KNOW+HOW

THE LEADING MAGAZINE FOR MAINTENANCE ENGINEERS FROM **ERIKS**

ISSUE 29

RAMP UP YOUR PRODUCTIVITY

Productivity and efficiency are the watchwords for this edition, as we take an in-depth look at Industry 4.0.

INDUSTRY 4.0 RESEARCH PAPER
keeping tabs on your assets

MAINTAINING YOUR STANDARDS
standard for motor efficiency

IS THE UK READY FOR INDUSTRY 4.0?

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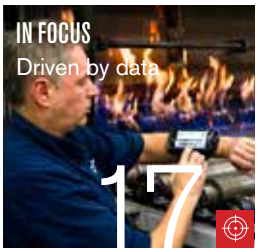

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DON'T MISS OUT

keep up to date with all the latest news from ERIKS

WELCOME TO KNOW+HOW

Productivity and efficiency are the watchwords for this edition, as we take an in-depth look at Industry 4.0. This month, we cover the latest news, industry developments and technologies that will help you ensure that your business is ready for the revolution.

The term "Industry 4.0" is becoming increasingly widespread, but there seems to be very little consensus of what it actually means. This confusion is encouraging misconceptions to form, which could hold the UK back. For every discussion on increased uptime, round-the-clock efficiency and preventative maintenance, there is another on the complexity of installing Industry 4.0-ready machinery, job losses, high initial costs, skills gaps and data vulnerability.

This edition of Know+How provides a comprehensive look at the challenges and benefits of adopting Industry 4.0, both in terms of its technology and its business practices, with expert commentary from business leaders who have already started implementing connectivity as an integral part of their short and long-term strategies.

Following the publication of ERIKS' latest whitepaper, International Product Manager (Automation and Services) Gary Price discusses what is currently holding the UK back from adopting Industry 4.0, and why these problems must be resolved sooner rather than later.

Schaeffler UK's Dr Steve Lacey takes a look at condition monitoring and how linking your CM system to the cloud could connect you to a world of industry experts in seconds.

We are also pleased to welcome SMC's Peter Humphreys, who explains why an effective strategy can prepare your business for the connected supply chain, and why your customers will soon expect this as standard.

We also open the doors to the Factory of the Future with Festo's Professor Dr Peter Post, and assess the role flexible networked production systems will play in the evolution of the production line.

If you have any comments you would like to raise on the topics contained in this issue, you can email the editor at **knowhoweditor@eriks.co.uk**.

You can also visit the Know+How website, **www.eriks.co.uk/KnowHow**, where you can register for a copy of the magazine, enquire about the subjects or projects discussed, or contact one of the contributors.

I look forward to hearing from you.

Richard Ludlam
Editor in Chief

DEBATE!

Is the UK ready for Industry 4.0?

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LATEST NEWS

2017 COULD BE THE YEAR OF **THE SMART FACTORY**

According to YCF, a member organisation supporting the manufacturing industry, 2017 could be the year of the smart factory.

The organisation stated that the next 12 months will be a critical time for manufacturers to understand the importance of Industry 4.0 and the Internet of Things (IoT), but will crucially be the time they begin to implement new machinery encompassing automation and data exchange.

Yet, despite this positivity, there is concern over the manufacturing and engineering skills gap as this new technology will require new skills. YCF suggests that the supply chain sector needs to train people to meet this shortage and employers, schools and the government need to push vocational apprenticeships.

MANUFACTURING AND ENGINEERING JOBS WERE IN THE TOP 10 MOST SEARCHED INDUSTRIES IN JANUARY 2017

According to independent job site CV-Library, manufacturing and engineering jobs were among the top 10 most searched for industries in January this year.

The data analysed included close to three million job searches made on the website in January 2017, with manufacturing receiving a total of 18,768 searches and engineering receiving 16,682 searches. This follows further data from CV-Library, which shows that there was also a 55 per cent increase in candidate applications in January 2017.

Other industries included in the top 10 list were construction, security, and IT, highlighting the importance of the continued promotion of the manufacturing and engineering sectors as a viable career choice.

UK MANUFACTURERS NEED A 'LEVEL PLAYING FIELD'

A conference on the future of the Northern Powerhouse was told that UK manufacturers will need to be on a 'level playing field' in order to compete globally.

This will include creating long-term investment strategies and addressing challenges UK manufacturers face, such as energy costs.

In order to support UK manufacturing, the government is also encouraged to create a long-term R&D investment strategy for the biotechnology sector alongside making it easier for particular manufacturing sectors to keep their operations in Britain, such as car manufacturing.

THE AMOUNT OF AGGREGATES TRANSPORTED BY RAIL IS **INCREASING**

The movement of aggregates by rail is rising in the UK, according to a report by BDS Marketing Research, which also suggests that the trend is set to continue, with a recent increase in depots and more in planning.

This is despite an overall decrease in the volume of freight moved by rail in recent years.

The report, entitled 'Estimated outputs of aggregates moved through rail depots in Great Britain', estimates the volumes and market shares of companies operating aggregate rail depots in Great Britain and includes information on those recently opened as well as planned.

BDS explains that using the rail network instead of road to move materials is an attractive option for companies, as it will boost their sustainability credentials by reducing carbon emissions.

SAVING YOU **TIME** AND **MONEY** EACH AND **EVERY DAY**

ONE CONVERSATION to unlock **COUNTLESS SOLUTIONS...**

You only have to ask ERIKS, to get all the answers you need. That's because it only takes one conversation to unlock countless solutions, for all your industrial product, service, supply and support needs. In fact, there's no simpler way to get things done than talking to ERIKS.

IN-DEPTH

For most ERIKS customers, that conversation starts with products. And since ERIKS is the European market leader for Industrial Products and Services, why wouldn't it? The company has over £23m of mechanical and electrical engineering components in stock, all manufactured with care to the highest quality. So one conversation with ERIKS can unlock a huge range of product solutions, across:

- Bearings and lubrication
- Power transmission
- Fluid power, transfer and control
- Sealing and polymer
- Flow control
- Tools, safety and maintenance

But products alone are only the start of what makes ERIKS unique.

The clue's right in front of you

The secret to ERIKS' unique capabilities is right under your nose. But it's much more than just the name of this magazine.

ERIKS' engineering know-how is decades of technical experience. It's engineers with real expertise gained and applied in real-life situations, where minimising downtime, optimising productivity and maximising safety are part and parcel of any project. It's also a deep understanding of customers' industries and product applications, so that product issues can be quickly and accurately identified, and effectively solved, prevented or mitigated.

A thorough understanding of applications also makes it easier for ERIKS to provide customised and engineered solutions, where off-the-shelf won't do. Unique problems demand unique solutions, and ERIKS has the skills and resources to engineer them.

However, ERIKS' know-how doesn't end with providing a product solution, whether ready-made or custom-built. In fact, that's only the beginning.

Life-support for products

ERIKS understand that the most forward-looking customers don't judge a product's performance on its price tag. After all, any savings on the initial purchase can soon be wiped out by the costs of excessive maintenance, unforeseen repairs, or a shorter than expected service life.

That's why ERIKS promise to supply products which provide long-term solutions and reliable, sustainable, energy-efficient operation – for a longer, more cost-effective life.

Every single product supplied by ERIKS is then supported by ERIKS. This TLC for your products throughout their lifecycle – including Condition Monitoring, Asset Management and On-Site Maintenance – means a lower TCO in the long-run. And the company can also commit to repairing, upgrading, and replacing at the end of the product's service life, to ensure you maintain optimum efficiency and productivity.

All of which helps to put into perspective investing a few extra pennies on a price tag at the start.

People make Solutions

Whether they're product specialists or van drivers, switchboard operators or maintenance engineers, sales staff or accountants, everyone at ERIKS works in customer service. So ERIKS people make products into solutions, by combining customer service that's consistently great with insight and solutions that deliver performance at the best TCO.

ERIKS' aim is to work with you in a true partnership. One that makes it hard to tell where your team ends and ERIKS' begins. By adding an extra layer of knowledge – without adding an extra layer of complexity – working with ERIKS is seamless, complementary, efficient and effective. Again, the statistics speak for themselves: ERIKS can save your engineers' time, and already delivers a total of £2m every month in signed-off cost-savings for customers.

That's not just for now, but for the future too.

ERIKS invest heavily in internal training, continued professional development and apprenticeship and graduate schemes, to bring on board then develop new talent ready to meet new challenges. The industrial engineering workforce may be ageing and shrinking, but ERIKS is ready to fill the gap.

Many businesses trust ERIKS to help them achieve their KPIs and meet their SLAs. Others simply rely on them to help keep their production running at its optimum, by providing condition monitoring and predictive maintenance solutions. Or timely repair, replace or upgrade advice. By helping them keep up to date with new products, new technology and new legislation. And of course, by providing the right products at the right time.

For those customers who need ERIKS people on site, the ERIKS Zero Accidents policy is highly reassuring. As a health and safety goal, it makes the company safer to work for and safer to work with. It also means that your own safety record won't be compromised by ERIKS' engineers or other teams, because you can be sure they're as safety conscious as you are.

Solutions at your fingertips

Even the best and most appropriate product solution is no use to you unless it's readily available and quickly, efficiently and reliably delivered. So it's reassuring to know that even the largest companies, which depend absolutely on a robust supply chain, depend absolutely on ERIKS.

As a major global business, ERIKS can guarantee continuity of supply. And as a business, with long-term partnerships with many manufacturers, they can also remove the risk of inadvertently purchasing counterfeit products.

In fact, many products supplied by ERIKS have been developed as a result of these partnerships. ERIKS' application know-how has informed the manufacturer's design expertise, to produce a high-quality and highly efficient end result.

Even ordering is made easier with ERIKS, thanks to the availability of a sophisticated ecommerce solution which can be integrated into your own ERP system. There's also a national network of ERIKS Service Centres and Regional Hubs, ensuring products and expertise are always within quick and easy reach. The statistics speak for themselves: 99.6% on-time delivery means less downtime and less lost production.

Or if you want the products you need, exactly where you need them, ERIKS' stock management, integrated or on-site solutions – taking ownership of your MRO supply chain – mean stock is always on site and always on time.

ERIKS **WEBSHOP** purchasing power at your **FINGERTIPS**

There for you **LOCALLY** through our network of **HUBS** and **SERVICE CENTRES**

Full **STOCK MANAGEMENT** through our **INTEGRATED** or **ONSITE** solution

All backed up by a **ROBUST** and **EFFICIENT LOGISTICS** infrastructure

99.6% on time **DELIVERY RATE**

Talk is cheap

It's easy to talk about the great products, great services and great people you'll find at ERIKS. It's harder to prove it's all true.

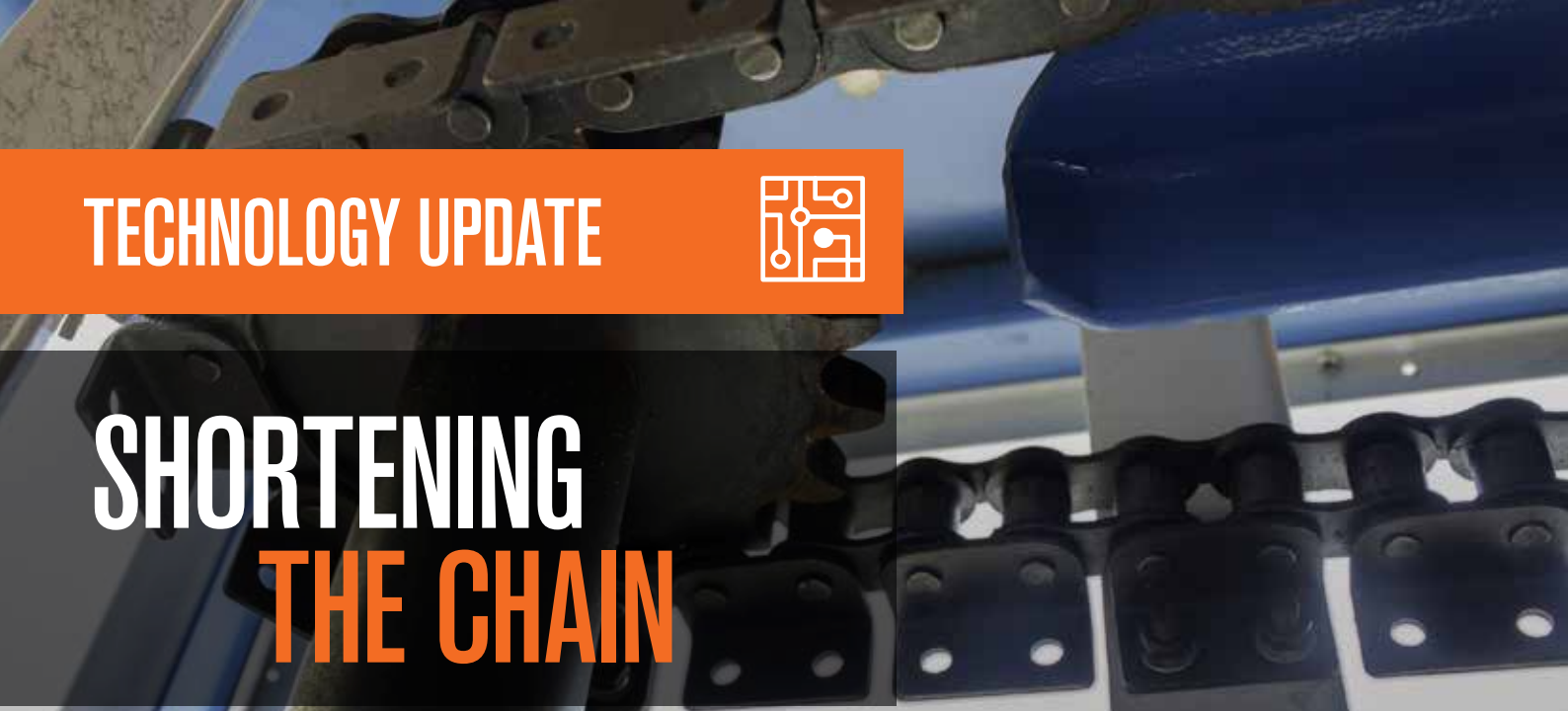
However, all it takes is one conversation to find out for yourself.

Talk to ERIKS about your product requirements. About a tricky application. About avoiding unplanned maintenance. About saving energy. About any one of the countless challenges you face every day.

All it takes is one conversation to unlock countless time and money saving solutions.

24/7

ERIKS... making it **SIMPLE** to get things **DONE**



TECHNOLOGY UPDATE

SHORTENING THE CHAIN

There's never been a shorter supply chain for your adapted chain, than from ERIKS – recognised in a recent survey as one of the largest chain suppliers in the UK.

All it takes is three simple steps to get the chain you need delivered to your door, with the ERIKS 48-hour adapted chain service.

First, you determine your adapted chain requirements using the simple enquiry form, and pass it on to your usual ERIKS contact. Second, ERIKS engineers will assess your needs, specify the ideal adapted chain solution, and provide a quick and competitive quote. And third, once you've approved the quote, your Fenner PLUS adapted chain will be designed, manufactured, assembled and delivered.

Whether your requirements are for carbon or stainless steel, to British or American standards, simplex or duplex, with K or M attachments, in extended pin or hollow pin variants, or in matched lengths, ERIKS' adapted chain service is the quickest, easiest, vital link.

3 BRIGHT IDEAS IN 1

For workers in low- or no-light conditions, clothing incorporating the latest Glowtex™ Triple Technology from Portwest can make sure they're seen, and safe, at all times.

In daylight, the brightly coloured fluorescent background fabric makes the wearer highly conspicuous. At night, Lumentex™ retroreflective tape bounces light – from headlights, for example – back to the source, so the wearer is visible even in poor weather conditions. Lastly, light-emitting Glowtex™ phosphorescence tape literally glows in the dark for up to 6 hours, after as little as 5 minutes' exposure to daylight or artificial light.

Lumentex™ uses thousands of glass beads per square centimetre to reflect like tiny mirrors, while Glowtex™ contains phosphorus molecules which are "charged" by UV light and then use that energy to glow when the light is extinguished. Tested to EN ISO 20471 and ANSI ISEA 107-2015 standards, Portwest Glowtex™ Triple Technology makes clothing safe, safer, safest.

THE FINEST FITTINGS AT A PUSH

The new range from FLEXION offers some of the best stainless steel push-in fittings and adaptors you can buy, for use in the food, pharmaceutical and chemical industries – or anywhere with aggressive washdown regimes.

Designed to withstand corrosive environments and substances, the FLEXION range includes push-in fittings for tube sizes from 4-12mm, and adaptors for 1/8 – 1/2 tube sizes. Quick and easy to install, they feature an FDM seal capable of withstanding temperatures up to 150°C, and all taper threads come pre-coated with PTFE.

FLEXION has been working with suppliers to ensure not only the quality, performance and reliability of the products, but also their continuity of supply. So reliability doesn't end with the products' performance. You can also rely on readily available stock from the company's main West Midlands warehouse, and technical support if you need it from ERIKS Fluid Power specialists.

WHEN YOU CAN'T REPAIR OR REPLACE

When hearing is damaged, that's it. Even ERIKS can't repair or replace it. So it's essential to use effective hearing protection. But how do you know the earplugs are working as well as they should? New Honeywell VeriPRO testing can tell you – in minutes.

Working with any earplug, VeriPRO is a testing tool with user-friendly software, that gives fast, accurate, easy-to-understand results. The Personal Attenuation Rating (PAR) it provides will show whether or not any particular earplug is providing the right amount of protection for the individual wearing it.

If not, you can decide whether they need to try a different type of earplug, or simply need more training on how to fit them properly – and ensuring "proper initial fitting" of hearing protectors is a regulatory requirement.

For a free demonstration of VeriPRO in action, simply contact your local ERIKS Service Centre. They'll be delighted to hear from you.

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IN FOCUS

INDUSTRY 4.0 WHAT'S HOLDING THE UK BACK?

With so much talk, jargon and hype surrounding industry 4.0. ERIKS' needed to know what was really going on in the minds of those it effected most, so commissioned independent research to get to the heart of the issue...

WHY 2017 MUST BE THE YEAR UK HARNESSES INDUSTRY 4.0

The so-called Fourth Industrial Revolution has received much press attention over the past few years, bringing with it the promise of automation, efficiency and output like never before.

However, when it comes to implementing this, UK manufacturers are standing still. Following a new report on the attitudes of UK industry towards Industry 4.0, Gary Price, International Product Manager, Automation and Services at ERIKS UK, examines what is holding manufacturing back, and why its inertia may prove costly in the long term.

It's an exciting time for manufacturing as the rise of Industry 4.0 gathers pace. The advantages are clear: more automation, less downtime, slicker processes and smarter decisions.

With all of the hype surrounding Industry 4.0, it's tempting to dismiss it as another bandwagon on which to hop. There are also valid concerns about how automation will affect jobs, the increasing sophistication of cybercrime, and the cost of implementing the technologies needed to connect an entire factory floor.

Nevertheless, Industry 4.0 remains the most important development for manufacturing industry this century and businesses must adapt, or fail.

INDUSTRY 4.0

Industry-wide inertia

A recent report by ERIKS UK, titled: Is the UK ready for Industry 4.0? Industrial maintenance in a connected world of Big Data, reveals that many manufacturers have yet to implement any aspects of Industry 4.0, despite seeing it as a potentially positive asset to production.

Over 80 per cent of the managers interviewed stated that it would be an advantage, particularly in the field of predictive maintenance. Many cited the ability to monitor machine problems and target maintenance resources, as key benefits of a connected production line. Despite this, 61 per cent had yet to implement any form of Industry 4.0 initiatives in their own business. According to the report, industry is experiencing several barriers to implementation, which may go some way towards explaining this inertia.

Data and the threat of cyber crime

Although Industry 4.0 relies on open collaboration and data sharing, manufacturing industry is hesitant to put this into practice. In fact, 79 per cent of those interviewed would offer limited or no disclosure of information to a third party or Original Equipment Manufacturer (OEM). One interviewee cited the confidential nature of their data and the large costs involved should that data be leaked or stolen.

Although this is understandable, there seems to be some conflict between what manufacturers say they need, and what they put into practice. Over 56 per cent said that they needed support from an OEM to analyse their data and perform necessary repairs because they did not have the skills in-house. It seems odd, therefore, that manufacturers are unwilling to share data, despite needing to do so to keep their factory floors working.

The shortage of data skills in the UK means that this problem will only exacerbate. Without the knowledge to predict faults before they occur, manufacturers will rely on reactive maintenance, thus increasing downtime and incurring the costs that they had hoped to avoid by keeping their data under lock and key.

Generation gap

Another interesting aspect is attitude and one of the biggest factors in this, is in fact age. According to the report, the younger generation of 25-33-year-olds who, perhaps unsurprisingly, understand the potential of Industry 4.0 and are more comfortable with sharing data. Crucially they appear to understand the need for support from the OEM or technical partner in order to accurately use data for diagnosis and fault-finding.

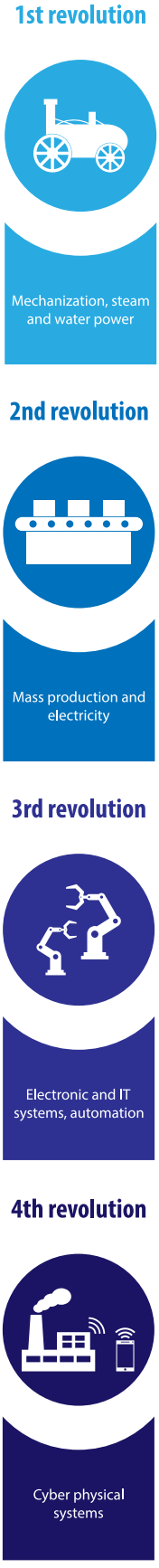
In contrast however, more than half of current senior managers admitted to a poor knowledge of Industry 4.0, this age group is also more likely to be suspicious of data sharing. The latter is particularly concerning, when you consider that it is often those in senior positions that will dictate how the UK adapts to Industry 4.0 over the next few years.

Changing mentalities

For many managers, making the most of Industry 4.0 may feel like trying to capture lightning in a bottle. The challenge lies in changing attitudes towards connected, collaborative workplaces. Granted, security of data is a concern, and will remain so, a key consideration for everyone, but this should be at the detriment of industry progression. By holding back the implementation of Industry 4.0 purely on this basis, managers run the risk of missing the chance to compete successfully in the global marketplace.

The point here is clear, whilst manufacturers know their own production processes, machine suppliers know their machines, it is the third party maintenance supplier who has the expertise in the individual components and sub-assemblies that go into not only that machine but all machines across the site giving a broader coverage. It is often this technical know-how that keeps operations moving and its importance therefore should not be overlooked. In fact, 56% of respondents in our report said that they need the support of the OEM for machine diagnostics and fault-finding and yet are reluctant to share the relevant data with them or technical specialists.

What is clear to see is that there are many challenges ahead and no simple overarching solution. Yes industry 4.0 will require significant investment, but it will also require a cultural change within businesses, we must embrace data sharing and collaboration. We should remember that UK manufacturing produces some of the most remarkable innovations in the world. We cannot let it falter. Industry 4.0 must be embraced, and the time to do so is now.



FLEXIBILITY IN FESTO'S **FACTORY OF THE FUTURE**

The factory of the future will be networked and extremely flexible. Those are two of the developments which come under the heading of "Industry 4.0". But is there more to "the next industrial revolution" than just technological developments? Festo believe so.

According to Festo, people – and their qualifications and training – will also play a critical part in the success of the factory of the future. Which is why, in all of their activities surrounding Industry 4.0, Festo focus on the benefits for the actual users of automation technology.

The world of production is changing fundamentally – moving more and more towards individualised products. The small batch quantities and large number of variants associated with this trend demand technologies that continually adapt themselves to changing conditions. This means flexible, networked production systems are required.

Theory of evolution

"The changes to the world of production – and thereby to automation technology – should be seen as an evolutionary process," explains Prof. Dr. Peter Post, Head of Corporate Research and Technology at Festo. "In the future, functions from the management and control levels will be shifted to the shop floor, and in some cases even down to the level of the individual components."

When that's the case, decentralised intelligence is increasingly required in the production systems to be able to actively support the production process.

For example, in the future, production lines could be automatically adjusted to incoming individual customer orders. In the same way, any failure of individual systems or components will be immediately recognised in a networked production system and automatically compensated for by other systems. So whatever the plant's workload, the capacity utilisation will match it perfectly.

In the future, components will also be able to organise themselves. Using a system similar to the one used by USB technology in computers, they will log on to the main computer autonomously, via uniform interfaces.

Finally, a virtual image of the systems will support users with quick and easy commissioning and reconfiguration, making it possible to respond as quickly and flexibly as possible to new requirements.

All these functions together enhance the availability of machines and systems, while at the same time reducing the amount of time and effort required by users.

Industry 4.0 in production

Many Festo components and systems already meet the hardware and software requirements of Industry 4.0. Some are still stand-alone solutions, not yet networked to any great extent, but Prof. Post says that the next stage will be for these and similar components to be connected together in complete, networked systems.

One example of a complete, consistently networked Festo component is the CPX automation platform.

An electrical terminal for valve terminals, it not only offers an interface to the field and management control levels, but also has a diagnostic capability, and can take on condition monitoring tasks. When equipped with a fully-fledged CoDeSys controller, the CPX can be used to control a subordinate function, an entire machine or a sub-process of a system. It even has an error-location role using the safety function, so that errors can be quickly found and modules exchanged if required, to keep production flowing.

Intelligence and ice cream

Another example of intelligence and networking driving flexibility is the energy efficiency module MSE6-E2M.

This module measures the flow rates in the compressed air network, and can also instantly evaluate the information before initiating appropriate measures. Know+How Issue 27 detailed its successful use in the ice-cream production process at Unilever, where it operates like the start-stop system in a car, to detect a standby mode and automatically shut off the supply of compressed air. This reduces compressed air consumption to zero during system downtimes and breaks. It also reports back if the pressure drops too quickly during downtimes, which enables leak detection.

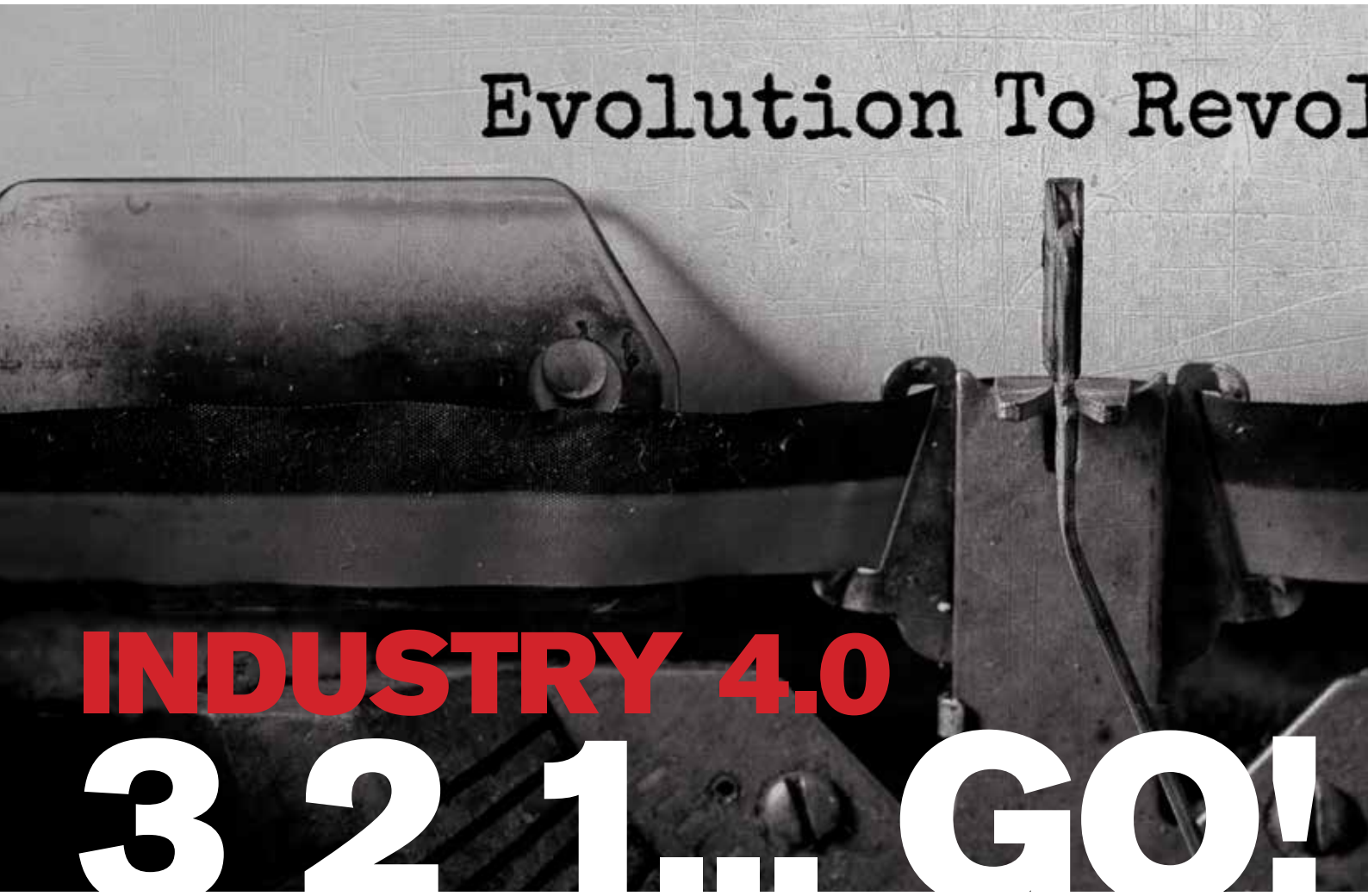
And it continuously delivers process relevant data such as flow, pressure and consumption, which it sends to the machine controller via Profibus.

The result is a module which pays for itself through transparency of energy use, and energy savings.

But your factory doesn't have to be producing ice cream for you to benefit from the intelligence, networking and flexibility which Festo components can offer. The increased productivity, reliability and savings will still taste sweet.

"The changes to the world of production – and thereby to automation technology – should be seen as an evolutionary process"

Industry 4.0 is coming. And it differs from all the revolutions which have gone before (the first industrial revolution, the factory automation and mass production revolution; the digital technology revolution) because this time we can all be prepared. In fact, you may be already, without even knowing it.



INDUSTRY 4.0
3 2 1... GO!

Industrial processes that integrate the real and virtual worlds, and where machines, products and components share and process information, will represent the fourth industrial revolution. A revolution which, according to studies by McKinsey Global Institute, has the potential to generate value of $1.2 – 3.7 trillion by 2025.

Where will that value come from? A great deal of it will be generated simply by the optimisation of the production process which Industry 4.0 makes possible. And what many people won't know is that some of the technology to make this happen is already present in their production environment.

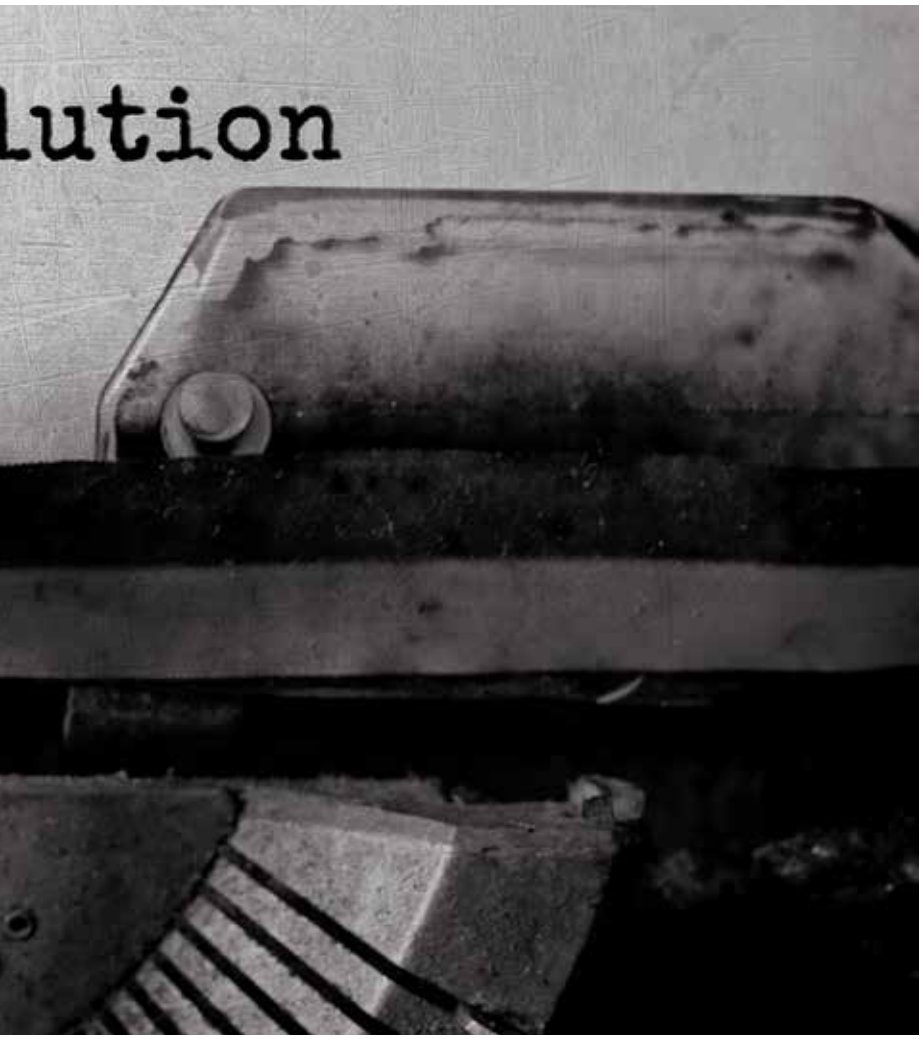
Joining the dots

One of the defining characteristics of Industry 4.0 is connectivity. Only when every component and element of a production process is connected to every other, can they share data and act autonomously on the information. Meanwhile, many individual pieces of equipment already have the capability to share and act – it's only the connectivity that's lacking.

Much existing equipment also already has the capability to be used more intelligently to improve efficiency, increase reliability, or reduce energy use.

As José Giacomoni, Automation Account Manager from WEG (UK) Ltd. points out: "major applications with drives use them to start a motor but nothing more." Yet a drive, properly utilised, can improve performance and help with process automation.

It's also a myth that it's only large, hi-tech industries which can benefit from Industry 4.0, or which can be making steps now towards greater automation, greater connectivity, and therefore greater productivity and reliability. The WEG CFW100 drive is proof that's not true.



Efficiency and condition data combined

Real-time monitoring

Smart maintenance

Start small

The CFW100 – starting at just 0.18kW – is the smallest drive in the market to offer as many functions as it does – including Bluetooth connectivity. So when other manufacturers bring out products with the same connectivity capability, this drive will be ready to make Industry 4.0 a reality.

The WEG CFW11 System Drive is also fully Industry 4.0 ready.

Covering power levels from 1.1 to 630kW (1.5 – 900HP), this highly advanced drive will control three-phase induction motors and permanent magnet synchronous motors, and will increase the performance of the most complex drive systems.

Incorporating a PLC to enable independent automation, and able to connect via the Ethernet, the CFW11 is highly innovative, yet also exceptionally simple and quick to install, using plug-and-play technology.

With its Vectrue Technology® allowing a combination of V/F, Sensorless Vector, VVW and vector-with-encoder control techniques all in one product, the CFW11 can deliver efficiency ratings of over 97%.

Ethernet ready

Also ready for Ethernet connectivity, and featuring an integrated PLC ready for process automation, the WEG CFW500 Machinery Drive covers power levels from 0.18kW to 15kW (0.25 – 20HP).

Ideal for centrifugal pumps, process dosing pumps, fans, compressors, conveyor belts and much more, the CFW500 is only one VSD, but it offers endless possibilities and another stepping stone to Industry 4.0.

Launching this year, the WEG Soft-Starter SSW900 will be Industry 4.0-ready, with connectivity features and an integrated PLC. Until then, the SSW-06 represents state-of-the-art, fully digital soft-starter technology, enabling motor starting with the lowest possible current for the load – saving energy with every motor start-up.

The SSW-06 has a huge range of applications, from fans to pumps, compressors to conveyors, furnaces to rotating filters, and HVAC to escalators.

Control and connectivity

For controlling the speed, torque and position of three-phase servo motors, the high-performance choice is the WEG Servo Drive SCA06.

Ready for full connectivity, it includes a PLC function, positioning blocks and CANopen as standard, and is ideal for packing machines, rotary tables, presses, feeders, robots and many other applications.

So although the full extent of Industry 4.0 is still waiting to be realised, there's no need to wait. Choosing the right Industry 4.0-ready products will provide efficiency and energy-saving benefits now, and enable greater process automation too. And when the revolution really starts to take hold, you won't just be ready – you'll be leading it.

If you still think of Condition Monitoring (CM) as something for expert, on-site engineers only, it's time to broaden your viewpoint. In fact, it's time to look up to the cloud and think global.

WHEN CONDITION MONITORING GOES GLOBAL

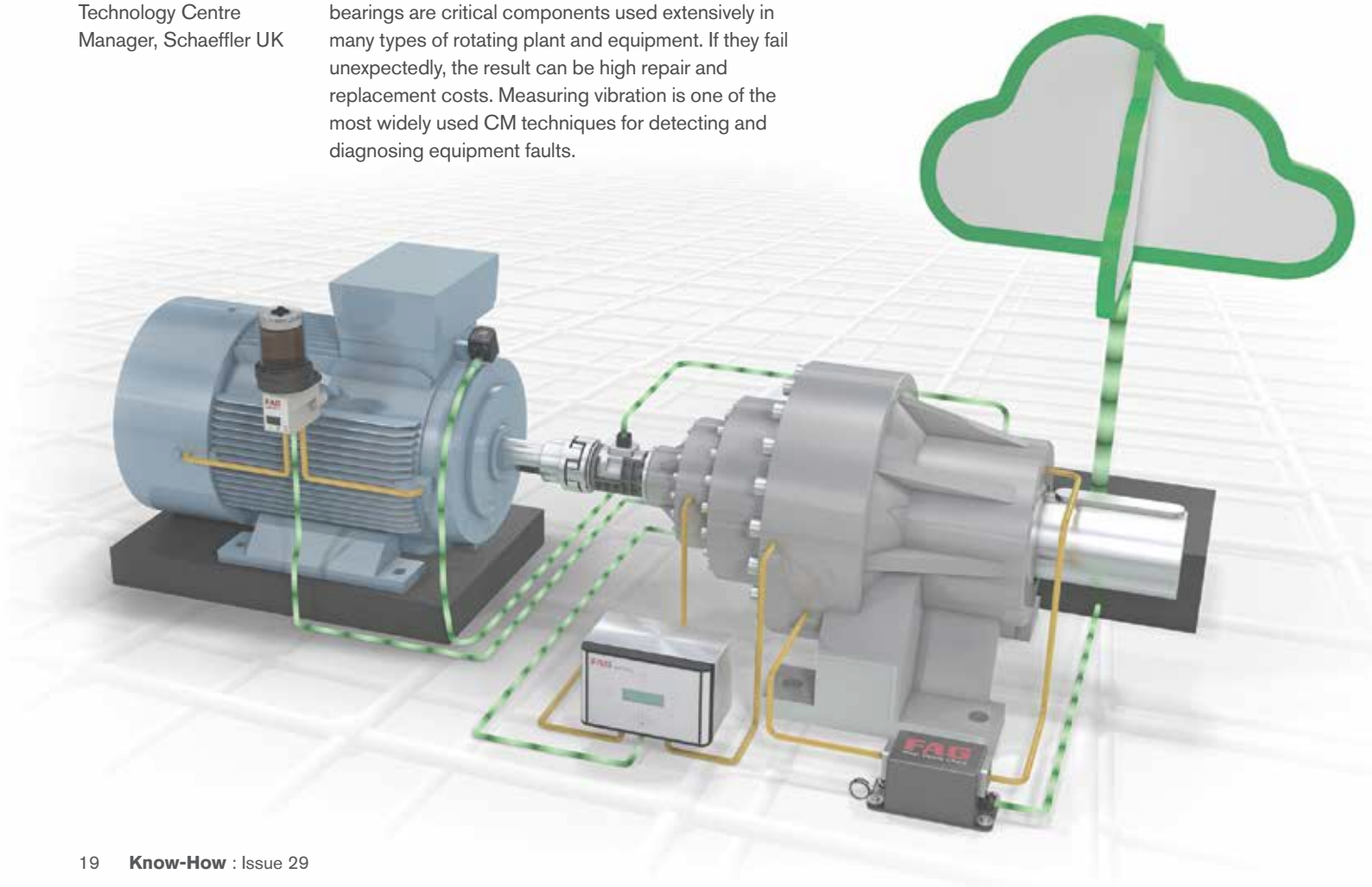
Dr. Steve Lacey
Technology Centre Manager, Schaeffler UK

As Dr. Steve Lacey, Technology Centre Manager at Schaeffler UK, explains, with cloud-based CM systems, experts can be anywhere. For improved fault diagnosis, faster reaction times and reduced machine downtime, all you have to do is share your data with them.

Critical components

CM is an integral part of Predictive Maintenance, which can help to prevent unexpected failures. Rolling bearings are critical components used extensively in many types of rotating plant and equipment. If they fail unexpectedly, the result can be high repair and replacement costs. Measuring vibration is one of the most widely used CM techniques for detecting and diagnosing equipment faults.

Until now, most CM systems have been local, collecting vibration data from machines and using analysis algorithms and a rolling bearing database to check for signs of wear, defects or other unusual behaviour. Imagine the added value of being able to share and compare your local machine condition data, via the cloud, with similar items of equipment across your plant or across your business, anywhere in the world.



And instead of having to rely on the local knowledge and experience of a skilled maintenance technician, a cloud-based CM system can provide a direct link to a specialist in vibration analysis, working for a bearing or CM system supplier.

Schaeffler will be offering these cloud-based CM systems from mid-2017."

Reliable diagnosis

CM systems with a direct link to the cloud can transfer data from systems and devices. Automated diagnosis signals are processed from the raw data (from the CM system and the machine's control system, for example), so vibration data is not only processed in the CM system itself, but also in the cloud.

This means more processing power and more analysis options, which makes the diagnosis provided to the customer more reliable than ever.

For highly critical applications, users may also have the option of directly contacting the CM system supplier, via the cloud, for expert vibration diagnosis."

Easy installation

The latest CM systems are quick and easy to install and set up, and users need no specific skills or knowledge of vibration diagnosis.

"When changes occur in the condition of the equipment, the CM system automatically displays plain text messages, giving clear instructions for action and enabling corrective maintenance work to be undertaken and replacement parts to be ordered if required. These 'automatic fault assessment' systems are truly ground-breaking – helping minimise the skills, knowledge and experience that maintenance staff or equipment operators need.

With ready-to-use, pre-set measurement configurations, these CM systems can identify and display the main causes of faults: bearing damage, imbalance, friction/cavitation (for centrifugal pumps) and temperature increases. If general changes in vibration patterns can't be clearly attributed to one of those, the system can use the cloud to ask for additional specialist analysis.

CM out of the box

The latest innovation from Schaeffler is a ready-to-use, pre-configured condition monitoring system which can be commissioned in only five minutes, and operated without any vibration monitoring expertise. The FAG SmartQB automatically assesses changes in the condition of the equipment, then generates informative messages on its display.

Designed to monitor the condition of electric motors, pumps, fans, compressors and gearboxes with fixed or variable speeds from 100-15,000 rpm, which are supported by rolling bearings, the FAG SmartQB comprises a sensor unit, touchscreen display, and Power-over-Ethernet cable.

Supplied with pre-set measurement configurations, the unit can identify the most common fault causes, and changes in vibration patterns that can't be definitely attributed. The text messages on the display give clear instructions for action, so users can undertake corrective maintenance and order replacement parts if required.

If the cause of the vibration signal can't be automatically identified, the system displays a recommendation to send the data to Schaeffler's technical support centre for in-depth analysis.

Up to six sensors allocated to several machines, individual machine components or sub-assemblies can be connected to one FAG SmartQB. Once installed and set up with the details of the component(s), the FAG SmartQB automatically selects the best measurement configuration, and is ready for automatic learning mode, which enables it to automatically adjust alarm thresholds. From then on, the relevant machine parameters are constantly measured and saved, creating a substantial database.

Its 24/7 monitoring capability means the FAG SmartQB can help companies reduce machine downtime and maximise plant availability.

SMARTER THAN THE AVERAGE PLASTICS

If Industry 4.0 is all about making factories smarter, then you don't get much smarter than embedding intelligence into motion plastics. By integrating sensing, monitoring and communications, igus® has created high performance engineering plastics products, based on e-chains, cables, and bearings, that can increase plant availability, maximise uptime and reduce costs.

igus® motion plastics are already self-lubricating and maintenance-free, as well as being harder-wearing and more energy efficient than traditional materials. There's a long list of conditions and contaminants which they can resist, including rain, salt, extreme temperatures, UV, oil and chemicals. They're also extensively tested, enabling igus® to accurately predict service life and offer comprehensive reliability guarantees.

Now after, over 50 years of manufacturing plastic bearings, and almost three decades of producing continuous-flex cable, igus® motion plastics are found in over 100,000 cables, energy chains and linear bearing products. However, the company's latest development goes a huge step further.

Smart choice

The Industry 4.0 factory isn't smart for smart's sake. It's smart to improve reliability and reduce costs. Smart plastics help, by automating condition monitoring and predictive maintenance, to provide performance data and early warning of critical wear.

igus® isense smart plastics encompass a range of sensing technologies and monitoring modules. These can then be networked with the icom Communication Module from igus® – either integrating with the factory's own IT infrastructure or with the igus® data cloud.

The data which the isense sensors gather is referenced against aggregated test data from the igus® test laboratory – the largest in the sector. This helps ensure the products are performing smoothly in the real world. Then, if the data shows the values are exceeding pre-determined thresholds, alerts are sent automatically, so that maintenance or replacement can take place before the situation becomes critical.

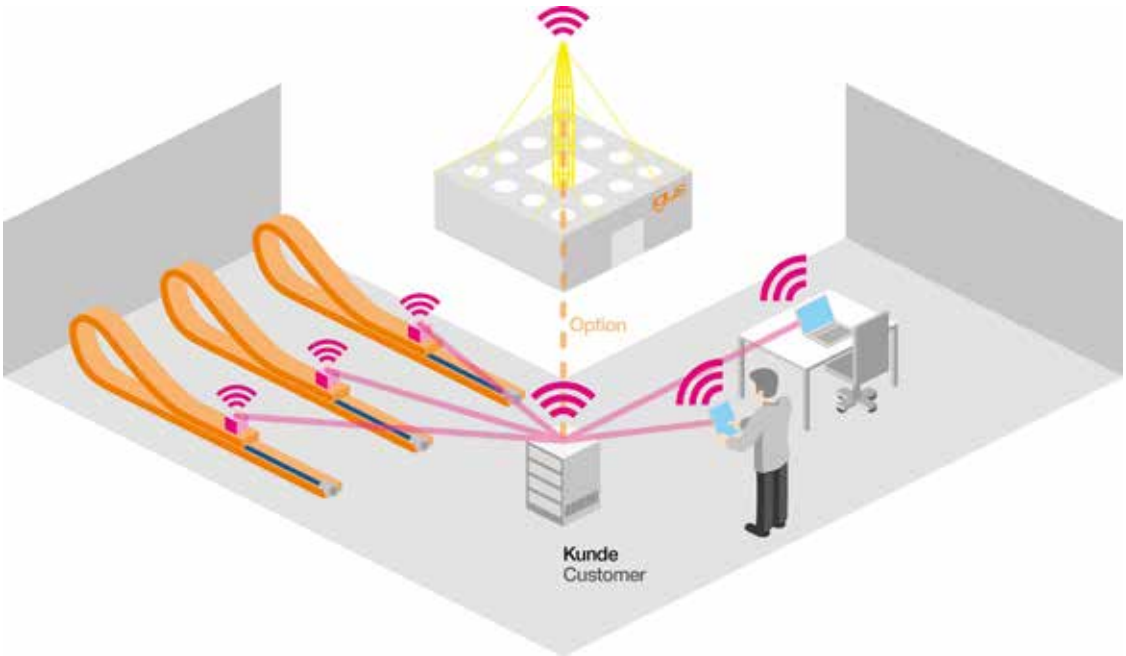
To find out more about making your factory smarter with new igus® smart plastics, talk to your usual ERIKS contact, or visit www.igus.co.uk/smartplastics

Sharing the burden

Commissioning maintenance at the optimum time, and ordering spare parts for just-in-time delivery, can be a challenge. However, igus® smart plastics provide the option to share the data they gather with the igus® data centre.

This opens up possibilities of customised service life calculation and optimisation of business processes. The result is even lower maintenance costs and even greater plant availability.

The latest igus® smart motion plastics actually monitor themselves for performance and wear – enabling users to use predictive maintenance to avoid critical failures and unscheduled repairs.



Pete Humphreys, Strategic Product Sales Manager at SMC Pneumatics UK Ltd, takes a look at how UK manufacturers can optimise the opportunities and deal with the challenges Industry 4.0 presents.

INDUSTRY 4.0: COMMERCIAL MELTDOWN OR THE ULTIMATE OPPORTUNITY FOR BUSINESS?

Pete Humphreys
Strategic Product Sales Manager, SMC Pneumatics UK Ltd

In recent years, UK manufacturing has faced many challenges from domestic skills shortages to aggressive international price pointing and product dumping. And now here comes Industry 4.0, apparently revolutionising the way we will all do business!

Where do we even start to deal with the issues that this throws up? From potential job losses on the factory floor to cyber security across globally connected networks, it brings commercial uncertainty.

And what does all that even mean?!

But is it really the 'fright night' scenario many organisations seem to believe? Or is it actually an exciting opportunity to provide the ultimate added value service to our customers, wherever they are in the supply chain?

It's not new, it's just a different way of doing things …

First of all, let's dispel some of the myths – Industry 4.0, ConnectedEnterprises, Smart Manufacturing or whatever you want to call it, is not new technology in itself. It is simply a new business philosophy that brings together all the different processes in the manufacturing and supply chain in a way that was not possible before wireless technology. It is the Internet that has enabled this to be done, not just across an individual organisation but between separate organisations wherever they are in the world.

Actually we are all familiar with this type of technology. Every time you buy something online - whether from a global marketplace like Amazon or a UK based individual retailer, your order gets loaded onto a smart tracking system that connects the product provider and logistics operator through the Internet to you, the customer. It tells you exactly what's happening with your purchase at any given time and when to expect your delivery.

Essentially that is what Industry 4.0 can help all of us in the manufacturing supply chain to do - and more! We just have to be open to the idea of a new way of working and able to adapt to all the different operating systems on offer.

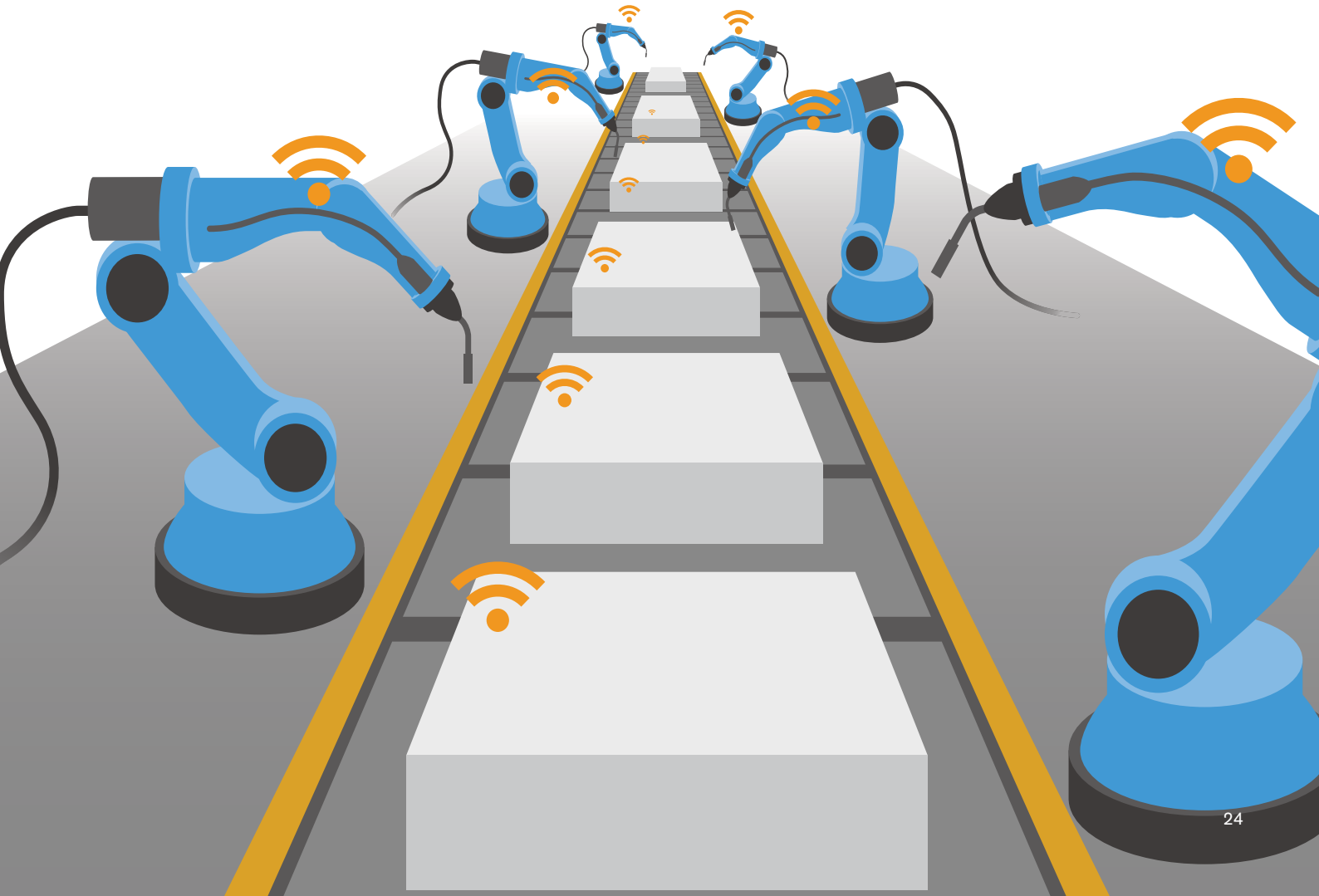
Within the European marketplace it is likely that Industry 4.0 will become the most widely used system. Manufacturing giants such as Siemens already have smart factories operating in Germany, and the German government continues to champion its cause to the tune of more than 200million Euros so far.

That is because many aspects of the Industry 4.0 philosophy are actually very straightforward. For example, rather than a maintenance engineer doing preventative maintenance regardless of whether the machine needs it, that machine can now monitor its own condition and if a replacement part is required it can order it and alert the maintenance engineer that fitting it will need to be scheduled in. This optimises productivity and minimises downtime on equipment but there is still an essential, but more efficient, role for the maintenance engineer to play.

Integrated systems

At SMC, our end user customers are starting to ask about Industry 4.0 and how we can use it to serve their accounts better, so yours probably are too. They are very aware of the added value it can deliver to the bottom line and that's not just among the larger multinationals.

So we all have to be able to respond to this to show that our production systems can integrate and communicate with theirs. Sensors and networks will be the key to achieving this and they will have to be able to talk to our various customers' enterprise resource planning software so we can predict component demand, thus optimising productivity.



For manufacturers across many sectors, this connected environment could work as follows:

When a sales engineer gets a customer order he loads it through his tablet computer onto the company's CRM system. This data is used to procure the raw materials, create the works order, schedule delivery and communicate with the logistics function to make the delivery to the customer. The factory, of course is already set up to make these components but the works order now tells the production line the exact specification required for the next two units. The production line software will then decide when is the most efficient time to manufacture these – perhaps now to avoid a tool change or later in the schedule if other similar components have also been ordered.

That's how Industry 4.0 works best for manufacturing businesses – itenables us to optimise productivity and customer service while reducing unnecessary machine downtime and providing an instant real-time picture of the whole business process.

Make that change

At SMC we are already supplying components for smart production lines and continuing to develop new products that can take the process even further forward. Because we have customers at all points in the supply chain, from OEMs and distributors to end users, we have been able to take an holistic look at how best to exploit the opportunities the move to Industry 4.0's intelligent self-diagnostic systems bring.

So, when looking at how Industry 4.0 can support your business, we believe there are three key market drivers that industrial manufacturers need to consider:

Identify the main benefits to your business:

- Greater production flexibility
- Reduced rates of defective goods
- Cost optimisation across the whole business
- Reduction of capital tied up in plant

Decide which of the Industry 4.0 basic technologies are the most appropriate for your business:

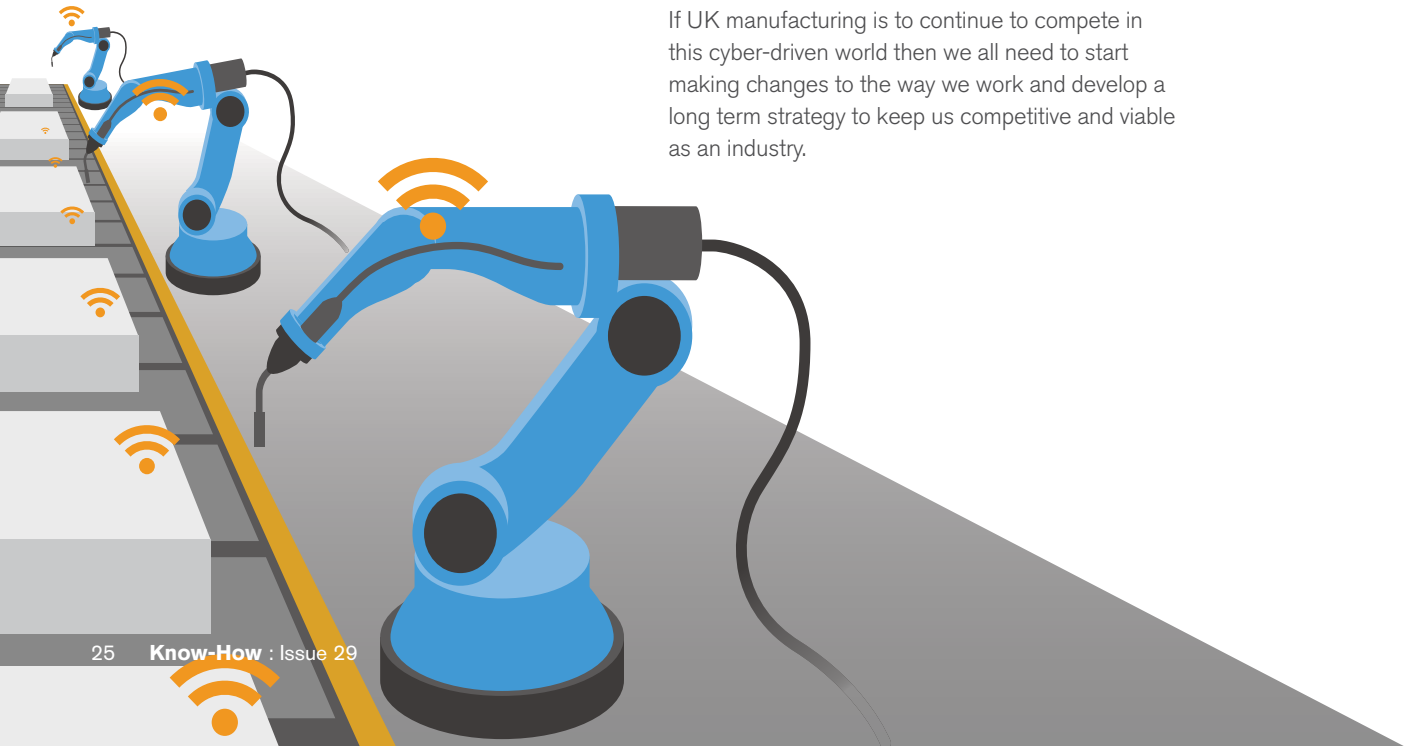
- Smart sensors feeding data back to intelligent machines (eg robots and smart manufacturing systems)
- 3D printers
- Cyber-physical systems –computers and networks running and monitoring a physical process
- SMAC – social, mobile, analytical and cloud based systems running software applications.

Manage your customers' expectations of what Industry 4.0 can deliver which essentially are:

- Higher quality bespoke products
- More customer focused service
- Sustainable production methods
- Instant real-time reporting.

Analysis of these drivers against your own business needs will enable you to create a strategic plan that moves your business into the Industry 4.0 era.

If UK manufacturing is to continue to compete in this cyber-driven world then we all need to start making changes to the way we work and develop a long term strategy to keep us competitive and viable as an industry.



DRIVEN BY DATA

Advanced engineering support tools and services from SKF are helping users boost productivity – and profit

In every sector, uptime, reliability and consistent high performance are top priorities for the owners and operators of machinery. Maximising the total productivity of an asset requires a lifecycle approach, starting with a robust design and high quality components, and extending through manufacturing, installation and commissioning, and operations and maintenance.

With expertise in rotating equipment that dates back to 1907, SKF has developed a comprehensive range of tools and services designed to help users get the best out of their machines at every stage in that lifecycle. The company's latest offerings take full advantage of advanced digital technologies – from network-connected devices and sensors to comprehensive cloud-based analysis and support capabilities.

Design support

A reliable, cost-effective machine design begins with the selection, specification and configuration of In every sector, uptime, reliability and consistent high performance are top priorities for the owners and operators of machinery. Maximising the total productivity of an asset requires a lifecycle approach, starting with a robust design and high quality components, and extending through manufacturing, installation and commissioning, and operations and maintenance.

In the Knowledge Centre, users can find calculation and selection tools for bearings, seals, linear motion systems and a host of other machine components. They can download CAD models of SKF components and systems, and access user-friendly tools to aid the set-up of configurable products such as lubrication systems.

Machine monitoring

The shift to condition-based maintenance is one of the most powerful ways users can improve the lifetime value of their assets. The approach has the potential to dramatically reduce both planned and unplanned downtime, keeping machines working better for longer.

SKF is the ideal partner to help companies at every step in their transition to predictive, condition-based maintenance. Its offering begins with a wide range of hand-held or permanently installed instruments to facilitate the collection and analysis of machine performance data. The company's range of powerful but easy-to-use basic condition monitoring tools is ideal for operator-driven reliability programmes. It includes infrared thermometers, hand-held tachometers, noise and vibration sensors, endoscopes, thermal imaging systems, electrical testing devices and oil analysis tools.

Moving on-line

By connecting production assets to their networks, companies can extend their data-driven machine performance and reliability programmes to the next level. Networked sensors and computing capabilities allow owners to automate machine monitoring activities and take advantage of powerful analytics capabilities.

The new SKF Multilog IMx-8 machine health monitoring platform, for example, is a compact, easy-to-use device that can collect data from multiple sensors and communicate with external systems over a wide range of network interfaces. In on-line mode, the IMx-8 can be used in conjunction with the SKF @ptitude Monitoring Suite for a completely integrated approach to condition monitoring that allows fast, efficient and reliable storage, manipulation and retrieval of large amounts of complex machine and plant information.

This data can also be collected and analysed locally using the SKF Microlog portable data collector/ analyser to provide advanced warning of developing problems such as bearing damage, imbalance and lubrication problems, which can be reported in good time to relevant on-site personnel. Moreover, SKF Microlog can be used in conjunction with the IMx-8 running SKF @ptitude Observer software to provide a complete system for early fault detection and prevention, ultimately improving machine reliability and availability.

Expertise on demand

Networked condition monitoring doesn't have to stay within the walls of the organisation. The SKF Industry 4.0 and Industrial Internet of Things initiative starts at the machine itself, where 'smart' bearing technologies using embedded sensors and self-powered wireless technologies enable real-time condition monitoring data to be transmitted to a variety of receiving devices and subsequently to the Cloud via Internet connections. Remotely located maintenance experts can apply analytical software tools to this huge reservoir of machine condition information to generate instantaneous machine condition reports and identify trends that might indicate an impending problem.

SKF has built dedicated capabilities to offer this kind of 24/7 online machine monitoring service in a number of industry sectors,including marine and offshore operations, and wind energy. The company is now extending similar monitoring and diagnostic services to a much wider range of sectors, and launching new tools and applications to dramatically simplify the work required to put condition monitoring data online.

Launching this spring, for example, the new SKF Enlight QuickCollect sensor is a simple and robust hand-held unit that monitors both vibration and temperature, transmitting this data wirelessly to a mobile device. From there, users can choose between two analysis options. An entry-level app called SKF QuickCollect allows users to capture and store diagnostic data for subsequent analysis. Alternatively, a second app, SKF DataCollect, offers users an upgrade path to extended diagnostic capabilities, customised forms for the collection and display of all types of inspection and process data, and the ability to register for, and connect to, the SKF Cloud for access to SKF's remote expert services.

The SKF DataCollect app also provides automated diagnostic features based on ISO standards, regulatory inspections for compliance, report generation, date and time stamping and compatibility with SKF @ptitude Inspector software.

ON THE CONVEYOR BELT TO SUSTAINABILITY

Sometimes sustainability solutions can be found in the most surprising places. Through their "Engineered Sustainability™ product program, Rexnord aim to deliver customers' sustainability goals – by conveyor belt.

Safety, energy use reduction and water use reduction are key sustainability goals for most businesses in many industries. And most will be looking in the same places to find ways to meet their targets. However Rexnord help customers achieve their goals in a surprising area of the production process: on the conveyor belt.

No slip-ups

The most important sustainability goal for all businesses is the safety of their employees. So Rexnord products are always designed with optimum safety in mind.

Firstly, they require no external lubrication. This not only means operators can maintain a safe distance from the machinery and moving parts, because there's no need to apply lubricant. It also means the factory floor becomes a much safer working environment, because the slip risk which can result from spilt lubricant is eliminated.

Removing the need for external lubrication also means the conveyor system can be closed. This makes it harder – if not impossible – for operators or other workers to come into contact with moving parts and risk being trapped or injured.

Lastly, an enclosed system reduces the noise level on the production floor – reducing the risk of hearing damage for operators and other employees, and creating a more pleasant working environment.

Heavyweight savings

Choosing the right conveyor belt can provide some heavyweight energy savings. And the most effective route to savings is choosing a lighter-weight belt. Rexnord use plastic chains that are much lighter than traditional chain materials. This reduces the tension on the drive shaft, which means less energy is required to drive them.

But that's not all.

The plastic material is also self-lubricating, with greatly reduced friction – which again means much less energy required to drive the belt. In addition, since most conveyor systems in high-speed beverage filling lines use large quantities of water for external lubrication, self-lubricating chain reduces water consumption, as well as eliminating the need for waste-water collection.

Less waste, more product

Products which are damaged or broken during the production process represent waste: not only of the product itself but also of all the energy and raw materials which went into its manufacture.

Product damage can often occur on an unsuitable conveyor when products fall over – particularly in the beverage industry, for example, where relatively unstable PET bottles are highly susceptible.

However Rexnord conveyor chains are designed based on extensive customer research, and so are engineered to address these problems.

The Rexnord 1040 Series Magnetflex® TableTop® Chain and the Rexnord 1001-84mm Series MatTop® Chain both offer excellent flatness, so that beverage and food containers can be effectively and stably supported.

Innovative installation

With a well-designed conveyor chain, safety considerations start before the conveyor system even starts up. In fact, with the new Rexnord Magnetflex TableTop and MatTop Chain Series, they start at installation.

Using a hammer and punch to insert pins in the chain – for installation or during maintenance – can be a safety risk. That's why Rexnord have developed a patented pin insertion and retention solution.

Pins are inserted in the Magnetflex TableTop Chain with a small amount of force – so there's no need to hammer them into place. They are then locked into position by simply clicking the links slightly backwards. It's safe, quick and easy. Pins for the new Rexnord 1001-84mm Series MatTop Chain are also quick and easy to insert safely from either side. Secured by hand, no tools or excessive force are required.

Safer all round

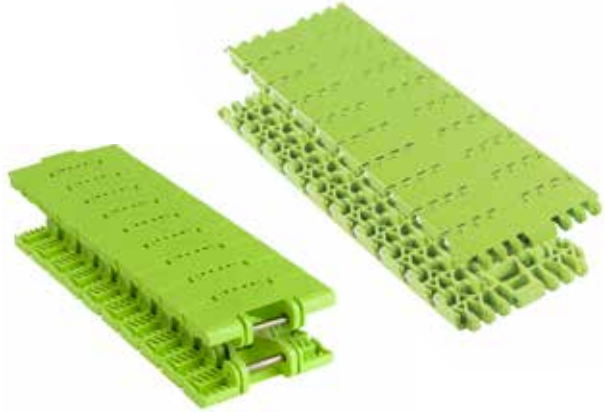
In the food and beverage industries, it's not only employee safety that counts. Food safety does too. So all production line components which come into contact with the products must be food safe.

The other important safety consideration is a safe choice of supplier. As Rexnord's preferred supplier partner for end-user customers, ERIKS can help you plan, design, engineer and install a Rexnord system which will meet all your sustainability goals, achieve your reliability targets, and safely deliver the savings you need.

Protects drive belts, gearbox and asset

Bi-directional torque spike protection

Quick, easy resetting



SEALING THE DEAL

If you want to achieve optimum productivity, then efficiency and reliability are part of the deal. For air, water and gas pipes and hoses, that means no leaky joints. Which means you need an efficient and reliable method of sealing them.

As with most things in equipment maintenance and repair, there's a traditional method and a more up-to-date method. But unless you're from the "that's what we do because we've always done it" school, the question you need to ask is which method works, works first time, and works most reliably for longest?

Let's compare traditional sealing using non-curing pipe compounds, with Henkel's LOCTITE® branded adhesives.

Traditionally less reliable

One of the oldest methods of sealing the spiral leak paths of threaded joints is with non-curing pipe compounds.

These are pastes made from oils and fillers, which lubricate and compact into the threads. Although they do create a seal, they provide no locking – and if they're placed under pressure they can squeeze out. They also have poor solvent resistance and don't solve the problem of sealing for parallel threads. An alternative is solvent-based sealing compounds. These also lubricate and compact into the threads to create a seal, though once they've been applied the fittings must be re-torqued to minimise any voids.

But that isn't their greatest failing. Their major disadvantage is that as the solvents evaporate during cure, the compounds shrink, which compromises the efficiency of the seal.

Got it taped?

PTFE tape is a solution that demands experience and expertise to give it any chance of working effectively and consistently. This is particularly true if you're trying to seal an elbow, valve or pressure gauge fitting, for example, which needs tightening up to a particular position.

The tape does give a good initial seal, and one which resists chemical attack. It even acts as a lubricant – but when it does it allows fittings to loosen under dynamic loads, which leads to loss of clamping force and, inevitably, leakage. It also encourages over-tightening of fasteners, which adds to joint stress and can even cause parts to fracture.

PTFE tape is not suitable for use in hydraulic systems, as it has a tendency to shred. Small pieces of tape can then break free to clog key apertures, leading to severe maintenance problems.

Lastly, perhaps one of the most traditional of all traditional methods is hemp and paste, which has been used for many years. Demanding a certain amount of experience and skill to achieve a complete seal, it is messy, slow to assemble, and unsuitable for use on fittings carrying potable water.

Sealing made simple

While the more traditional solutions make sealing a hit-and-miss process that takes far too much time, the LOCTITE® family of pipe thread sealants offers reliable easy sealing time after time.

These single component sealants are clean and easy to apply, and won't creep, shrink or contaminate systems. The LOCTITE® liquid sealants can be used on pipe fittings up to 3", and LOCTITE® 55 Pipe Sealing Cord can be used on pipes with a diameter of up to 4". Both types are approved by all the relevant major agencies.

Liquid or cord, the products create a full pressure seal that resists vibration and shock loads, as well as protecting the mated threaded areas against corrosion. But just because they're proven effective doesn't mean they're not still being improved.

For example, LOCTITE® 577 – Henkel's medium-strength, anaerobic general purpose sealant – has been the subject of continuous development. Its latest formulation introduces several improvements, including higher strength on contaminated surfaces, the ability to withstand higher temperatures, and high performance on passive materials, without the need for an activator.

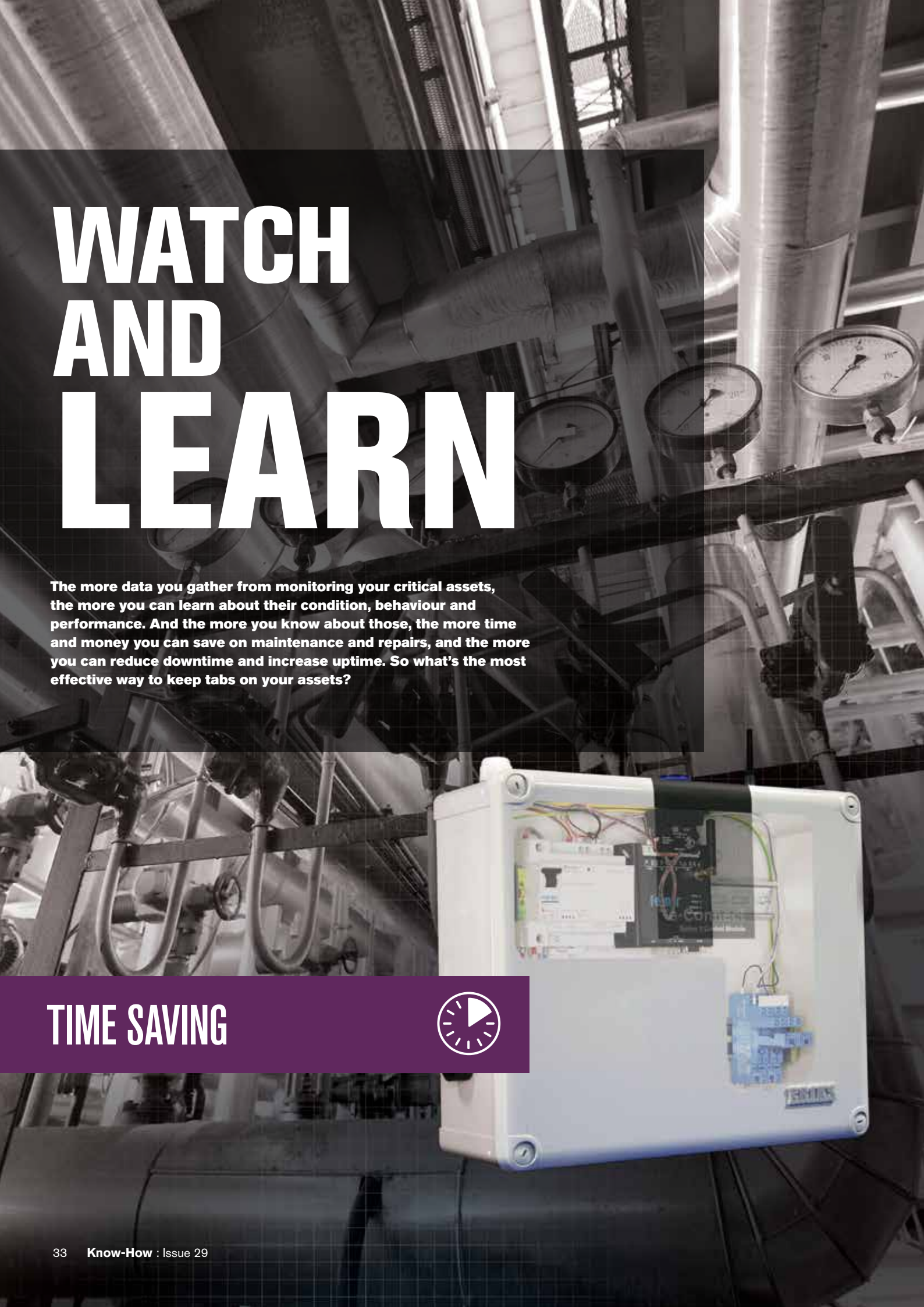
Reel savings

The LOCTITE® 55 Pipe Sealing Cord mentioned above may be simple technology, but it's simply very effective: sealing threaded fittings (metal and plastic) quickly, cleanly and cheaply. Its new 160m dispenser even enables a single reel of cord to seal up to 405 half-inch thread joints.

So if you step away from the traditional sealing solutions and try the LOCTITE® sealants instead, you'll find you can make more consistent and more reliable seals, more quickly and more easily. Which means you can maintain productivity of your equipment, and of your maintenance engineers.

WATCH AND LEARN

The more data you gather from monitoring your critical assets, the more you can learn about their condition, behaviour and performance. And the more you know about those, the more time and money you can save on maintenance and repairs, and the more you can reduce downtime and increase uptime. So what's the most effective way to keep tabs on your assets?



TIME SAVING

We all know what Condition Monitoring (CM) is. But what it really means depends very much on who's providing it.

Some CM companies do nothing more than monitor. Asking them for advice on optimising the performance of an asset is like asking the electricity meter reader to tell you how to get your toast more evenly browned in your toaster.

Others may be able to offer generic advice, but nothing which addresses your specific equipment and unique processes.

What you need is CM supported by information and advice from people who have experience of your industry, understand your processes, and appreciate the individual nature of your equipment and applications. And even before you start to gather and analyse the data, you need people with the necessary skills to identify what you should be monitoring, and how to monitor it most effectively.

Do you speak data?

The data gathered from Condition Monitoring is another language, which needs careful interpretation.

Take the recent example of a short, sharp peak in vibration from an asset, which triggered an alert to ERIKS' 24/7 e-Connect CM team.

As an experienced CM provider, they identified that the peak was infrequent, isolated, and caused no lasting damage. So they decided there was no need to shut down the equipment or replace components.

A less experienced CM provider would have instantly identified the vibration peak as a critical issue requiring a change of bearings and seals. The result would have been extensive downtime, lost production, repair costs – and the apparent elimination of the vibration peak. Until the next time a forklift bumped into the machine.

A less experienced provider would also find it harder to identify what should be monitored in the first place.

With over 40 years' CM experience – in processes from car presses to chocolate extrusion, and water treatment to jet engine manufacturing – ERIKS can not only interpret the data and understand its significance. They also know precisely where to place sensors to gather the data which will provide the most effective early warning of failure.

Tailor-made monitoring

There are five versions of the ERIKS e-Connect monitoring system, each one extendable as required.

In addition, ERIKS use their industry, process and engineering expertise to adapt each version to each customer's specific requirements. Because ERIKS know how machines fail, they know how to monitor them for the most timely and relevant data.

Log and Alert; e-Connect Series 1

Providing data logging and alerts from up to 4 analogue sensors. This system wakes up to test and send periodic text reports, and alarms when required, then returns to sleep mode. Battery powered.

Status Monitoring; e-Connect Series 2

A 3G or 4G connected version ideal for process plant rooms and similar situations. Permanently powered, it continually monitors the state of devices (on or off; duty, standby or tripped?) and sends alerts by text or email. A web-viewer is also available.

Trending; e-Connect Series 3

A permanently-powered version which connects to most analogue or BUS output sensors. As well as monitoring values and sending text or email alerts when a threshold is triggered, this version provides trending information over time. It includes a web-viewer and offers two-way communication – enabling remote system control.

Diagnostics; e-Connect Series 4

As Series 3, with the addition of local algorithms (for multi-dimensional alarms) and local history storage.

Prognosis; e-Connect Series 5

As Series 3. Also includes storage of full analytical data on the cloud. Enables data overlay from various machines and makes high-end analytical techniques possible.

From monitoring to maintenance

Effective monitoring and expert data interpretation are still only part of the story.

If equipment maintenance, repair or replacement is identified as necessary from the data gathered, then timely action is required.

ERIKS' capabilities across the whole spectrum – from CM to parts supply and installation – and across flow, rotation and mechanical processes, enable them to provide a comprehensive, time-saving service.

It saves customers time through better parts availability, better-scheduled maintenance and – one of the cornerstones of Industry 4.0 – through greater equipment reliability.

ARE YOU MAINTAINING YOUR STANDARDS?

BEST PRACTICE

Since 1st January this year a new standard for motor efficiency has come into force, with fines for non-compliance. But even though it's been in the pipeline since 2011, many people are still unaware of what it involves and what their responsibilities are. ERIKS has all the information you need to save you from being caught out.

The IE3 European Minimum Energy Performance Standard (MEPS) is now mandatory for all 2, 4 and 6 pole single speed, three-phase induction motors from 0.75-375kW, rated up to 1,000V. This means manufacturers and suppliers can only sell you an IE2 motor if it's already in their stocks and if you are going to fit it with a variable speed drive.

But with IE3 motors now readily available, they're the obvious choice for any business which wants to reduce its carbon footprint and energy costs, and enhance its manufacturing sustainability.

Cutting carbon and costs

Electric motors are responsible for more than half of industry's electrical consumption every year. And they make up a fifth of the UK's entire annual electrical energy usage1. So it's hardly surprising that they have such a major influence on industry's carbon footprint and energy bills.

A 2.2kW motor running for a year at full load, for example, will produce over 10 tonnes of CO_2. That's why the government estimates that the changes being brought in under the EU MEPS legislation will help to reduce the amount of CO_2 going into the atmosphere by at least 1 million tonnes a year.

At the same time, the changes have the potential to save UK businesses a total of £200 million a year. After all, the running cost of a motor can easily outstrip the purchase cost within just one month. And while the purchase cost of an 11kW IE3 motor represents only 2% of the total cost of ownership, and maintenance only 1%, energy costs make up a staggering 97%.2

The legislation means you have little option other than to purchase IE3 motors when you come to replace existing motors. But if you have an IE2 motor which needs a repair, why wait?

It could make real economic sense to upgrade to an IE3 motor instead – and start saving money and reducing emissions sooner rather than later.

Calculate your savings

Talk to a manufacturer about a motor in need of repair and you'll almost certainly be pressured to replace it. But talk to ERIKS and you'll be given a free, fair and unbiased opinion on the relative costs and benefits of repair versus replacement, using the ERIKS Total Cost of Ownership calculator.

By entering details about your IE2 motor (such as power, speed and voltage), we can use our web-based calculator to produce accurate running costs, CO2 footprint and energy use figures. But that's only the beginning. It then factors in the repair cost, to produce a new set of figures, and compares those with the purchase, running and other costs of a new IE3 motor.

Finally, it calculates the total cost of ownership, and shows the annual energy cost-savings and CO2 emissions savings.

With these figures in front of you, you can make an informed decision about which is the most cost-effective route to take.

Brexit and Best Practice

The Minimum Energy Performance Standard is, of course, EU legislation. But that doesn't mean we'll leave it behind when we leave the EU.

The restrictions on motors that are encompassed in the EU MEPS are almost certain to be continued in UK legislation. It's also unlikely that any motor manufacturer would go to the trouble and expense of continuing to produce IE2 motors just for a market the size of the UK.

But Brexit and legislation aside, if you have energy costs and carbon emissions to reduce, and a reputation as a responsible and sustainable manufacturer to protect, why would you choose anything other than the most energy-efficient and cost-effective electric motor option?

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INDUSTRY 4.0 THE ELEPHANT IN THE ROOM?

DEBATE

In a new report, which can be downloaded from the ERIKS UK website, we ask the question, "Is UK Industry ready for Industry 4.0?" Here, Gary Price, International Product Manager for Automation and Services at ERIKS UK, details some of the findings.

Industry 4.0 is the hot button topic for UK industry, but there are formidable obstacles in the way of implementation. ERIKS UK recently published a report analysing UK industry's preparedness for Industry 4.0 specifically and its impact on maintenance.

72 per cent of the engineers who took part in our research believe they have a good understanding of Industry 4.0. What's more, 64 per cent of respondents think that Industry 4.0 will have a beneficial effect on maintenance.

However, there are also some significant barriers, the first of which is knowledge. 50 per cent of our respondents graded their own knowledge of Industry 4.0 as being average or below. 24 per cent of our respondents also identified cost as a significant barrier.

There is also the problem of silos and information sharing, particularly with OEMs and third party maintenance suppliers. 79 per cent said their own organisations would offer only limited or non-disclosure of information to OEMs. For third party maintenance suppliers the situation is worse, with 83 per cent declaring that their organisations would offer limited or zero disclosure of information.

These findings are a concern because it is the third party maintenance supplier who has the expertise in the individual components and sub-assemblies that go into the machine, such as bearings or the chain drives on a conveyor. This reluctance to share information impacts the ability of either OEMS or third party maintenance supplies to diagnose, fault-find and prescribe solutions.

Big Data is another issue and there is clearly some disquiet amongst UK engineers about their own abilities to interpret and use data. 56 per cent of respondents say that they need the support of the OEM for machine diagnostics and fault-finding.

With our research we wanted to find out if Industry 4.0 can help industry implement more predictive maintenance, such as remote monitoring. 40 per cent describe their abilities to interpret data as being average or poor and yet only 46 per cent of our engineers say their organisations would grant access to a third party supplier.

Overall I can't help but ask whether our respondents, and industry in general, are focusing on the big picture, namely that Industry 4.0 offers an unprecedented opportunity to truly connect with its supply chains whilst not truly understanding how this can be achieved.

My advice to any organisation is to get the support of the right partners who can help you build and design the sensing systems that can give you the data you need in the right format to use to make decisions. It is possible, with the right advice, to build secure local area networks using sensor technology that will allow you to have early insights and fast links to your supply chain and plan work schedules ahead of you asset coming to a grinding halt.

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