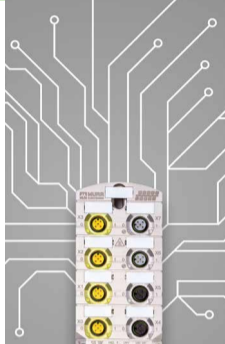# impulse

Murrelektronik Customer Magazine

MVK FUSION

An opportunity to standardize modular processes

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iLEARNINGFACTORY 4.0

Tettnang Electronics College: Learn, understand and do!

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OPPENWEILER

Murrelektronik has opened its new R&D center

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EDITORIAL

Dear Customer,

Technology changes unlock opportunities in automation, and not to mention they save you time and money. If you want to make the most of these changes, seek to strengthen your market position in the long term. Change processes naturally pose challenges and new tasks. Companies that aim to stay ahead of the times are implementing innovative business models, new communication techniques and react much more quickly. And we look forward to helping take advantage of the technology change. We'll help take you to the next level. We combine your know-how and our expertise to solutions together with you that will take you to the next level.

We also focus on promoting young professionals to make sure that groundbreaking ideas continue to flow into the automation industry in the future. Part of this involves supporting initiatives at schools and universities. We've been supporting the electronics college in Tettnang. In this issue of Impulse we will be presenting you the iLearningFactory 4.0 – it takes students to a new level. We have also reached the next level at our company headquarters in Oppenweiler, where we have opened our new development center. It creates space for communication and concentration. In the future, we will also be developing even more innovations. And you will benefit from these future-focused products, solutions and concepts.

Stay connected!
Your Murrelektronik Executive Management Team

Stefan Grotzke   Veronika Capek   Jürgen Zeltwanger

NEXT LEVEL SOLUTIONS – POWERED BY MURRELEKTRONIK

Behind every expert is a strong team.

The future will bring many technological challenges.

We have the right experts for every future challenge.

NEXT LEVEL SOLUTIONS
Smart Service for Smart Systems

www.murrelektronik.com/nextlevelsolutions

Smart Service for Smart Systems

NEXT LEVEL SOLUTIONS
powered by Murrelektronik

Technologies change, we change. Sometimes quickly, sometimes slowly, but continually. We are currently facing one of these transition periods, both in society and technology. The digital transformation is here and has already impacted people all across the globe. It has unlocked many new opportunities and also has brought with it new challenges. Companies need to react to these challenges by creating innovative business models, communicating differently and reacting more quickly. Murrelektronik and our Next Level Solutions Team is here to help you make the transition and take your business to the next level.

When it comes to technology transitions, Murrelektronik has always been a thought leader. We belong to the committees and international organizations that define our future technologies. We have been there from the beginning as new trends established themselves as standards. Our approach is driven by a single question: How can our customers benefit from these new technologies?

The technology transition also requires new ideas to take our customers to the next level. It requires both knowledge and experience to successfully manage the transition from the traditional, analog systems in machine engineering to smart, digital, Ethernet-based communication systems. Our individual employees contribute significant ideas, but teamwork is our most valuable asset in order to develop the best and most extensive solutions for our customers.

Murrelektronik's outstanding technological expertise and our excellent customer service make us a strong partner to take you to the next level. Working together, we have an experienced team to support you through all phases of your machine and system lifecycle. Merging your specialist knowledge with our automation expertise allows us to develop the optimum solution for your needs.

Technological changes have revolutionized many areas in your organization and that of your end customer. The purchasing department is now able to tap into new savings potentials. Planners can design the best machine layout by working together with our experts. Machine and systems operators appreciate intelligent machines that are easy to operate. Management also has access to real-time-data that visualizes system utilization. The whole organization is taken to the next level because machines increase their run-time, production is only briefly interrupted for scheduled maintenance and the cost-effectiveness and productivity of smart machines and systems becomes a reality.

We're there to support you with large-scale projects and small-scale tasks alike, from planning and commissioning to customer service. We take advantage of the right opportunities unlocked by this technology transition and create customized solutions that are optimized for your specific challenges. We draw on more than 40 years of valuable experience to take you to the next level.

The latest technology transition is driven by five main aspects. By taking advantage of these five new technologies, we can help take you to the next level.
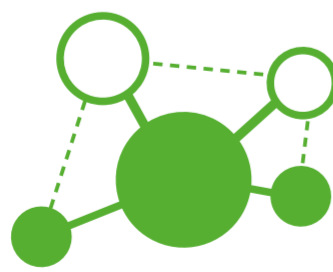
SWITCH FROM FIELDBUS TO INDUSTRIAL ETHERNET

... represents the shift from traditional, closed bus systems to open, Ethernet-based systems. This change is one that can be the most beneficial for our customers! Ethernet technology links the physical world of machines to the virtual IT world. It links the shop floor to the office floor.

The PROFINET standard enables high performance, outstanding functionality and straightforward service with minimum assembly effort. Ethernet standard wiring ensures stable connections and switches let you design flexible topologies and connect networks.

We belong to the committees and international organizations that standardize this technology and have developed cutting-edge PROFINET expertise that we want to share with you during trainings and on-site consulting where we assist with the planning and implementation of new automation concepts – for new machines and systems or retrofits. This will take your machine or system to the next level.

IO-LINK ROLLOUT

IO-Link is the only international standard that connects sensors and actuator regardless of the fieldbus protocol. The development of this proven connection technology is a crucial step towards replacing simple sensors and actuator with smart devices.

We focus on our customer's needs: maintaining the most flexibility during the planning and commissioning phases translate into technical and financial security for the plant manufacturer and operator.

The key benefit is that you can easily integrate devices with complex parameters into the controls unit. Your customers, the machine and plant operators, benefit from easily available data in the controls unit, while you can easily change parameters and replace devices, resulting in transparency and increased run-time.

Murrelektronik's advice is independent and neutral because we are not a sensor/actuator manufacturer. Our complete product portfolio focuses on connecting sensors and actuators in all environments. We call it IODD on Board. It integrates your device's parameters into the IO Device Description (IODD) of our fieldbus modules. So if a recognized IO-Link device is connected, all the configuration data is already available. This will help take your communications concept to the next level using IO-Link.

SAFETY

Until now, designing a safety system in your machine or system required a second controls unit. It was used to connect the safety sensors to the control system and reliably shut down the actuators independently from all other devices.

By switching from passive to active safety technology, you can integrate safety components into the standard system wiring. Now, all machine or system functions are integrated into one automation concept! Setup becomes much easier thanks to the reduced wiring effort.

We offer our customers cost-effective solutions that let you gradually switch over to future-focused, active safety technology.

And our certified safety engineers are on hand to help you do it. Take your safety concept to the next level by taking advantage of the valuable help we offer when designing the safety concept for your machine or system.

INTERNET OF THINGS

For Murrelektronik, the internet of things is simply a new way of transferring data from smart devices into the cloud. This process is independent of the controls unit and is necessary to transfer data to a higher-level system. The data can be transferred into the cloud in various ways: with a LAN cable or via the GSM standard. Once the data lands in the cloud, there are different ways of using it: for predictive maintenance, real-time analyses or creating a transparent overview of machine and production processes.

We offer different ways to make this transition in terms of technology and cost. You can transfer data via an OPC-UA interface to the Murrelektronik cloud or an independent cloud. This solution is convenient and can be directly linked your ERP systems. Here, you also benefit from our comprehensive consulting services that take you to the next level: from defining the right tools to hooking up the system and programming special interfaces for your dashboard.

MECHATRONIC ELEMENTS

A trend is emerging towards modular design in the electrical installation of machines and plants. We support this trend and offer manufacturer-independent and system-independent pre-assembled, pre-configured machine elements. You can integrate these

into your automation concept as standard components. This enables simplified designs and reduces the number of individual components in your machines and systems. We will help you create fully fledged system solutions for machines and systems using this approach. By reducing the number of parts and suppliers involved, you can focus on furthering your competitive advantage.

Modular engineering elements enable machine set up to become highly cost-effective and easy, which becomes a real competitive advantage given the shortage of skilled employees. We do not confine ourselves to our own products when putting together these elements and will add components from other manufacturers when it makes sense. Together, by creating smart solutions to develop modular mechatronic elements, we will take your machines and systems to the next level.

MVK FUSION

...is an opportunity to standardize modular processes, opening the door to a one-module strategy

The PROFINET/PROFIsafe module unites three basic functions of installation technology:

01 Standard digital sensors and actuators
02 Safety digital sensors and actuators
03 IO-Link

This combination is new and innovative. It enables unique and groundbreaking automation concepts to be realized. Installation becomes simpler and faster.

MVK Fusion makes complex configurations easier because they can be done entirely by the engineering tool in the safety control system. Software developers and electrical engineers no longer need in-depth knowledge of other manufacturers' tools and manuals.

MVK Fusion makes it possible to have fewer fieldbus modules per unit. Some applications might only require a single module. This opens up new opportunities for many automation applications!

02 Safety
IO-Link
03
01 Standard IO

Emergency stops

IO-Link button systems
IO-Link valve islands
Key and selector switches
Double safety valves
Smart IO-Link sensors
Foot switches

Safety valves
IO-Link inductive couplers
IO-Link analog converters
DC motors
Solenoid interlocks

Safety door systems
Door switch
IO-Link inductive sensors

IO-Link hubs
Valves

IO-Link distance sensors
Safety command devices

IO-Link pressure sensors
IO-Link temperature sensors

Electromechanical safety switches
Enabling switches

IO-Link transponder systems
IO-Link grippers

Two-handed devices
Laser scanners
Digital sensors
Light curtains

Control solenoid for guard locking

Only One Module per Mechatronic Component

With our fieldbus module MVK Fusion, we're advancing the standardization of modular processes for the users. This makes it possible to realize new and groundbreaking concepts for the automation industry. Installations will become easier and quicker. Hopefully, only one module per component will be needed.

*Michael Greiner,
Senior Product Manager*

One Module with Extreme Range

What makes the MVK Fusion fieldbus module unique is its variety. It combines three basic functions: standard digital sensors and actuators, safety digital sensors and actuators and IO-Link.

- The two standard digital ports can be configured as inputs or outputs – they are customizable for each application.

- The four safety ports ensure that almost all digital safety requirements are integrated into the installation.

- The two IO-Link ports offer a wide range of functions: they integrate smart devices into the fieldbus system and they also enable the system to be expanded cost-effectively via IO-Link hubs.

MVK Fusion simplifies installation by minimizing the number of modules required.

Flexibility within Safety Applications

MVK Fusion integrates all safety aspects into one module:

- Safety sensors signals are transmitted over the three safe input ports, each of which have two channels. Emergency stop buttons, light curtains, two-handed units, safety doors, etc. can be qualified up to Performance Level e.

- The safety output port has two safe outputs that can be configured according to the application (PP, PM or PPM switching). You can integrate a wide variety of actuator types like double valves and valve islands that still qualify up to Performance Level e.

- A special Class B IO-Link port ensures that IO-Link devices like valve islands and hubs can be easily and safely switched-off complying with safety standards up to Performance Level d.

MVK Fusion lets you achieve high safety standards, protecting both man and machine.

Safety Configuration within a Mouse Click

MVK Fusion makes configuring safety sensors and actuators extremely easy: select the safety function in the safety control system engineering tool, and within a few mouse clicks configuration is done.

The users – usually the software developer or the electrical engineer – do not require any special knowledge to configure the module. The MVK Fusion module eliminates the extra verification work step (CRC calculation) and doesn't require additional manufacturer-specific software. This speeds up the process because it prevents entry of incorrect data.

High Performance

MVK Fusion is excellent for high power applications when reliability cannot be compromised. The module is one hundred percent compatible with PROFINET solutions. MVK Fusion is suitable for Conformance Class C (IRT), Shared Device and Netload Class III applications.

A Wide Range of Uses and Comprehensive Diagnostics

- Rugged, fully-molded metal housing made for a wide range of uses – like extreme welding applications.

- MVK Fusion saves error information with a time stamp on an integrated web server, even in the event of power failure, helping you identify errors and reduce downtimes.

- The module functions at high outdoor temperatures (up to 60° C) in combination with high currents (up to 16 A). We offer an optional heat sink is for these extreme conditions, which extends the life of the module.

- The safety address is set directly on the module via rotary switch – MVK Fusion can also be restored to its default setting via the address 000.

- Unique to the market, the module can be used in at very high altitudes: up to 3,000 meters (10,000 feet).

- Every single channel is monitored for problems like overloads, sensor shorts or short circuits – the comprehensive diagnostics detect errors quickly, so they can be analyzed and fixed.

THAT'S COOL!

When it's **hot outside** (temperatures up to 60° C) or if the module is under **high current** (up to 16 A), it's possible to mount the MVK Fusion module onto a **heat sink** so that the module will continue running under **extreme conditions**.
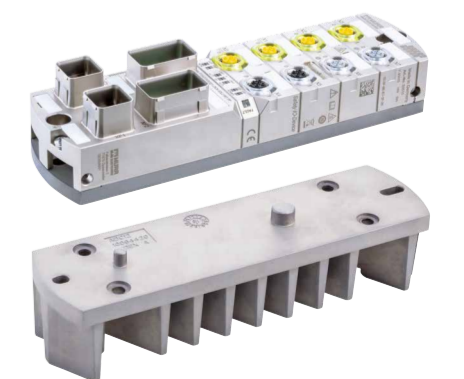
LEARN, UNDERSTAND AND DO!

At the Tettnang Electronics College, students study at the iLearningFactory 4.0 – using hardware supplied by Murrelektronik
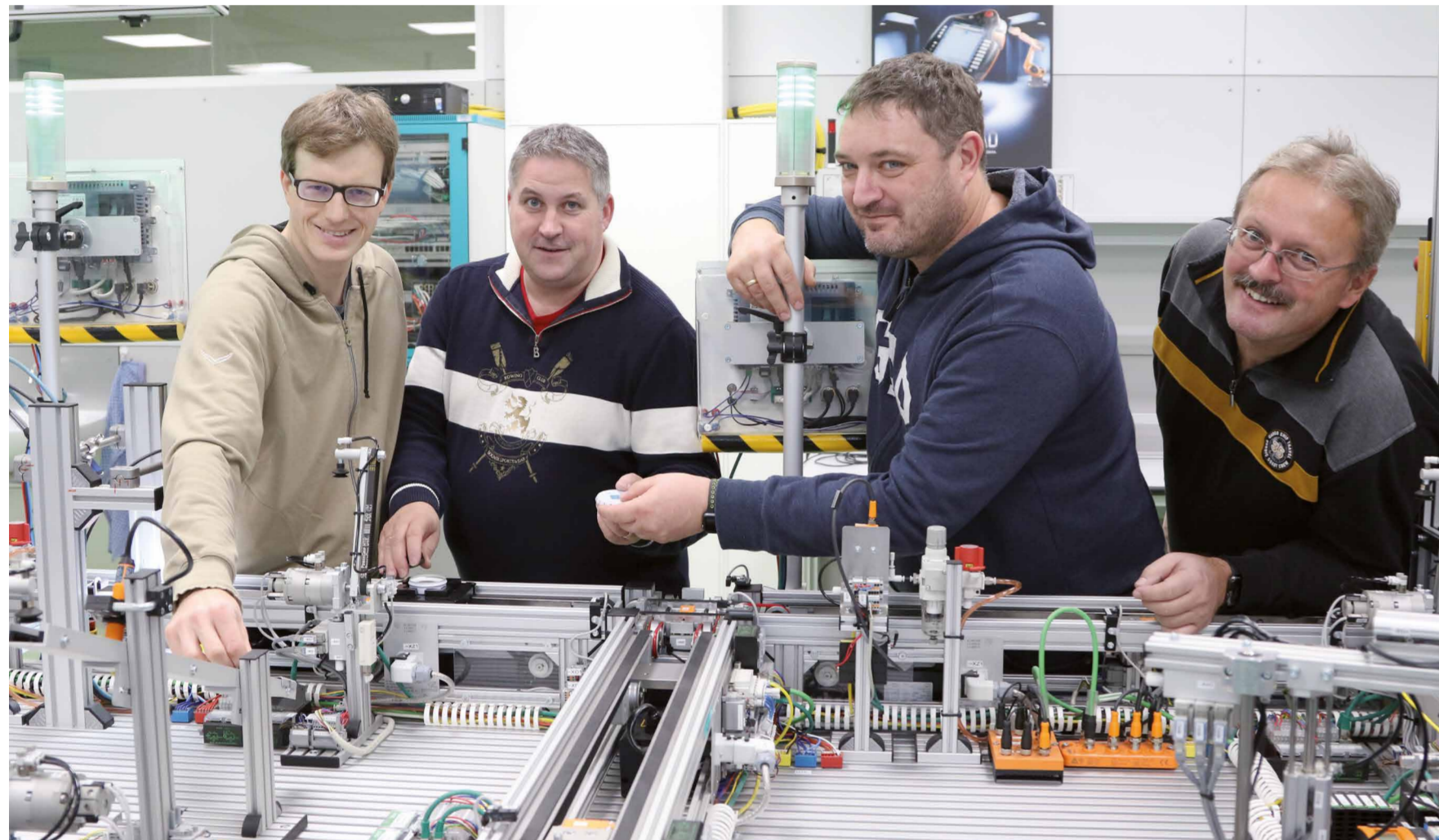
Lots of time and effort went into giving students a real-life insight into production processes: Gregor Kompa, Andreas Greck, Christian Schick and Martin Retzbach from the Tettnang Electronics College.

Insights from the iLearningFactory 4.0

M12 Push-Pull

THE UNIVERSAL QUICK-CONNECT SYSTEM

The Tettnang Electronics College focuses on practical, real-world applications. The newly opened iLearningFactory 4.0 is an entire production chain for packing plastic chips and is realistically simulated. Students enjoy hands-on experience of what Industry 4.0 is all about. Murrelektronik places a lot of value on young professionals receiving the highest education – which is why we support such a ground-breaking innovative project by supplying the hardware components for the automation system. Murrelektronik also assisted in an advisory capacity with the planning stage.

Around 1,000 students attend the Tettnang Electronics College. They receive basic and further training in automation technology, electrical engineering and information technology. This degree of specialization is unique to Germany. So it is no coincidence that many electrical engineering companies have popped up around the college. Many companies have recruited talented young engineers from Tettnang. Some students attend the electronics school full time, others attend part time which is a component of the integrated study program: work during the day and go to school in the evenings and on the weekends. Because this type of educational environment is unique, the college is keen to make study as attractive as possible for the students. This applies to the teaching times, close cooperation with companies, and the material, which strives to fascinate, inspire and motivate students.

Recently, Tettnang Electronics College applied to the State Ministry of Economic Affairs, Labour and Housing Construction (in Baden-Württemberg) to establish training factories at vocational colleges. These training factories would focus on the practical education of skilled workers and young professionals to meet the requirements of the digital age. The electronics college won the call for the laboratory and received funding from the state and Lace Constance regional government. The investment totals €1.1 million. It was then up to the electronics college to seek industrial partners in for the project. However, the idea was not to collect checks, but to ask companies for products and components, their time and know-how to get the iLearningFactory 4.0 up and running. The laboratory was officially inaugurated at an opening ceremony in October 2018.

The production lab includes automation components from many manufacturers, which is ideal, says teacher Christian Schick: "We want the students to see and understand how different components interact." The installation consists of six modules with numerous sensors and actuators. They operate on a cooperative basis and pack plastic chips into containers – based on an order entered via web interface. Operations are highly varied, with containers of different shapes, sizes and colors, requiring a high level of flexibility from the automation solution.

Murrelektronik supports the iLearningFactory 4.0 with our hardware components. Our Cube 20S fieldbus station and compact Cube20 fieldbus modules electrically connect the sensors and actuators to the control system. These systems offer high signal density, enabling many channels to be connected in limited space. The students learn how to terminate individual wires on these IP20 modules. Thanks
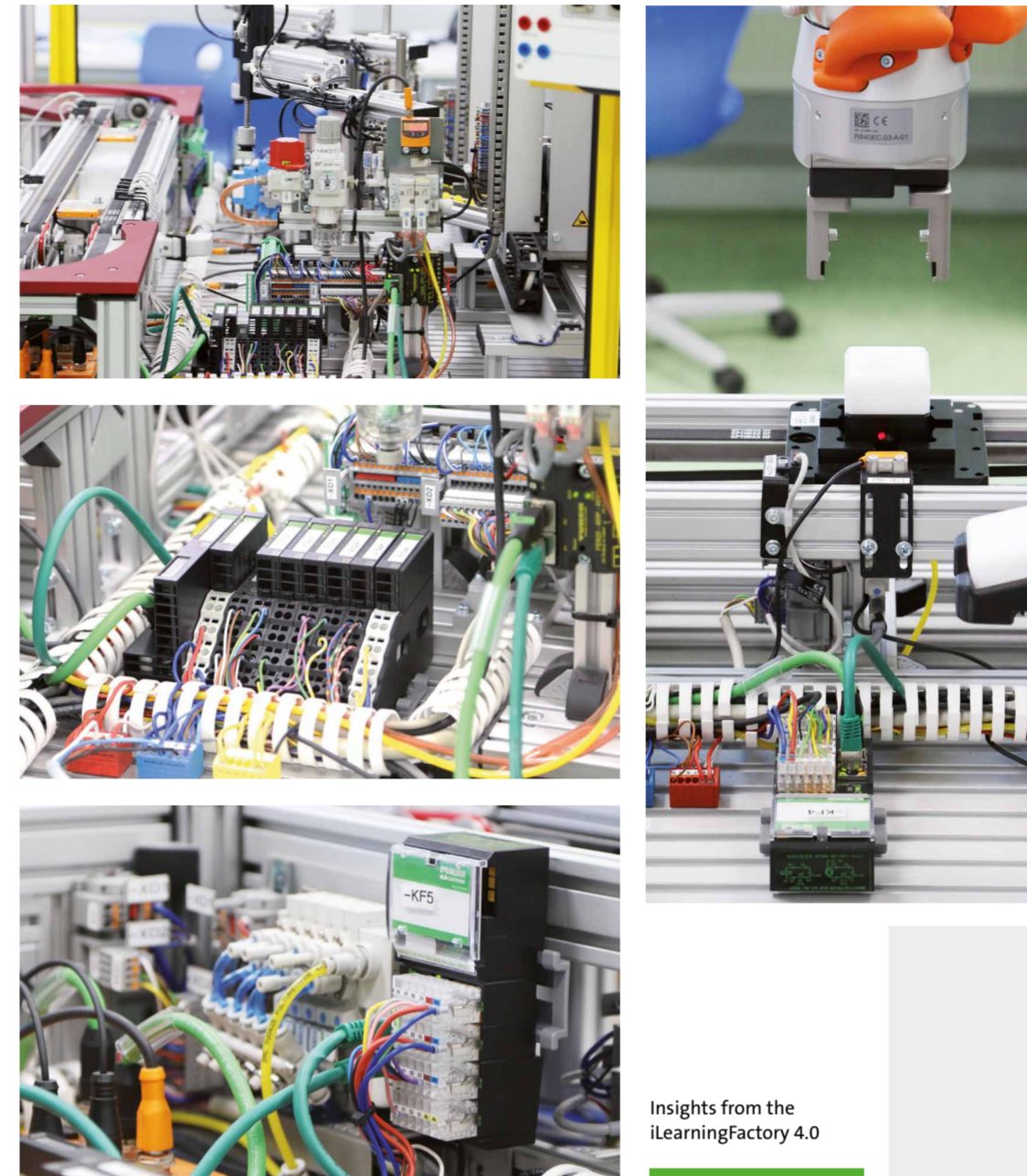
to the modular design of the Cube20S, additional modules can be added quickly and easily when more modules are integrated into the installation. Cube67 fieldbus system modules are installed to effectively integrate sensors and actuators that are located further away from the core area of the installation. By building the I/O modules in close to the operational process, cordsets can be shorter when incorporating components into the system. Pre-wired M8 and M12 connection technology minimize the risk of wiring errors. Murrelektronik's Impact67 compact fieldbus module is also part of the installation solution: it provides another way of cost effectively incorporating sensors and actuators into the installation.

Students focus on practical aspects at the iLearningFactory 4.0. They tackle tasks that they will also have to deal with as part of routine operations in the real-world. This might include, for instance, students being given the task of integrating new components, signal towers or even an entire supply module into the iLearningFactory 4.0 to increase the automation level. Some other real-world examples: How to replace a piece of equipment in the installation without causing a long downtime, which would be very costly? How can processes within the installation be visualized to identify whether signaling between the individual elements is working perfectly? How can a predictive maintenance solution be integrated into the installation?

"Many of the automation projects we tackle with our students on the installation side are identical to those in their day or future jobs," says teacher Andreas Greck, identifying an interesting aspect for companies that have provided material for the iLearningFactory 4.0: "The students work with the components and get to know them. When they have to opt for the products of manufacturers on the job, then, of course, they prefer ones they know and have found to be good."

Jürgen Zeltwanger, CSO/CTO of Murrelektronik, is happy to sponsor this ambitious and unique college and its teaching staff: "We support the electronics college's iLearningFactory 4.0 because we want students to enjoy the best possible training. And the college in Tettnang succeeds in doing this with its impressive practical applications."
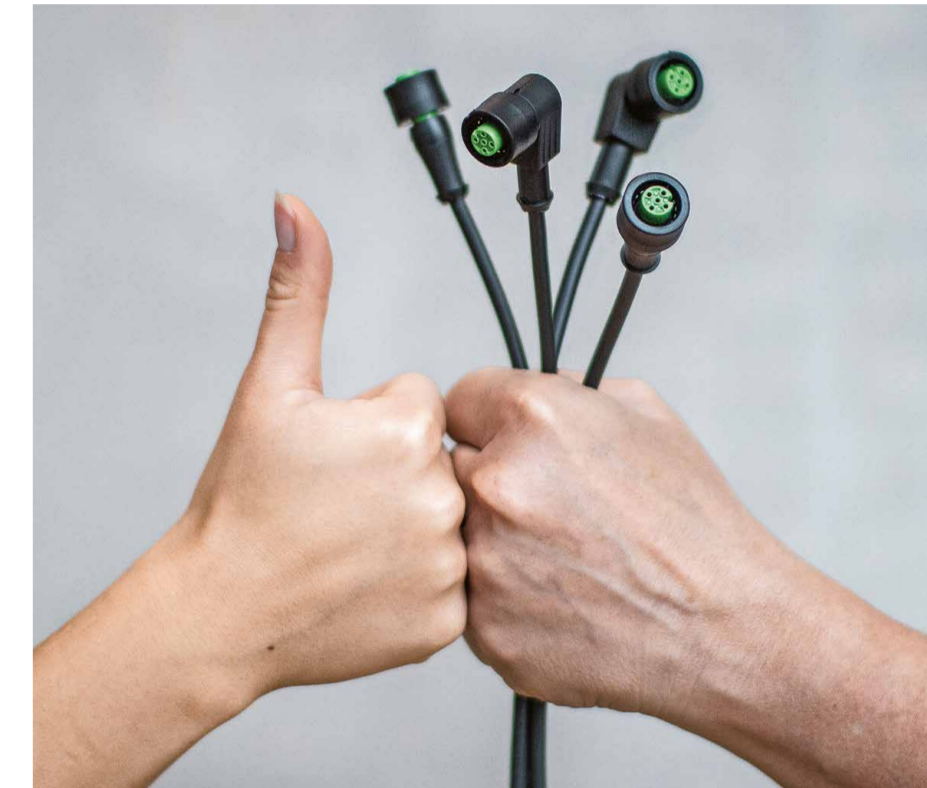
Anyone who spends a lot of time installing M12 cordsets must have asked themselves if a reliable and universal quick-connection system exists that is capable of coping with the full spectrum of stresses and strains. **In future, the answer to that will be "Yes!"**

The M12 Push-Pull is a standard system that enables M12 cordsets to be connected in record time. Leading connector manufacturers have worked together to deliver a top-quality and standardized product to the market.

It connects by using a push-pull system. The technician can hook up the connector very quickly and without tools since each wire has an identical connector pattern. This is unlike the conventional M12 because using the M12 Push-Pull reduces the installation time by about 80 percent. This is extremely efficient in installations where space is limited – the male connectors with push-pull connection technology offer several benefits.

Is there a risk of achieving speed at the expense of process safety? **Clear answer: no!** With the M12 Push-Pull system, male and female connectors lock into an accurately aligned contour, and once connected and locked in, each connection is leak-proof and is IP67 protected. Acoustic and tactile feedback provide the technician with the feedback that the cordset is correctly connected.

Our forecast: The new standard M12 Push-Pull will be the trigger to the rising trend of M12 connectors, making it the first choice for many other applications! The success story of the M12 Push-Pull cordset has just begun.

FLEXIBILITY COUNTS

WHEN EVERY MACHINE IS DIFFERENT

Hager relies on Murrelektronik's modular, decentralized and compact Cube67 system when building their own testing machines

Anyone installing or renewing electrical systems in a house or apartment is almost certain to come across Hager products and solutions. The company is the world's leading specialist in building automation and electrical installations.

Not only is Hager represented worldwide, but they have production plants on every continent. They maintain the highest quality standards at these plants. No component leaves the plant without undergoing a meticulous function test, checking every single detail. To carry this out this successfully, it's a must to have first-class testing facilities. And in this case, as the saying goes: if you have high standards and want the job done well, then it's best to do it yourself. So Hager manufactures its own machinery and systems to test its products. The team responsible has remarkable expertise and is based in Obernai, a town in Eastern France.

When it comes to choosing the optimum installation concept for the automation of testing facilities, the challenge facing the Hager team is that no two test machines are the same. New aspects have to be continually considered. Different products need to be tested for a wide, and ever-changing, range of quality characteristics and functions. Specifications where the test facilities are used from the factories around the globe have to be taken into account. Only a few installation areas can be repeated designs. The task is not made any easier by the fact that while I/O density is always very high, space is extremely limited. Bringing the machines quickly into circulation is also important because demand is high for efficient

and reliable testing facilities within Hager Group and deadlines for rolling out new products are tightly scheduled and binding. In terms of the installation concept, it means that it has to be particularly flexible – and this is why the team in charge at Hager opted for Murrelektronik's modular, decentralized and compact Cube67 system.

#1 Advantage: Flexibility

Hager's top benefit from the Cube67 system is the flexibility: they can implement any number of different I/O modules with the system. Depending on requirements, a component with four or eight ports can be integrated into the installation. In some machines, modules with M12 cordsets are used; frequently however, Hager selects the compact modules with M8 ports. This saves spaces and allows several I/Os to be grouped in a tiny area. The modules are mounted right next to the sensors and actuators – at the heart of the process – for example on pneumatic devices or grippers. This enables the design engineers connect sensors and actuators with short cables to reduce wiring effort and save costs. The second flexibility advantage for Hager is the multifunctional ports. Engineers can decide whether they want to use each port as an input or output – this turn standard modules into customized modules, making it possible to group both sensors and actuators close to a module. Thanks to this multifunctionality, the number of module versions and the total number of modules required can be reduced, which makes this solution cost, space, and installation-friendly. The Hager engineers can also easily control valves on site with the Cube67 valve cluster connections.

One Cable Technology

Another main benefit for Hager is that the Murrelektronik Cube67 system modules are connected to the bus nodes using one cable technology. The single cordset transmits both data and energy and runs from one module to the next. It's easy to design the system as needed since it is based on a star-line topology. The one cable technology transmits both data and power to supply the sensors and actuators – so there is no need to run two separate cordsets to the modules. This simplifies installation and maintenance for the engineers. They only need half the amount of cabling and are twice as fast – not to mention that significantly less space is needed for cabling in the first place. This represents a substantial advantage, especially in drag chains where space is often limited. The Cube67 cable is pre-wired and supplied to Hager in the exact the lengths required. This means that there is no need to wire connectors to the cables, which offers two benefits: Hager saves time and the company can rest assured that a whole bunch of potential error sources are excluded because pre-wired cordsets from Murrelektronik are 100 percent tested during the production process.

High Machine Run-Time with Cube67 Diagnostics

Since the cost effectiveness of Hager machines also hinges on high availability, detecting and eliminating errors quickly is essential. Hager engineers use the Cube67 system's extensive diagnostics options for this purpose. They make it easy for maintenance personnel

on site to find the problem, analyze it and take appropriate action to eliminate it. The technicians at the Hager plants are trained by their colleagues in Obernai. And, in the unlikely event that a tougher problem does arise, the team in Obernai can lend a virtual helping hand via remote access over the Internet.

The experts at Hager already successfully switched from PROFIBUS to PROFINET some years ago. They have since been satisfied with the installation concept. Thanks to the Cube, existing systems can adopt new protocols simply by changing the bus module instead of the system. Cube67 makes it possible to simply replace the bus modules, changing the protocol with it and equipping machines for the higher level PROFINET system. The structure after the bus module can remain unchanged – cables and all! No longer does the team have to spend time on documentation and reprogramming, nor for new purchasing process or stock checks. Hager benefits from the Murrelektronik concept. While 80 percent of the machines and installations are designed for integration in PROFINET systems, 20 percent of them are designed for Ethernet/IP environments. The same concept applies here simply replace the bus modules to implement a different protocol – and leave existing cabling in place.


Hager engineers can decide whether they want to use each port as an input or output – this turn standard modules into customized modules.
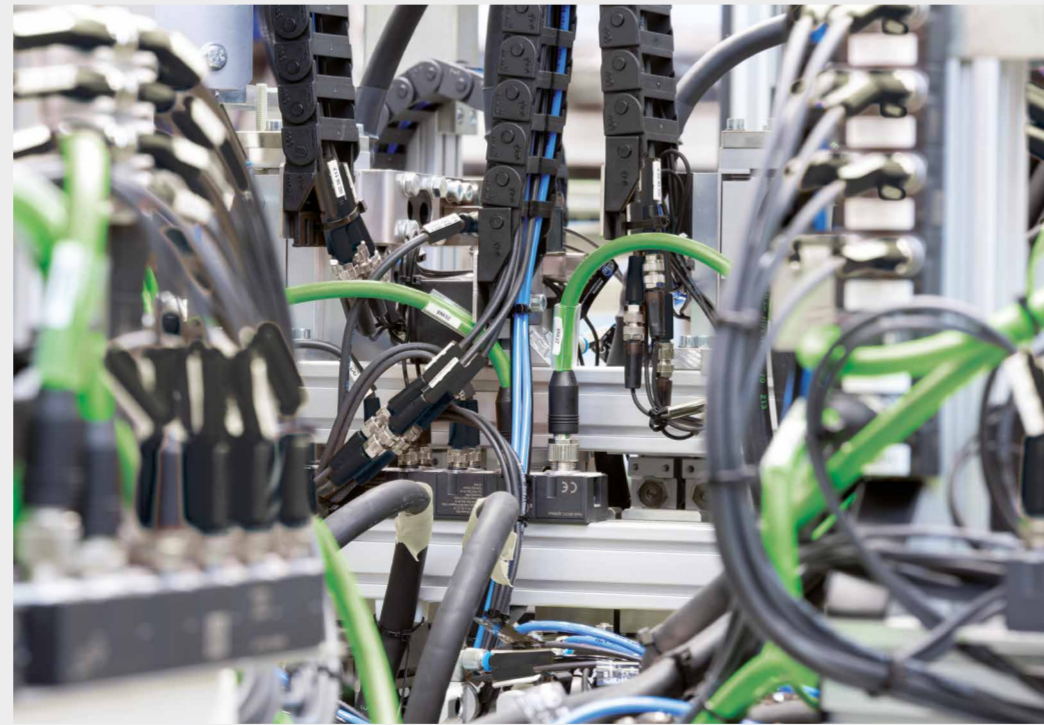
In drag chains, whether space is often extremely limited, using a one cable system for both data and power is a major advantage.

The modules are mounted right next to the sensors and actuators – at the heart of the process – for example on pneumatic devices or grippers.
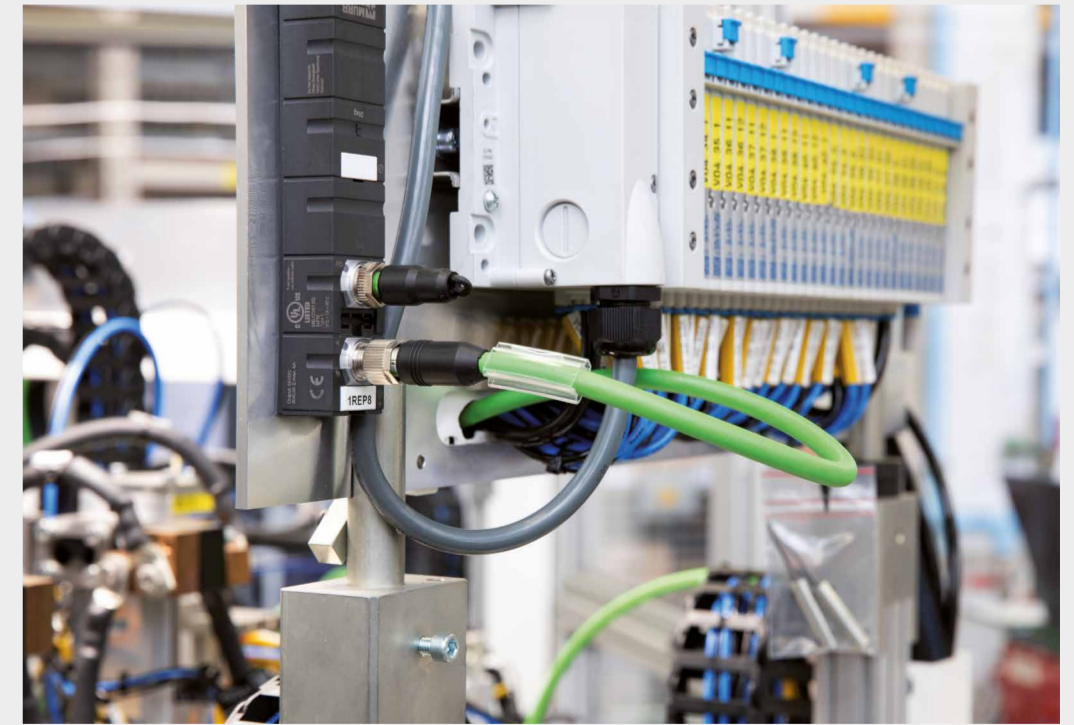
Valves can be easily controlled directly on-site via Cube67 valve cluster connections.

nexogate

USING DATA TO YOUR ADVANTAGE

NEXT LEVEL SOLUTIONS
Smart Service for Smart Systems

The Murrelektronik Cloud is here and it's ideal for using machine and plant data smartly. Murrelektronik's nexogate device is your interface to the industrial field.

A lot of people in a company can benefit from process data including the management, maintenance, programmers and service personnel... Data is used for different purposes such as adapting production, adjusting scheduling and organizing maintenance work.

The Murrelektronik Cloud keeps users up-to-date with the precise information they need. Data can be accessed online via a dashboard from any mobile device, anywhere, any time. You can also define the type of information sent to teams in advance. This allows the production planner, for example, to receive information on a plant's output, while the temperature of servomotors is displayed to the maintenance team.

When problematic conditions arise during the production process the speed of response crucial to contain the situation and avoid expensive downtimes. Prepare for these conditions in advance by setting threshold values for key figures in the dashboard. If the figures are outside of the defined minimum or maximum limits, an email or encrypted message is sent directly to the user's cell phone, allowing them to quickly react to the situation.

Data Transfer Made Easy

The device carrying the data from the industrial field into the cloud is Murrelektronik's nexogate. The compact control cabinet component is integrated into the communication system (Ethernet or PROFINET) and transmits data via the mobile network to the Murrelektronik Cloud. The advantage of this method is that the transfer takes place independent of the IT-infrastructure. If relevant, users can still also transfer information via the LAN connection into their own cloud system.

Expert Advice from Murrelektronik

When setting up our Cloud and integrating the nexogate device into an automation concept, the application consulting engineers from Murrelektronik are here to provide valuable support – from the initial idea to setup and far beyond.

> **Quick reaction time**
>
> A wide variety of data is collected in machines and plants. Using it smartly will give you a competitive advantage. We make it easy with our Murrelektronik Cloud and nexogate device. They provide transparency that lets you react quickly and plan ahead. It simplifies predictive maintenance.

Bianca Schoch
Cloud expert
at Murrelektronik

Social Media

Follow Murrelektronik!

Get all of the insider information from the automation industry on our social media channels ...

Deliveries from Murrelektronik

FAST AND RELIABLE

When you place orders with Murrelektronik, you can rely on us to meet the given delivery date. For you, short lead times are important. And you want to minimize planning, keep stocks low, maintain flexible material requirements and get product from us on short notice. At Murrelektronik, we pride ourselves on the fact that we meet all these requirements!

Our organization is focused on serving your needs. Based on a balanced mix of warehouse stock and fast order-based production (MEX = Murrelektronik Express), we ensure that the products you need leave our logistics center shortly after your order is placed and are delivered to you promptly. We have also installed a sophisticated live monitoring system in our production to ensure that best-selling products are always available immediately. We prioritize orders according to current stock levels and produce what is needed right away. In doing so, our production runs in-step with customers. We're continually enhancing the flexibility and speed of our production lines. We have reduced setup times, allowing us to produce small batch sizes and one-piece flows – thus increasing our flexibility and minimizing cycle times. Components are produced quickly, and only one person gets sweaty: the delivery man.

New Headquarters R&D Center

Space for Creativity and Innovation

Murrelektronik has opened its new research and development center at its company headquarters in Oppenweiler, a town outside of Stuttgart, Germany. The area of 3754,38 m² (40,411.80 ft²) available to the R&D teams provides a whole lot of space for creativity and innovation.
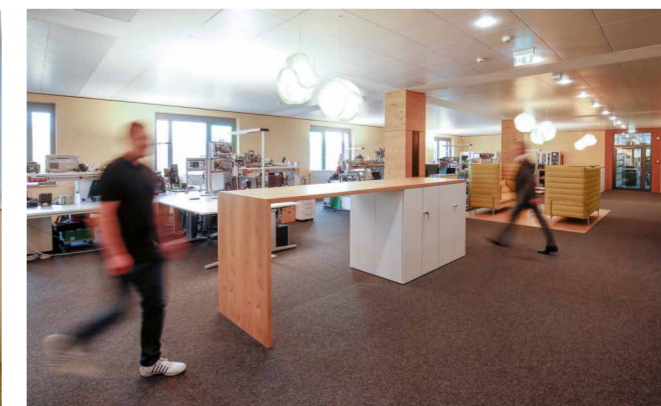
Bernd Waser, Head of Development for Automation & Power at Murrelektronik, explains: "When we designed our new R&D center, it was really important to us to provide a way for quality, efficient communication between employees." Communication areas in the new space invite Murrelektronik teams to get together during work, which can help solve minor challenges by working together. There's many uniquely styled quiet areas that are available for concentrated work to let developers focus on creating new ideas in a calm environment.

Combining different teams and work areas in the R&D process under the one roof helps intensify cooperation and eliminate wasting resources when interfacing. Murrelektronik's technical trainees and students have their own learning workshop and it's also located in the new R&D center. The workshop is a welcoming work environment where they can experiment and play without limits.

Murrelektronik selectively curated the materials used in the R&D center to promote a natural working environment. The use of wood provides a high level of ambient quality, while the clay walls provide a pleasant room climate.

> **Bernd Waser:** We hope the R&D teams feel comfortable in the new offices and that this translates into productivity and solution-oriented results for our customers.

Murrelektronik in Sweden

Skilled Experts and a Strong Team Spirit

Murrelektronik is represented in over 50 countries worldwide! And because Sweden is the Partner Country for the 2019 Hannover Messe, we would like to introduce our branch located in this innovative Scandinavian country that is characterized by leaders in the automation revolution …

Murrelektronik in Sweden's strength is based on expertise and a strong team spirit within decentralized automation. Managing Director Johan Oscarsson says, "Our internal structures represent our strength. Support requests should never get stuck on the customer's end – our "teams within the team" give us insight into all details and enable staff to support each other. We also receive backup from the global support office when needed."

The employees in Sweden can be found in the sales offices in Gothenburg and Stockholm, as well as in the main office in Helsingborg. Sweden has a history of industrial innovation, and there is currently a clear focus on automation and solutions for Industry 4.0.

Johan Oscarsson provides an insight into the customer structure at Murrelektronik in Sweden. "Our customers can be found in numerous industry segments – automotive, food and beverage, medical technology and mobile hydraulics." One customer that stands out is Epiroc, a leading productivity partner for the mining and infrastructure industries. Using cutting-edge technology, the company develops and produces innovative equipment with Murrelektronik products. No matter where their machines and systems are used in the world, all the cables and connectors used come from Murrelektronik.

TRADE SHOWS 2019
AT A LOCATION NEAR YOU!

Maintaining our connections with our customers is important to us – which is why we will be exhibiting at many trade shows in 2019 bringing you the **latest products, solutions and concepts for automation technology.** Here is a little teaser…

Apr 1–5, 2019	Hannover Messe	Hanover (GER)
Apr 8–11, 2019	Automate	Chicago, IL (US)
Apr 10–13, 2019	AHTD Spring	Amelia Island, FL (US)
May 14–16, 2019	Smart Automation Austria	Linz (AT)
May 15–16, 2019	Automation Expo Ticino	Bellinzona (CH)
May 20–23, 2019	NI Week	Austin, TX (US)
Jun 5–6, 2019	automation & electronics	Zürich (CH)
Jun 5–6, 2019	all about automation	Essen (GER)

We'll also be at a location near you hosting several sector meetings, workshops and customer events. Go to www.murrelektronik.com for an overview of all our scheduled dates…

TECHNOLOGY TALKS 2019

When technologies change, you are in the best hands with Murrelektronik. We invite you to our Technology Talks where you can get the latest and newest information on the automation industry.

Visit our **Compact Seminars** to get a quick overview of two topics in one day. Our **Comprehensive Seminars** cover one topic, in-depth.

April 30, 2019	Hanover	**Compact Seminar** IO-Link – The Last Few Meters Go from Sensors into the Cloud – IoT Connection Possibilities
June 03, 2019	Oppenweiler	**Compact Seminar** Switching from Fieldbus to Industrial Ethernet Safety made easy
June 04, 2019	Oppenweiler	**Compact Seminar** IO-Link – The Last Few Meters Go from Sensors into the Cloud – IoT Connection Possibilities
June 05, 2019	Oppenweiler	**Comprehensive Seminar** IO-Link – The Last Few Meters
June 06, 2019	Oppenweiler	**Comprehensive Seminar** Switching from Fieldbus to Industrial Ethernet
June 07, 2019	Oppenweiler	**Comprehensive Seminar** (half-day) Safety made easy
Sept 24, 2019	Hanover	**Compact Seminar** Go from Sensors into the Cloud – IoT Connection Possibilities Safety made easy
Sept 25, 2019	Chemnitz	**Compact Seminar** Go from Sensors into the Cloud – IoT Connection Possibilities Safety made easy
Sept 26, 2019	Lauf an der Pegnitz	**Compact Seminar** Go from Sensors into the Cloud – IoT Connection Possibilities Safety made easy

Looking to register or for more information?
Email **Marianna Dück** (marianna.dueck@murrelektronik.de) or reach her at +49 7197 47-4607. We'd be happy to help you find a hotel or provide more detailed information. Just let us know!

MURR ELEKTRONIK
stay connected

Follow us!