



impulse

Murrelektronik Customer Magazine

IO-LINK

Murrelektronik
Revolutionizes IO-Link
with IODD on Board

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BEST PRACTICE

Ready in the
Shortest Time
Possible



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POWER CONNECTORS

Motors – We Make
Them Easy to Connect

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EDITORIAL

Dear Customer,

Since Franz Hafner founded Murrelektronik 40 years ago, innovation, customer loyalty and global growth have been the cornerstones of our success. Since then, we have introduced a wide variety of innovative products and solutions with game changing features.

Our award winning Cube fieldbus system has the requisite flexibility and modularity for creating a variety of decentralized installations. With MICO, we introduced the first efficient solution for monitoring electronic load circuits. To this day, several million load circuits have been protected with our solution.

This year, we are celebrating our 40th anniversary, and in the sense of the Swabian saying “der Schwabe wird mit 40 g’scheit” (a Swabian gets mature with 40), the joy of innovation continues to be our driving force. As a result of your needs and requests we are constantly developing new products and solutions. Our goal continues to be making your machine and system installations easier with our products and solutions.

Presently, we are focusing on a “Zero Cabinet” principle that moves components from the cabinet into the field. This makes installation more transparent, user-friendly and cost-efficient. With our product innovations, you will be able to improve the competitiveness of your machines and systems bringing you closer to the design principles of Industry 4.0.

In this edition of Impulse, we are showing off our new plug & play solutions for integrating IO-Link sensors and valves, as well as trailblazing features like the preventive diagnostics of our Em-parro power supply. Both developments are excellent examples of Murrelektronik’s innovative strength. Customer loyalty is the cornerstone for growth. As a result, we are pleased to report on the expansion of our plant in Stod (Czech Republic) and the opening of our new cordset production facility in Atlanta (USA).



Stay connected!

Ihr Markus Schybol
Chief Executive Officer



SMART AUTOMATION by Murrelektronik

The strong networking of machines and systems and the required transparency along the complete product lifetime are interesting challenges for the future. The “thinking factory” is a model with a great outlook. We are going this way with our customers and we offer products and solutions for pioneering installation concepts with the motto: “Smart Automation by Murrelektronik”.

With cutting-edge components, innovative functions and efficient interfaces, we contribute to modularization and flexibility of production. When doing so, we keep our focus on our customers’ interests... safe and easy installation, eliminating downtime, consistent solutions from the control to the last meter in the field...



MURRELEKTRONIK REVOLUTIONIZES IO-LINK

IODD ON BOARD

Now you can set up machines and systems with IO-Link devices even faster. Murrelektronik is the first manufacturer to offer “IODD on board” which allows you to “Plug & Play” when integrating IO-Link devices.

An IODD (IO Device Description) file describes sensors and valves. It contains information about the device’s identity, parameters, process data, diagnosis data, communication properties and other details.

Murrelektronik’s new MVK Metal and Impact67 fieldbus modules have IODD files (for participating manufacturers IO-Link devices) integrated into the GSD file. If those devices – like IO-Link sensors or valve clusters – are included in an installation, this database is available and can be quickly integrated. Prior to this each new IO-Link master had to be individually integrated into the software taking up valuable time. If a large number of identical sensors had to be connected, the process had to be repeated for each new device on the network. This was a time consuming and error-prone process.

Now, with “IODD on board”, the IO-Link master is configured by the control – and the setup is complete. Just “Plug & Play” and the job is done.

Another interesting feature of these new modules is the option to integrate IO-Link devices by asynchronous access. This option is also available on the new Cube67 IO-Link master module.

All of Murrelektronik’s new IO-Link modules correspond to IO-Link specification 1.1. and are equipped with IO-Link Class A and B ports.

ABOUT IO-LINK

IO-Link is a communication system that was established in 2006 to quickly and cost effectively integrate intelligent devices with a standardized connection into installations. IO-Link converts analog data to digital data directly in the sensor. This enables transfer with cost effective, standard, unshielded cables. When identical IO Link sensors are replaced, no reparameterization of the sensors is required.

FIELDBUS MODULES WITH IRT FUNCTION

PRIORITIZED DATA TRANSFER

16 Murrelektronik MVK Metal and Impact67 fieldbus modules with IRT (“Isochronous Real Time”) function offer even more applications for PROFINET installations.

IRT function modules process time-critical data packages with priority (“fast forwarding”). This ensures that corresponding operations in a production line – like the operation of synchronous motors – take place exactly at a predefined time. These fieldbus modules enable PROFINET Conformance Class C installations that meet

PROFINET V 2.2 or 2.3 specifications. With the implementation of IRT it’s possible to reach update times of 250µs and a jitter accuracy (time offset) of less than 1µs.

The only real difference in the two types of modules is their suitability for different types of installations. MVK Metal fieldbus modules with IRT function are designed for applications in harsh industrial environments while the Impact67 modules are an efficient option for less demanding applications.

NEW PRODUCTION HALL IN STOD

Murrelektronik is growing rapidly. As a result, it has become necessary to expand our production facilities in Stod, Czech Republic. The cornerstone for a sixth hall was laid and the new building, to be completed by May 2016, will provide additional room for cordset production and will also become the new home for sales operations, including a showroom, and training for the Czech Republic.

In our existing production facility, we have the ability to produce almost every product in our line up: from small, slim cordsets to intelligent circuit breakers to transformers. The new production space will allow us to increase our flexibility making us able to respond to customer needs even faster. This new building is the third expansion of Murrelektronik Stod within five years.

FIGURES & FACTS Currently, 570 people work at Murrelektronik Stod. The new production hall will create about 250 new jobs. The new 4,200 m² hall has 3,100 m² of production space. Its completion will bring the amount of dedicated production space in Stod up to 13,900 m².



Hammers in hand to symbolize laying the cornerstone, from left: Stefan Grotzke (COO), Dieter Scherz (Board Member), Markus Schyball (CEO), Franz Hafner (Founder), Caroline Hafner-Pinnel (Chairwoman of the Board), Václav Štekl (Regional Government Officer), Jiří Vlk (Mayor of Stod), Pavel Vlček (New Plant Manager), Helmut Feulner (Retiring Plant Manager), Daniel Züllig (Board Member) and Stefan Krämer (Vice President Finance and Administration).

MICO: NOW WITH NEC CLASS 2 APPROVAL



Murrelektronik's MICO is a proven solution for intelligent power distribution and efficient protection of load circuits in UL508A cabinets. Eight MICO models are now available with NEC Class 2 approval making it possible to design efficient NEC Class 2 circuits.

Class 2 circuits are those with limited energy and maximum power of 100 VA. According to the UL definition, there is neither the risk of electrical fires nor electric shock due to the limited energy in these circuits. Therefore, according to UL508A, the cabinet components used in a Class 2 circuit don't require UL approval.

Up to now, an individual NEC Class 2 approved power supply was used for every circuit of this kind. This resulted in high costs, required a lot of cabinet space and considerable wiring effort. With Murrelektronik's NEC Class 2 approved MICOs, you can design NEC Class 2 circuits even faster, in a more compact and cost effective

way. All you need is a standard power supply (that doesn't necessarily have to be NEC Class 2 approved) combined with a MICO to easily create two, four or eight separate load circuits with limited energy. By connecting several MICO modules with their integrated bridging system, the number of channels can be increased up to a total current of 40 A. Now the following cabinet components in these NEC Class 2 circuits don't require UL approval. This prevents a lot of paperwork.

Channel-specific switch off, visual warning notice, error memory

MICO offers additional benefits for circuit design with its proven functions including: channel-specific switch off in the event of overload, a visual warning notice, saving of error messages and cascading start of current paths – making it possible to use a smaller power supply.

CLOSER TO THE CUSTOMERS IN AMERICA

Murrelektronik opened their first manufacturing facility in the United States. M8 and M12 cordsets are now being made just outside of Atlanta. This increases the size of Murrelektronik's production facilities to just over 30,000 m² worldwide.

During the grand opening, Caroline Hafner-Pinnel, Chairwoman of the Board, symbolically cut the green ribbon. She was accompanied by Markus Schyball (CEO) and Stefan Grotzke (COO), managing directors of Murrelektronik GmbH, as well as Markus Keller, President of Murrelektronik Inc. and Nick Masino, Sr. Vice President of Partnership Gwinnett.

With this new production facility in the U.S.A., Murrelektronik is now able to bring key products closer our customers in the U.S., Canada and Mexico. Cordsets can now be delivered in a much shorter time frame. With the opening of this new facility, Murrelektronik has completed their global production network and prepared the company for future growth.

During the grand opening, over 100 people including customers and distributors toured the production facility to see how Murrelektronik produces M12 and M8 cordsets. The new production lines are identical to the established production facilities in Europe and in Asia, ensuring the same consistent, high quality products no matter where they are manufactured.



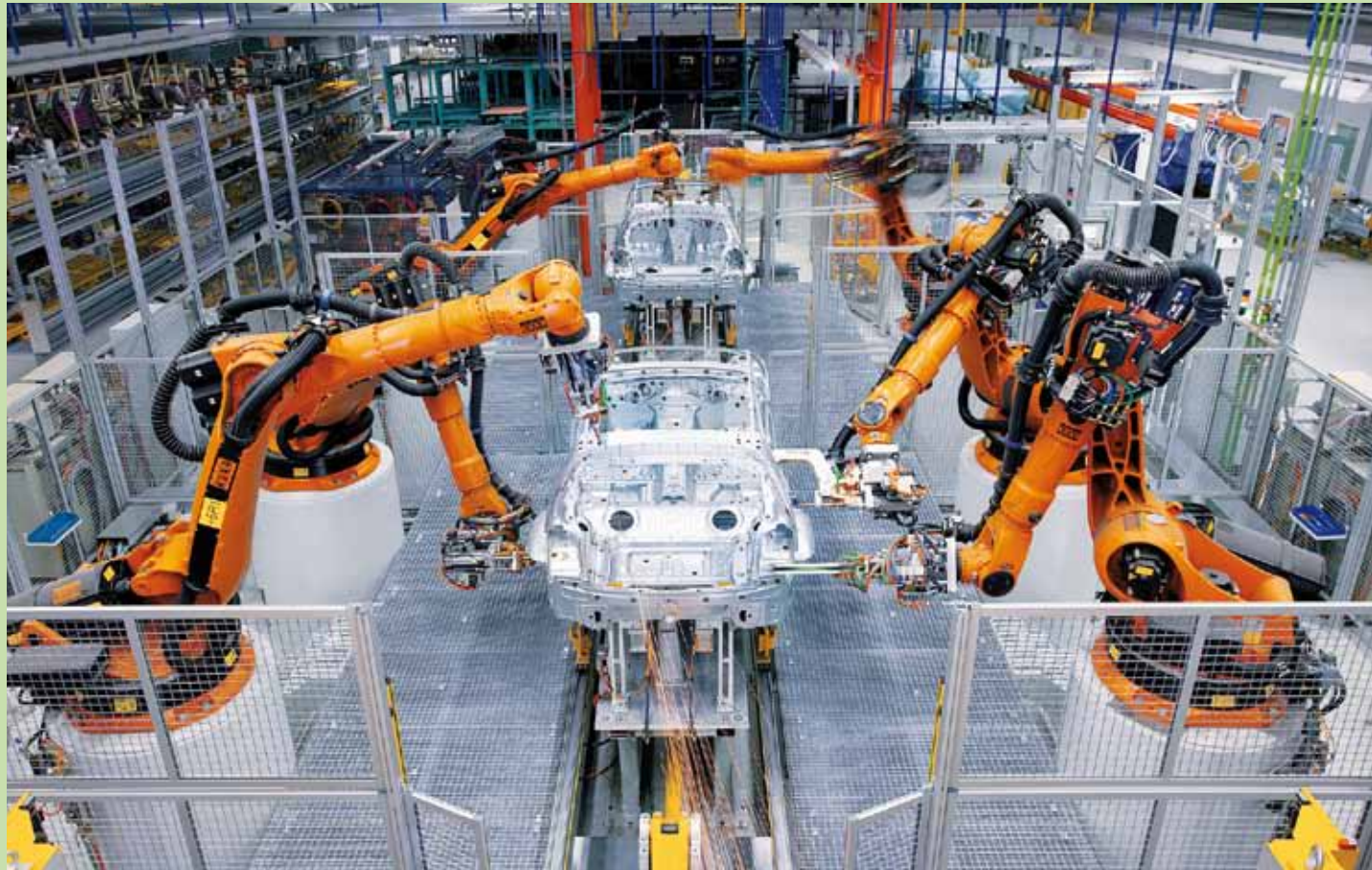
By Gianluca Torrielli, Segment Manager Automotive,
Murrelektronik Italy

READY IN THE SHORTEST TIME POSSIBLE

Murrelektronik's MVK Metal fieldbus modules allow KUKA to achieve the shortest possible tool changing times with their robots for body shop applications.

KUKA Robotics is one of the leading manufacturers of industrial robots worldwide. The company offers a unique product range covering almost all common payload categories and robot types. Their innovative robotic solutions are installed in a wide range of industries.

In the automotive industry, robots contribute to both optimization and flexibility within production. Several robots work together to increase accuracy or to transport heavy parts with short interval times. In these fully automated body shops the equipment has



CONSISTENT DECENTRALIZATION

TRANSNOVA RUF USES MURRELEKTRONIK'S CUBE67 FIELDBUS SYSTEM
FOR EFFICIENT WIRING IN COMPLEX PACKAGING MACHINES



The fieldbus modules are installed close to the process so sensors and valves can be connected with shorter cables.

Transnova Ruf's state-of-the-art packaging systems use a large number of sensors and valves to ensure smooth, fully automated operation. Because the machines are so large, their electrical installation requires a "lean" solution. By using Murrelektronik's Cube67 fieldbus system, they are able to achieve their goals and benefit from the modular nature of the system.

Transnova Ruf Verpackungs- und Palettiertechnik GmbH in Southern Germany is a successful packaging machinery company. About 250 employees design and produce turnkey machines and systems for secondary and end of line packaging. These systems pack products for shipping and distribution: single units are put into a box; or prepared in shelf-ready packaging then the boxes are stacked on pallets. This requires a multi-stage packaging process; therefore the engineers have

to design and implement comprehensive and efficient systems that are able to link a series of consecutive processes. Since the mid-1990s, Transnova Ruf has been using robots in many applications making the automation level very high.

Transnova Ruf doesn't produce "ready-made" machines for their customers. The company uses a modular approach where the individual functions are split into modules that can be assembled, as needed depending on the application. "This gives us room for a wide variety of solutions", explains Michael Ruf, TR executive board member. It also enables Transnova Ruf to meet the complex needs of their customers. This approach also has another important advantage – it makes it possible to develop a winning solution even under less than ideal conditions like installing a packaging machine in a small hall with many corners.

Transnova Ruf produces not only small and compact systems, like "Case Packers" in their production halls they also manufacture large, comprehensive systems with dimensions of up to 70 or 80 meters. A machine of this size has to be very modular not only for installation but also for transportation since that usually requires several trucks. As a result, decentralization principles are given priority when it comes to the electrical installation of the systems, already in the early planning stages. "We want to keep the installation lean. We don't want to have to route cables 50 or 100m into the cabinet", says Hermann Schindler, who is responsible for the hardware planning. As a result, Transnova Ruf moved the frequency converters, which are quite numerous in a packaging system, from the cabinet into the field.

Transnova Ruf is currently working on the logistics for a new production plant for a Swiss pharmaceutical company. Medical products are packed in small boxes that are then conveyed on any one of 10 production lines via supply routes to make a round trip. Two robots place the packages on pallets that are then carted with a linear carriage. At the end of the process, the finished pallets are transported to the high rack warehouse. The system operates by itself, "once every four hours it's necessary for a worker to replenish the film at the wrapping unit", explains Hermann Schindler.



to be changed several hundred times a day. This requires flexible automation systems, so that the time for tool changing and restarting the production can be reduced to a minimum.

The latest generation of KUKA robots are installed in the welding stations of big automotive manufacturers where doors, hoods or vehicle bodies are produced. KUKA's electronic specialists in Italy use Murrelektronik's rugged MVK Metal fieldbus modules in the robots' tool changers to meet the requirements of an efficient automation solution.

These components use the PROFINET protocol and support a fast startup function, meaning the time from connecting the voltage to data exchange is less than 500 ms. The parameters that have to be transferred are predefined so that the amount of data transferred at the moment of startup can be kept low. Only the most important data is transferred to the control. Additionally, the modules actively signal the control when they are available for communication, without waiting for the cyclic request further accelerating the process.

KUKA uses MVK Metal modules with push pull terminals because they are easily assembled without tools, which shortens the installation time. Pre-wired and tested connectors eliminate wiring errors while the internal contacts are protected from external influences. MVK Metal modules have a die-cast zinc housing with protective coating that makes them resistant to welding sparks and oils and lubricants. Furthermore, they are very resistant to shock and vibration.

MVK Metal's single channel diagnostic is another important feature for KUKA's engineers. LEDs indicate the modules' connection and supply state. In the event of an error, only the affected channels are shut off keeping some operations running while reducing downtime.



Efficient circuit protection with MICO

A large number of sensors and valves are integrated into this system. The data matrix codes printed on the primary packaging help to bring the boxes into the system at the right time and transport them to the right packaging station.

Transnova Ruf uses Murrelektronik's Cube67 fieldbus system as the backbone of the system's electrical installation. Since the fieldbus modules are connected with pluggable cables, Transnova Ruf's engineers along with Mr. Schindler were able to put together a very flexible solution that can be quickly assembled and disassembled as needed. Furthermore, the system is easily expandable. It does not require a lot of modifications from the electro-technical point of view. Often another Cube67 module can be integrated simply by connecting it to nearby module with a Murrelektronik hybrid (data and power) cable. The double-ended hybrid cables also lower the risk of wiring errors.

15 Cube67 ProfiNet bus nodes are installed in this system. The modules collect information from the

sensors (mainly light curtains that detect the position of the product) and transfer the signals to the valves. The fieldbus system is responsible for about 70 drives in this installation. These SEW motors, located at various positions along the conveyor line, are equipped with integrated frequency converters. "This solution doesn't require any switch boxes and terminal boxes in the field, where the space is already confined", says Hermann Schindler. Using Murrelektronik's Movimot function module, Transnova Ruf connects a component for the Cube67 system that makes these motors easy to connect.

Because each port on a Cube67 module can handle two signals, Transnova Ruf's engineers use T-couplers to split the signals in some applications. In these cases the T-couplers connect M8 cables. To connect the data transfer unit that sends information from the palletizing unit to the high rack warehouse, Transnova Ruf's engineers use a Cube67 valve module with 16 contacts for the exchange of digital signals.

By implementing Cube67, Transnova Ruf achieves a practical and versatile installation concept. It fits into the new packaging system and, due to its modular design, it is a practical solution that offers the potential for future expansions.

CUBE67

REDUCED SETUP TIME



Fluid Brasil, a subsidiary of the MANN+HUMMEL group, uses Murrelektronik's Cube67 fieldbus system in their drinking water filtration and wastewater treatment systems on disposal sites. These systems consist of several parts including tanks, a filter unit and a reverse osmosis component. The elements are transported separately to the installation site where Fluid Brasil's partner companies assemble them into working systems. Here, Cube67's ease of installation is great benefit for all involved. By connecting a few cables, the operators have the system up and running, saving time – the average setup time of these large systems is reduced from about two months to approximately three weeks – and labor. Additionally to Murrelektronik's Cube67 fieldbus solution, Fluid Brasil uses the Cube20 fieldbus station in their cabinets. To protect the load circuits in the systems, the company installed MICO module from Murrelektronik.





MVP12 STEEL

100% CLEAN

Because machines and installation components used in the F&B industry have to be easy to clean Murrelektronik's new MVP12 Steel distribution box is made of high-quality stainless steel. It is a key component in the implementation of a decentralized installation concept in both F&B machines and installations.

The MVP12 Steel distribution box features a closed stainless steel housing and V4A screw thread bolts to ensure permanent

protection with an IP69K rating. No matter where it is used – precleaning, cleaning, rinsing or disinfection – MVP12 Steel will always operate reliably.

One Homerun Cable Replaces Eight Single Cables

Up to this point, individual cables had to be routed in food and beverage installations. Routing cables while also meeting hygienic requirements required a lot of space, time and material. MVP12 Steel changes all of that. Now one homerun cable replaces eight single wires to considerably reduce your wiring effort. Valves and sensors can be connected close to the process with very short cables – no terminal boxes are required! This is an important step in the move towards decentralized installations.

A STRONG TEAM!

To go along with the MVP12 Steel distribution boxes, Murrelektronik offers M12 Steel connectors that are also fully potted and made of corrosion resistant stainless steel. Together, the distribution box and cordset form a closed and rugged unit for F&B applications.

Please exchange
at the earliest
opportunity



EMPARRO® 3~

JUST IN TIME!

PREMIUM POWER WITH PREVENTIVE DIAGNOSTICS

Murrelektronik's Emparro 3-phase power supplies allow you to create a power management system to match your needs. They are remarkably reliable and extraordinarily efficient. The newest addition to the Emparro 3~ family is a 40A model that also has a preventative diagnostic function.

This function notifies the user when the time has come to replace the power supply. The notification is given just in time: not too early to ensure a long operating time, but not too late, avoiding lengthy troubleshooting time and cost-intensive failures.

When the signal is given, no immediate action is required. Replacement can take place during the machine's next regularly scheduled maintenance. This puts the focus on action rather than reaction.

Monitoring for Results

The preventive diagnostic function is made possible because the unit monitors several different parameters including inner temperature, operational load, the number of start-ups and the components' life. When the optimum time to replace Emparro 3~ 40A is

reached, this information is forwarded to the control via an easy-to-integrate alarm contact.

EMPARRO 3~ AT A GLANCE

Emparro 3~ power supplies are available in 5, 10, 20 and now, 40A models. Integrated reserve power makes it possible to use Emparro 3~ with ambient temperatures of up to 45°C with 20% overload. Hence the 40A becomes 48A. This reserve power can be used for system expansions. Emparro 3~ is very compact and offers additional boost functions for starting high loads. It comes with push in terminals that make installation quick and easy. Emparro 3~ is the only 40A power supply on the market with these maintenance-free terminals.

"The preventive diagnostic function is unique and real highlight. Emparro 3~ 40A is an important tool for knowing when schedule service work and keeping downtime to a minimum".

Manuel Senk
Product Manager

MOTORS – WE MAKE THEM EASY TO CONNECT



M12 Power

Its very compact design makes the M12 Power connector ideal for linear drives, brushless DC or step motors. It has a capacity of up to 2×16 A at max. 63 V AC/DC (I-coded) or up to 2×12 A at max. 630 V AC/DC (K-coded). The Murrelektronik product range is comprised of single ended cordsets, connection cables, receptacles and adapters which, when combined, offer a vast number of installation options.

MQ15 X

The MQ15-X is designed for quick connections with reverse polarity protection for asynchronous motors up to 7.5 kW. The connector offers three power contacts up to 16 A, PE and two auxiliary contacts up to 10 A. The quick connection technology ensures sealed connections in no time. The molded plugs make sure the connector is sealed, tamper-proof and prevents wiring errors. Receptacles with an M20 outer thread complement the product range. These connectors are simply attached to terminal boxes with a screw connection.

M23-Drives

With the M23-Drives line up, Murrelektronik offers the most powerful 8-pole M23 connector on the market (with a reference ambient temperature of 40°C). With 28 A/630 V per pin for the power contacts and 8 A/300 V for the signal contacts, the connectors are suitable for high performance drives and AC/DC servo-motors. A complete 360° shielding ensures very low interference emission. The M23 also features a high-quality locking mechanism that ensures permanently sealed connections with the hex thread and the suitable torque wrench. While the coding arrow on the housing helps make installation easy. A conduit retainer, high-quality, original Siemens cables and excellent seal (even when exposed to oil) in industrial applications are just a few of the important features of Murrelektronik's M23 Drives cables.

Murrelektronik's new M12 Power, MQ15-X and M23 power connectors make motors easy to connect. The M12 Power is the most compact and powerful 5-pole M12 connector on the market while the MQ15-X takes advantage of the new M15 power standard connection technology to make assembly extremely quick. Last, but not least, the M23 connectors are an established, standard solution for connecting servo-motors.

Perfect contacts, a good seal and environmental resistance are basic requirements for all connector types. Motor connections require additional special features including wide connector cross sections, high performance in a very compact design and, most important, an integrated anti-vibration locking mechanism to make sure the connector stays tight even when exposed to very strong vibrations. Murrelektronik offers power cables to meet these requirements.

EMERGENCY STOP AND RESET BUTTON WITH M12 PORT

ADD SAFETY MEASURES QUICKLY AND ERROR FREE

Murrelektronik's new emergency stop and reset buttons come with standard M12 ports so they can be integrated into installations with standard M12 cables. This is a timesaving solution that eliminates the risk of wiring errors. This port makes the control devices a "Plug & Play" safety solution for a wide variety of machines and systems.

The devices are suitable for a wide range of applications – from those with basic functions all the way up to sophisticated,

high-end ones. Installations with control devices, like safety fences, or workstations in decentralized locations have the most demand for these buttons.

The standard models are very compact (40 mm wide) which makes them suitable for connections to standard aluminum profiles. The wider (72 mm) emergency stop buttons are available with a light ring as well as a protective collar to prevent accidental triggering.

Quick assembly in three steps



PROFISAFE WORKSHOP AT THE TRAINING CENTER

MEETING OF THE MINDS – HOSTED BY MURRELEKTRONIK



YouTube: Impressionen

Over 120 PROFISafe experts from around the world came together for a workshop at Murrelektronik's training center in Oppenweiler. It was the first time these manufacturers and users have met here to share knowledge and exchange ideas. Jörg Krautter, Murrelektronik's member of the executive board for automation and PI (PROFIBUS & PROFINET International Organization) board member, was pleased with the success of the event. He said: "The focus of the meeting was on cooperation, between not only different manufacturers devices but also customers and suppliers." A live safety demonstration was one of the highlights of the workshop while a discussion about "Safety vs. Security" examined many new solutions to old problems. At the Mini-Fair, held in conjunction with the meeting, manufacturers had the opportunity to show off their products and solutions to the attendees.

DIRECTLY CONNECTED TO THE CUSTOMERS

As a global company, Murrelektronik is aware of how important it is to be available for, and accessible to, our customers. The customer care control center for the German West region is located in Netphen, North Rhine-Westphalia. From this location our administrative, technical and inside sales employees provide support for their outside sales representatives. Now, they are providing this support from a new, larger facility that has streamlined work processes and improved interdepartmental communication – while always staying focused on customer needs. Murrelektronik Netphen is looking forward to using their new training center and showroom to keep customers informed of the latest developments in automation technology.



EDUCATING THE FUTURE AT MURRELEKTRONIK

Murrelektronik takes education seriously. The "Best Place to Learn" award the company has won is a proof of its excellent quality. This autumn, new trainees will be trained at Murrelektronik as industrial clerks, skilled warehouse employees, electrical engineers and industrial electricians. Furthermore, new bachelor students from the German university Duale Hochschule also started their dual training program.

Markus Schyboll, CEO, emphasized in his welcome address for the new employees at the company's headquarters in Oppenweiler that an apprenticeship at a company provides a solid base for a successful professional career. The practical experience that young professionals gather from a work/study program is a valuable asset for the company.

Currently, Murrelektronik is training a total of about 40 young professionals in eleven different jobs and university courses.

		8	4	6				
	2			7				
4			2				8	1
			1	3	7			
		1	8			4		
			9				2	7
	8						9	
	4			2		5		
		5					7	

EPISODE 27

MURRPHY



SUDOKU FUN WITH MURRPHY

Solving a Sudoku puzzle is not easy. Figure out the first couple of numbers and then watch the rest fall into place.

I hope you enjoy the puzzle!

Murrphy

Solution:

4	2	8	6	9	5	1	3	7
8	1	5	3	7	2	6	4	9
9	6	3	4	1	5	2	8	7
2	7	1	9	4	6	3	5	8
3	9	4	2	5	8	1	7	6
6	5	8	7	3	1	4	9	2
1	8	9	5	6	7	2	3	4
5	4	6	8	7	3	9	2	1
7	3	1	2	9	4	8	6	5

