sit for a few minutes.
- 7) Empty the chamber and you are ready for validation.



It is possible that calcium or salt deposits have settled on to the sensors which can lower conductivity readings. In this case extra cleaning with clean-up vinegar may be required prior to priming as above (See chapter Cleaning the SSM for more information)

10.3 Preparing a clean surface

When validating the SSM, it is imperative that the surface and SSM are completely clean to ensure proper measurements. To ensure they are clean:

- 1) Rinse the surface several times with deionized water.
- 2) Dry the surface with a *clean* rag.
- 3) Select *Clean* in the *Maintenance* menu and follow the clean procedure. (see *chapter cleaning the SSM for more information*)
- 4) Allow the cleaning cycle to finish and note the measurement.
- 5) Repeat the cleaning step and note the measurement again, the result must be more or less constant ($< 0.5 \mu\text{S/cm}$ different from the first measurement).



The lowest value you may achieve is equal to the conductivity of the deionized water. Any significant difference in measurements or difference between the deionized water may mean there are some slow dissolving deposits on the surface. Try cleaning again.

10.4 Validation

To initiate SSM validation, select *Validate* under the *Maintenance* Menu.



*If the SSM sensors are completely dry from a prolonged period of non-use validation measurements may be unstable. To prevent this, the SSM may be “primed” with the validation solution (see **Priming the SSM**).*

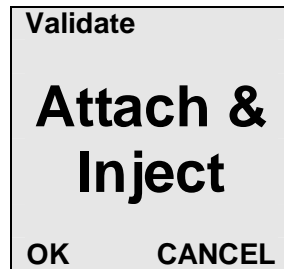


If the SSM has any residual deionized water present in the chamber prior to validation, the measurements may be lower than expected. To prevent this, rinse the SSM chamber once with validation fluid prior to validating.

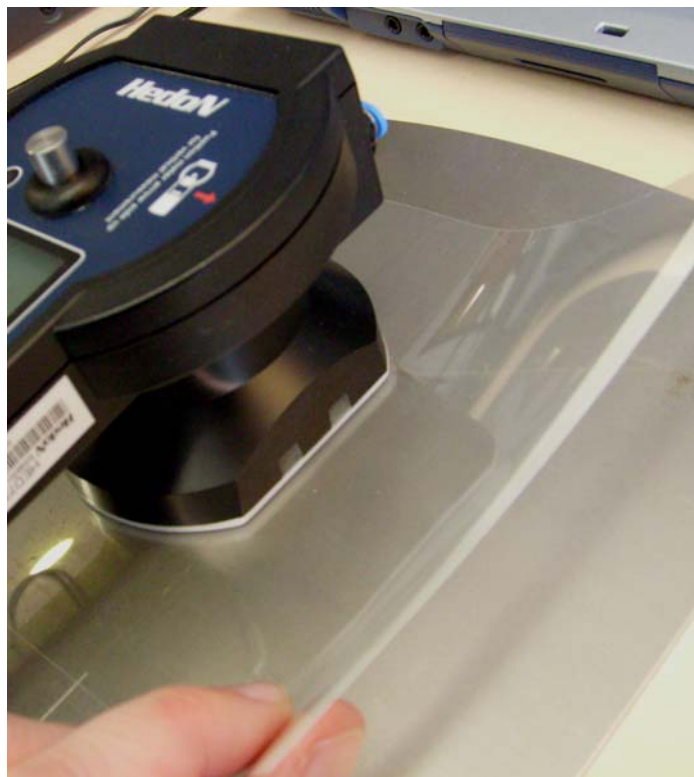
The validation procedure is as follows:

- 1) Press the piston extension above the display down completely (this moves the measuring chamber flush with the silicone seal).
- 2) Using supplied syringe, draw out 10ml of $84 \mu\text{S/cm}$ standard conductivity solution from the validation sachet.
- 3) Remove air bubbles out of the syringe and tube by ticking against the syringe while holding it upside down.
- 4) Attach the syringe tube to the SSM via the blue tube connector at the top end of the SSM.
- 5) Flush 5ml of solution through the SSM until it drips out of the measuring chamber (*this step is critical as it removes air and fluid from the internal SSM tubing*).

- 6) Select *Validate* from the *Measurement* menu, the screen displays:

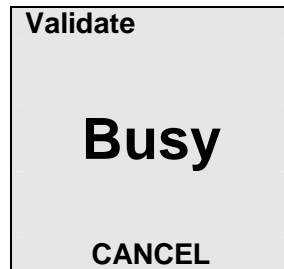



- 7) Put the clean transparent sheet over the test plate that corresponds with the measuring head curvature and fixate the SSM



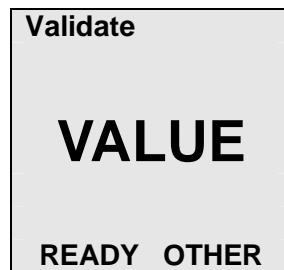
- 8) Attach the SSM.
9) Inject the remaining standard conductivity solution into the SSM using the syringe until the chamber is fully retracted. This point is reached when the plunger no longer moves out and you feel resistance when dispensing the syringe. The amount of fluid needed is app. 4ml. It may be necessary to maintain light pressure on the plunger of the syringe to prevent fluid from backing out of the measuring chamber.

10) Select *OK* and wait for about 1,5 minutes till the SSM beeps.



 If the validation was successful the Status Indicator is green and the screen displays the validation measurement. If the validation was unsuccessful the Status Indicator is red and the associated error is displayed on the screen.

11) The screen displays :



There are various display modes :

- 1) $\mu\text{S}/\text{cm}$ including the actual temperature in $^{\circ}\text{C}$ or $^{\circ}\text{F}$
- 2) $\mu\text{S}/\text{cm}$ temperature compensated to 25°C (77°F)

You can toggle through the various display modes by selecting *OTHER*. The SSM uses the last chosen display mode as default.



The SSM displays to flush the SSM before moving on to the next reading. See chapter Flush SSM to flush the SSM.



Be sure to remember to clean the SSM prior to storing.



It is normal to see validation measurements that are slightly higher than the conductivity standard because of the difficulty in achieving a completely clean test surface. Validation measurements $\pm 2.0 \mu\text{S}/\text{cm}$ within the specified conductivity of the standard solution @ 25.0°C / 77.0°F are OK.



If the validation returns measurements that are much lower than expected it is possible that the sensors need cleaning or the SSM was not properly prepared (See **Priming the SSM**).



If you are still unable to validate the SSM you should return the SSM to your local distributor for service.

11. SSM Maintenance and Care

11.1 Packing Up

After using the SSM, be sure to properly store and pack your SSM and SSM parts. When packing up be sure to:

- Run through a complete cleaning cycle (See ***Cleaning the SSM***)
- Wipe SSM and body to remove excess fluid.
- Check if the plunger is fixated by turning it clockwise.
- Ensure the SSM is turned off
- Attach the SSM shock absorber before storing
- Disconnect all tubing and ensure fluid is removed
- Reseal all bottles of fluid
- Remove water under the shock absorber



When the SSM is not connected to a power adapter it automatically powers down when no button or USB communication has been activated for 10 minutes. Before the actual switch off the SSM displays “*Meter will be turned off in xx seconds*”, beep, and count down from 20 seconds.

11.2 Service

When the SSM has taken 2.500 readings it warns the user that service is advised.



You can still take further readings but service is recommended. Please contact your distributor for more information.

11.3 Replacing the battery

Depending on usage the rechargeable battery gradually diminishes in total capacity over time, eventually needing replacement. The battery has a special connector which needs extra care while disconnecting and reconnecting it. Please contact your distributor for ordering a new battery.

To replace the battery:

- 1) Open the battery compartment.
- 2) Disconnect and remove old battery.
- 3) Connect the new battery to the connector and position the battery.
- 4) Close the battery compartment.

Please contact your distributor if you have problems replacing it yourself.

11.4 Replacing the seal

In case the seal starts leaking it needs to be replaced by a new one. To replace the seal:

- 1) Remove the protective cap from the SSM.
- 2) Gently press the plunger back into the SSM.
- 3) The rubber seal is now fully visible and can be removed from the SSM.
- 4) Take a new seal and apply a little bit of vaseline on the outer part of the seal.
- 5) Put a new seal in the SSM.



Avoid vaseline entering the plunger chamber.

- 6) Remove vaseline from the inner part of the seal when it is back in its original position.



Removing vaseline can be done by using a solution of lukewarm water and a detergent followed by cleaning with deionized water.

- 7) Push the plunger back in its original position.

11.5 Caring for Your SSM



Do not immerse in water. SSM is water resistant NOT waterproof.



Do not drop SSM.



Do not allow SSM to stand in direct sunlight for extended periods of time at high temperature.



Avoid direct contact of the plunger with skin or grease.




Do not wash with aggressive solvents, strong acids, or strong alkalis.



Try to avoid water entering the shock absorber.

12. Troubleshooting Guide

Problem	Cause(s)	Solution
Plunger is not flush with chamber when piston fully depressed.	The action of the plunger during measurement and cleaning cycles can slightly loosen the plunger.	Gently use finger to rotate the plunger clockwise to tighten. Conduct cleaning cycle after tightening to remove any residue on the plunger.
Validation measurements higher than expected.	Cleaning surface not completely clean. Measurement chamber and/or sensors not cleaned and primed properly. Conductivity standard expired. Not exactly 3ml was injected SSM in need of service.	Re-clean the surface. Clean and primer the SSM. Standards can only be used once. Order new standard. Try to inject exactly 3ml. Contact your representative for service.
Validation measurements lower than expected.	Sensors not clean or have deposits. Residual deionized water present in chamber prior to taking validation. Too much air present in chamber. Surface of protective cap wet with deionized water prior to validation. SSM in need of service.	Run cleaning cycle, prime, and retest. If necessary clean sensors using vinegar solution (see Priming the SSM). Prime SSM with standard solution prior to validation. Be sure to follow the validation steps exactly to flush air out of internal SSM tubing. Be sure protective cap is dry and clean. Contact your representative for serviced.
Measurements higher than expected.	Measurement chamber and/or sensors not cleaned properly. Water for measurements not deionized.	Clean the SSM. Be sure to use deionized water (conductivity < 5 $\mu\text{S/cm}$).
SSM keeps displaying "Not Clean"	Cleaning surface not clean	Try to clean the surface

	<p>SSM not Clean.</p> <p>Sensors or chamber have deposits.</p> <p>Used deionized water is not clean</p> <p>Not using deionized water</p>	<p>Try to clean the SSM again.</p> <p>Try to clean the sensors and chamber (See cleaning deposits on the sensors and chamber)</p> <p>Use new deionized water.</p> <p> The following procedure is not recommended and must only be used in case of emergency:</p> <p>In case you really need to take a reading at a location and do not have access to deionized water you can simulate a cleaning cycle in clean air (without cap mounted and without fluid). The SSM will now say the SSM is clean. In the SSM go to the settings menu followed by the measurement menu. Change the water uS/cm value to 0. Now take a normal reading which will be stored in the SSM. This value must be subtracted from further readings by hand.</p>
--	--	---

13. ISO 8502-9 Equivalence Validation Certificate

Corrosion Control Consultants and Labs, Inc.

a **GPI** company

Laboratory Testing Report

ISO 8502-9 Equivalence Validation by NACE SP0508-2008

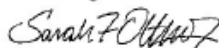
it
F

HedoN Electronic Developments BV
Elektronicaweg 15, 2628 XG Delft
Netherlands

Contact: Richard Parks

HedoN Electronic Developments BV Soluble Salt Meter (SSM) Model HED7263901 demonstrated equivalence to the ISO 8502-9 method for determining soluble salts during testing by CCC&L, performed March 4 through March 17, 2009. Testing was performed in accordance with NACE SP0508-2008.

Testing Conducted By:



Corrosion Control Consultants and Labs, Inc.
An independent testing facility
March, 2009

4403 Donker Court South East, Grand Rapids, Michigan 49512
616.940.3112 phone 616.940.8139 fax www.ccclabs.com

Report# 3900524.01

14. Warning



Warning, the SSM is equipped with magnets, precautions should be taken for those with pacemakers, implants and metal prosthetics, magnetic objects, credit cards and watches.

15. Warranty

HedoN electronic developments B.V. warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment. In no event shall HedoN electronic developments B.V. its manufacturer, and/or distributors be liable for special, incidental, or consequential damages arising from ownership or use of this instrument and/or data collected by this instrument. If it should become necessary to return the instrument for service during or beyond the warranty period, contact your local distributor or HedoN electronic developments B.V. for authorization. A Return Authorization (RA) number must be issued before any product is returned to HedoN electronic developments B.V. The sender is responsible for shipping charges, freight, insurance, and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, dropping, operation outside of specification, improper maintenance or repair, or unauthorized modification. Use of validation solution or deionized test water other than that sold and distributed by HedoN electronic developments B.V. or its appointed representatives negates all warranties. HedoN electronic developments' total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

16. Service and Repair

HedoN electronic developments B.V. and/or its appointed representatives offer service and services for the products. Contact us for information on services available for this product. HedoN electronic developments B.V. recommends that an annual service is performed to verify SSM performance and accuracy.

For technical support always contact your local representative first. If he is unable to help you contact HedoN Electronic Developments B.V. at support@hedon.nl.