

THE

ORANGE **COLLECTION**

Water & Wastewater

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Hardware

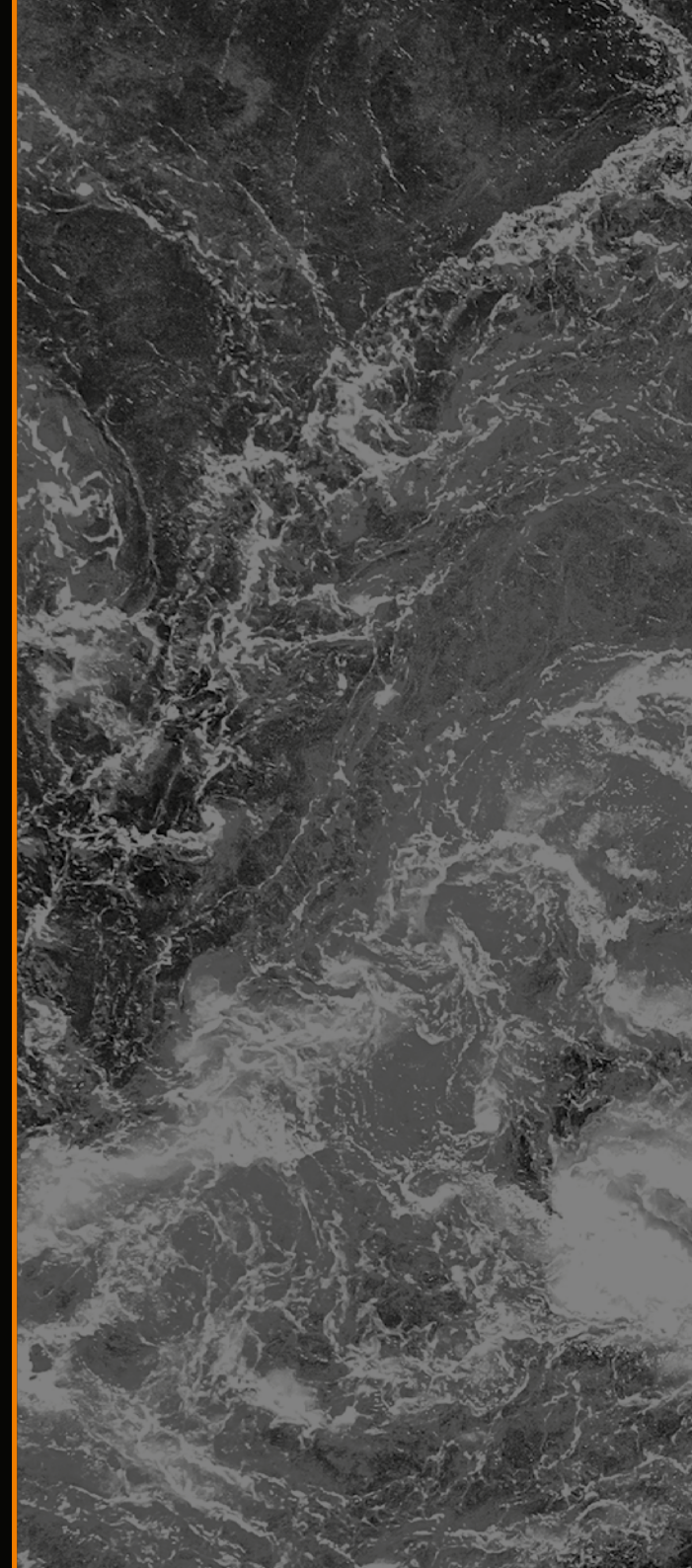
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The orange way of automation.

We believe that good automation is not just a means to an end. It must also be fun, so that something great and valuable grows out of it. Of course, sensors, connection cables, masters and software are primarily used to operate systems efficiently. And they can do that best if they are of outstanding quality. We have been committed to this aspiration for more than 50 years. But we do not define quality solely in terms of sensing ranges, repeatability, response times or protection classes. Quality means much more to us: Our colleagues' passion for automation. The ambition to develop the best possible solution every time. Setting benchmarks.

Inspiring customers. That means countless steps in development. Forwards and backwards. For every innovation, for every evolution. Until finally, all requirements which ifm places on its products are one hundred percent fulfilled: The best functional quality, maximum ease of use and a distinctive design.



A wide-angle photograph of a desolate, arid landscape. The foreground and middle ground are dominated by parched, cracked earth in shades of brown and tan. The cracks form a complex, irregular pattern across the surface. In the far distance, a range of low, hazy mountains stretches across the horizon under a pale, overcast sky. The overall atmosphere is one of extreme dryness and environmental hardship.

If we don't think in cycles, we're going to crash.

There is no life without water. A fact none of us can argue with. Old news yet still important. Another fact is: Water is scarce. And is getting scarcer. Also not new, but just as important. If we want to preserve life as we know it on our planet, we must use the water resources at our disposal responsibly. Both at home and at work. We need to start thinking more in cycles. Taking water, using water, cleaning water, giving water back.

Challenge accepted – our contribution to effective water usage

The less water we consciously or unconsciously take from the cycle, the more habitable our planet will be in the future. By providing top-quality products for water management and industrial water utilisation we help you use our planet's most valuable resource efficiently and effectively and with as little loss as possible. And we do it worldwide. Our local colleagues know the challenges you face and develop the appropriate solution together with you. At the same time, you benefit from the international exchange through which we give local expertise a global reach. For more efficient practices with water – our most precious resource. For a future worth living.



Impulse: yes, you can believe your eyes!

Experience automation as you have never experienced it before.

Do you remember the intro of this brochure?
When we said: "Automation must be fun"?
When we talked about "our colleagues' passion"
for this topic?

Should you have had any doubts as to whether we really meant that: What could be more passionate than dedicating an elaborately produced video format that will appear regularly from now on to a topic? With "Impulse – the ifm magazine" we will illuminate industrial automation from every conceivable perspective. We take a look at details, at the big picture, at new products and at success stories.

We let images and facts speak for themselves and experts have their say. In other words: We do everything to inspire, inform, entertain and infect you with our passion for hardware, software and finding solutions. To begin with, we took a look at four important topics.

We guarantee you: With Impulse, you will experience automation as you have never experienced it before. Have a look. You won't regret it!







Thinking outside the control cabinet!

VSE9xx: Diagnostic system for vibration analysis in the field

Pumps, fans, gearboxes, motors – whatever rotates in an industrial plant generates vibrations. If you know how to evaluate these vibrations, you're able to respond quickly in the event of changed measured values and initiate maintenance work or stop a machine before unbalance, friction, bearing damage or a crash cause something much more serious. Condition monitoring is the magic word.

Condition monitoring: Machine care 24/7

Nowadays, it's no longer necessary to establish and maintain an intimate human-machine relationship to be kept up-to-date with the physical well-being of machines (though we're not going to stop you if you want to. That's up to you). Instead, automated condition monitoring focuses fully on the plant. 24/7, whole-heartedly and just as attentively. This is how it works: Installed sensors send the detected vibrations to a diagnostic system like our VSE9xx for evaluation. The system then forwards the evaluated information to the IT level, for example.

More time for urgent cases

Even the slightest of changes can be detected quickly by this long-term ECG recording. Supplemented by other vital values such as speed (as a pulse signal) and temperature (as an analogue signal), which are also recorded efficiently by the VSE, it provides a comprehensive overview of a machine's current state of health. Assistance for recovery can be initiated if and

when required. This helps to reduce the level of human intervention at each machine. And in turn provides more time to take care of machine patients that are really sick and in need of critical care.

Welcome to the IP67 club!

This is nothing new, especially among fans of condition monitoring. So why not add a little something which could also possibly cause the pulse signal of professionals to temporarily jump for joy? Because unlike other solutions of its kind, the VSE9xx collects information without miles of cables connecting the sensors in the field to the diagnostic system inside a snug control cabinet. In fact, thanks to its IP67 housing, this model feels right at home outside the cabinet and can be mounted exactly where it suits you best.

Thank you for everything, Rudolf Loh!

Now you may think: Vibration diagnosis in the field, all well and good. But what about the rest of the infrastructure? What about power, fieldbus, Ethernet switch or EdgeDevice? We're well prepared for this, too: Since we offer everything in an ultimate IP67 design for field use. Therefore: Think outside the control cabinet and make the most of flexibility!

And a big thank you to Rudolf Loh for ensuring safe enclosures over the past 60 years!





About South West Water:

South West Water provides reliable, efficient and high-quality drinking water and wastewater services for a population of around 1.7 million in Cornwall, Devon, the Isles of Scilly and parts of Somerset and Dorset.

Condition monitoring across the entire water cycle

How South West Water achieves its business goals with vibration monitoring.

South West Water provides reliable, efficient and high-quality drinking water and wastewater services for a population of around 1.7 million in Cornwall, Devon, the Isles of Scilly and parts of Somerset and Dorset. To meet the needs of its customers the company stores water in more than 20 reservoirs and treats it in around 40 water treatment works to produce drinking water for the region.

South West Water also operates 650 wastewater treatment works. Among them is the Marsh Mills facility on the outskirts of the city of Plymouth. Around one third of the wastewater of the city's 230,000 inhabitants is treated here in several stages before being fed back into the water cycle. After initial mechanical treatment, South West Water relies on a biological treatment using the activated sludge process at Marsh Mills. Microorganisms decompose the organic substances dissolved in the water.

"As these are aerobic microorganisms, it is crucial that sufficient oxygen is permanently added to the water so that the decomposition process can take place in the required quality," says Brendon Teague, Condition Based Maintenance Manager at South West Water. This task is performed by nine Roots blowers, which supply a large volume of air at low pressure. With a total power of 615 kW, they pump up to 390 cubic litres of air per minute into the activated sludge tanks.

Fans – an unjustly overlooked piece of equipment

"So far, each blower and motor were checked about once a month in terms of their need for maintenance. Nevertheless, plant failures between maintenance intervals could not be excluded, as bearing damage was either unforeseen or developed between the intervals."

Another problem exists in that the noise which could indicate deterioration of the motor condition cannot be heard from the outside. "The motors are soundproofed, so people can literally walk past them undisturbed. Perhaps this is also one reason why fans and blowers in the water and wastewater treatment industry are often overlooked, even though they perform a task that is just as critical as, for example, the work of the pumps used in the drinking water supply."

Brendon Teague finally decided to equip nine blower units in Marsh Mills with vibration diagnostics from ifm. This first step is, therefore, logical and does not come as a surprise.



"I have been working with ifm for a long time to safeguard South West Water's plants against unforeseen downtime by using condition monitoring."



Condition monitoring: keeping an eye on the health of the plant

"I have been working with ifm for a long time to safeguard South West Water's plants against unforeseen downtime by using condition monitoring," says Brendon Teague. Together with his team, he has installed over 200 VSE100 evaluation unit devices, plus the acceleration sensors connected to it, in South West Water's water and wastewater treatment works.

The vibration monitoring system consists of acceleration sensors and an evaluation unit. The sensors – South West Water uses sensors of the types VSA001 – are positioned at relevant positions in the system and transmit the data to the evaluation unit, in this case the VSA001. The latter permanently evaluates information from up to four sensors and sends corresponding switching signals to the control system when limit values are exceeded. The data and alarms can also be transmitted to a central control room via an Ethernet interface.



Easier troubleshooting and maintenance planning remotely

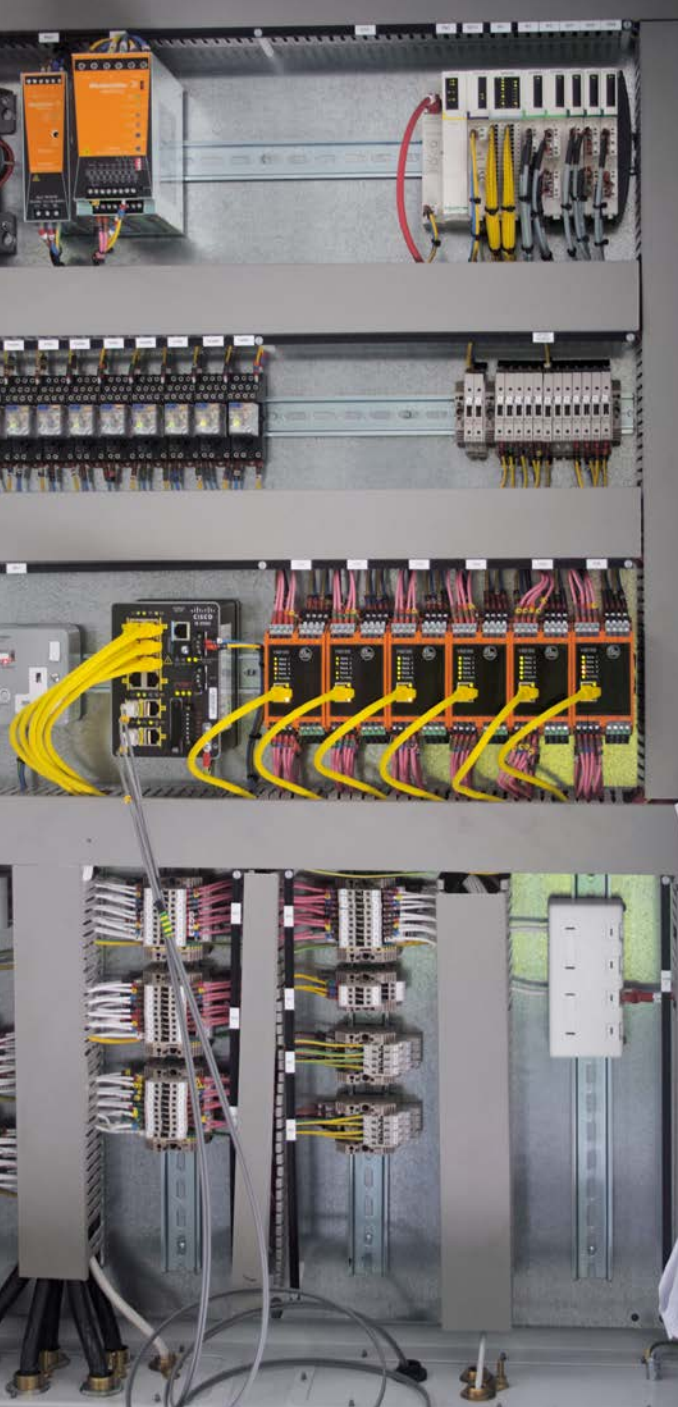
By means of vibration diagnostics, the state of health of a machine is permanently recorded. Thanks to the monitoring of the occurring vibrations in the time and frequency range, incipient damage is registered at an early stage and can be analysed in real time by ifm's own software in a more detailed FFT analysis (Fast Fourier Transformation). As an exact frequency can be assigned to the individual plant components or damage patterns, the sometimes time-consuming troubleshooting on site is no longer necessary and maintenance work can be prepared effectively, even remotely. This drastically minimises the amount of work and downtime.

Sensors help to achieve the company goals

"It is a real benefit to have a central overview of the status of all relevant machines via the software and to be notified as soon as a value exceeds a critical limit," says Brendon. The site Maintenance Manager can thus quickly get an update of the situation, assess the need for action and, in an emergency, inform the maintenance team on site. "Condition monitoring in this form is already helping us to achieve the company goals relating to the environmentally friendly handling of water and wastewater.

By detecting damage at an early stage, we have often been able to react in time and thus avoid downtime and costly repairs. Overall, we expect that due to the implementation of condition monitoring, we can reduce the cost of maintenance and replacement of damaged assets on average by between £100,000 to £150,000 per year."





"Every new plant must be equipped accordingly with sensor and evaluation technology that can be integrated into our existing infrastructure."

Condition monitoring: standard on newly installed machines

In order to benefit even more comprehensively from the advantages of condition monitoring in the future, South West Water has defined condition monitoring on pumps and fans as a technical standard. "Every new plant must be equipped accordingly with sensor and evaluation technology that can be integrated into our existing infrastructure. This not only creates more operational certainty for large, important treatment works, but also helps us to efficiently and effectively maintain the quality and keep everything in perfect condition at smaller treatment works in rural areas."

The future: collaboration via the IoT platform

As a further development step, Brendon Teague can very well imagine switching to the new ifm moneo IoT platform. With moneo, even complex sensor infrastructures can be easily mastered, while the optional moneo RTM module

offers far-reaching possibilities for an even more comprehensive vibration analysis. "In combination with the new edgeGateways from ifm and thus the possibility of making the data available in a cloud environment, I would be able to share the relevant data even more effectively with my maintenance colleagues in the supply area, so that the maintenance quality and the reaction speed in the event of an alarm would again increase significantly."

Conclusion

South West Water has been able to effectively prevent serious failures of critical water supply and wastewater treatment equipment such as pumps, centrifuges and fans with their comprehensive condition monitoring system. This saves the company significant costs for repair or replacement of equipment. At the same time, plant monitoring supports the company's goals regarding the responsible use of water as a resource.



It couldn't be any easier!

Improved digitisation thanks to IO-Link.

"It's really quite simple!" is easy to say if you know what you're talking about. Usually, as expertise decreases, practical results often increasingly deviate from what one had in mind. Does this also apply to the digitisation of your system? We promise: No! With IO-Link, even potential #uncharterredterritory is quickly transformed into a paradise on earth. Because IO-Link is not only simple, but also convenient.

Cable clutter? Not at all!

Take the wiring, for example: Thanks to a standard connector, it is protected against reverse polarity and leads from the sensor to the master, which is located directly in the system. There, the sensor information is bundled and sent to the next higher level system via another cable with a standard connector. This can be the fieldbus, or the IT – or both. Gone are the days of a tangled mess of cables, countless Gordian knots, winding their way from the sensors to the controller, where, according to Murphy's Law, they created at least one false connection.

Automatic parameter setting

What if a new sensor is added? The choice is yours: facing the endless shallows of the cable ducts – or choosing the convenient, easy connection to the IO-Link master. Hours vs. seconds. The old sensor no longer works? With IO-Link, this is no problem, only two simple steps are required: 1. unscrew the old sensor, 2. install the new sensor. Done. The master automatically carries out parameter setting of the new sensor. As we said: IO-Link makes digitisation simple and convenient.

There is so much more than 0 and 1.

We haven't even talked about all the data that the sensors permanently provide you with in digital form. With IO-Link sensors, data doesn't only consist of 0's and 1's, but includes everything that happens between the switch points. Exact pressure curves, temperature curves, flow rates – everything up to date at all times.

And if we tell you that you can even save measurement points with the smart sensors, because not just one, but two or more parameters are measured and transmitted from one sensor: Do you still think negatively about IO-Link?





About Midvaal Water Company:

To ensure a reliable water supply, Midvaal Water Company, from South Africa, relies on modern remote monitoring.

Modern pump monitoring with IO-Link

Condition monitoring ensures regional water supply in South Africa

Although about two-thirds of the earth's surface is covered by water, there is an equally large proportion of the world's population living in areas that suffer water scarcity. The groundwater is increasingly polluted for different reasons. As a result, drinking water is the most common cause of illness worldwide. If current usage trends don't change, the world will have only 60% of the water it needs in 2030.

Therefore, ifm's goal must be to help their customers to save water. Innovative automation solutions are easy to implement and help companies to achieve savings in water, energy and maintenance.

The Midvaal Water Company is a water service provider supplying potable water in bulk to South Africa, serving an area of some 900 km². Situated on the banks of the Vaal River, the company purchases raw untreated water and after purification, delivers it to consumers. In addition to this, Midvaal renders operation, maintenance and consultancy services for water treatment plants and sewage works.

The five newer motor-pump sets (grey motor housing) were equipped with IO-Link-sensors and condition monitoring solutions. The three older sets were used for production while the installation of the new sets.

"From the sensor to the infrastructure to the IT level, ifm provides an integrated system, from a single source."

Contemporary, simple system for remote monitoring

In September 2019, the non-profit organisation decided to refurbish one of its high-lift pump stations. Traditionally, these stations were equipped with analogue sensors and standard infrastructure. "In the past, it took our technician a week to connect a pump in the station to the PLC due to the complex wiring structure", said Mark Richards, Maintenance Manager at Midvaal. "In addition, wiring failures could easily occur due to the significant amount of cables, resulting in complex reworking."

Midvaal wanted an innovative and easier solution that would enable reliable control of the pumps and motors of the high-lift pump station as well as remote monitoring to schedule timely maintenance tasks, ensuring performance and preserving the value of the pump station for the long term.

In a pilot project, five sets with motors and pumps were equipped with control and monitoring sensors as well as the corresponding infrastructure. Each of these sets consists of a 600 KW motor with 3.3 KV supply and a pump that can raise 43,000 litres of water per minute to a height of 60 metres. In addition, condition monitoring, sump level control and pressure monitoring of inlet and outlet was implemented.



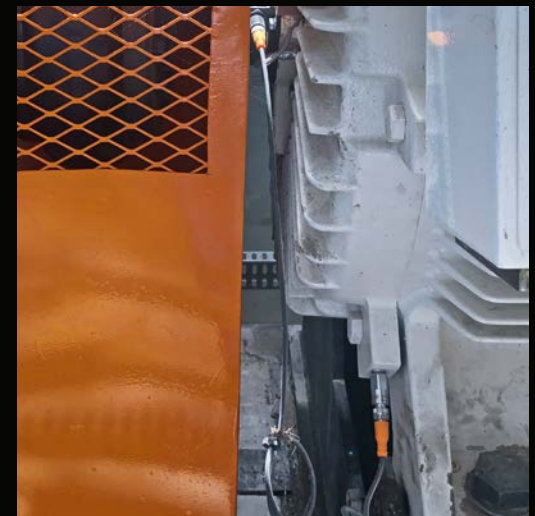


Vibration monitoring expertise at ifm: everything from a single source

Several factors led Midvaal to choose ifm as their automation partner for project implementation. "ifm initially presented their solution to us at a trade fair and we were convinced right away. The smart wiring with lower cable requirement, the possibility of transmitting data to the PLC via Ethernet and the storage of historical data in the diagnostic electronics all represented real added value for us," said Richards. "The collaboration also meant that we didn't have to hire an external vibration expert, as ifm delivered professional advice and full implementation support, e.g. by ensuring that all limit values were set correctly. Even today, ifm's experts assist us with their long-standing expertise in vibration diagnostics whenever we need help in analysing the historical data."

Together with the engineering office Wasterspec cc and system integrators from APJ Automation, the ifm experts implemented the automation and condition monitoring solution. It comprises VSA001 vibration sensors whose data are evaluated by a VSE151 diagnostic unit. Combined with the temperature sensors, they provide the required data to ensure continuous monitoring of system health and visibility of the maintenance requirements of the motor and pump. In addition, PG2454 pressure sensors are used for pressure monitoring at the inlet and outlet of the pump – both remotely and on site via an analogue display.

The pressure and temperature sensors are connected to AL1122 IO-Link-Masters using standard M12 connection technology. This type of master features an EtherNet/IP interface enabling simultaneous data transfer to the PLC and IT system. The same applies to the vibration sensor data, since the VSE151 diagnostic unit also communicates directly with the PLC and the IT system via an EtherNet/IP interface.



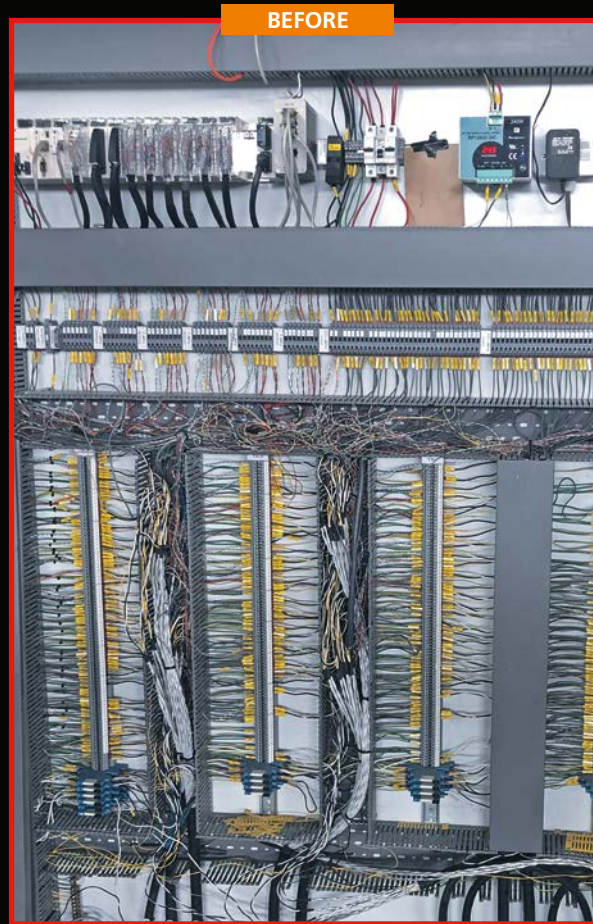
Installation time reduced by 80 percent to one week

The installation time of the sensors was significantly reduced thanks to IO-Link. "The installation time of five pump and motor sets used to be five weeks with hardwired technology. With the modern wiring structure, which is primarily based on IO-Link, the time required is also one week – but for all five pumps," said Richards. In addition to saving installation time, the condition of the pump station can now be monitored remotely. The condition monitoring software is also provided by ifm. "From the sensor to the infrastructure to the IT level, ifm provides an integrated system, from a single source. This means that we have a single point of contact at ifm for all questions that may arise and receive fast and competent support at all times."

Conclusion

The motor-pump monitoring solution meets the customer's requirements for predictive maintenance, online condition monitoring, sump level control and pressure monitoring of the inlet and outlet. Also, the fault-finding time is reduced thanks to IO-Link and less terminations. This helps to reach a reliable protection of valuable assets of motors and pumps. The Midvaal Water Company is rightly very proud of what it has achieved in owning a plant that is one of the most innovative pumping stations in South Africa.

"With the modern wiring structure, which is primarily based on IO-Link, the time required is also one week – but for all five pumps"





Sleep tight, process experts!

Conductivity sensors LDL: Perfect water and product quality at all times

Cherry yoghurt with a raspberry flavour? Inebriated on non-alcoholic beer? Limescale deposits in the ultra pure water circuit? If you are plagued and awoken night after night by such nightmares, don't worry: Help is at hand! The products of our LDL family put an end to sleepless nights, restless tossing and turning and bolting up from your bed in the early hours.

The right remedy for every diagnosis

Do you want to ensure that your ultra pure water is as pure as it can be (and when we say ultra pure, we mean 0.055 µS/cm) all of the time without the usual hassle and stress? If so, the LDL101 is the ideal choice. A top tip if you are looking for carefree and comfortable as well as efficient and effective execution of CIP processes, is the LDL2xx. It checks conductivities ranging all the way to 1S/cm. While the LDL100 is easy on your nerves and offers simple phase separation.

Reassuring reliability 24/7

So whatever you need to relax and find your inner peace: We can provide it. Whichever one you pick, our LDLs are just the tonic for a good night's sleep. Your quality assurance. Your comfort zone. Around the clock. Also during the night.

So much less, so much more

And please, don't be irritated by the dimensions, which are almost homeopathic in their effect compared to similar products of the competition. Our LDLs are reduced to the bare minimum to guarantee the best results in the long term: No extra protruding structures, a standard M12 connector, lots of stainless steel and even more IO-Link convenience. Compact dimensions, low weight, high strength and maximum performance. This is the recipe for success in modern conductivity measurement. Efficient quality assurance, effective sleep aid.

Puresonic & 101 – the best of friends

Sorry, but there's one final shot of adrenaline before we let you get some well-deserved rest: If you're really interested in the quality assurance of ultra pure water, be sure to take a look at page 22, where we introduce the SU Puresonic, the LDL101's best buddy. Why are they unbeatable as a duo? You'll just have to read that for yourself.

Here's wishing you the best rest you've ever had!



Since nothing matters

Flow meter SU Puresonic: Measures ultra pure water without any obstacles

Sometimes less is more. People love to use this saying, for example when attempting to turn their lives around, to declutter, to create free space. And there are developers who reference it as their guiding principle when creating flow meters.

Everything has to go

That's exactly what we decided to do with our SU Puresonic. We turned things around, decluttered and created some free space. When you look through the measuring channel of a flow meter from the competition, what do you see? Protruding structures. Obstacles that the medium has to circumnavigate, bumps into, rubs against or blocks. A lot of maintenance, but not much fun for those involved. When you look through the measuring channel of the SU Puresonic, what do you see? The other end. And what else? Absolutely nothing.

To ensure purity

And that's why this ultrasonic flow meter is the ideal choice, especially when it comes to measuring ultra pure water. You know it: Only water and nothing but water. No minerals, no salts, no micro-organisms, no dirt, no conductivity. Nothing. And to keep it that way, the ultra pure water should ideally not come into contact with anything but itself. All right, a conversion is necessary. And we use the best, robust and uncomplicated stainless steel for this task.

So in terms of water, our flagship ultrasonic sensor has done its homework. Let's take a look at the outsourced measuring

unit. We don't want to bombard you with lots of (from a technical point of view really exciting) details, but we'd like to shout out about one highlight. The display not only shows the actual measured values, it also provides information about the strength of the measuring signal. Something that is extremely helpful, as you'll discover.

Everything will turn out well in the end

Let's assume that the ultra pure water is contaminated due to suspended particles or even deposits on the pipe walls. Both scenarios make it difficult for the ultrasonic waves to travel from A to B and from B to A, as the contamination adversely affects the signal. And the SU passes this information directly to you.

Visually via the display and the operating status LED on the sensor and digitally via IO-Link. This enables you to act quickly – quality assured. The only way to make quality assurance even more precise is in combination with our conductivity sensors, which are presented on page 20.

But that's enough about the sensor. Let's talk briefly about getting started. It's also quite simple: Fit, rinse - that's it! Since we've already calibrated everything.

So what speaks against choosing the SU Puresonic as your ultra pure water flow meter?

That's right: Absolutely nothing. And nothing really matters!





About EnviroFALK:

For more than 30 years, EnviroFALK GmbH has been designing, manufacturing and selling pure and ultra-pure water systems for a wide range of industries worldwide.

Pure and ultra-pure water treatment systems

Not just clean, but absolutely pure

For more than 30 years, EnviroFALK GmbH has been designing, manufacturing and selling pure and ultra-pure water systems for a wide range of industries worldwide. Fundamentally, water as it comes out of the tap does not present a challenge for process sensors. Ultra-pure water, however, is a whole different story. The sensors used in these treatment processes have to be much more efficient and robust.

Everyone who has tried to clean a surface with tap water is familiar with the effect: You might find that unsightly stains appear. On window panes or drinking glasses, this effect may only disturb our aesthetical perception, but in industrial processes, it can seriously compromise the quality of products. For example, where treated water is used to rinse processed metal parts to remove oils and coolants, in order to prepare them for subsequent coating or electroplating. Or in the optics industry and in medical technology, where rinsing water must not leave any residue after drying.

The solution: pure water. This water contains no dissolved minerals, salts, or bacteria. Depending on the quality grade, the term pure or ultra-pure water is used.

Ultra-pure water systems

The company EnviroFALK based in Westerburg, Germany, has established itself as a specialist in this field. Founded in 1989, the company is now one of the market leaders for ultra-pure water systems. Peter Leyendecker, co-founder and Managing Director, explains: "We develop concepts from the different water treatment technologies available on the market: reverse osmosis systems, ultrafiltration, nanofiltration, or ion exchange systems. Often, our systems use a combination of various technologies. We offer our customers complete concepts for water reduction, recirculation, and in particular for pure water treatment."

With this soft water, all solids are filtered out by means of reverse osmosis. In the next purification step, the water passes through an ion exchange cartridge. It is filled with a special granulate, or mixed bed resin, which removes all minerals from the water. To check the quality of this fully desalinated water, we use conductivity sensors from ifm. Based on the process value it provides, we can immediately recognise an increase in conductivity once the cartridge is exhausted and needs to be replaced. The pure water is pumped into a tank for intermediate storage and also partially heated to allow for flexible use in various applications. The desalinated water is additionally subjected to UV radiation to combat germs and maintain a high degree of purity."

"With IO-Link, I have full transparency right down to each individual sensor via the HMI and the controller."

Maximilian Meurer, Measurement and Control Engineer at EnviroFALK, explains how it works: "In this process water treatment system, we inject normal water as it comes out of the tap. In the first step, it is softened.





Sensors and requirements

Various sensors of the automation specialist ifm are used to monitor the complex treatment process and ensure a permanently high quality of the ultra-pure water. Even the smallest contamination or remineralisation could reduce the quality and must be avoided at all costs. This is why EnviroFALK uses flush mount sensors in their pipes and tanks. The advantage: There are no dead spaces causing static water, which could lead to unwanted enrichment.

Another challenge is that demineralised water will constantly try to compensate for the unnatural desalinated state by dissolving minerals from the surrounding materials, e.g. from conventional stainless steel walls, which will lead to pitting over time. This is why the pipes in this system are made from plastic or stainless steel of a particularly high quality. The same applies to the sensors that come into contact with the media. ifm provides special sensors for ultra-pure water applications. The contacting parts of the sensing face consist of high-grade stainless steel or other materials from which ultra-pure water cannot extract any molecules.

Key measurement: the conductivity value

The LDL101 conductivity sensor is the right choice where the purity of water is crucial for product quality or process reliability. The conductivity value is the reciprocal of the electrical resistivity value of water. The purer the water, the higher its resistance and the lower the conductivity.

Maximilian Meurer, Measurement and Control Engineer at EnviroFALK, adds: "We use the LDL101 IO-Link sensor for conductivity measurement, which is key to assuring the quality of highly purified water. The conductivity indicates the concentration of ions in the water. The smaller the number of free ions, the lower the conductivity. The LDL101 conductivity sensor impressed us with its very large measuring span from 0.04 to 1,000 microsiemens per centimetre. This is ideal because it allows us to cover all system stages with one type of sensor, from normal 'municipal' water at the inlet to ultra-pure water at the outlet. Using only one sensor type reduces our storage costs. And less sensor variety also means less complexity for our service technicians in the field. We have





"Another area of application where the pressure sensor can really unleash its strengths is the tank."

equally been impressed by the compact design of the sensor. We can connect it with standard M12 connection technology and do not need expensive data cables or an external evaluation unit in the cabinet, which saves time, space and costs."

The high resolution and the loss-free digital transmission of the measured values via IO-Link enable a permanently precise analysis of the water quality, ensuring flawless processes. For example, if the conductivity value rises during ultra-pure water production, this indicates that parts require maintenance.

Clean pressure measurement

The pressure in the pipes must be monitored at several points in the system. In the future, the PL15 pressure sensor will be used in a complex water system to fulfil a combination of several tasks. "Firstly, we use the PL15 for pump control. Thanks to IO-Link, the sensor possesses excellent resolution across the entire pressure range of 0 to 10 bar. IO-Link allows direct reading of the measured values in a digital format, i.e. without conversion losses, which gives us even more precision. In addition, we no longer need to make any settings on the sensor itself, which facilitates handling."

Another area of application where the pressure sensor can really unleash its strengths is the tank. "The PL15 is also suited for level monitoring. Its flush design prevents dead spaces causing static water, and thus, unwanted enrichment. Another benefit of the pressure sensor is that it provides the medium temperature as an additional process value, which further enhances process transparency and control," says Maximilian Meurer.



Precise flow rate measurement of ultra-pure water

Also relevant to the customer is the quantity of pure water available at the end of the treatment process. During reverse osmosis, the feed stream is separated into a pure water stream, referred to as permeate, and a concentrate stream, which contains the particles. For example, by comparing both quantities, the plant operator can see that filters require maintenance or that the feed stream is heavily contaminated with foreign substances. To obtain an exact result, the flow rate must be precisely measured at several points in the system.

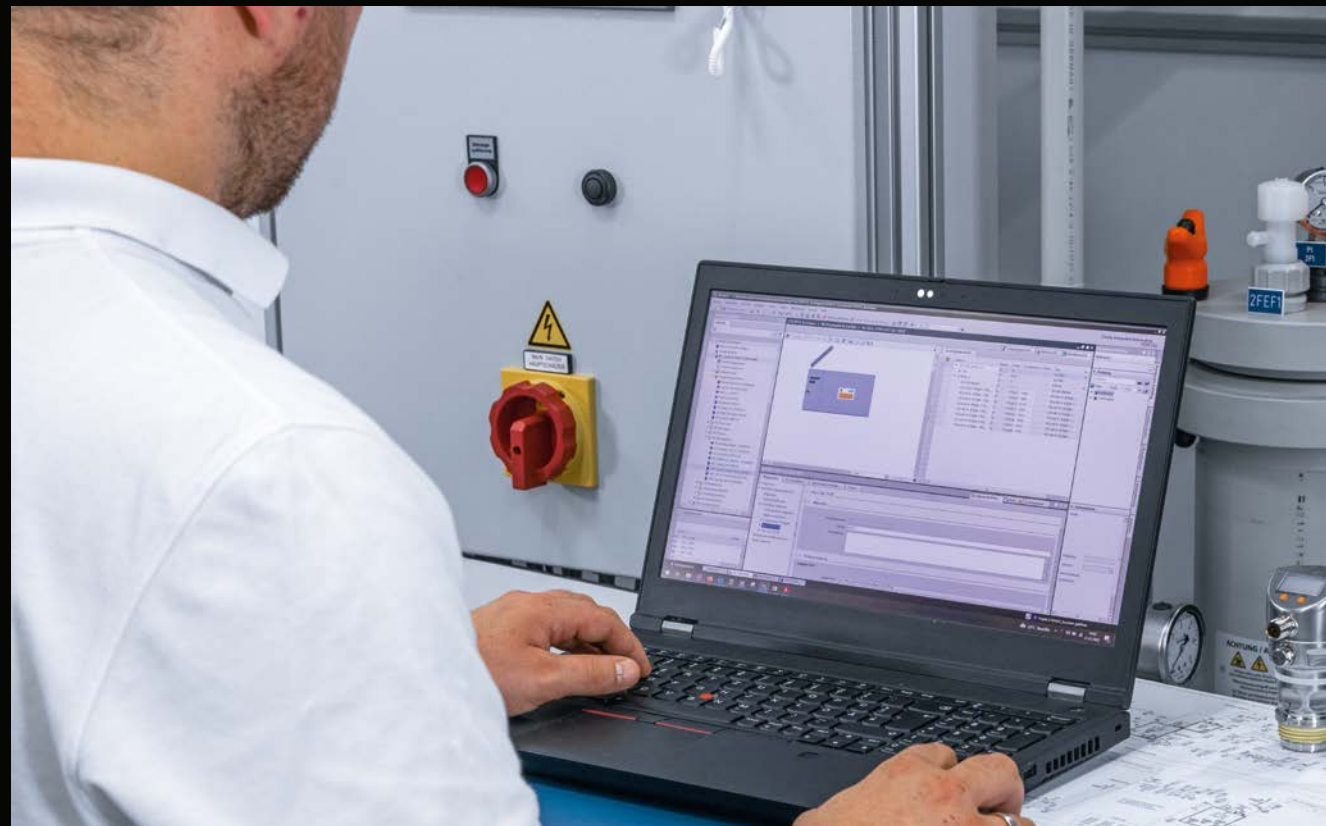
For this purpose, sensor specialist ifm has developed the SU-type ultrasonic flow meter for ultra-pure water applications, which can detect flow rates of up to 1,000 l/min with high precision. Thanks to ultrasound technology, this also applies to ultra-pure water with low conductivity as it is produced in the plants at EnviroFALK. In combination with the conductivity sensors of the LDL family, reliable control of the quality and quantity can be established in the filtration process. The measuring pipe of the flow meter is made of higher-grade stainless steel and is free of measuring elements, seals and moving parts. This means that faults caused by deposits, damage, leaks or blockages, which can occur in mechanical systems such as impellers or turbines, or design-related pressure drops as they occur with other measuring principles, are excluded from the outset.

The measuring pipe made entirely of stainless steel eliminates the need for material compatibility tests of electrodes or seals and allows easy, complete and residue-free cleaning.

The LED, which can symbolise the signal strength, serves as an additional visual indicator of a stable process. A dropping value can be an indicator of particles, air bubbles or deposits on the inner wall of the pipe.



**"The main advantages
the reduced sensor variety**





of IO-Link for us are and storage costs."

Non-contact radar measurement in tanks

The IO-Link-capable LW2120 radar level sensor is ideally suited for non-contact level monitoring in tanks. It can detect levels up to a height of 10 metres without blind zones and at a millimetre resolution. The 80 GHz frequency used ensures stable and precise measurement results even in confined spaces. With the antenna extension, available as an accessory, the sensor can also be used outside closed metal tanks, for example on open tubs or plastic tanks.

"For certain applications, we use the radar sensor instead of hydrostatic level measurement. For example, end customers request this in the ultra-pure field, where every screw connection and every measuring point represents a potential source of contamination. In such applications, level measurement using a radar sensor is advantageous, as the sensor is installed outside the tank lid and does not come into contact with the medium," explains Maximilian Meurer.

Standard M12 connection technology ensures error-free installation within minutes, while IO-Link adds the con-

venience of remote parameter setting and reading. The intelligent algorithm in the unit makes parameter setting via IO-Link seem like child's play: After setting the reference height once, the sensor immediately provides the exact level via IO-Link.

Added value with IO-Link

Speaking of IO-Link: Inspired by the technology, EnviroFALK has chosen to rely on sensors using this digital communication protocol.

Maximilian Meurer explains the benefits: "With IO-Link, I have full transparency right down to each individual sensor via the HMI and the controller. If abnormal conditions arise, the diagnostic data of each sensor helps me to quickly identify and eliminate the problem. Passing the sensor data into the controller is also very simple. Thanks to cyclic data queries, the measured values are directly provided as numerical values. Previously, with analogue measured values, this was not possible. IO-Link also allows me to query and digitise other data, such as serial numbers or calibration data. I can even specify the output unit of the measured values, e.g. for flow sensors litres per minute or cubic metres per hour. Moreover, IO-Link lets me transmit several measured values of a sensor. An example of this would be the conductivity sensor, but also the pressure sensors we use on the tanks and the pump: We measure the pressure to determine the level in the tank, while at the same time reading the temperature value the sensor provides in order to know the medium temperature in the tank. This saves us the effort of installing additional temperature sensors and adding the corresponding screw connections in the tank. The SU-type flow meter also transmits several measured values through one data line: In addition to the flow rate and the sensor status, the total flow rate and the temperature are also available via IO-Link. And thanks to

the data storage function, we, and the end customer notice immediately if a wrong sensor is used or if there are wiring errors. With this function and the simple connection of prewired M12 cables on both the master and the unit, you no longer necessarily need a qualified electrician to just quickly replace a sensor."

IO-Link supports comprehensive parameter setting. Output functions, measuring ranges, switch points and other parameters can be freely selected within the characteristic values of the sensor. Where many different sensors were required before, one IO-Link unit is often all that is needed today.

Maximilian Meurer: "The main advantages of IO-Link for us are the reduced sensor variety and storage costs. Our service technicians no longer need so many different sensors when replacing devices. This saves time and money."

Conclusion

In pure and ultra-pure water systems, ifm sensors allow streamlined yet precise process monitoring. IO-Link reduces the storage costs and mounting complexity, which results in significant costs savings, while also creating complete transparency of all processes as companies move into the digital age. In a nutshell: a clean solution!



The benchmark

Flush pressure sensor PL15: Excellent in (almost) every aspect

When exactly can you claim to have defined a new benchmark? And are you even allowed to make this claim?

After all, you can't just declare yourself world champion in your chosen discipline. A new benchmark should, therefore, be able to offer certain features or achievements, ranging anywhere from significant to outstanding. And not just when training, but also when competing against the best players.

Is it the convenience?

So when we say the PL15 makes the hearts of measuring point wizards and condition monitoring fans miss a beat thanks to IO-Link, it's nothing more than that for now: A simple statement. But if our customers go ahead and confirm what we're saying, namely that they save time and effort because they can simultaneously read out the temperature and can also use much more precise data across the entire pressure range, then that would be confirmation, right?

Or the seal?

Another example: The sealing concept of the PL15 is extremely flexible, absolutely leak tight and, in combination with the flush design, extremely helpful. That's what we say. But you'd probably find it much more convincing if, for example, a company that produces paints and varnishes reported that thanks to these properties it no longer fears any loss of quality due to paint and rinsing residues at the measuring point. Right?

Or the robust measuring cell?

We have installed the best ceramic measuring cell available in the PL15. This cell will never break. Not even after a knock, scrape or drop. That's our claim. But you'd probably rather hear it from one of our customers after they've convinced themselves of its truth in practice? And if the customer were the producer of ceramics who had forced ceramic slurry past our product (as you well know: a diamond can only be scratched by another diamond) – would that be credible evidence?

Everything spread over just 63 millimetres

By now you've probably deduced: We're able to back up the claims we make. This pressure sensor has already proven in practice that it is truly outstanding. Most of the time, at least. The sensor is 63 millimetres long, exactly one third of which disappears into the process connection. Resulting in 42 millimetres being visible on the outside. Admittedly, this is not particularly special, but it does have its benefits. And – guess what? We're not the only ones who see it that way.

Many companies are already enthusiastic PL15 users. Four of them put the sensor through its paces (and tested it against the competition). Click the link or QR code on page 31 to read what they think.

And then: Judge for yourself whether the PL15 is the new benchmark. We look forward to hearing your assessment!





Is this really a radar sensor?!

The LW family: almost too good to be true.

Time for a thought experiment: Imagine a radar sensor for level measurement. State of the art technology, with all the bells and whistles you need for everyday use. Now place this radar sensor on the palm of your hand...

Impossible, you say? Well just give it a try! And not just mentally, but in reality. With our palmsized radar sensor LW. Reduced to the maximum of minimum, a silver coin made of one piece in the hand with all it takes to compete with the "big boys" in its field – outshining them, despite its significantly smaller size.

Maximised on the inside

We really don't want to reduce our sensor to its outward appearance. But take a look at its purist, stylishly shaped housing without any seal. A no-frills, timeless statement in stainless steel. And while we're on the subject of timeless: Where there is no seal, there is no porosity. And where there is no porosity, there is no ingress of moisture. IP 69K at its best. Long live the radar sensor!

Reduced to attractive stainless steel on the outside, the LW also shines with inner values: 80 GHz technology. Where precision meets reaction speed. Fill levels are detected at a millimetre precision from a ten metre distance – and thanks to the slender sound beam and clever algorithm, even with agitators in hygienic tanks. Level changes of up to 200 millimetres per second? No problem either. Accuracy, speed, happiness!

Do you want to measure the level in plastic containers or monitor open basins or flow rates in Venturi flumes without installation? With the appropriately equipped outdoor version, this is also no problem.

What else!?

Not enough, you think? How about we add something new. Simplest installation, for example? Starting with feather-light weight, which, even in the case of climbing a ladder leading to the top of the tank, hardly makes a difference. Followed by the connection of the standardised M12 cable. Attach,

tighten, done. No cable fumbling, no fiddling with screw-drivers. Attach, tighten, done. Susceptibility to error: zero.

And the parameter setting? Thanks to IO-Link, that's child's play, too. Set the tank height, done. With moneo|blue it can be done even more conveniently: on your smartphone. Wondering how that works? Learn more here: www.ifm.com/gblmoneo-blue

During operation, the LW handles all the distracting things that you might have installed in your tanks that could get the better of the sensor system with complete confidence: Thanks to its slender sound beam, the LW elegantly bypasses obstructive agitators and spray-ball attacks roll off it like raindrops off lotus petals. So much comfort, so much sovereignty, so much ingenuity, so much size now fits in the palm of your hand.

That's all a radar sensor needs.



Rescuing Valve City!

MVQ: Position sensor makes valve actuators transparent

What does every good superhero story need?

A hero with superpowers, a territory that needs protecting and an adversary who is wreaking havoc there.

We'll get the storyline right. Although, if we're being honest, it might be a bit too much to attribute supernatural qualities to our MVQ. It can't fly (it doesn't need to) and doesn't turn green when something makes it angry. But our hero still has one ingenious ability; the one that made the original 'spit curl' hero from outer space so super in the first place: X-ray vision.

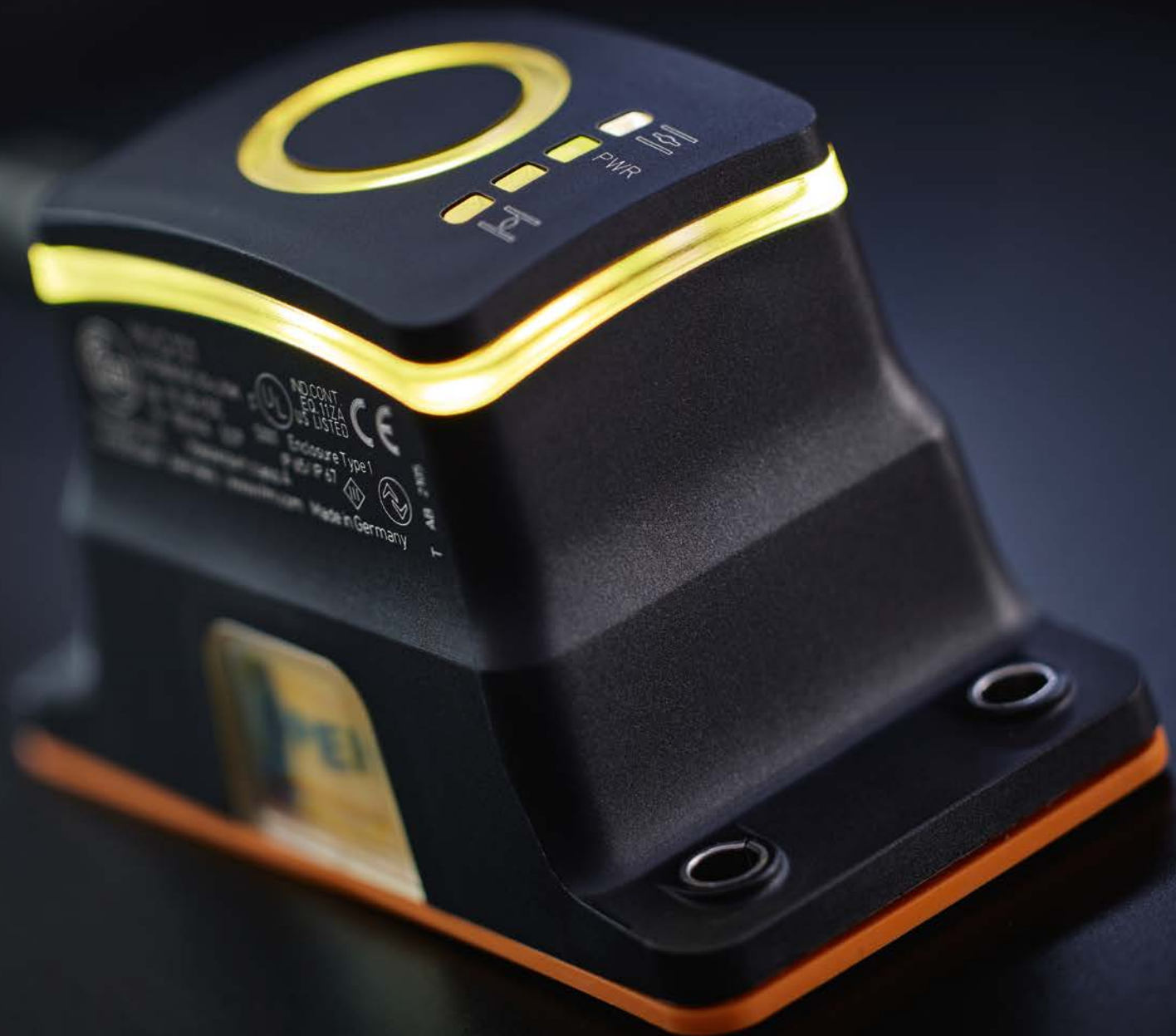
No chance for the evil villain

Despite this quality, MVQ might not be able to see through everything that is not made of lead. But it doesn't have to. It's enough for it to look inside your valve flap with a razor-sharp gaze. This allows you to stay one step ahead of 'Downtime', the evil villain hell bent on causing trouble. And if he tries to sabotage Valve City along with his helpers Blockage, Wear and Deposits, MVQ recognises the evil of his actions in good time and reacts before media contamination, loss of quality and a waste of resources can have a devastating impact on your processes.

Even the slightest attempt is thwarted

How exactly does MVQ do it? This, unlike its alter-ego identity, is no great secret. MVQ permanently and meticulously measures the opening and closing times of the valve flap and also records the flap position to the nearest tenth of a degree. As movements slow down, wear or deposits could wreak havoc and cause leaks. Here, as with the sudden occurrence of an equally dangerous blockage, MVQ reacts in a flash. It unmistakably indicates the problem by means of a red flashing light; at the same time, it also informs the digital command station where, thanks to IO-Link, everyone is also permanently informed about what is happening on site.

The days when Downtime and other horrors could go around terrorising Valve City due to a lack of transparency are well and truly over. The age of MVQ has dawned.



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Made in Germany





About Lower Murray:

Lower Murray Water is a regional water service provider with headquarters in Mildura in the Australian state of Victoria.

A clear view for clear water

In Australia, the MVQ valve sensor is ensuring reliable backflushing processes in a water treatment plant.

Lower Murray Water is a regional water service provider with headquarters in Mildura in the Australian state of Victoria. To cover the supply of approximately 80,000 customers in an area of about 14,600 square kilometres reliably, the company treats raw water from the Murray River in nine plants to produce drinking water.

The untreated water passes through several stations as it is treated to become drinking water, including filtration. During this step in the process, tiny suspended particles that have not already been removed from the water by flocculation, precipitation and sedimentation are filtered out. Since the filters become increasingly blocked as particles settle on them, they must be cleaned regular by means of backflushing. This is the only way to retain functionality and the

flow of water. "To do this, the filtration process is stopped, then water that has already been filtered is directed through the filter in the opposite direction at an increased flow rate to release trapped particles", explains Mark Blows, Team Leader, Electrical Maintenance at Lower Murray Water.

To ensure that the backflushing runs in a self-contained process and no dirty water gets into the drinkable water that has already been treated, it is important for the necessary valves to open and close reliably. "Until now we have ensured this by means of limit switches and that has allowed us to trace whether the valve is open or closed." When a new backflushing system was installed in the water treatment plant in Mildura, Lower Murray Water decided to use the MVQ101 valve sensor from ifm instead of limit switches.

"Until now we have ensured this by means of limit switches and that has allowed us to trace whether the valve is open or closed."



"This prevents unnecessary downtimes and the risk of endangering drinking water quality is also minimised."

Recognising what happens in the valve

The Smart Valve Sensor MVQ101 is a position sensor for valve actuators that provides a transparent view of what happens in the valve. The MVQ not only transmits via IO-Link that the end positions have been reached. Thanks to continuous recording of the position, the user can also keep an eye on the current valve position, accurately reported in degrees, as well as opening and closing times.

For example, slower movement patterns point to accumulations in the valve or pipe. Blockages or adhering residue that prevent the flap from actually closing completely are detected by the sensor with a valve opening of as little as 0.1 degrees and a corresponding message is generated. The information is available via switching outputs and IO-Link and also on the device itself, thanks to a distinctive status LED with clear all-around visibility.

"In systems conducting water, even a minimal valve gap that cannot be reliably recorded by conventional limit position switches can be enough to effectively eliminate the separation between drinking water and industrial

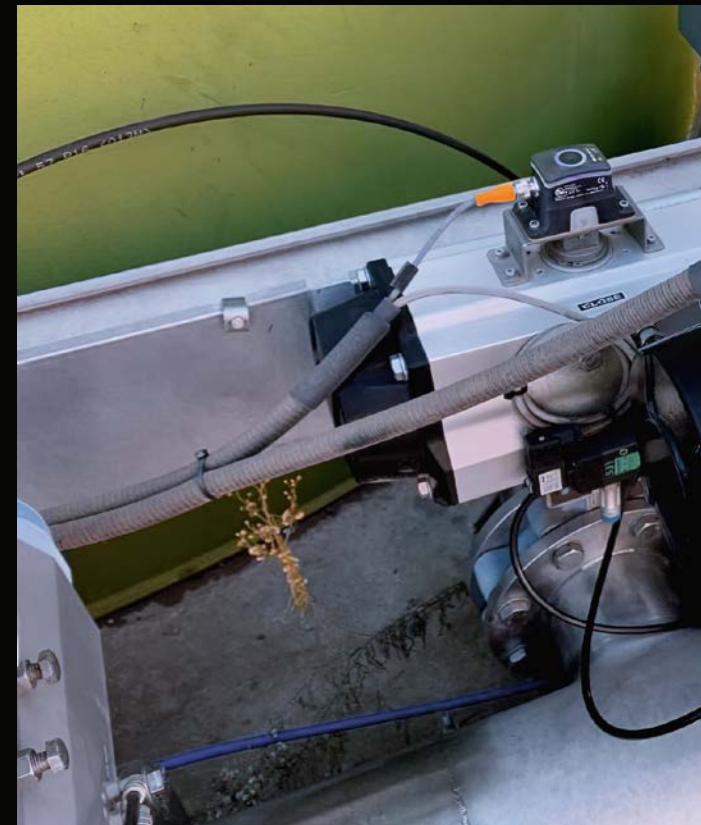
water", says Mark Blows. "With the MVQ we can make certain before every flushing process that all the valves are actually closed and sealed. The additional diagnostic possibilities such as the actual movement time of the valve help us to maintain our systems based on actual need. This prevents unnecessary downtimes and the risk of endangering drinking water quality is also minimised."

Resilience proven under the Australian sun

Another advantage: The MVQ is lowmaintenance – and extremely resilient. "Previously the feedback for the valve position was provided by sensors with mechanical switches. The many movable parts were a potential source of errors which could lead to a plant stoppage.

With the MVQ, we are able to reduce the number of movable components and also work digitally, which significantly lowers the risk of a plant stoppage caused by an error." It should also be mentioned that Lower Murray Water operates the Smart Valve Sensor outdoors, where it is largely unprotected from the Australian climate.

"Dust and rain have had as little effect so far on the MVQs we installed as direct sunshine and temperatures between minus two and plus 45 degrees Celsius."





"Installing the sensors on the valve is really easy, as are commissioning and connecting to the controller thanks to IO-Link."



In addition to the information and process reliability gained, Lower Murray Water employees also appreciate the accelerated installation process. "Installing the sensors on the valve is really easy, as are commissioning and connecting to the controller thanks to IO-Link." Thanks to the IO-Link digital communication technology, up to eight MVQs can be connected to a single IO-Link master, which forwards the bundled data to the IT level as well as the controller. When a replacement is made, the time for implementation is reduced thanks to the master connection, because the parameters are saved on the master and are automatically written to the new device after the sensor is replaced. For Lower Murray Water that means seamless and reliable monitoring of the backflushing process is guaranteed at all times.

Conclusion

Now that the MVQ101 is installed, Lower Murray Water has a continuous and transparent view of the condition of the valves in the backflushing system of the water treatment plant in Mildura. The digital transmission of the valve position, opening and closing time via IO-Link as well as digital and visual alarms on site in the event of blockages ensures drinking water quality and gives the company the ability to recognize the need for maintenance early on and to carry out maintenance measures.





Lighthouse in the fog of noise

Light towers: Recognise and assign the status in a flash

300 000 000 meters per second. In terms of speed, light is unsurpassed. This has been common knowledge ever since Einstein stated it. But the ancient Egyptians also realised that light can travel great distances and made use of this knowledge roughly 2500 years ago. Pharos, reputedly the first lighthouse in the world, guided ships within a radius of 56 kilometres safely into the port of Alexandria.

The clear language of light

To this day, mankind has relied on light as a signalling element: Traffic lights, position lights, indicators, to name but a few. And: Light towers. What do all these modern light beacons have in common? They send out a clear message, day and night, easily recognisable from near and far and, as a visible signal, their purpose can be identified and assigned more quickly than their invisible colleague sound.

Acoustically impenetrable cacophony

Take a busy machine workshop as an example. It's a hive of activity and noise. Every machine hums, whirs, buzzes and rattles away. A joyful but utterly deafening confirmation of performance. Question: How can an individual machine attract attention in the midst of this fog of noise?

When it runs out of components, for example. If the oil pressure drops or other trouble looms? Should it groan, play a tune or shout out loud? Just another sound among many. And what if someone actually does manage to hear

it? It then takes forever to identify the source amidst all the noise. Try finding your friends at a music festival by simply shouting out their names...

Search less, act faster.

So it's better to build a lighthouse. A flashing red light does not go unrecognised even in the strongest sunlight. And even if 20 plants communicate their condition: The single light source is still clearly visible and action can be taken quickly in the event of an emergency. You need to spend less time searching, which allows you to act faster.

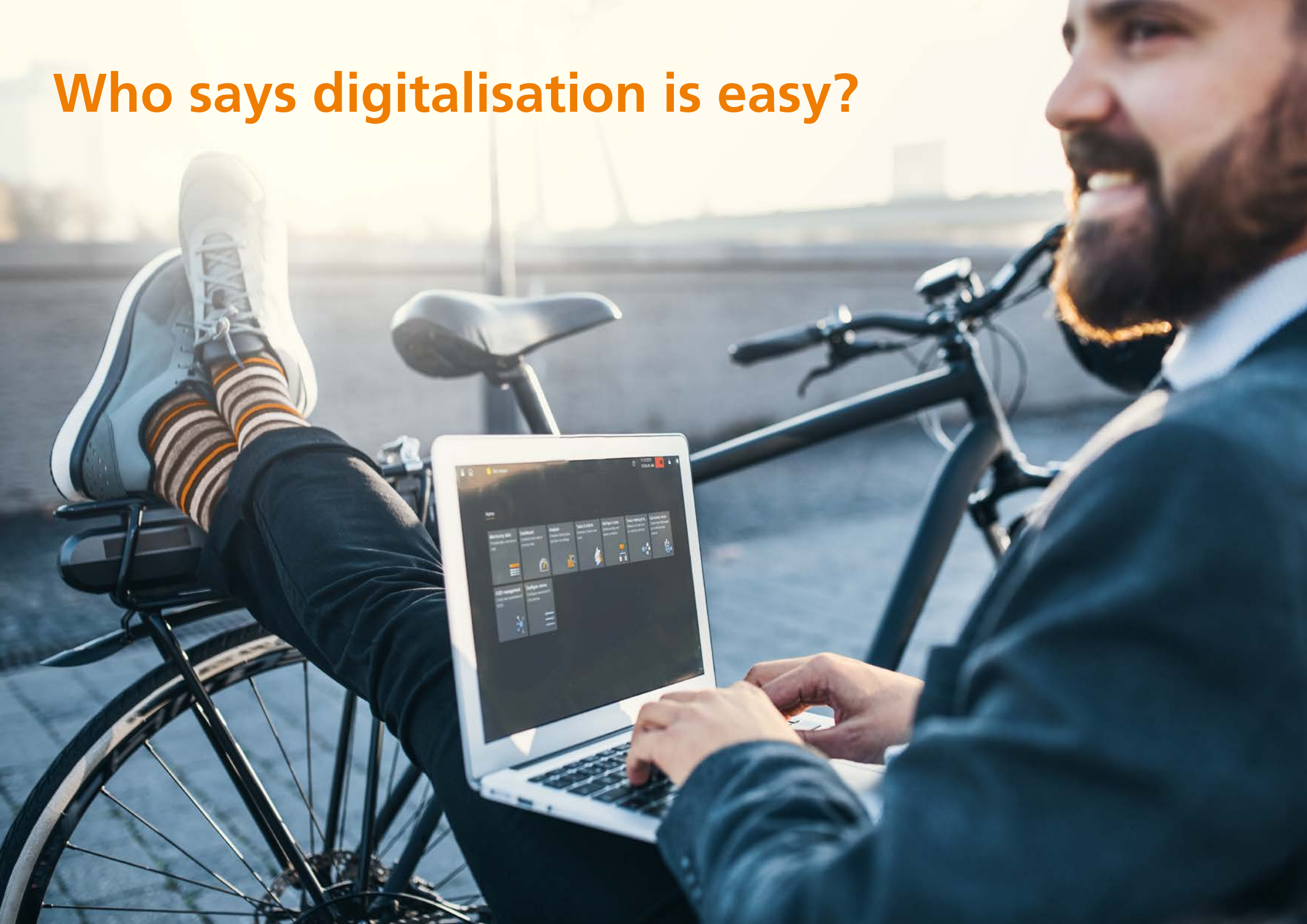
And those who receive clear information at the speed of light can act more purposefully. For this reason, our light beacon can also make otherwise hidden or poorly visible values visible to production staff: Levels, production cycles, temperature windows ...

Whatever you want to display visually: Do it! Use the clear and rapid language of light to your advantage.

It's time to lift the fog and see the light.



Who says digitalisation is easy?



We do!

ifm system sales: your one source digitalisation partner.

What do people really think about when they talk about digitalisation? Where do they think they will struggle? And why?

Digitalisation is not a mystic, magic sword that only the bravest ones are able to pull out of the granite rock. Digitalisation is more like riding a bicycle. Of course, you must learn it. But yes, you will learn it quickly. All you need to get started is a bike that fits your size and a good teacher on your side. And once you take the first miles, you will never even think about the complex moving and balancing processes that are needed to ride on that steel-on-wheels-thing to any place you want to. You just do it.

Same for digitalisation. And as chance would have it, we don't sell bikes for more than 50 years but are a reliable address for everything you need to start your digitalisation: sensors, infrastructure, software – and expertise.

More comfortable than a ride in Copenhagen

You will get the whole path the sensor data will follow in this adventure 4.0 from us. From one single source. That means: no hurdles, no cobblestones, no dead ends, no missing links, no non-matching interfaces. Just a seamless, flawless avenue. More comfortable than the most comfortable bicycle lane you can imagine – even if you live in Copenhagen.

As we said, we are also there for you to teach and support you on any of your steps on the digitalisation process. We have been specialists for automation and digitalisation for more than five decades and it would be a pleasure for us to share our experience with you. We will help you keep yourself on that bike until you feel confident enough to ride the rest of the path alone. The best-fit equipment and the best possible teacher. Both from one hand.

Let's go for a ride!



This is how it goes: the flawless ifm data avenue.

Do you want to know more about the health status of your fans or the best time to change the mechanical sealing of your pump?

Do you want to be told when your compressor needs maintenance or your cooling circuit has a leak that needs to be fixed? The easiest way to get this information is to let the machines tell you. And the easiest way to get the machines to tell you is to contact us. We know where to put sensors to get the big health picture. We know what infrastructure is needed to get the data to your plc and to your IT level. And we know how to set the alarms to enable you to react early enough to prevent unexpected downtime and save a lot of money.

**And at the end you will know all this, too.
Sounds good? Your machines say yes!**

IT level: Software like the IIoT toolbox moneo processes the incoming data into value added information that helps the user to optimise his processes like internal and external supply chains or the maintenance management.

Middleware: IO-Link master, diagnostic electronics or edge devices gather and process data and transmit them to any destination where the data is further processed. This can be the plc and at the same time the IT infrastructure with ERP systems, data memories or the cloud.

OT level: Sensors measure values like pressure, temperature, vibration, level or flow. Modern sensors with IO-Link can submit more than one value and also transmit more information like machine runtime or the number of process cycles.



Whoever says digitalisation will also say moneo.

moneo: The IIoT tool kit for industrial evolution.

Did you know that only 5 percent of sensor data is used by your PLC? Can you imagine that with the remaining 95 percent of the sensor data, you can achieve a plant transparency that allows you to permanently optimise your processes? Save costs, resources and support your employees in getting the best out of the machines while achieving high product quality. Use an IIoT software solution that provides you with the right tools and grows with your challenges. Discover moneo.

Create added value

What sensors generate and send to the IT level is initially nothing more than data, values, signals, zeros and ones. With moneo, they become information, a basis for action and added value, in short: valuable insights. For example, regarding the total value of the stocks of critical means of production, even if they are stored at different locations. Or regarding the health of engines and rotors. Or regarding the optimum moment to change tool attachments. Or much more.

moneo makes processes and their individual participants visible, tangible. Unplanned downtimes or soaring energy costs can be avoided with the help of this information. But moneo would not be moneo (and ifm would not be ifm) if this were the end of the story. Imagine what other steps could be optimised via the digital visualisation of all manufacturing processes along the entire chain...

Flexibility 4.0: moneo grows with you

In what areas would you like to benefit from innovative digitalisation solutions? IO-Link parameter setting, Predictive Maintenance and Energy Monitoring are three applications for whose optimisation moneo and ifm offer the appropriate tools. And whether it's a single machine or an entire plant, moneo is scalable and offers you what you need. If digitalisation is an adventure trip into the unknown, then moneo is the driving assistant that keeps you safely on track.





moneo

IO-Link parameter setting

Simple setting of IO-Link parameters

Sensors create the information basis for a constant insight into the condition of your systems and thus facilitate their maintenance. But what about the infrastructure itself? Are the connected sensors, masters and evaluation units working? With the parameter setting software **moneo|configure*** you can find this out with just a few clicks. The onboarding of new or replacement units and parameter setting are just as quick and easy.

Would you like to check some sensors while walking through your production? Simply download our **moneo|blue** app to your smartphone and install the appropriate Bluetooth adapter and you're ready to go.

*also available as stand-alone version **moneo|configure SA**

Predictive Maintenance

Plant conditions at a glance

Would you like to use sensor data directly or compile and link individual data sources with logical and mathematical operators with just a few mouse clicks?

In the graphical data modeller of **moneo|OS** you can generate exactly the information you need. This allows you to capture visualised representations in the cockpit at a glance or use them in other **moneo** modules. The choice is yours.

Does the engine need to be serviced? Is the tool already worn? Is quality maintained? Do you know these questions? Vibrations can tell you a lot – or rather everything – about the health of moving machine parts. With **moneo|RTM** you can easily create a plant ECG that helps you to plan maintenance in advance and minimise rejects. With AI support from the **moneo|DataScience Toolbox**, you can set dynamic thresholds based on the target values of the vibration curve.

Transparent detection of energy consumption

With your car, you are certainly glad to have a tyre pressure sensor. Because it lets you know in good time when the air needs to be topped up or the tyre needs to be changed because it is defective. This is for your safety. If air escapes undetected in your compressed air system, this has no effect on your personal safety at first, but the unnecessary costs incurred directly affect the operating result.

With our compressed air meters, you can precisely detect all relevant values of the compressed air flow from the beginning to the end: total consumption, pressure and the current flow rate.

In **moneo|OS** you can easily trace the path of the air with the help of this data or set values in relation to each other. Pressure drops, excessive consumption? These indicators of leaks or malfunctions become visible immediately. Efficient energy management has never been so convenient!

Energy Monitoring



Because safety should be more than just a feeling.

ifm safety service: all-round protection for every plant.

No industry, no manufacturing sector can do without the support of machines and systems in production today. From the beginning of industrialisation up to today, the means of production have developed considerably in terms of performance. Precision, power and speed are elementary factors today – and where there are interactions with people, this is also the case for safety. Wherever man and machine work together, whether for or next to each other, the risk of worker injury must be reduced to a minimum.

To ensure this, plant manufacturers are required to consider safety already at the design and construction stage. Plant operators have a duty to guarantee sustainable effectiveness of the selected protective devices.

It is not always easy to keep an eye on current regulations, to assess the hazard correctly from the inside, or have the according expertise ready and waiting for holistic, standard-compliant, safety-oriented system designs. This is where ifm safety service comes into play. We support plant operators and plant manufacturers in all questions concerning plant and machinery safety: From initial site inspection, risk assessment and hazard evaluation to design and inspection of safety systems, including final documentation.

With our many years of expertise, we work independently of manufacturers and according to standard for the safety of your employees. A good feeling must be based on ascertained fact.

Four modules for plant safety

Benefit from our services for operators or manufacturers of machinery, which can be commissioned separately:

Savings potential by outsourcing time-consuming processes

Legal certainty through compliance with statutory requirements

TÜV Rhineland certified technicians and engineers

Risk assessment with proven tools



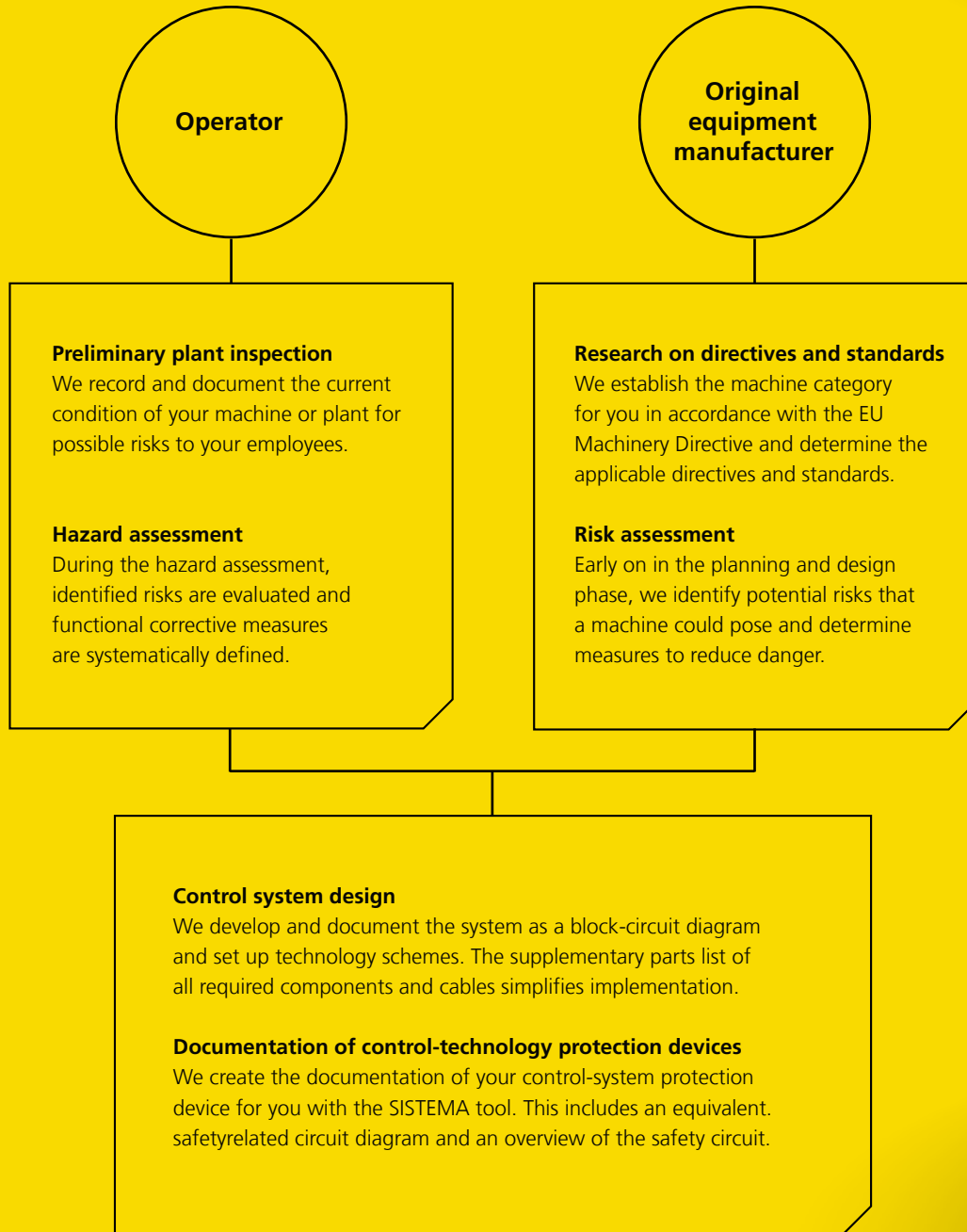


Operator

**Original
equipment
manufacturer**

Both proper function and correct safety distance of protective devices must be checked at regular intervals. Mechanical wear or modifications can result in changes preventing reliable protection.

We offer this inspection, manufacturer-independent and compliant to standards according to EN ISO 13855.





About AQUACHEM:

For almost 30 years, the company AQUACHEM GmbH Separationstechnik from Senden near Ulm in Southern Germany has specialised in the manufacture of fully automatically operated membrane filter presses.

Cleanly pressed!

Sensor technology on the automatic filter unit ensures fully automatic 24/7 operation

For almost 30 years, the company AQUACHEM GmbH Separationstechnik from Senden near Ulm in Southern Germany has specialised in the manufacture of fully automatically operated membrane filter presses. With the help of these filter presses, filter ash containing heavy metals from industrial plants is pressed into recyclable filter cakes. AQUACHEM relies on sensor technology from ifm for reliable operation of the fully automatic plants. Chiresa AG uses no less than four of these AF1200 membrane filter presses in Switzerland. They specialise in the ecological and economic recycling of hazardous waste as it arises in industry, trade, commerce and municipalities in a wide variety of forms. Approximately 95,500 tonnes of suspension are conveyed through the four filter presses every year. That is almost 37 tankers per day.

"The filter presses used at Chiresa AG produce and empty compact filter cakes continuously, literally around the clock," says James Babbé, Managing Director of AQUACHEM.

"The presence of an operator is not required as we can guarantee up to 98 percent machine availability. By using chamber and membrane plates the operating parameters

can be optimally set to cover the span between economic efficiency and ecological requirements. The system also helps us to prevent the suspension from leaking during the filter cycle as all filter presses in our portfolio are completely sealed. We are very proud of these features." Chiresa AG uses filter systems to process filter ash containing heavy metals from incineration plants in Switzerland. For this purpose, it is first dissolved in hydrochloric acid.

With the subsequent so-called precipitation reaction, the dissolved components are separated into water and settling hydroxide sludge. The sludge is neutralised and then either disposed of or recycled as a solid filter cake using fully automatic filter presses from Aquachem. The water collected from filtration is then returned to the cycle.

Process monitoring by means of sensors

On the automatic filter unit, numerous ifm sensors support both the optimum process flow and the energy management. The inductive sensors monitor, for example, the end position of the filter press. This means that when the panel pack is approached, the motor is operated until the preset end position is reached.

"On the automatic filter unit, numerous ifm sensors support both the optimum process flow and the energy management."





Capacitive sensors

Capacitive sensors, on the other hand, are used for limit value monitoring at the washing and rinsing station. The 700-litre rinsing station is used to clean the filter press. Filling it with acid dissolves suspension residues, regenerates the filter cloths and thus increases their service life. Two sensors for limit level monitoring and one sensor for fill level monitoring are installed on the rinsing station. The sensor at the bottom of the tank prevents the pump from running dry if it is under-filled. Overflowing of the acid in the tank is prevented by an additional sensor at the top of the tank. If the level falls below or exceeds the respective limits, a signal is sent to the control station. Normal filling is monitored with a third sensor.

The washing station with a volume of 3,000 litres is used for cake washing and cleaning the press from acid residues. Cake washing takes place after filtration to wash out the chlorides contained in the filter cake before it is sent to landfill. After acidification, water is used to rinse all acid residues out of the filter press. Thus the press is neutralised and the filter cycle can start again. Only two sensors are installed on the washing station to monitor the minimum and maximum levels.

In addition, the entire rinsing and washing station is located in a tub which is also equipped with an ifm leakage sensor. This immediately indicates if the tanks are leaking or if there are any faults in the two feed pumps.

PQ pressure sensor

In addition to an analogue pressure sensor that detects the closing pressure (up to 350 bar) of the hydraulics, another digital pressure sensor monitors the compressed air supply within the filter press to ensure functional and safety-relevant operation. This ensures that the air supply is within the specifications and that the valves installed on the filter press also switch correctly. The so-called pressure switches are installed both on the rinsing and washing station and on each individual filter press.

The air flow sensor type SD6500 measures the current air flow as well as the total consumed air flow, temperature and pressure. This enables the sensor to undertake several tasks at once: Documenting the air consumption benefits energy management. In addition, the sensor can also be used to determine the level of the filter chambers and thus contributes, among other things, to the longevity of the filter plates.





Controlling and monitoring the filling process of the container

Below the filter presses there are platforms for two containers in which the filter cakes are collected for removal. Laser distance and inclination sensors support an angled-justable rocker that ensures that the container is filled evenly. Five laser sensors are installed on each container. Two are used to ensure that a container is available for filling. The other three sensors monitor the level to optimally align the rocker. In addition, an IO-Link master with Modbus interface was installed via which the parameter setting of the laser sensors can be carried out. Especially during commissioning and later remote maintenance or troubleshooting, these masters are fundamentally helpful.

Cooperation between AQUACHEM and ifm

AQUACHEM and ifm have been working together as partners for many years. AQUACHEM supports a wide variety of customers with different requirements. A special challenge in the project implemented for Chiresa AG was to establish the cake discharge by means of a rocker, and to safeguard the container room in order to avoid endangering the employees at all costs.

AQUACHEM has been represented with its filter presses in flue gas scrubbing for many years and supports a large number of waste incineration plants. Setting the ideal positions, both of the rocker and the containers, was a task they were happy to solve. In cooperation with ifm and its sensors, AQUACHEM was able to master the challenge.

"AQUACHEM relies on sensor technology from ifm for reliable operation of the fully automatic plants."



We love it when a plan comes together.

And so do our customers.

Actually, each of our products would have earned it: Having its quality, performance and added value confirmed by our customers. But our application reports don't just tell the story of a sensor. They tell the story of the joint success of the customer and ifm. Because one thing is clear: ifm is more than hardware, more than software, more than solutions. ifm is a solution provider, partner, pioneer and companion. This is also reflected in the small selection of stories we would like to offer you in the following.

Good automation solutions live from new insights, open minds, courageous approaches. This applies to our developers as well as to our colleagues in sales and, last but not least, to you – our customers. Take a moment to be inspired by the exciting stories from a wide range of industries. After all, who says that these success stories cannot be adapted to suit you?

And if you need someone to develop a plan together: You know where to find us.

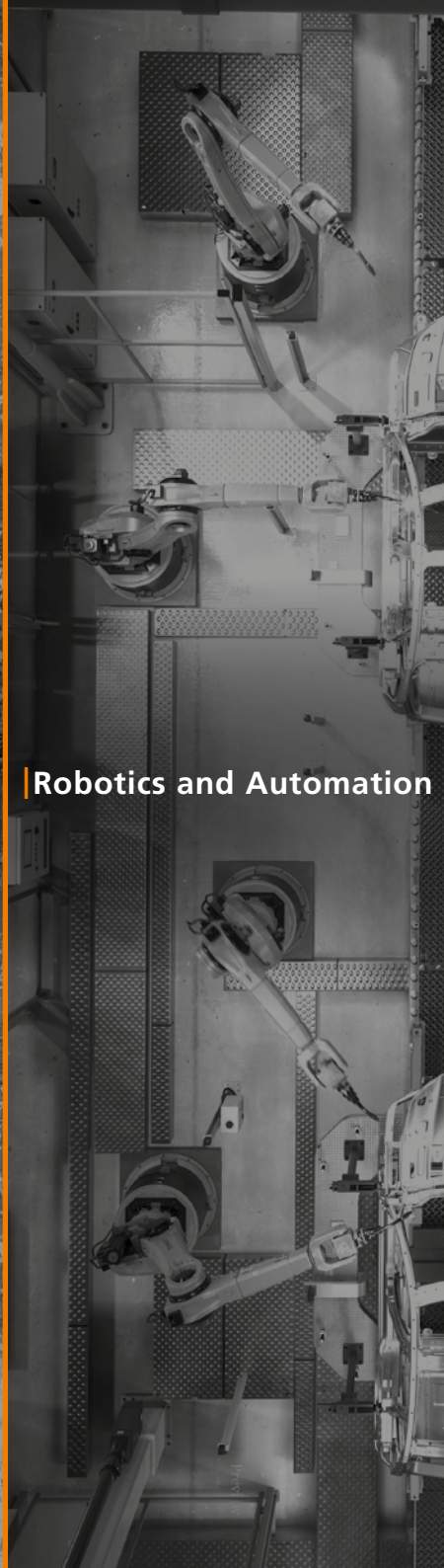




| Food and Beverages



| Water and Wastewater



| Robotics and Automation



| Automotive Industry



| Mobile Machines

Why we don't (or can't) think like Einstein.

"You don't have to understand the world, you just have to find your way in it."

A quote attributed to Albert Einstein. Would such a genius have said the same in today's world? Probably not. The lack of resources due to the growing world population is becoming more and more noticeable. The inefficiency of our behaviour patterns is clearly affecting the planet. In the face of these challenges, it is no longer enough for us to make our way in the world. We must change it. We must contribute to preserving a planet that is worth living on in the future. Those who want to create solutions must understand the challenge.

In other words: We need to understand the world in order to improve it.

You don't have to be a genius to understand this. Not a researcher. Not an innovator. Though innovation, research and genius should be driven by this insight. That, at least, is our goal. And with this goal in mind, we develop solutions for the most pressing challenges of the future, with an understanding of the challenges faced in each individual industry.



Everything the automation heart desires.

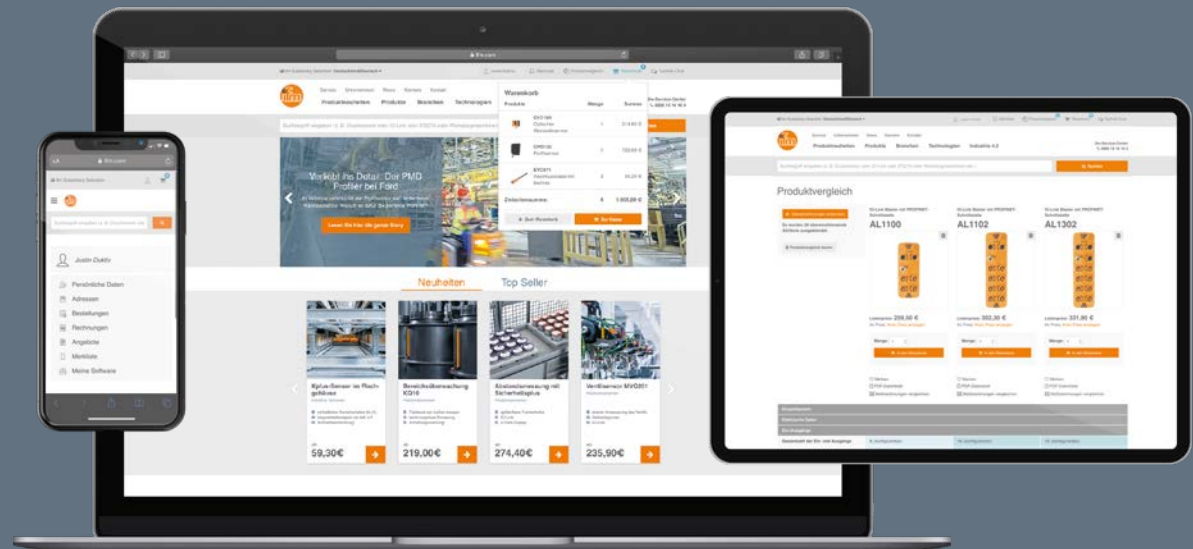
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Are you looking for the suitable accessories for your product? No problem! We have compiled everything you need to know about installation, parameter setting and set-up and added it to the respective product page. Of course, in our online shop you will also find lots of interesting information about the technologies in our sensors, inspiration in the form of application reports, factory certificates for free download, and, and, and...

So if you are thinking about how to shop more efficiently, a visit to ifm.com is definitely worthwhile!





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More you: Create offers yourself, convert them into orders with one click, track shipments and status, save and retrieve invoices. my ifm – it's yours!

More future: Digitisation, Industry 4.0, finding solutions, downloading software, managing licences – all in one place.

More time: No closing times, no nasty surprises, shopping at any time, always up-to-date availability – and a reassuring 6 weeks' right of return.



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That's it? Not by far!

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