

SMART MONITORING SYSTEM

Dealer Guide

Table of Contents

- [IMPORTANT FACTS](#)
- [SYSTEM SPECIFICATIONS](#)
- [SYSTEM COMPONENTS](#)
- [INSTALLATION OVERVIEW](#)
- [TESTING & NOTIFICATIONS](#)
- [CALIBRATION](#)
- [FIRMWARE UPDATES](#)
- [WATER CARE PRODUCT COMPATIBILITY](#)
- [TROUBLESHOOTING](#)
- [TROUBLESHOOTING BY ISSUE](#)

OVERVIEW

FreshWater® IQ combines the FreshWater Salt System with the FreshWater Smart Monitoring System. The Salt System automatically generates chlorine from salt for fresher, cleaner, more natural feeling spa water with fewer chemicals required, while the Smart Monitoring System tests water hourly and displays clear instructions when adjustments are needed.

To work properly, it's critical that the two systems are installed in the correct order. First, the FreshWater Salt System must be fully operational and maintaining a 3 parts per million (ppm) chlorine residual. At that point, setup of the Smart Monitoring System can begin. If the Smart Monitoring System is installed before the Salt System is fully operational, it will not provide accurate chemical readings or recommendations. Until the Smart Monitoring System is operational, FreshWater 5-Way Test Strips and Salt Test Strips should be used to balance spa water.

This document is intended to guide dealers and technicians through the FreshWater IQ installation process and to help identify and troubleshoot issues customers may experience when using FreshWater IQ. Detailed instructions about the installation, operation, and maintenance of FreshWater IQ can be found in the Smart Monitoring System Owner's Manual, Salt System Owner's Manual and in the FreshWater IQ Portal in the Watkins Marketing Library.

IMPORTANT FACTS ABOUT FRESHWATER IQ

FreshWater Salt System MUST be Operational before the Smart Monitoring System can be used.

- The FreshWater Salt System must be installed, operational, and holding a 3 ppm chlorine residual for the Smart Monitoring System to function.
- If the Salt System is in an error state or the cartridge has expired, the Smart Monitoring Sensor will not take readings.
- Ensure that the FreshWater Salt System and a working cartridge are installed, and that adequate salt has been added to the water to allow the Smart Monitoring System to operate.

The Smart Monitoring System does not alter the Salt System operation.

- The Smart Monitoring System tests spa water hourly and displays system status, feedback, and recommendations.
- The Smart Monitoring System is not connected to and does not automatically control the Salt System. It displays instructions on the spa's control panel to be manually performed by the user.
- The Salt System's 10-day timer and 4-month Replace Cartridge indicator are unaffected by the Smart Monitoring System.

24 Hour Initialisation Period

A 24-hour start-up period is programmed into the Smart Monitoring Sensor unit and occurs when the unit is first operated. "24 Hour Initialisation Period" is displayed on the top side control panel during this process.

Initialising

The initial test results, after powering the spa, will be published to the control panel in 5-15 minutes. "Initialising" is displayed until the readings are available to be shown.

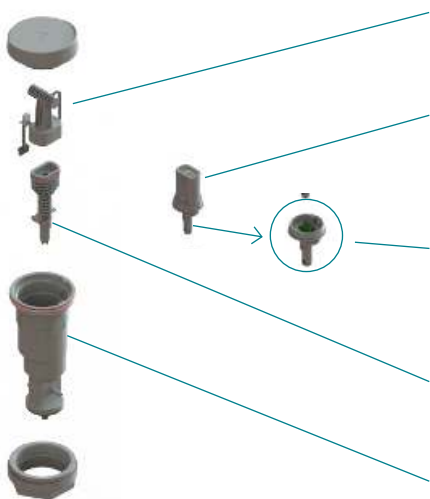
Test Strips

- FreshWater 5-Way Test Strips and Salt Test Strips will be used during the start-up process until the FreshWater Salt System is operational and the Smart Monitoring System is up and running.
- 5-Way Test Strips will continue to be required to measure calcium hardness, and alkalinity levels. The Smart Monitoring System does not test calcium hardness or alkalinity levels.
- Phosphate Test Strips will be required to manage phosphate levels during set-up and beyond. The Smart Monitoring System does not test phosphate levels.

SYSTEM SPECIFICATIONS

Item	Smart Monitoring System
Parameters Tested	Chlorine, pH, TDS (salt)
Sensor Technology	Proprietary chip technology
Sensor Serviceability	Customer
Sensor Life	Up to 12 months
Sensor Location	Bar top
Controller	FreshWater Smart Monitor
Spa Compatibility	2024+ Eagle equipped spas
Spa Software	Install latest, found in the Service Portal
Target Salt level (test strips)	1750-2000 ppm
Target TDS (Salt) Level (Smart Monitoring System or digital meter)	900-2500 ppm
Target Hardness	50 ppm
Target pH	7.4
Target Alkalinity	80
Target Phosphate	< 150 ppb
Target Copper, Iron, Manganese	< 0.2 ppm
Temperature	50-104F (10-40C)

FRESHWATER SMART MONITORING SYSTEM COMPONENTS



- **Handle:** The Factory Installed handle and cable set is mounted in the bar top housing and connected to the spa controller.
- **Controller:** This small control module is mounted to the handle and connected to the sensor and is located in the bar top housing. The controller can be replaced by an authorised dealer or technician.
- **Sensor:** This removable system component is mounted to the controller and located in the bar top housing. Its function is to test the spa water. For best results, the sensor should be replaced every 12 months by the spa owner.
- **Plug:** The plug mounts to the handle and locks the system into the housing when the system is not installed.
- **Bar Top Housing:** This enclosure is mounted in the bar top and holds the components of the Smart Monitoring System.

How the Components Work Together

The bar top housing, plumbing, and handle are factory installed. Water from the circulation pump bleed line is plumbed into the inlet of the housing and discharges into the filter bucket. A small drain line is connected to the bottom portion of the housing and exits the spa under the front corner or toe kick depending on the spa model. The drain line keeps the electrical connection compartment dry.

INSTALLATION OVERVIEW

NOTE: The FreshWater Salt System must be fully installed, operational and the water must be holding a 3 parts per million (ppm) chlorine residual, verified via a 5 Way Test Strip, before the Smart Monitoring System can be turned on.

After installing the FreshWater Salt System, it may take several days to maintain a 3 ppm chlorine residual. Follow these steps to ensure successful installation of the FreshWater Salt System:

1. If the Smart Monitoring System has already been installed, ensure that the system has been turned off at the control panel before beginning the FreshWater Salt Start-Up process. Best practice calls for the Smart Monitoring Sensor to be installed after all treatments are complete and the water is balanced and holding a 3 ppm residual.
2. Refer to the Salt System Best Practices for start-up as detailed in the FreshWater Salt System Owner's Manual and watch the FreshWater IQ Start-Up video.
3. Treat for metals, if required, and wait 24 hours.
4. Treat for phosphates, if required. When treating for phosphates, run all jets and clean filters daily for 3 days. Use the minimal amount of remover needed when dosing. Continue with balance and shock treatments while treating for phosphates.
5. Balance the water.
6. Shock water to 5 ppm.
7. Test and shock daily until water holds a 3 ppm chlorine residual.
8. Install or turn on the Smart Monitoring System once the water is balanced, clean, and holding a 3 ppm residual.

Maintain the water within the recommended ranges. Always test for phosphate before treating the water and use the smallest dose needed to correct the problem. Do not over dose and do not recommend weekly treatment.

System Parameter	Target	OK Range	
		Min	Max
Salt	1,750 ppm	1,500 ppm	2,000 ppm
Hardness	50 ppm	25 ppm	75 ppm
Alkalinity	80 ppm	40 ppm	120 ppm
pH	7.4	7.2	7.8
Chlorine*	3 ppm	1 ppm	5 ppm
Phosphates	<150 ppb	0 ppb	300 ppb

*Chlorine range and target may vary by country.

TESTING AND NOTIFICATIONS

Test Frequency

Chlorine, pH, and salt readings are automatically taken by the Smart Monitoring System every hour.

Recommendations

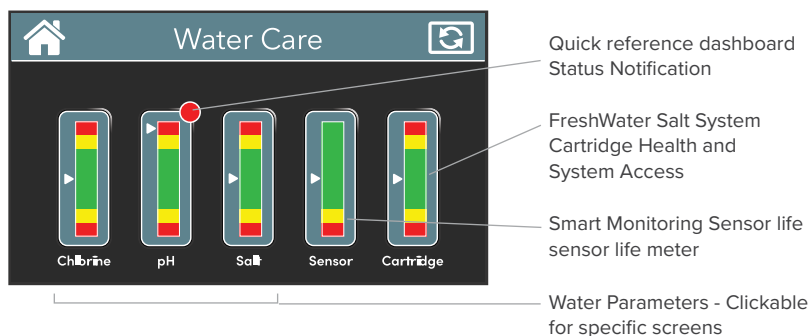
When measurements are outside the recommended bounds, the system will display clear instructions to the consumer on the control panel.

Updated Salt Cartridge Status

When the Smart Monitoring System is installed and turned on, the Salt System cartridge status will reflect only green, low yellow, and low red states to indicate the cartridge health.

Water Care Dashboard

- Spas with a touchscreen control panel have a single dashboard providing the status of the chemical levels, Smart Monitoring sensor life, and Salt System cartridge life.
- Spas with a button control panel have two pages of menus providing general status notifications.



Notifications

- The Water Care icons and menus will illuminate yellow or red if action is needed.
- The notifications are cleared when the individual parameter screen is viewed and will remain suppressed for 24 hours.
- If the issue is still detected the next day, the notification will be displayed again.
- Water maintenance advice is provided by the system based on the water conditions measured. The doses/adjustments are sized to prevent over dosing.
- One change per 24 hours is recommended to allow the water to equilibrate before further changes are made. Additional adjustments may be needed.

Status Meters

- Each parameter has a status meter to give the user a visual indication of the condition or measurement.
- The Salt meter on the Salt page does not have level indicators for the amount of salt measured. This is because the reading is calibrated for TDS rather than the colorimetric measurement of sodium chloride from the test strips. See below table for breakdown of colored regions for each meter.

Range	Chlorine	pH	Salt (TDS)	Sensor	Cartridge
High Red	>6	>8.0	>3000	N/A	N/A
High Yellow	5-6	7.8-8.0	2501-3000	N/A	N/A
Green	1-5	7.2-7.8	1901-2500	~10 mo	Ok
Low Yellow	0.5-1	7.0-7.2	1750-1900	~2 mo	Prepare to replace
Low Red	<0.5	<7.0	<1750	Replace	Replace

The chlorine green band can be changed to 1-3 and 4-6 as desired for any regional requirements.

Chlorine green range adjustment in the Super User menu settings:

- 1-5 ppm (default)
- 1-3 ppm
- 4-6 ppm

To adjust the chlorine green range:

Highlife	Press and hold the “info” button in the settings menu for 6 seconds and release.
Limelight	Press and hold the “software” soft button in the settings menu for 6 seconds and release.

CALIBRATION

The Smart Monitoring System is factory calibrated and does not auto-calibrate once installed. The system should not need calibration over the life of the sensor. If the sensor is exposed to water conditions caused by metals, or products on the Do Not list such as AG+ (silver nitrate) the sensor can be affected and require replacement.

A Calibration Offset feature is available to adjust the chlorine and pH readings. This setting should only be used when the readings are stable but consistently slightly higher or lower than a reliable reference measurement. To determine if this feature should be used, the spa should be stable and holding consistent values for 3-5 days. A ~3 ppm residual must be in the water and the pH in the recommended range 7.2 - 7.8.

Do not use this if “0” chlorine is being read by the spa and or reference because a “0” spa reading could be due to other reasons that will not respond to the calibration offset. A “0” reference reading does not indicate the chlorine or true water state and factors around dirty water.

Setting access: Navigate to the chlorine or pH detail screens. For Touch panels, press and hold the status meter for 6 seconds. For Button panels, press and hold the upper left soft button for 6 seconds.

Set offset: Measure the parameter with a reliable method. Access the setting screen. Increase/decrease the displayed value to match the reference value and confirm with the “check” or OK button.

Clear offset: Access the setting screen. Press the “X” or Clear button to reset the setting.

FIRMWARE UPDATES

The spa's firmware can and should be updated when the spa is installed and during any service to ensure the latest features are available. Please follow the latest controls firmware update process to update the spa and system. The system firmware revision is visible in the settings menu. In certain instances, it may take longer to display the firmware version in the setup menu after power-up. If the version is not displayed, recheck the firmware version after a few minutes and it will be updated. Selecting the icon brings you to the water testing system home page where you will find graphics that display your water reading.

Note:

If updating to a new spa control box or control panel, first power up the spa to allow the control box to gather the device firmware information. Then power down, insert the drive, and power the spa to reprogram the components.

Unplug all devices off the peripheral bus except the one to be updated. If multiple devices are on the bus when updating a peripheral, the process may not complete which will result in no update or a non-functional device. If this occurs, ensure that the Smart Monitoring System is the only device on the bus and try to reload the firmware.

Firmware Update Summary:

1. Download the latest firmware packet from the service portal.
2. Unzip the packet and place all files from within the folder on the root of the programming thumb drive.
The packet contains all current firmware files for all Watkins Wellness spa products. The control system will select the appropriate files for update.
3. Power down the spa.
4. Remove all devices from the peripheral bus except the Smart Monitoring System.
5. Insert the drive.
6. Power the spa.
7. Wait for the programming process to complete. The light sequence will change when the next device is being updated.

Estimated update timing:

Spa Control Box	15 seconds
Control Panel	25 seconds
Smart Monitoring System	15 seconds
Graphics	5-15 minutes

COMPATIBILITY

There are a variety of water conditions and products that can interfere with the proper operation of the Smart Monitoring System. Operating the spa outside of the recommended parameters or exposing it to various products can interfere with the proper operation of the Smart Monitoring System. If this happens, the sensor will need to be replaced after the spa water has been changed and lines flushed. A line purge is not typically required unless the spa is highly contaminated and dirty. FreshWater brand chemicals are recommended to ensure the best performance and minimise contamination. This is an intro to compatibility. For in-depth information on this topic see below.

Some chemicals can interfere with the Smart Monitoring System and cause it to read incorrectly.

- **These Products Should Never be Used with the Smart Monitoring System.**

If any of these products have been added to the water, drain, rinse, and refill the spa to remove them.

- **FreshWater Mineral Spa Sanitiser** or other silver nitrate products can permanently offset readings. If these products are installed, remove the silver device, drain and refill the spa, and replace the sensor.
- **MPS:** The Smart Monitoring System is not calibrated to this type of chemistry. Stop use and allow up to one week for the MPS to dissipate.
- **Ozone:** The system is not calibrated for ozone use. Remove the ozone unit from the spa.
- **Bromine** is not compatible with FreshWater Salt System or the Smart Monitoring System.
- **O-care/Aqua finesse/Silk Balance/Soft Skin** add salts and metals and are not compatible with the Smart Monitoring System. If these products are used, drain and refill the spa. Leave the sensor in to see if it recovers – see the troubleshooting section for more information.
- **pH locking products** contain borate or other materials that build up in the water and can interfere with the Salt cartridge and Smart Monitoring Sensor.
- **Oil and salt-based Aroma products** should be avoided.

- **Limit Use of:**

- **Dichlor:** Excessive use of dichlor and CYA build up will dampen chlorine response. Drain and refill the spa if levels are above 50 ppm.
- **Clarifiers, phosphate remover, and metal treatment products** can contain clumping agents that collect material and can stick to the Salt cartridge and Smart Monitoring Sensor. Use products like these in moderation and only per the manufacturer's instructions. The Salt cartridge and Smart Monitoring Sensor should be turned off and removed from the water during these treatments to ensure they are not damaged or coated.

Drain and Flush:

A drain and refill is recommended in the event of a poor initial start-up or contamination of the sensor. Any manufacturing residuals in the spa after packaging as well as material entering the spa from damaged packaging can react with the fill water and cause the Smart Monitoring System to read incorrectly. If Smart Monitoring System is not working correctly after the first week or two of operation, it is recommended to drain, rinse, and restart the spa.

TROUBLESHOOTING

SUMMARY

- Understand FreshWater IQ fundamentals
- Gather Spa and water care history
- Software check and update
- Reset calibration
- Correct salt issues
- Flow issues
- Chemical compatibility and contamination
- Alkalinity check
- When to calibrate system

FRESHWATER IQ FUNDAMENTALS

- “Initialising” is the spa waiting for the first test results (FW Salt must be working)
- The 24-hour initialisation period is:
 - The first 24 tests of a sensor's life
 - Is a “break-in” period - not calibration
- The sensor is factory calibrated
- The sensor is based on new solid-state “dry technology” and does not require regular calibration
 - Field calibration option

TROUBLESHOOTING CHECKLIST

1. Check if software is current and update: (Q3 spas have current 2024 software)
 - a. (Resolves displayed chlorine ok when 0ppm measured)
2. Clear & reset calibration for Chlorine and pH to factory settings. ("X" or "Clear")
 - a. Check if chlorine and pH readings better align with reference measurement.
3. Salt must be green for pH and Chlorine to display
 - a. Salt strip measures sodium chloride vs. Sensor measures total dissolved solids (TDS)
 - b. Add salt as needed to get indicator reading in the green.
 - c. Trouble shoot the salt reading by checking flow and turning off the Sensor to read the Salt system status.
4. Flow through the sensor is required for accurate readings (Flow affects all 3 readings)
 - a. All spas have a circulation pump return line in the filter bucket. Is there strong normal flow? If not, investigate and repair:
 - b. Confirm sensor is in the full locked position
 - c. Inspect sensor for debris and discoloration
 - d. Unclog/clear filter bucket circulation pump return line
 - e. Check for pinched or blocked lines - remove panels and trace line from pump
5. Some chemicals will damage the sensor - (low chlorine)
 - a. Silver: Do not use
 - Drain, rinse, and refill - Change the sensor
 - b. Phosphate remover: Test for phosphates, minimal dose (25% of full dose). Test again.
 - Drain, rinse, and refill
 - › A second drain and rinse might be needed if phosphates drop to 0 ppb the next day
 - Monitor and replace sensor if it does not recover after 1 week
 - c. Water Conditioner Products: (O-Care, Silk Balance, Aquaguard/Finesse or Clarifier and multi-function products)
 - Drain, rinse, and refill
 - Monitor and replace sensor if it does not recover after 1 week
6. Initial fill water can contribute to contamination of the sensor
 - a. Properties of unique local water combined with any residual chemicals and treatment from the factory has been linked to poor Sensor performance
 - Drain, rinse and refill
 - Ensure no new chemical contamination
7. Low alkalinity can contribute to an inaccurate pH measure
 - a. Resolve chlorine issues before working on pH as chlorine affects pH reading
 - b. Check alkalinity for low value (volatile pH reading) and if low, example: 40 ppm, increase to 80 ppm and monitor
8. Do not calibrate until the following are confirmed:
 - a. Software updated
 - b. Previous calibration cleared
 - c. Flow to filter bucket
 - d. Contamination issues checked and water drained and refilled
 - e. The spa has been holding a chlorine residual and measuring in the green

Prior to Fill

- ☐ Is fill water being tested prior to install? (see parameters - see below)
- ☐ Is water being treated with Clean Screen and On-the-Go prior to filling the spa (metals, hardness)?
- ☐ What chemicals have you given your customer to use with their spa? (What's in your start up kit?)
- ☐ Are or have you been using any products with active ingredients on the Don't List (see list below)? If yes, which ones?
- ☐ Is FreshWater Mineral Spa Sanitizer (Ag+) being provided?

Set up and Installation

- ☐ Was the spa water tested and treated for metals and phosphates (25% initial dose), if required, before start-up?
- ☐ Is the service team handling the start-up or the consumer?
- ☐ Is the service team ensuring the Smart Monitoring System (SMS) is OFF when delivering the spa?
- ☐ Was the spa updated to latest firmware (applicable for spas manufactured prior to June 2024)?
- ☐ What instructions are provided to consumer before turning on SMS?

Post Installation

- ☐ Confirm the spa maintained a 3ppm residual before turning on SMS.

List of Do No Use Chemicals (ref 4)

1. FreshWater Mineral Spa Sanitizer or other silver nitrate products
2. MPS
3. Ozone
4. Bromine
5. O-care/Aqua finesse/Silk Balance/Soft Skin
6. pH Locking Products
7. Oil and Salt Based Aroma Products
8. Dichlor*
9. Clarifier, Phosphate Remover, and Metal Treatment Products*

System Parameter	Target	OK Range	
		Min	Max
Salt	1,750 ppm	1,500 ppm	2,000 ppm
Hardness	50 ppm	25 ppm	75 ppm
Alkalinity	80 ppm	40 ppm	120 ppm
pH	7.4	7.2	7.8
Chlorine*	3 ppm	1 ppm	5 ppm
Phosphates	150 ppb**	0 ppb	300 ppb
Iron	<0.5 ppm		
Copper	<0.2 ppm		
Manganese	<0.5 ppm		

*Chlorine range and target may vary by country.

** Treating phosphates down to 0 ppb can lead to excessive remover in the water.

TROUBLESHOOTING BY ISSUE

Control Panel Display

1. The Water Care icon is not showing on the spa control panel home screen:

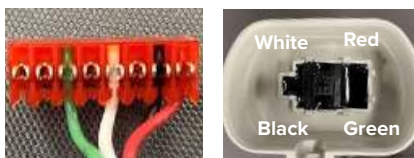
- a. Verify the FreshWater Salt System is installed. Confirm the Freshwater Salt Controller is connected to the Salt Housing and the Control box.
- b. Verify the Smart Monitoring Sensor is installed. Confirm the Smart Monitoring System controller is connected to the spa control board via the cable attached to the T-handle.

2. Both the Smart Monitoring System and the Connected Spa Kit are installed, but one or both do not work or are not present on the control panel:

- a. Remove all accessories from the hub and test them independently.
- b. Connect the FreshWater Salt System directly to the control board, trying both port options to verify the accessory works in both ports.
 - If Salt System does not function when connected to the control board, replace the accessory.
 - If 1 port on the control board works but not both, replace the control board.
- c. Detach the Salt System controller and plug in the expansion hub.
- d. Connect the Salt System controller to the hub to verify that the hub is functional.
 - If the Salt System no longer works when connected to the hub, verify the hub is installed correctly and replace the hub if still not working.
- e. Remove the hub and Salt System and connect the Spa Network Adapter from the Connected Spa Kit directly to the control board and verify operation.
- f. Reconnect hub, Salt System, and Connected Spa Kit.
 - If Salt System and Hub work without Connected Spa, but no longer work when the Connected Spa Kit is installed, replace the Connected Spa Kit.

3. Water Care dashboard is not present. The Control Panel goes directly to the FreshWater Salt System menu:

- a. Verify that the Smart Monitoring Sensor is connected.
 - Controller and Sensor installed in Housing.
 - Handle and Cable Assembly connected in the control box.
 - Check the wire connector at the control box for loose wires.
- b. Remove the Smart Monitoring Sensor from the housing and disconnect the sensor from the controller.
 - Replace the sensor and controller if water is found on either.
- c. Remove from the hub and directly install FreshWater Salt System and Smart Monitoring System into the control box.
- d. Check for broken wires in the T-handle.
 - Remove the controller from the T-handle.
 - Check continuity between the control box connector and T-handle.
 - Replace the T-handle assembly.



4. No Chlorine, pH, Salt, or Sensor indicators (no detail screens accessible):

- a. FreshWater Salt System is off, in error state, or no cartridge installed.

5. System Initialising does not go away after 5 -10 minutes or the 24-Hour Initialisation does not go away after 24 hours:

- b. The spa started with the FreshWater Salt System in an “off” or error state which is not allowing the sensor to make its first reading.
- c. Correct the FreshWater Salt System issue and restart the spa.
- d. Verify that the Smart Monitoring System is turned on.

6. No indicator visible for Chlorine, pH, and Salt (no detail screens accessible):

- e. Check to see if the Smart Monitoring System is turned off.
 - If yes, turn on the Smart Monitoring System in the Sensor menu.
- f. The Smart Monitoring System will turn on in post start-up Initialisation mode.
 - Message present until first values are visible.

7. No indicator visible for Chlorine or pH (no detail screens accessible):

- g. Check to see if the “24-hour initialisation” status is displayed on the control panel.
 - Wait 24 hours until initialisation is complete.
- h. Check to see if the salt level is low red.
 - Chlorine and pH will not be visible if salt is low.
 - Correct low salt by adding more salt and waiting 1 hour for Smart Monitoring system to update.

8. Sensor reporting an error on the control panel:

- a. Verify that the sensor is fully connected to the controller. If not, remove and reconnect.
- b. Remove the sensor from the controller and inspect for damage and water.
- c. Replace sensor or controller based on the on-screen error recommendation.

Test Strip Readings / Balancing Your Water

1. Test strip showing high salt, Smart Monitoring Sensor showing low salt:

- a. This issue is typically due to either not enough salt in the water or could be the sensor not working correctly. The sensor salt (TDS) meter is not reading the same things as the test strips.
- b. Check the test strip expiration date on the bottle. Follow the instructions on the salt test strip bottle, waiting 20 seconds to read and discard after 30 seconds.
- c. Check for flow through the sensor.
 - Check for flow in the filter bucket at the small opening in the wall of the filter area.
 - Smart Monitoring Sensor not fully installed and in the locked position.
 - Smart Monitoring Sensor housing loose and twisted (hoses pinched internally).
 - Kinked bleed supply line. Verify the 0.25” line coming from the circulation pump to the sensor housing and exiting in the filter bucket is not obstructed.
- d. Check spa water temperature – bring water to 35 °C +.
- e. Remove the sensor from the controller and inspect for damage and water inside the components and replace both if water is present.
- f. Turn off the Smart Monitoring System and check the Salt System status bar without Monitoring System influence.
 - If the status is below mid to high green, more salt is needed. Go to step h.
 - If status is high green or above, proceed to step i.
 - The test is most accurate with a new Salt System cartridge and water temperature 35 °C+.
- g. If salt has been added before troubleshooting or at step (f), monitor for four hours to ensure the salt is fully dissolved and the Smart Monitoring System has updated its readings.
- h. Add 0.5 cup salt with the jets running and wait 1 hour for the reading to update.
 - Repeat up to 3 times.
- i. If adding more salt did not increase the salt reading into the green:
 - Drain and refill the spa.
 - Start-up using best practices.
 - Change controller and sensor.

2. Test strip showing low salt, Smart Monitoring System showing ok/high salt:

- a. This could be due to high background TDS levels or sensor fault.
- b. Check the test strip expiration date on the bottle. Old test strips will not read correctly.
 - Follow the instructions on the test strip bottle, waiting 20 seconds to read and discard after 30 seconds.
- c. Check for flow through the sensor.
 - Check for flow in the filter bucket at the small opening in the wall of the filter area.
 - Smart Monitoring Sensor not fully installed and in the locked position.
 - Smart Monitoring Sensor housing loose and twisted (hoses pinched internally).
 - Kinked bleed supply line. Verify the 0.25" line coming from the circulation pump to the sensor housing and exiting in the filter bucket is not obstructed.
- d. Check spa water temperature – bring water to 35 °C +.
- e. Remove the sensor from the controller and inspect for damage and water inside the components and replace both if water is present.
- f. Turn off the Smart Monitoring System and check the Salt System status bar without Smart Monitoring System influence.
 - If the status is in the green, then there is enough TDS in the water for the FreshWater Salt System to operate properly.
 - If the status is high, the water contains high background TDS levels, and less salt is needed.
 - If the status is below mid to high green, more salt is needed. Continue to troubleshoot the Smart Monitoring Sensor.
 - The test is most accurate with a new Salt System cartridge and water temperature 35 °C+.
- g. Monitor for four hours to ensure the salt is fully dissolved and the Smart Monitoring System has updated its readings.
- h. Drain and refill the spa if the issue continues.
 - Turn off the Smart Monitoring System.
 - Start-up using best practices.
 - Turn on the Smart Monitoring System.
- i. Replace Smart Monitoring Sensor if it does not read correctly after 3 days.
- j. Do not troubleshoot Chlorine or pH issues until the Salt System is installed and working.

3. Test strip reading low/no chlorine, Smart Monitoring System showing green or higher chlorine (+2.5 ppm):

- a. Smart Monitoring System is registering alternate active substances.
- b. Check firmware and update if older than:
 - **Control Box:** EG.... 1302
 - **Highlife Bartop:** TH.... 1301
 - **Limelight Bartop:** LL.... 1302
- c. Verify if the water is balanced within the recommended ranges.
- d. Check for AG+, MPS, ozone, or other chemicals added to the spa. Drain if present.
- e. Check for use of metal treatment and phosphate remover. Test before use and limit doses to small steps to avoid overdosing the spa. Drain the spa if excessive treatment and dosing is suspected.
- f. Check for flow through the sensor.
 - Check for flow in the filter bucket at the small opening in the wall of the filter area.
 - Smart Monitoring Sensor not fully installed and in the locked position.
 - Smart Monitoring Sensor housing loose and twisted (hoses pinched internally).
 - Kinked bleed supply line.
- g. Shock the water and chlorinate to ~3-5ppm. Leave the Smart Monitoring System on and monitor for three days.
- h. Drain and refill the spa.
 - Turn off the Smart Monitoring System.
 - Start-up using best practices.
 - Turn on the Smart Monitoring System.
- i. Replace Smart Monitoring Sensor if it does not respond after three days.

4. Test strip reading high chlorine (+3 ppm), Smart Monitoring System showing low (yellow) or no (red) chlorine (indicator present):

- a. Verify if the water is balanced within the recommended ranges. Check for low alkalinity.
- b. Check for AG+, MPS, ozone, or other chemicals added to the spa. Drain if present.

- c. Check for use of metal treatment and phosphate remover. Test before use and limit doses to small steps to avoid overdosing the spa. Drain the spa if excessive treatment and dosing is suspected.
- d. Check for flow through the sensor.
 - Check for flow in the filter bucket at the small opening in the wall of the filter area.
 - Verify that the Smart Monitoring Sensor is fully installed and in the locked position.
 - Verify that the Smart Monitoring Sensor housing is not loose and twisted (hoses pinched internally).
 - Check for a kinked bleed supply line.
- e. If dichlor (chlorine) was recently added, allow 1 hour after addition for the next test to be taken.
- f. Drain and refill the spa.
 - Turn off the Smart Monitoring System.
 - Start-up using best practices.
 - Turn on the Smart Monitoring System.
- g. Replace Smart Monitoring Sensor if it does not respond after 3 days.

5. Test strip reading high chlorine (+5 ppm), Smart Monitoring System showing ok (green):

- a. If both readings indicate chlorine is present and the values are off a little, trust the system and monitor. The variance is likely due to the combined accuracies of the two measurement techniques.
- b. Verify if the customer is properly using the strips and can read them correctly. Check the test strips expiration date and measurement technique. If concerns persist, use an alternate reference.
- c. Verify if the water is balanced within the recommended ranges. Check for low alkalinity.
- d. Check for AG+, MPS, ozone, or other chemicals added to the spa. Drain if present.
- e. Check for use of metal treatment and phosphate remover. Test before use and limit doses to small steps to avoid overdosing the spa. Drain the spa if excessive treatment and dosing is suspected.
- f. Check for flow through the sensor.
 - Check for flow in the filter bucket at the small opening in the wall of the filter area.
 - Verify that the Smart Monitoring Sensor is fully installed and in the locked position.
 - Verify that the Smart Monitoring Sensor housing is not loose and twisted (hoses pinched internally).
 - Check for a kinked bleed supply line.
- g. If dichlor (chlorine) was recently added, allow 1 hour after addition for the next test to be taken.
- h. Calibrate the chlorine reading. If the chlorine reading is tracking the reference but off by a consistent amount, use calibration to adjust it and then monitor for further action.
- i. Drain and refill the spa.
 - Turn off the Smart Monitoring System.
 - Start-up using best practices.
 - Turn on the Smart Monitoring System.
- j. Replace Smart Monitoring Sensor if it does not respond after 3 days.

6. Test strip pH reading does not match Smart Monitoring System:

- a. If the pH is in the green on the dashboard, make no changes.
 - Verify the water balanced within the recommended ranges. Check for low alkalinity and increase the alkalinity to target 80 ppm.
- b. Check for flow through the sensor.
 - Check for flow in the filter bucket at the small opening in the wall of the filter area.
 - Verify that the Smart Monitoring Sensor is fully installed and in the locked position.
 - Verify that the Smart Monitoring Sensor housing is not loose and twisted (hoses pinched internally).
 - Check for a kinked bleed supply line.
- c. Verify if a chlorine residual is registering via both the Smart Monitoring System and test strips.
 - If the water is constantly without chlorine and out of balance, correct the spa owner's behavior and stabilise the water.
 - If no chlorine present, Boost or add chlorine to establish a residual.
 - Verify pH after maintaining a ~3ppm residual for 48 hours.
 - If the pH is chronically high or low by a few tenths, then make a calibration offset adjustment.
- d. Monitor and allow pH to stabilise for 24 hours - pH is a slow-moving system.

- e. Drain and refill the spa.
 - Turn off the Smart Monitoring System.
 - Start-up using best practices.
 - Turn on the Smart Monitoring System.
- f. Replace Smart Monitoring Sensor if it does not respond after 3 days.

7. pH is changing quickly or day to day:

- a. Increase spa water alkalinity.
- b. Decrease pH chemical dosing amounts from recommendations. Recommendations are approximate and the actual dose amounts can vary depending on other water conditions not being measured, such as alkalinity and calcium hardness.

Problems with Physical Components

1. Hard to remove the Smart Monitoring Sensor cap:

- a. Cap O-ring not greased and requires additional O-ring lubricant.
- b. Replace O-ring (PN 79738).

2. Spinning or loose Smart Monitoring Sensor housing:

- a. Resolve a hard to remove cap.
- b. Reposition housing and ensure plumbing lines are not kinked.
- c. Tighten wall fitting nut.
- d. Apply thread lock to threads - silicone, Devcon or similar.

3. FreshWater Salt System change cartridge sequence is locking up at the replace cartridge step (Limelight):

- a. Check firmware and update if older than:
 - **Control Box:** EG.... 1302
 - **Highlife Bartop:** TH.... 1301
 - **Limelight Bartop:** LL.... 1302

4. Water leaking onto the floor

- a. Check the Salt System housing and cartridge for any water leaking past the cartridge.
 - Replace the cartridge. Continued leaking may require changing the housing.
- b. Check the Smart Monitoring Sensor housing for visible water. Water in the Smart Monitoring System controller or sensor indicates an internal leak and the parts need to be replaced. If the sensor is dry, remove the spa panel and inspect for water leaking through the housing drain line. Replace the housing if it is leaking.



Visit the FreshWater Smart Monitoring System portal in the [Watkins Marketing Library](#) for more tools and resources.