Calibration of ISM pH Sensors

For Optimum Accuracy, Safety, and Measurement Uptime

METTLER TOLEDO

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This interactive PDF is optimized for Acrobat Reader.

Introduction

Intelligent, Efficient, and Safe Sensor Management

Over time and through use, pH sensors are affected by their measuring environment and require cleaning, calibrations and adjustments to ensure accurate and precise measurements.

Digital, intelligent sensors with METTLER TOLEDO's Intelligent Sensor Management (ISM™) technology provide clear diagnostics that help ensure maintenance of your equipment only when necessary – never too soon or too late.

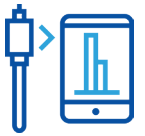
Whether you are performing pH testing in the lab or field, METTLER TOLEDO's ISM sensors with ISM Core™ software, enables calibration and adjustments to be completed in a few minutes.

MEASURE
High Precision Sensors

To sustain process consistency, you need analytical instrumentation that you can fully rely on. Regardless of how tough your process conditions might be, ISM pH sensors provide extremely reliable measurements. ISM's predictive diagnostic tools tell you how many days remain before sensor calibration and replacement should be performed.

MANAGE
Maintenance Only When Required

With ISM, you can calibrate your pH sensors only when it's necessary – neither early, nor late. ISM Core software makes calibrations significantly quicker and easier. The step-by-step user guidance reduces training efforts to a minimum. ISM Core enables calibration in a laboratory or workshop – away from any challenging environments.



INTEGRATE
Sensor Data Wherever It's Needed

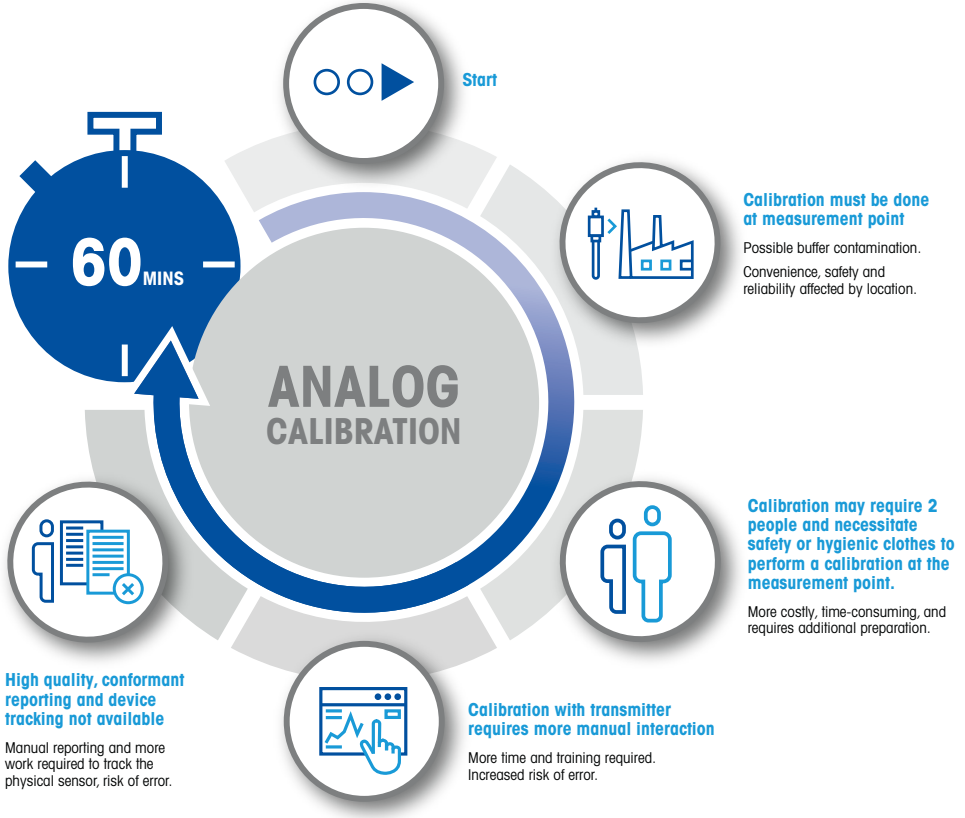
Compatible with all common communication and bus systems, ISM pH sensors can be easily integrated into your facility. Once installed, you can receive pH measurements and sensor predictive diagnostics data wherever required, in control rooms, on handheld devices, as well as on the connected transmitter.

The maintenance routine described in this guide shows how easy it is to reliably and accurately calibrate ISM pH sensors using ISM Core software.

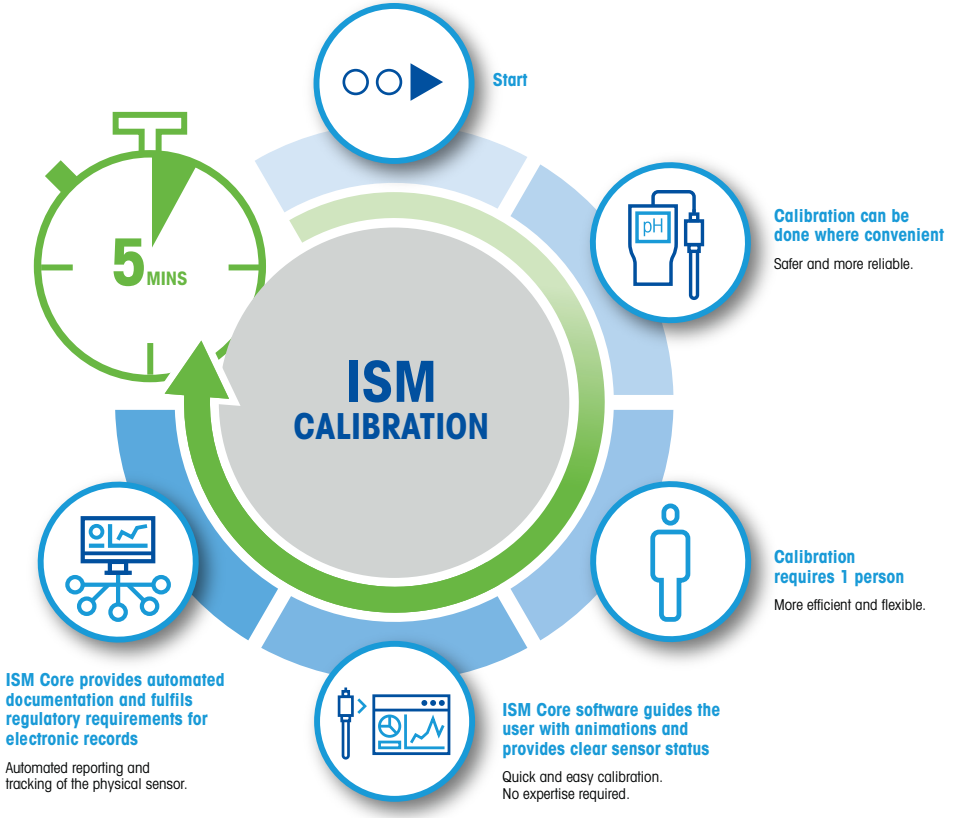
Comparison of ISM and Analog pH Sensor Calibration

ISM calibration delivers fast, accurate, traceable results – done safely, wherever convenient, and only when necessary.
Analog calibration must be done at the measurement point, normally to a fixed schedule. It's time consuming and can be inaccurate, with results that are harder to trace.

Calibration on a fixed schedule - not at the optimum time **and possibly too late**.



Calibration when needed - **based on actual sensor condition.**



ISM 2-point pH Sensor Calibration Guide

Prepare the following materials:

- ISM Core software
- ISM sensor to ISM Core cable
- 2 x clean 50 ml beakers
- 1 x waste beaker
- Bottle of deionized water
- 2 x pH buffer solutions
- pH 7.0 buffer solution
- Safety goggles
- Safety gloves
- Storage solution, 3M KCl
- Suitable cleaning solution(s)
- Kimwipes® or equivalent

Step-by-Step Calibration Process

In a maintenance workplace away from the process

1

Isolate the pH sensor to be calibrated from the process and disconnect the cable.

2

Remove the sensor.

3

Rinse the sensor with deionized water (tap water is OK if no deionized water is available).

4

Fill the watering cap with fresh 3M KCL solution and attach it to the sensor. Take the sensor to your maintenance workplace.

5

Remove the watering cap and place the sensor in appropriate cleaning liquid and allow sufficient cleaning time.

6

Once clean, rinse the sensor with deionized water and gently pat it dry with Kimwipes or an equivalent. (Do not wipe the sensor as this can induce an electrostatic charge which will affect measurement.)

Step-by-Step Calibration Process

In a maintenance workplace away from the process

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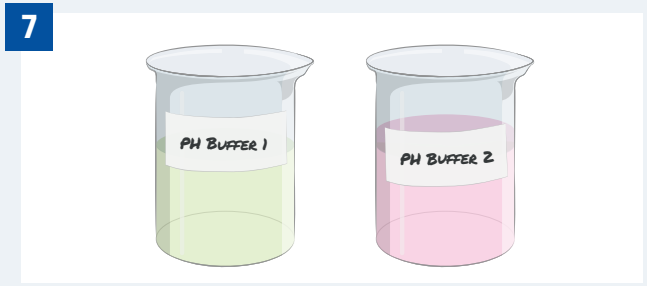

Pour each of the required calibration buffers into separate, clean beakers. (Never place the sensor into the buffer bottle as this can contaminate the buffer, even if the sensor has been cleaned.)

8

Start the ISM Core software.

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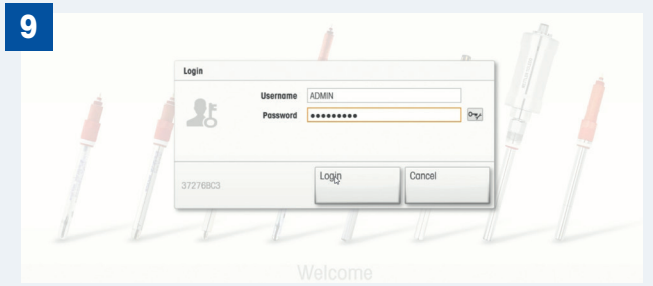

Log in.

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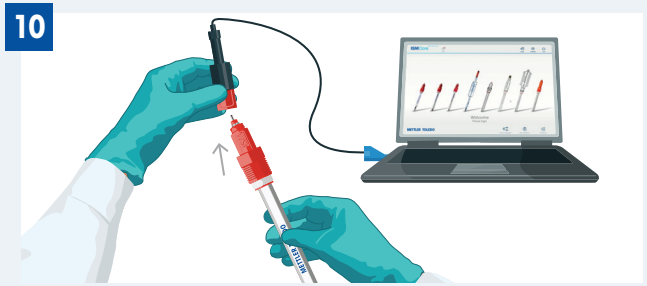

Attach the sensor to the ISM USB connector.

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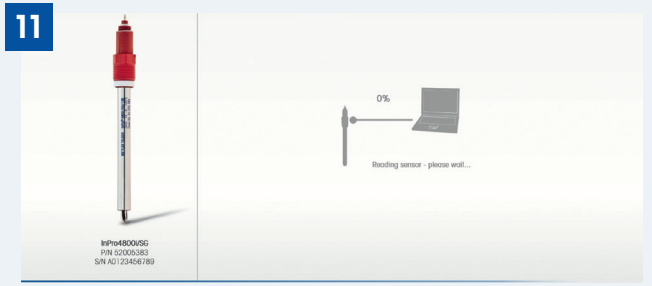

Wait for ISM Core to read information from the sensor.

The software will then guide you through the next steps.

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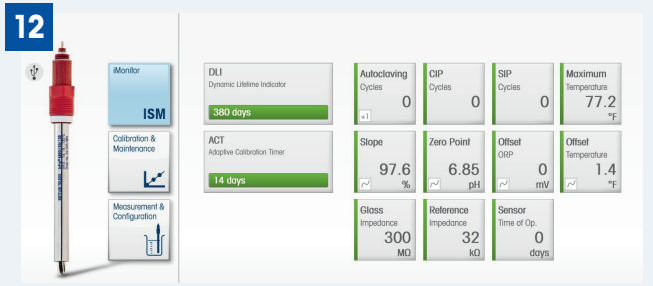

Note any anomalies in sensor health (yellow or red vertical bar).

Click on the ‘Details’ icon to see specific issues.

Step-by-Step Calibration Process

In a maintenance workplace away from the process:

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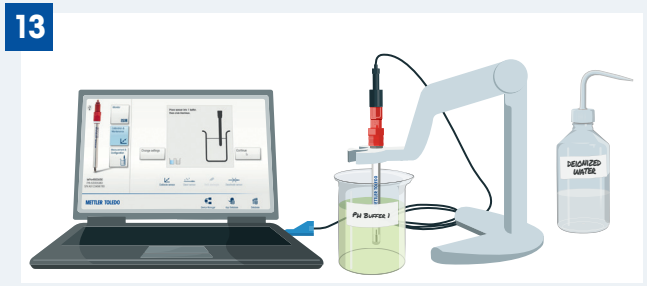

Click on "Calibration and Maintenance" to begin calibration. Following the on-screen instructions, place the sensor into the first buffer and click "Continue."

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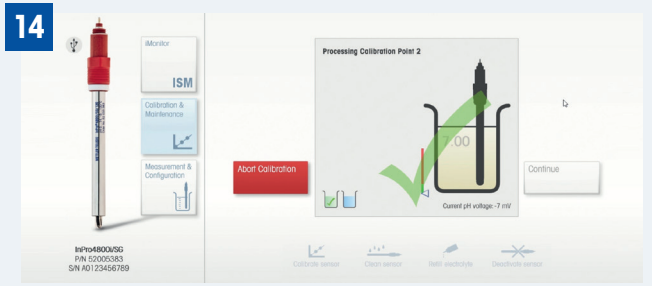

Wait until you see the checkmark to confirm the first buffer reading.

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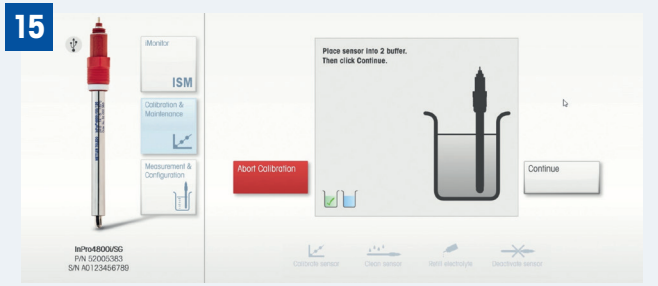

Rinse the sensor with deionized water and pat dry (see step 6) before placing the sensor in the next buffer. Click "Continue" and follow the on-screen instructions. Wait for the checkmark and successful calibration.

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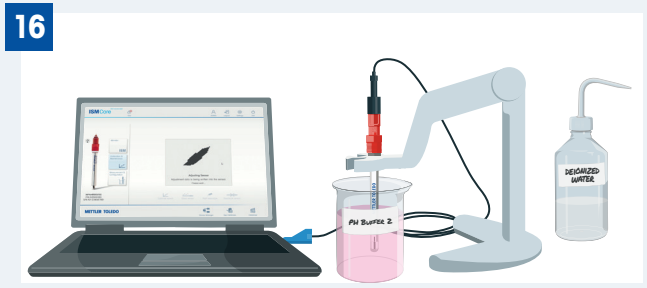

After confirmation of successful calibration, click "Adjust sensor" and follow further on-screen instructions.

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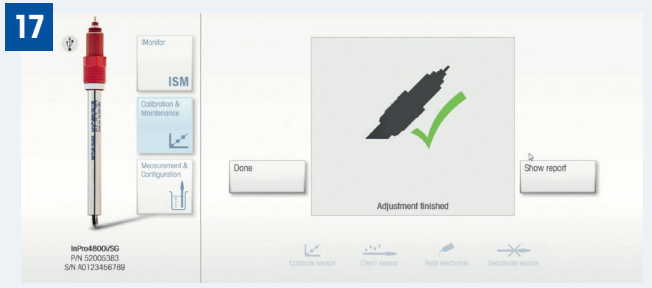


When adjustment has finished and calibration information has been transferred to the sensor, a checkmark and "Adjustment finished" will appear.

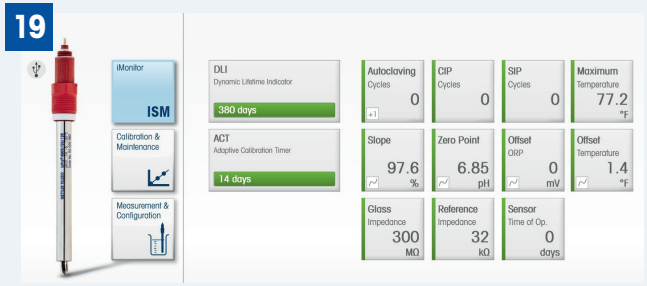
18

If required, generate an Adjustment Report in PDF format by clicking "Show report". Click "Done" once this is complete.

Step-by-Step Calibration Process

In a maintenance workplace away from the process

19

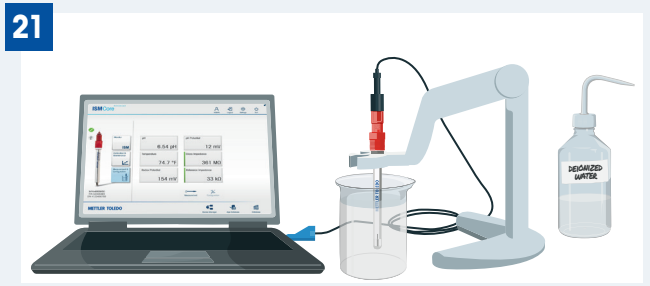


Display the predictive diagnostics, DLI and ACT, to show when the next calibration or sensor exchange is due.

20

Rinse the sensor with deionized water and pat dry.

21



Click "Measurement & Configuration" and place the sensor in pH 7.0 buffer for verification. If the displayed value is not correct, repeat the process from step 13. If the displayed value is correct, rinse the sensor with deionized water and pat dry.

22

Fill a clean watering cap with new 3M KCl storage solution. Cap the sensor such that its membrane tip and diaphragm are totally submerged.

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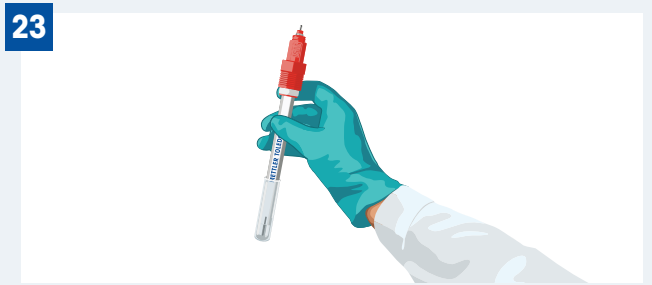

Store the sensor for use in the next sensor hot swap or return it to its process measurement point. You have now finished your ISM 2-point pH sensor calibration.

Conclusion

Quick, easy and error-free calibration to extend the life of your pH sensors

With METTLER TOLEDO's ISM sensors and ISM Core software, sensor health information such as in how many days a sensor needs to be replaced (DLI) or calibrated (ACT) and asset data such as serial number or calibration dates can be simply retrieved.

Utilizing this smart technology will drastically minimize the maintenance workload, while the efficient cleaning, calibrations and adjustments will ensure accurate and precise measurements and extend the life of your pH sensors.

Benefits Overview

Chemical Industry:

- Enables predictive maintenance and ensures calibration is done only when needed.
- Guided maintenance away from the process that significantly reduces maintenance efforts, training investments and cost of ownership.
- Enables hot swap of sensors to ensure maximized measurement uptime.

Pharmaceutical Industry:

- Provides guided maintenance in the lab that significantly reduces maintenance efforts, training investments and cost of ownership.
- 21 CFR Part 11 & Annex 11 compliance-ready software fulfils regulatory requirements for electronic records and electronic signatures.
- Pre-batch predictive diagnostics ensure no lost batches.

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