



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Faster, easier, cost efficient and more reliable

A revolution in maintenance of pH measuring systems –
and substantial savings!

They have all tested it – in their own environments and based on their own needs – and now they talk about it here: how their day-to-day tasks have been transformed for good by the advent of digital electrodes and a truly innovative maintenance concept launched by Endress+Hauser.

In the field electrodes are only replaced

“Don’t forget the bottles of buffer solution (and are they still ok to use, by the way?), distilled water for rinsing, and a rag for wiping ... When you’re out in the field, it’s essential to have everything at hand: there’s no question of wasting time going back to get something.” Didier Roussel, Head of Maintenance at a wastewater treatment plant*, is no longer concerned by worries such as these – which are otherwise too familiar to specialists tasked with measuring pH values.

* Wastewater treatment plant operated by the Association Syndicale Libre of the Upper Touyre Valley (France)



Endress+Hauser 

People for Process Automation

All he needs to do to calibrate the various pH measuring points around the plant is disconnect the electrode to be calibrated and replace it with another one – pre-calibrated, of course. The most important maintenance task is then carried out in the comfort of the plant laboratory, with everything at hand.

Extending sensor service life

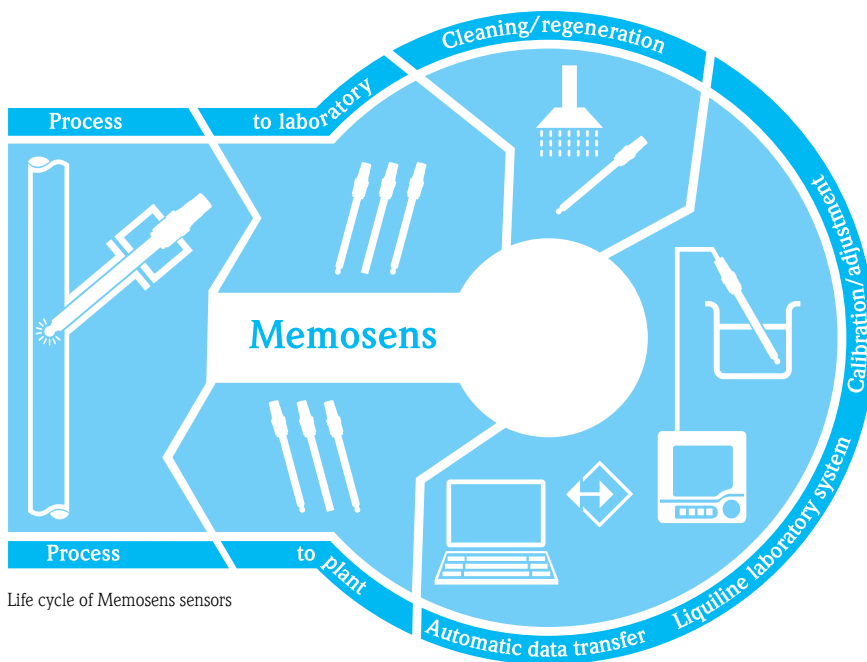
Manfred Walter at the Merck production facility in Gernsheim (Germany) notes the same thing: “We have increased the service life of our electrodes by 30%. Certain sensors have been in operation for six months – a period never previously achieved with analog sensors.” This is in spite of particularly harsh conditions – temperatures in the region of 176°F (80°C) and a very acidic pH which can, however, climb to 10 at certain moments – necessitating regular maintenance of the pH measuring systems.

With Memosens technology, it is the tough sensor which is exposed to field conditions, not the operator, for whom discomfort is kept to a strict minimum in that he is only required to extract the electrode and replace it with one that has been pre-calibrated. Back in the ‘measurement and control’ lab, the technicians can then perform truly predictive maintenance, including an evaluation of the condition of the sensor, cleaning – plus regeneration if necessary – and, finally, calibration and adjustment.

One of the key innovations of Memosens technology is that the electrode head stores numerous pieces of maintenance-relevant data in digital form. Viewed by the technicians when the electrode arrives at the lab, this data provides a good idea of the electrode’s operating condition.

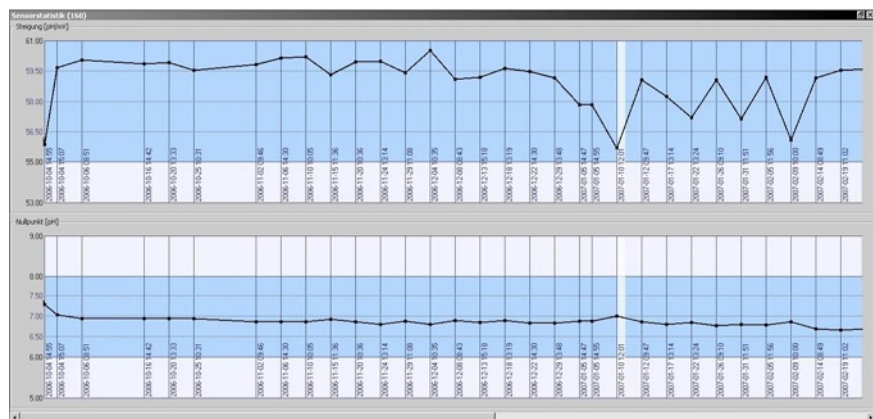
What is his secret? “Two years ago we changed over to Orbisint CPS 11D digital sensors with Memosens transmitters.” With Memosens technology, the analog/digital conversion takes place inside the sensor itself, so the sensor is the only item requiring regular checking and calibration; the cable and transmitter impact far less on the measurement process than in an analog system, which is sensitive to moisture and electromagnetic interference, among other

things. “I check the measurement with a pH meter every week, and every sensor is calibrated once a month”, adds Didier Roussel. Calibration, which is carried out also provides an opportunity to clean the probe with a hydrochloric acid solution, an operation which cannot be easily performed on site. Better maintenance obviously means the probes deliver more reliable readings and have a longer service life.



Life cycle of Memosens sensors

Data is automatically recovered and stored by Memobase, the comprehensive management solution for measuring points based on Memosens technology. Installed on your PC, Memobase allows you to document calibration procedures and maintenance work, an option which is attractive to many companies, particularly in the chemicals, food and life sciences industries. Memobase can display a history of stored data for the purpose of monitoring the development of the slope or the zero-point of each electrode.



On calibration, the entire Memosens data set is transferred and saved in the database. Process and measuring point-relevant data are documented in addition to the quality relevant data required for calibration.

Reducing on-site maintenance time by over 50%

At Lanxess in Leverkusen (Germany), all the data for a particular measuring point – whether relating to operational phases or calibration/adjustment – are recorded and analyzed when the sensor is calibrated. This gives measurement and control specialists an easy means of monitoring and analyzing the entire sensor lifecycle – from the moment it is taken onto stock right through to disposal. This data also helps ensure the ongoing improvement of measuring systems and maintenance work. Associated with improved asset management, preventive maintenance thus becomes an integral part of a new maintenance strategy.



For Didier Roussel, calibration is carried out in the comfort of the plant laboratory, with everything at hand.



A central laboratory has been set up and equipped with a computer-aided pH calibration bench in order to manage the extensive base of pH measuring equipment. The tasks are clearly defined: the operators recover and replace the on-site sensors – certain installations are difficult to access – and the measuring specialists take care of the laboratory maintenance and calibration work. This reduces time spent on on-site maintenance by over 50%.

Reproducible laboratory conditions enable precise calibrations and therefore more accurate process management. Here, too, it has been noted that periodic cleaning and regeneration prolong the service life of the pH sensors, which obviously increases the availability of the measuring points.

Calibration of Memosens sensors in the laboratory

The Memosens technology

Endress+Hauser's Memosens digital pH sensor is designed for reliable and verifiable pH measurement. The device allows important process data to be saved directly in the sensor, guaranteeing interference-free measuring signals while also simplifying process measuring technology. Teamed with all common fieldbuses, Memosens systems are open for all process control and asset management systems. They are already industry proven even in the chemical and life sciences industries, food, water and wastewater, pulp and paper and energy.

Easy qualification of measuring points

Faced with the need to meet many strict legal requirements, the life sciences industry also has much to gain by this revolution in pH measuring systems. Memosens technology allows the user to consider the digital sensor (comprising the measurement chain) distinct from the cable + transmitter duo which takes care of data transfer to a Process Control System (PCS). Since the sensor can be calibrated in a laboratory environment, only the cable and transmitter need be qualified on-site.

And to simplify this step, Endress+Hauser can propose its dedicated qualification tool, Memocheck Plus. This tool will allow the Quality Manager to perform the IQ and OQ phases with ease (Installation Qualification and Operational Qualification). An additional second tool, Memocheck, makes it easy for maintenance teams to perform a fast, easy check of a measurement loop when carrying out commissioning or repair

work. Another key argument for regulated industries: controlled by Memobase, the sensors are managed on the basis of each one being assigned to one measuring point (TAG), or possibly to a group of similar



Back in the lab, Manfred Walter can perform truly predictive maintenance, including an evaluation of the condition of the sensor.

measuring points (TAG group). This link cannot be altered, and guarantees the coherence and traceability of the measuring points.

Memosens technology currently covers measurement of pH, conductivity, oxygen and chlorine... and will also include turbidity in the near future: enough to satisfy most users of physico-chemical analytical tools.

The financial benefits of migration have been demonstrated in numerous cases – but let us leave the last word to Mr. Werske, a measurement and control specialist with Merck in Gernsheim: “In terms of quality and cost-savings, there are so many advantages to having an easy means of replacing on-site sensors and of performing maintenance work in a central laboratory, in ideal conditions, that the expense of changing over to this system is more than justified.”

Dedicated calibration tools



Memocal T is a calibration instrument for pH measurement using digital sensors – Wet or numeric calibration (9.8 ft/3 m of cable).



The Memocheck service tool enables a quick and easy check of the measuring loop by simulating fixed sensor status.



Memocheck Plus enables qualification of the measuring loop in the life sciences industries.

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