How operators and engineers can
optimize maintenance and simplify calibration

Savings and Simplicity: Less Time Consumption with Smart Liquid Monitoring

OpreX ™

Industries that require water-monitoring instruments are changing. Modern operations are more efficient, because the water-monitoring instruments are resistant to electrode contamination and damage. The water-monitoring instruments used in various processes must be able to meet the latest standards during water recovery, wastewater treatment, wastewater management, and impurity removal.

Water quality standards are becoming more restrictive; fewer skilled technical staff in the field are required to do more with fewer resources. Maintaining existing pH and conductivity measurements with conventional water-monitoring instruments can be hard enough within the confines of current panel space. Therefore, changing requirements demand more measurements and reduced maintenance costs.

More than 63 percent of maintenance time is wasted due to routine checks of field devices or responding to situations where no problem is identified.*

How can a system be expanded to provide a faster and more accurate picture of liquid process chemistry without increasing panel space?
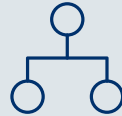
*Source: Fieldbus Foundation

Challenges of using conventional liquid analyzers

- **Measurement availability:**

  Unexpected sensor failures, Unskilled maintenance staff, Fewer engineers to maintain more equipment

- **Flexibility:**

  Constrained installation space, Limited communication protocols

- **Asset sustainability/process downtime:**

  Inefficient operations, Maintenance scheduling, Spare parts management and storage

- **Optimizing opex:**

  Time spent on inventory management, Time spent on manual monitoring
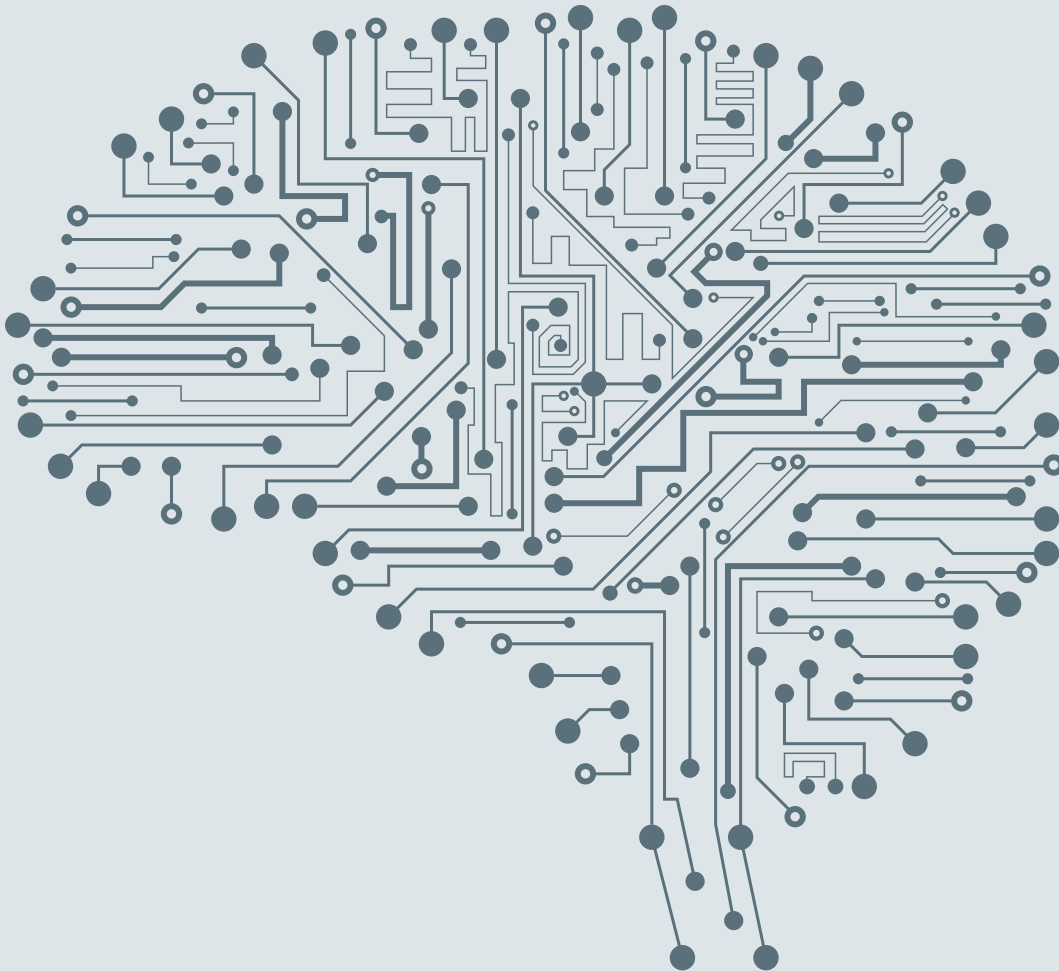
Strategic concerns for plant operators:

"I worry about unplanned outages"

"There is a constant pressure to reduce costs on maintenance"

"My largest concern is the service and maintainability of our equipment"

The benefits of
smart liquid analyzers

Digital technology has redefined how the industry uses liquid analyzers, improving measurement accuracy and reducing maintenance cost.

Applications using smart sensor technology establish an ideal operation, making water-monitoring systems simpler to use and the entire measurement process more efficient.

More and more companies are switching from analog to smart monitoring solutions. There are many things to consider when deciding whether or not to make this change. Next, we discuss some of the most popular questions about smart systems and the advantages they offer.

How **easy** is it to use smart sensors?

Conventional electrochemical sensors with analog outputs have been around for decades, but using them is labor and time-intensive. Electrode sensor calibration is manual and must be done regularly.

Smart sensors allow calibration and pre-configuration prior to field installation. Smart sensors store calibration data in an internal memory chip, allowing simple hot swap or plug and play replacement. Therefore, plant downtime and the need for highly skilled maintenance staff are reduced.

 When a sensor is connected to an analyzer, the latest calibration data is uploaded automatically; this saves operators from being called out to deal with electrode contamination/damage or sensor

If the old system works, why **change** it?

Calibration is a complicated maintenance process. It is easy to get comfortable working a certain way, but sometimes a better system comes along that benefits everybody. Welcome to the world of 'smart'.

Most smart systems can work with both digital and analog sensors, allowing the system to be installed immediately; as well as swapped to digital at a later date. So, when the time is right, the new utility for plant solution- the smart system- should be ready to go digital.

How much **time** can a smart system **save**?

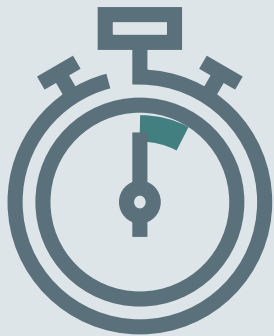## Typical ANALOG sensor calibration (six pH measuring points):

15-20 minutes
for each loop
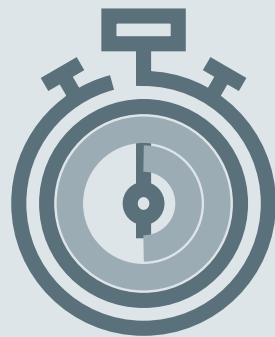
90 minutes
per month

Typical DIGITAL sensor calibration (six pH measuring points):

5 minutes
for each loop

30 minutes
per month

Electrode calibration is one of several stages in monitoring that can save time.

There are six pH measuring points. An analog calibration is performed once a month, and may take 15 minutes or more per loop, depending on the cleaning time. This includes the time from when the sensor reading goes from hold mode to live mode. The operator removes, cleans, and calibrates the sensor before bringing the analyzer back into live mode. This process takes a few hours a month for maintenance.

Using a digital sensor with that same application, the downtime each month is only 30 minutes. This is because the maintenance (cleaning and calibrating) is all done in the laboratory or instrument shop, without affecting the measurement reading availability.

With analog sensor calibration, the measurement reading was offline for 15-20 minutes per loop; with digital sensor calibration, it was only offline for 5 minutes per loop.

How much **money** can a company **save**?

Time is money and when a process if offline, every second counts.

The smart system enables secure calibration and provides continuous and reliable measurement. This prevents impurities from reaching the turbines and improves power generation efficiency, saving millions of dollars by avoiding lengthy maintenance and repair issues.

Digital real-time diagnostics let plant operators know immediately when conductivity readings spike, so immediate action can be taken to trip on or do whatever else is necessary in order to avoid damage.

# Where does the **data live** and how can it be accessed?
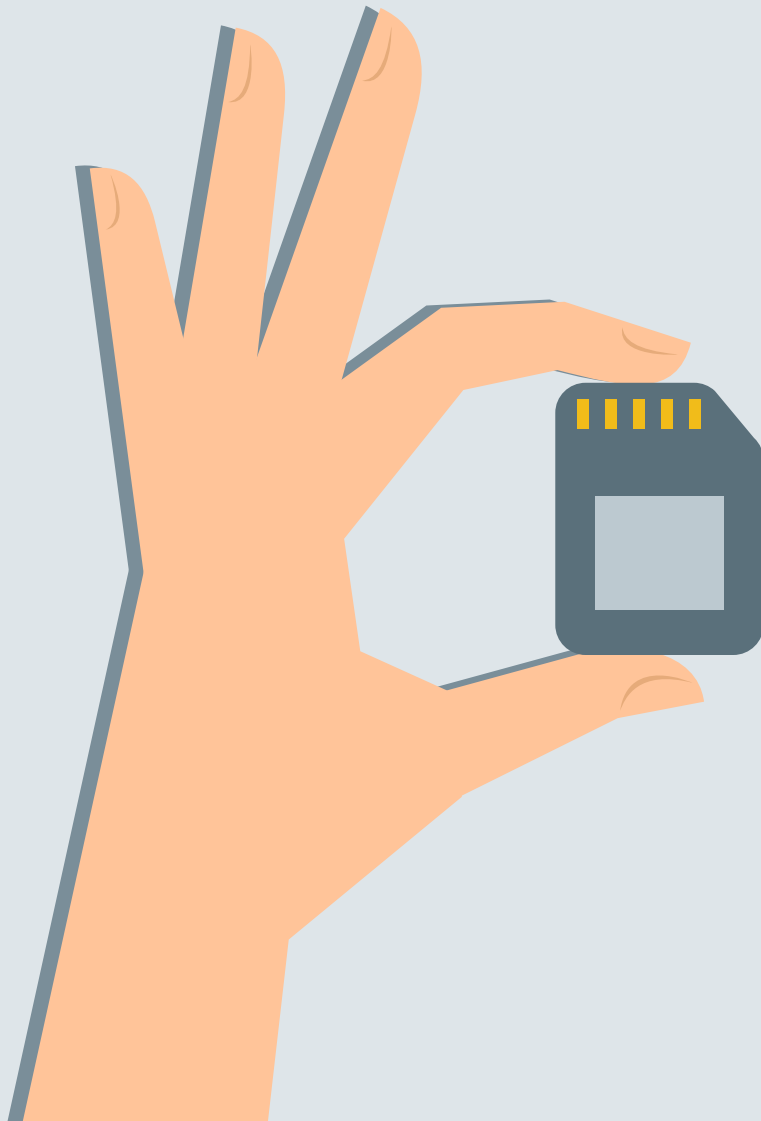
Handwriting calibration values and manually transferring the data to spreadsheets is tedious and time consuming.

Smart systems store the data, so operators can get on with more valuable (and frankly, more exciting) parts of the job. SD card capabilities allow configurations to be copied, reducing setup times. Troubleshooting and backup data is available for easy archiving and viewing.

How hard is it to **install** a smart system in the plant?
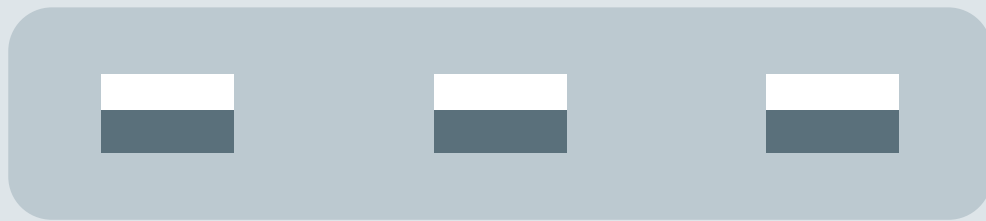
Most smart systems have straightforward and clear guidance for configuration and trouble-free set up, allowing them to easily integrate into an existing process.
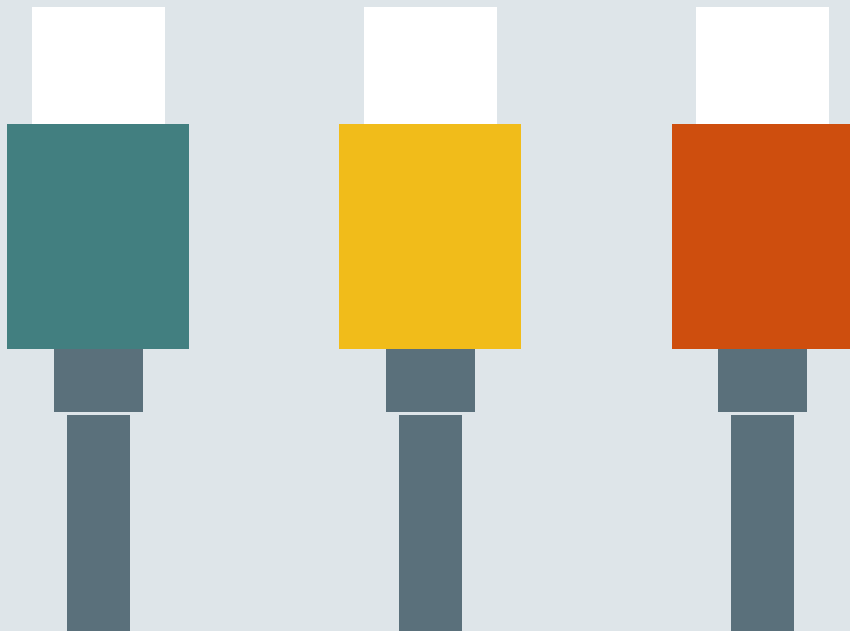
Introducing the **SENCOM™ 4.0 Platform**

OpreX™ Analyzers

SENCOM 4.0 Platform

The SENCOM smart system is an innovative platform that measures pH/ORP, conductivity and dissolved oxygen in real-time. It optimizes maintenance, reduces configuration time and simplifies in-field maintenance and calibration across a wide range of processes from wastewater treatment to process measurement, cutting your capex and opex.

The SENCOM smart system combines a reusable smart adapter with a multi-input analyzer, offering analog or digital flexibility for up to five sensors at once, using just two sensor module slots.

Process optimization with **reduced** maintenance **costs**

SENCOM's multi-input flexibility and simplified selection enables connection of up to five sensors at a time without the need for multiple analyzers. This gives operators a faster and more accurate picture of what is happening to the liquids.

Smarter than smart

Smart data gathering can provide historical data and calibration reports, but SENCOM gives you more. It provides predictive maintenance and replacement alerts through a unique sensor wellness feature, tracking heat cycles from your sensors and advising action.

An expert guide makes set up straightforward with clear guidance for system configuration. Calibration tools give you detailed process analysis. There are multiple connection options (HART, Modbus/TCP, Modbus-RTU) and because it has 4-20 mA outputs, cables in the old system do not have to be replaced.

How **accurate** is SENCOM?

SENCOM provides unrivaled monitoring accuracy, empowering plant operators with more accurate calibrations and measurements than analog systems.

Additional SENCOM benefits include:

- Field-proven sensors designed for operations from routine conditions to harsh environments

- Sensors are securely calibrated in a laboratory under controlled conditions

- Galvanically isolated electronics eliminate interference from ground loops, stray voltages, or noise from pure water pH measurements

- SD card enables easy and automated data uploads for pH system replacement with an activity history log

- Calibration history provides maximum information with a simplified procedure

How often must SENCOM be **replaced**?

Most digital smart sensors come with integrated electronics on top of an analog sensor. Once the sensor has failed, the still functioning electronics are thrown away with the sensor. However, with SENCOM, the smart adapter is reusable and only the analog sensor needs to be disposed of.

We are confident our analyzers will last at least double the life of alternatives. Our sensors also improve glass durability without compromising measurement performance.

That helps reduce maintenance costs.

What back-up support does **Yokogawa** offer?

One of Yokogawa's founding principles is Quality First. More than a century after our founding, Yokogawa still has a reputation for testing all our products thoroughly.

Our support staff are committed to assisting our customers and potential customers throughout the entire lifecycle; from Engineering & Purchasing to Optimization & Service.

Thank you for taking the time to read this ebook.
Want to see SENCOM in action?
Do you have any further questions?

Contact us here:

IAMKP-1785-19-002

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Co-innovating tomorrow ™