GUEST ARTICLE: PROF. DR. ALBRECHT M. OEHLER
IT cabling: Quo vadis?

INTERVIEW WITH THE EC, EL & ICPN DIVISIONS
The future of the connector: smaller, smarter, and more versatile

FEATURE STORY: A. HUHMANN
Connected Industry

Interface Future
Connectivity for Industry 4.0
The new cyber reality

In industry, the real world and virtual world are bridged with the help of Cyber-Physical Systems. Real production processes are simulated and controlled by computer-generated representations. Industry 4.0 is going one step further – towards the genuine integration of both worlds.

Dear customers and business partners,

At first glance, connectors and the cyber world seem to belong to opposing, even incompatible universes. Of course, everyone is accustomed to seeing connectors with computers. Still, connectors pale all too quickly in comparison to the perfect simulation the virtual universe offers. Today, the world of the computer is first and foremost defined by this virtual reality – and not by its hardware.

Nevertheless – in both private life and industry – the cyber world and real world are closely allied. We live in two worlds that are increasingly melding into one.

The cyber world and real world are also uniting in the industrial sector. We call the devices that serve as interfaces for this interlinkage “Cyber-Physical Systems“, and the changes they are triggering are advancing the fourth industrial revolution - Industry 4.0.

The integration and connection of physical reality with the cyber world is our topic of interest, both within HARTING Technology Group and this issue of tec.News. We’re taking you on a journey with us through the world of technical connections. We are highlighting strategies, solutions and applications to show you the importance that connector solutions assume in this context, and the associated roles that both cybernetic and physical properties have to play.

With our current edition of tec.News we would like to invite you to take a glimpse into the future of connectors!

Yours sincerely,

Philip Harting, Senior Vice President Connectivity & Networks
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The future of the connector: smaller, smarter, and more versatile

Higher performance for Industry 4.0

» Interview with:
Andre Beneke, Dimitrios Charisiadis, Hartmuth Schmidt, Kilian Schmale
Networked systems in the meaning of cyber-physical systems are advancing dynamically. Consequently, it’s no surprise that the scope of duties performed by connectors is also changing. By way of example, specialized connectors must not only transmit electricity reliably and without error, they must also relay data and information in real time. Given the ongoing pursuit of flexible production that is capable of self-configuration and optimization within the context of Industry 4.0, the industrial connectors of the future will also witness changes in their tasks and designs. HARTING has risen to these challenges from the very beginning. tec.News spoke to Andre Beneke, Director Product & Industry Segment Management at HARTING Electric, Dimitrios Charisiadis, Director Industrial Communication and Power Networks, and Hartmuth Schmidt, Director Global Product Management, and Kilian Schmale, Industry Segment Manager, both of HARTING Electronics.

The decentralization and modularization of production systems is at the heart of the concept of Industry 4.0. How is HARTING meeting this fundamental challenge?

Andre Beneke: In my opinion, the need for industrial-grade connection technology will rise as a result of decentralization. First, the robustness of the components used in the respective manufacturing environment must be ensured and must meet the appropriate levels of protection. Second, the need to alter the communication situation within a plant will have a direct impact on e.g. the number of required mating cycles. Connectors cease to be purely an installation-related feature and increasingly become multi-use components that must be repeatedly plugged in, disconnected and locked on a daily basis. HARTING’s connector portfolio attends to this need and already offers a range of inserts and housings permitting up to 10,000 mating cycles.

Dimitrios Charisiadis: For quite some time now, sub-functions have been migrating to the field level and away from centrally organized control in the switch cabinet. This requires decentralized control systems that operate without a centrally located hub. Up to now, in the case of data exchange intelligent connectors and switches were used to construct the corresponding topologies. In the future, however, all lifelines – data, signals and power – will come into play. In our smart Power Networks solutions we show how we’ve gone beyond pure communication and integrated power management into the switch.

If you think logically about Industry 4.0, it’s all about turning passive components – objects that until now have functioned purely in mechanical manner – into intelligent ones. What impact does this have on connectors?

Andre Beneke: In the future, components like the Han® connector will be equipped with RFID technology or directly save data themselves, for example like our ID modules, or they’ll be equipped with the appropriate sensors. This will turn them directly into Smart Objects.

Dimitrios Charisiadis: This is why we’ve integrated measurement systems into the individual modules that perform diagnoses of the transmission paths and monitor individual modules. For example, using the appropriate sensors allows you to monitor the moisture level within the connector or monitor the temperature and currents, which significantly improves safety.

Kilian Schmale: Devices are becoming smaller, smarter and more modular. Modularization simultaneously makes it possible to have different network configurations on a platform, which of course once again gets back to the special challenge for connection technology. Cyber-Physical Systems will be characterized by communication interfaces everywhere. In response to one customer’s wish for miniaturization, we’re currently working on an interface that we’ve equipped with RJ45 jacks with integrated electronics. This lets the device designer get by with smaller PCB sizes.

Ethernet is considered the communication system of the future, and with increasing data rates will continue to grow in importance. What are the
If you think logically about Industry 4.0, passive components also have to become intelligent.

Andre Beneke

challenges facing HARTING in terms of inter-component communication?

Andre Beneke: We have a broad portfolio of corresponding Ethernet interfaces that are based on RJ45 and M12 solutions. Our solutions are robust, industry-compatible and equipped with industrial cables. There’s also a pressing need to increasingly simplify the installation effort due to the very different training levels of installers in different parts of the world. Consequently, the goal is fully assembled units as well as simple and easy to perform on-site assemblies. This not only applies to data interfaces, but also to components used in signal and power transmission.

Against this background, HARTING is the first rectangular connector manufacturer offering the corresponding system cables and components with UL 2237 certification, which is required for power transmission in the machine engineering field under the UL rules. An example of a simple assembly is the Han-Eco®, in which the inserts are not screwed in any longer but are only clicked in. This saves time and provides additional safety.

Hartmuth Schmidt: To ensure optimized error-free transmission in real time between devices, besides the connector you need a pre-assembled cable capable of maximum performance. In addition to selected copper cables with certified screen characteristics, we’re increasingly using optical transmission technology, which is less sensitive to interference and is best suited for longer transmission distances and higher data transfer rates.

Dimitrios Charisiadis: The high flexibility of fiber optics goes hand in hand with the needs of Industry 4.0. We also perform uninterrupted diagnoses in this area that permit us to detect any installation errors or material fatigue.

Hartmuth Schmidt: At the same time, we’ve set ourselves the goal of offering a perfectly pre-assembled cabling solution for any application. The “Press & Go” brand offers connection technology that uses a press-on cap instead of a screw cap, but still offers all the benefits of
In the future, connectors will be Smart Objects.

Dimitrios Charisiadis

Our previously mentioned smart Power Network Units likewise come into play, with which we can map the communication and diagnostic functions to the power supply as well. HARTING is on the way to the intelligent connector in which we integrate electronics.

**What steps is HARTING continuing to take in the classical tradition? What are the challenges in terms of automation technology that employs profile-specific cabling systems?**

Hartmut Schmidt: We offer our customers every opportunity to perform simple and secure assemblies. On the one hand via quick, tool-less field assembly based on our radial HARAX® insulation displacement technology and, on the other, with cost-effective, lean pre-assembly using preLink®, which offers a host of benefits and planning security for the future.

Kilian Schmale: preLink® can be viewed as a building block for the pre-assembly of four or eight-wire data cables whose contacts can be installed in different connection elements, e.g. RJ45 or M12. The small preLink® building block means you only need a very small pre-assembled size to permit entry into tight cable channels.

Andre Beneke: Profile-specific cabling systems can also be deployed in an appropriately combined modular interface for Industry 4.0. For example, our Han-Modular® connector can also transmit PROFINET, among others in conjunction with preLink®.
In the face of strong competition from wireless solutions, where is cabling headed? The answer:
towards higher data rates and higher capacities for remote power supply.

Standards have been in place for application-independent IT premises cabling since 1995. The terms “Cat. 5”
and “RJ45” have become commonplace. These categories represent transmission characteristics and backward compatibility. The higher the category, the more bandwidth available. The commonly used abbreviation “RJ45” stands for a mating face that has been accepted worldwide as the dominant data mating face in the workplace. The official designation is EN 60603-7, behind which lies a family of standards for connectors in categories 5 to 7A. Both designations, i.e. the categories and the uniform mating face, hail from international standard ISO/IEC 11801, “Customer Premises Cabling”, which has its German counterpart in DIN EN 50173.

“Competition” to IT cabling is in the air: Wireless and radio links are offering ever increasing bandwidth. Therefore the question: Cabling - Quo vadis? Where are things headed?

The answer: cabling is progressing towards even higher data rates and increased capacities for remote power supply! Compared to wireless, cable-bound transmission offers unbeatable advantages. On the one hand, each end-user has exclusive access to the bandwidth. On the other, electrical power can be transmitted to the end devices in parallel to the transmission of information.

BANDWIDTH

Besides telephony, Ethernet represents another common data-transmission application that uses twisted pairs, and boasts data rates up to 10 Gbit/s. The relevant IEEE 802.3 committee is currently working on 40 Gbit/s.

40 Gbit/s transmission will still not be “the end of the line”. As part of a project sponsored by the Federal Republic of Germany, HARTING and LEONI have teamed with Reutlingen University on research into 100 Gbit/s over twisted pair cables. Higher data rates require greater transmission bandwidth and consequently higher peak frequencies. For Cat. 7A this is 1 GHz, and is expected to be 1.6 GHz for Cat. 8.

The new categories will be incorporated...
into the new edition of ISO/IEC 11801, which we expect in 2016/2017.

REMOTE POWER SUPPLY
By way of example, the “competitor” referred to as wireless transmission is employed in WiFi applications. WiFi is attractive because it offers end devices flexibility and mobility. WiFi requires access points. These in turn require data interfaces and a power supply – both of which can be provided by IT cabling if it also supplies remote power in parallel with data transmission. At present, IEEE 802.3 offers components that can receive 300 mA of power per wire via remote supply. This is transferred either via unneeded pairs or by way of the so-called phantom circuit. IEEE 802.3bt and the working group ISO/IEC JTC 1 SC 25/WG 3 are currently

40 Gbit/s transmission will still not be 'the end of the line'.

Growth in transmission performance for Ethernet

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working on boosting the capacity of remote power. The goal is to be able to supply an end device with 49W (!) of remote power via the data cable, with 500 mA per wire.

**AND FINALLY, THE QUESTION:**

**ONE, TWO OR FOUR PAIRS?**

The analog phone requires one pair to transmit the send and receive signal. This transmission occurs in so-called full-duplex mode, i.e. simultaneously in both directions.

In digital transmission over symmetrical twisted pairs, the transmit and receive directions were initially transmitted separately via their own pair. This is e.g. the case with ISDN and 10 Mbit/s and 100 Mbit/s Ethernet. In these cases, two pairs are sufficient for transmission.

Ethernet with Gbit/s transmission rates, i.e. 1000 BASE-T and 10 GBASE-T, employs parallel transmission over four pairs. Thus the cabling requires four pairs for the connection to an end device.

Most recently, a new area of application requires a reduction in the number of pairs. Plans call for 1 Gbit/s transmission in automobiles over a single pair (!), in order to achieve space and weight savings.

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**IN BRIEF**

- Electrical power is to be transmitted to end devices in parallel with the transmission of data.
- The relevant IEEE 802.3 committee is currently working on 40 Gbit/s.
- Higher data rates require greater transmission bandwidths and therefore higher peak frequencies.
Industry 4.0’s use of Cyber-Physical Systems has radically altered the face of industrial production. Still, Industry 4.0 will only become a reality when the cyber world and physical world are connected. This is as much a mission as it is a vision.

» Andreas Huhmann, Strategy Consultant Connectivity + Networks, HARTING Technology Group, Andreas.Huhmann@HARTING.com
Until today, industrial facilities have largely followed a simple concept, a concept that is all about automation tasks that are performed by automation devices. These devices need to be connected to a central controller. That’s it – nothing more is necessary for this undoubtedly extremely powerful concept.

The network is merely the vehicle for the industrial Ethernet fieldbus, or – stated in even more trivial terms – just the connecting line. From the perspective of automation, this is completely understandable and sufficient.

Industry 4.0, however, entails new demands on network technology, and by extension on connection technology – production in Industry 4.0 needs to be more effective, more flexible and more powerful. Control functions shift from a central controller over to the system itself. This entails a radical conceptual change in the structure of production facilities: a strictly hierarchical system gives way to a decentralized one. Plans and systems are constructed in modular form, while control tasks are relocated in the system itself. The network becomes the crucial component.

WHAT DOES INDUSTRY 4.0 MEAN FOR THE FIELD LEVEL?

For something that admittedly sounds so simple and logical, the implementation is dependent on a number of conditions, among which the integration of Cyber-Physical Systems (CPS) with the material world of production holds center stage.

Industry 4.0 is characterized by the integration of CPS (Cyber-Physical Systems) into IT applications. This integration
should be as flexible as possible, meaning that the rigid arrangement employed in conventional production is broken up. This results in two areas that need to be melded.

The initial implementations (e.g. the smartfactory®x, see tec.News 26) revealed that the crucial interface lies between the autonomous system modules. These may be of conventional design, i.e. with central controller and decentralized I/O, however they can also be constructed from CPS. In any case, what distinguishes them is that the modules perform a completely self-contained service on the real object in the production process. The set-up of the modules can still be performed conventionally without compromising the advantages of Industry 4.0.

Modules at a production facility need to be able to be integrated into the production process at different locations in an extremely easy fashion – and above all quickly. And different modules must be able to be deployed at these sites. These two key requirements mean that cabling takes on a different character. Deployment at varying locations becomes basic set-up, while its use with various modules means it constitutes a basic service. Cabling is transformed into an infrastructure.

Smart Factory infrastructure is currently in the definition phase.

WHAT WILL INFRASTRUCTURE LOOK LIKE IN INDUSTRY 4.0 MANUFACTURING?
Smart Factory infrastructure is currently in the definition phase. Ethernet will be used both for IT as well as automation. In addition, office buildings will employ application-neutral cabling according to ISO/IEC 11801, the standard provides specifications for setting up passive network infrastructure.

If one applies this view to a production plant, this will entail integrating different modules into the network. In addition, all the lifelines that supply industry need to be considered, i.e. communications, 400 Volt power, compressed air, auxiliary power and other signals. Consequently, the required connections are numerous, which means that simple plug-and-produce will only become possible when the connections are integrated in one interface, i.e. in one connector. Thanks to its modular construction, Han-Modular® can make all lifelines available. The standardization of the module interface means that a decisive step has already been taken. Still, infrastructure development requires more than just this. In the case of industrial production, the module interface must be capable of offering a wide variety of functions in order to ensure simple and – above all – more secure operation. In addition to the module connector interface, this includes management with respect to diagnosis, identification of modules, energy measurement and energy switching, protection for power (400 Volts) as well as safety and real time communication.

These functions can be ensured by using active network components.

HARTING is intensively driving the development of these Industry 4.0 infrastructure components forward. By way of example, HARTING’s smart Power Network Unit brings together the topic of the administration of communications and power. This infrastructure component supports industry-typical topologies via line and ring, thereby enabling infrastructure to be put in place which facilitates the flexible use of different production modules.

IN BRIEF

• Rigid arrangement employed in conventional production is broken up.
• Cabling now becomes part of the infrastructure.
• HARTING is intensively driving the development of Industry 4.0 infrastructure components forward.
At HARTING, quality takes top priority, which is why the company opened the doors of its all-new Quality and Technology Center on June 27, 2014. The building boasts in excess of 5,000 m² of office and laboratory space where expertise and competencies can be concentrated around the topics of quality and technology. The new structure was necessitated by the continuous expansion of the two areas, in order to ensure the proverbial “HARTING quality” for the company’s fast-growing product portfolio.

This quality is the result of more than 50 years of consistent quality strategy and a steady expansion of testing facilities used to vet HARTING products. HARTING products had been tested in the central laboratory as early as 1950. In addition to HARTING connectors, juke boxes and automotive electronics were also manufactured and tested at the time. The quality demands placed on products increased steadily, as did the number of tests. Consequently, the central laboratory was certified to DIN ISO 17025 in 1994. In parallel to this, the entire company was certified according to ISO 9001. To complement laboratory tests, in 1990 an in-house simulation section was put in place to verify designs even before the production of test samples began. Starting in 2010, a separate department for technology development was established to support the company’s technology leadership.

RESEARCHING FOR THE WORLD OF TOMORROW

Today, company headquarters in Espelkamp are complemented by subsidiaries in Romania and China which support the development departments locally and also help guarantee quality internationally. More than 70 employees work at the company’s headquarters. Each year, more than 1,000 test
reports are compiled, and 100 simulation reports and 10 technology projects are completed. The testing spectrum is constantly expanding and includes, in addition to environmental mechanical testing, electrical testing, EMC testing, software testing, fiber optic testing, material analysis with scanning electron microscopy and Focused Ion Beam, as well as geometric measurements with 3D coordinate measuring machines and a computer tomograph.

The interplay of simulation and test results permits simulation results to be improved via experimental input, while laboratory results can be expanded upon and complemented through simulation results. The close connection of the central laboratory with quality management enables rapid process optimization driving the improvement of products. The architectural concept of the building, with its test areas situated along the contour of a 7-meter tall open atrium that connects the upper floor with the ground floor, means, on the one hand, that the testing premises are within easy reach of each other, while the arrangement also promotes the sharing of experiences of the test engineers and employees of all departments. State of the art EnOcean technology allows the building’s technical aspects to be flexibly controlled. A sustainable energy supply is provided by a powerful photovoltaic system and HARTING’s biogas-powered cogeneration unit. Energy requirements are concurrently minimized by daylight-sensitive LED lighting and CO₂-dependent fresh air regulation. The indoor climate is enhanced by a temperature-controlled floor, which makes for a pleasant working environment.

At HARTING, quality is top priority.

"
Intelligence in the connector

Intelligent connectors are a core component of the high-performance infrastructure in Industry 4.0, the way the concept is developed today. The transformation has begun.

» Dr. Lutz Tröger, Head of Corporate Technology Development, HARTING Technology Group, Lutz.Troeger@HARTING.com

Concepts of the future such as Industry 4.0 place high demands on the performance of the supply infrastructure. At the same time, requisite reliability and security must not be achieved at the cost of a disproportionate utilization of resources. Quite the contrary: the cost efficient use of resources is one of the cornerstones of progress in industrial production. Condition monitoring systems permit the extrapolation of operating states and as such improve the prospect of meeting the necessary high availability, since maintenance and service operations can be optimally planned, downtime is minimized.

Intelligent connectors equipped with sensors can not only record data, they can also process it and thereby provide input used in the control of other systems. They are considered core components of future high-availability infrastructure systems since they play a central role in data collection and are critical to the performance of the overall system.

System data that can provide information about the state of the plugged-in connection, completed mating cycles, transmitted power or the temperature of the contact point are not only suitable for monitoring junction points – such data can also provide insight into the state of the entire networked installation topology.

If changes in load can be logged in a connector inside a plant or system, non-permissible operating states such as e.g. an elevated current heating curve can be predicted and used to prevent damage to machines. Untapped potential can also be identified at the same time, and utilized in an optimal manner.

Sensors in the connector enable the monitoring of infrastructure as well as machinery.

IN BRIEF

• The integration of sensors and the connector offers monitoring capabilities without additional installation effort.

• Intelligent installation infrastructures enable flexible production environments.
Drive control in rail transport technology

New requirements in rail transport technology are leading to safer and more powerful transmission systems. HARTING’s Active Multi Fiber POF modules offer a new solution that makes handling the connection of optical fibers easier and faster.

Rainer Bussmann, Product Manager, HARTING Technology Group, Rainer.Bussmann@HARTING.com

The demands placed on the management and technology employed in rail transport systems are constantly increasing. Installations need to be simplified, maintenance accelerated, and communication data rates stepped up – not least in order to boost operational safety – all in connection with lower costs.

Today, polymer optical fibers (POF) are a standard part of engine control in rail transport. The cornerstones here consist of relatively short distances and high data rates, all grounded on a safety-oriented concept. Consequently, it makes sense to employ a larger number of connections in the application itself. The goal is to extend the lifetime of the components while achieving higher efficiency. This entails improving the performance of the interface itself while simultaneously simplifying handling, as well as simplifying and speeding up the implementation of maintenance work or installation in the field.

With its Active Multi Fiber POF modules, HARTING Technology Group has developed an innovative approach for connecting optical fibers.

HARTING Active Multi Fiber POF modules enable the connection of up to 16 POF (Polymer Optical Fiber) pairs in the space of a DIN 41 612 connector, instead of cumbersome pairwise connection, while a partial configuration is also possible. An eight-way version is in preparation.

This results in significantly simplified handling in the field, which takes place under considerable time and cost pressures while observing extremely high safety standards. Incorrect connection of the optical fiber pairs is prevented, although the interface connection is multiplied.

An innovative approach for connecting optical fibers.

IN BRIEF

Installations need to be simplified, maintenance accelerated, and communication data rates increased.
I nstallers performing daily on-site installation of HARTING products all want to do a good job. In order to accomplish this, they need reliable and installation-friendly products, i.e. connectors with few components that can also be installed under extreme conditions and – above all – can be installed extremely quickly and reliably in terms of ongoing processes.

SIMPLE, FAST – ALWAYS THE SAME, AND ALWAYS RELIABLE

This requirements profile based on real-world experience has led to the concept of a connector for which the mating face and connection area consist of two mutually compatible modules. In this system, the mating face can take the form of a jack or plug.
The connection area is always identical. It is realized with the preLink® terminal block, which accommodates up to eight wires and the connection is done by the preLink® assembly tool in one single operation.

This simple and very fast assembly process is always identical for all preLink® products. At the same time, preLink® is error-resistant. Feedback from the assembly tool gives the installer the assurance that assembly has been properly performed.

With regard to the RJ45 plug, HARTING’s preLink® product range is now complete. In addition to existing preLink® RJ45 jacks, the preLink® RJ45 connector is now available as well.

The preLink® RJ45 plug in the IP20 version is fitted with a protected locking lever. The lock of the IP65/67 version does not apply, since the function is assumed by the Han® PushPull housing after V14 (PROFINET and AIDA compliant).

The preLink® RJ45 plugs rated at IP20 are extremely well suited for connecting devices in the field. Wired data collection terminals, controllers or wireless access points can be quickly and reliably connected with preLink®.

The preLink® product range is completed by D-coded M12 connectors for Fast Ethernet (100 Mbit/s) and X-coded for Gigabit Ethernet, i.e. 10 GBit/s. Matching M12 sockets employing preLink® technology are currently under development.

A problem that frequently occurs during the expansion or conversion of a cable system can now also be solved with preLink® technology – thanks to the preLink® Extender, cables can be reliably extended at any time.

Connecting to a cable is simple, safe and quick.

High-performance connection technology that is equally suitable for industrial networking and IT network cabling.
Switzerland’s MICROTRONIC AG has developed a new cashless reader generation for clients such as Coca Cola, Nespresso and MEI in which SMD PCB connectors from HARTING’s har-flex® and har-flexicon® series are used.

» Lennart Koch, Product Manager, HARTING Technology Group, Lennart.Koch@HARTING.com

The development of payment systems continues apace, with a wealth of functions having been enhanced. MICROTRONIC’s contactless payment system supports a variety of RFID technologies, including Mifare Classic, Plus, DESFire and CALYPSO, with HID iClass slated to be supported in future as well. In addition to use with keys, tags and cards, payment is also possible via an NFC (Near Field Communication) mobile phone. Another highlight is a vending reader certified by EMVCo, which permits cashless payment via VISA or Mastercard.

har-flexicon® is HARTING Technology Group’s miniaturized and field-installable single-wire termination technology. One of the main requirements of modern device technology is the central importance of flexible single-conductor wiring of industrial equipment using PCBs.

With a tiny 1.27 mm contact grid size, the reflow and SMD-solderable components result in cost advantages in the production process through the use of uniform and automated loading and soldering processes.

The miniaturization of the new generation of readers not only requires more compact single-wire connectivity, but also corresponding device-internal board-to-board interfaces. Whereas MICROTRONIC AG formerly used connectors with a grid size of 2 mm, today the company wholly relies on HARTING PCB connectors from the har-flex® series. With a grid size of 1.27 mm and continuous scalability in pin count configurations of 6 to 100, har-flex® supports exceptionally compact device construction with permanent robustness.

Compact device construction with permanent robustness.

New contactless payment systems use SMD PCB connectors from the har-flex® and har-flexicon® series.

Cashless payment with VISA or Master Card.

Miniaturization requires board-to-board interfaces and more compact single-wire connectivity.
Valve terminals are an indispensable feature in pneumatic automation systems. Today’s devices are optionally field-bus compatible and thus permit the integration of various electrical functions. In addition to the flow rate, one of the key product features is the compact design.

The Swabian company Festo is the inventor of the valve terminal and today ranks as one of the world’s leading supplier of pneumatic and electrical automation technology.

Festo has employed HARTING’s har-flex® PCB connector series to develop a variant of the VTUG valve terminal that boasts even stronger flow rates, while still being more compact in design.

With their miniaturized 1.27 mm grid and compact design, the connectors enable much needed space savings in device design.

Particularly decisive for Festo was the fact that HARTING’s 30-pin variant could offer the company the precise pin count it sought. Available in all pin counts between 6 and 100, this is the standard for HARTING customers.

Despite their miniaturization, the connectors are characterized by a high degree of robustness. In addition to the reinforced wall thicknesses of the inserts, the additional side-mounted SMT fixations (“hold downs”) always guarantee a secure connection to the PCB, making the connectors ideal for use in industrial electronics.

The exact number of pins, thanks to availability in all contact counts of 6-100.

IN BRIEF
• Fully automated processing thanks to SMT connection technology and tape & reel packaging
• Robust miniaturization featuring a 1.27 mm grid
Complete portfolio for high-speed data communication

Ethernet deployed in the industrial arena requires especially robust, high-performance connectors that can also be connected in industrial environments. Industry 4.0 reinforces this requirement – and the new standard for the X-coded M12 (IEC 61076-2-109) represents the response to these demands. HARTING has now built up a comprehensive portfolio for the X-coded M12 connector that ensures its deployment in high-speed data communications that conform to Cat. 6a/10 GB Ethernet.

» Dirk Peter Post, Product Manager, HARTING Technology Group, Dirk-Peter.Post@HARTING.com

It was inevitable that additional increases in bandwidth due to Industry 4.0 would result in the further development of the M12 connector for data communication in industrial applications. Consequently, the HARTING Technology Group has actively helped drive forward the development of a new industry standard and IEC standardization in order to achieve manufacturer-independent mating faces. The benefits for customers? Thanks to the new IEC standard, a uniform mating face now exists worldwide, as does investment security for end users.

HIGHEST DEMANDS
The demands placed on the M12 vary in line with the large spectrum of applications, and range from traffic technology to industrial automation. To meet the extremely stringent demands made on the connectors' vibration resistance in traffic technology, HARTING Technology Group developed a cable connector with crimp termination technology.

For the various cables used in traffic technology, there are two different contacts to choose from which cover the cable diameter range of AWG 23 to 28 (AWG = American Wire Gauge). The outside diameter of the cable must not exceed 8.8 mm. Color coding the contact carrier with the standardized wire colors also simplifies assembly and ensures the correct position of the contacts. The contacts audibly snap into place when inserted into the housing.

The portfolio is rounded out by components employed in automation technology - more specifically, a har-speed M12 that can be assembled
in the field. Here, HARAX® insulation displacement technology (IDC) is employed, which has proven itself in this environment.

On the device side, M12 PCB connectors are available in straight and angled versions. A special selection of materials enables the components' reflow capability. In order to guarantee $E_3$ class performance, a shielded cross is present on both the cable, as well as on the device, which leads cable pairs into individual chambers, thereby preventing signal impairment.

MORE FLEXIBILITY

Extra cabling flexibility is provided by additional components such as the har-speed M12 gender changer and the har-speed adapter. The M12/RJ45 adapter serves as a bridge component from the M12’s IP65/67 protection classes to the specific IP20 environment of the RJ45. The gender changer is used to connect two pin connectors to each other. In addition, a fully shielded panel feed-through is possible - here, the entire cable is connected, including shielding.

In addition, the X-coded variants of the product group will be made available with the extremely user-friendly PushPull locking technology. Locking is indicated by a clearly audible “click”, thereby dispensing with the need for torque control when screwing. In addition, PushPull technology offers space savings benefits on devices. Consequently, higher connector density is easy to implement. PushPull delivers significant time savings during installation: no more searching for the beginning of the thread, with time-consuming tightening also no longer necessary.

HARTING device-side flange sockets are backwards compatible, which means customers can employ both conventional M12 screw connection as well as the PushPull technique.

IN BRIEF

- M12: the development of a new industry standard and the IEC norm leads to a uniform mating face worldwide, as well as investment security for users.
- A complete portfolio ensures maximum flexibility while meeting the highest requirements.
HARTING ensures Ethernet networks on trains

Ethernet networks on trains are gauged by their high availability. With its Ha-VIS Ethernet switch, HARTING Technology Group has developed a rugged, flexibly deployable component.

» Dirk Peter Post, Product Manager, HARTING Technology Group, Dirk.Peter.Post@HARTING.com
» Heiko Frese, Product Manager, HARTING Technology Group, Heiko.Frese@HARTING.com
On-board Ethernet networks on trains are judged by their high availability and consequently also on criteria such as vibration resistance and uninterrupted operation. As a result, Ethernet switches are faced with ever-increasing demands, which in turn has repercussions for design, processing and handling. In response to this, HARTING Technology Group has developed Ha-VIS 4100 switches. Here, the company looked to the specific requirements of train technology as a reference point. In addition to media redundancy via the arrangement of the switches in a ring (ring topology with the RSTP and MRP protocols), Ha-VIS 4100 switches provide a by-pass function that ensures uninterrupted Ethernet communication. By way of example, in the event of a voltage interruption at a switch in the middle section of a train, the Gigabit Ethernet ports are directly connected, so that the Gigabit backbone – communication from the front to the rear of the train – remains unaffected.

PushPull connection simplifies and speeds up the handling of the Ethernet switch.

The Ha-VIS 4100 Ethernet switch with 10 ports is available in un-managed or managed variants. Eight ports (100 Mbit/s) are used to network Ethernet end subscribers in the train car. Two Gigabit ports (1000 Mbit/s) guarantee the high-performance Gigabit backbone over the entire length of the train. Variants of the switches offering Power over Ethernet (PoE) are available for the installation of camera systems that are used to increase passenger safety. Here, the switch combines the power supply to the PoE camera with Ethernet communications on a single cable, reducing installation costs and the fire load (one cable instead of two) in the train.

In addition, the new Ha-VIS Ethernet switch for use on rolling stock has already integrated the new M12 PushPull connector technology. PushPull connection simplifies and speeds up the handling of Ethernet switches. M12 PushPull produces a reliable and vibration-resistant connection to the switch, which locks with an audible signal. This in turn means that complicated monitoring of the screw-held M12 using a special tool is no longer required.

M12 PushPull
Pressure to increase the safety and comfort afforded by train technology is leading to the increased use of connectors with small dimensions which can be easily handled. These connectors also need to have high resistance to vibration. The final locked position should be clearly recognizable. The system must be backwards compatible on the device side so that standard M12 with screw locking can be used on the cable side.

The HARTING M12 PushPull solution is characterized by an M12 connector on the cable side engineered with the HARTING M12 Slim Design in mind. The result is an M12 connector with PushPull locking that features audible latching, facilitating handling in the field.

The housing on the device side can accommodate a standard M12 connector with screw locking as well as the HARTING M12 PushPull. Its design makes its method of use obvious.

IN BRIEF

- Demands made on Ethernet switches impact design, processing and handling.
- M12 PushPull produces a reliable and vibration-resistant connection to the switch.
Application areas such as traffic engineering, mining and petrochemical industries place extreme requirements on equipment and components. Connectors used in these fields are subject to impact, shock, or even rockfall and stone-chipping against which they must be effectively protected. To meet increasing demands for flexibility, ease of maintenance and easy installation options in the field, connectors are increasingly being used in critical outdoor areas as well. This has led to intensified efforts in the development of freely usable connectors whose performance equals that of permanent connections in every measure.

To meet this challenge, HARTING Technology Group has developed Han® hoods and housings that provide connectors with effective protection – also under extreme conditions. A polyurethane coating protects the connector against mechanical (e.g. impact from rocks), chemical and other influences, as demonstrated by the associated applicable tests. The Han® M Plus series is thus particularly suited for extreme outdoor applications, including marine use (on ships, offshore platforms, wind turbines, etc.) and deployment on machinery and vehicles exposed to aggressive (e.g. salty) air, road salt or impact by rocks.

This is enabled by RIM technology. The abbreviation RIM stands for Reaction Injection Molding. In this method, two liquids are injected into a molding tool surrounding an aluminum die-cast body. The mixed liquids cure inside the mold, thereby creating a solid coating of polyurethane (PU) that forms on the housing. The PU coating displays excellent adhesion to the housing and increases the impact resistance of the surface. HARTING has patented the aluminum die-cast connector coated during the RIM process.

RUGGED TEST SERIES

HARTING has verified the robustness of the Han® M Plus series via abrasion and impact tests, as commonly used in the automotive industry on coatings. The results: when tested with sandblasting per EN 60068-2-68 and in the stone impact test per ISO 20567-1 (Method B), no surface defects arose on the PU-coated Han® M housing. By contrast, after an intense bombardment with stones, metal enclosures without PU coating suffered scratches, which in some cases reached down to the metal housing. Such cracks can act as starting points for corrosion. The housings with PU coating have already proven their special corrosion resistance in salt mist tests.
HARTING Technology Group has developed Han® hoods and housings to provide connectors with effective protection – also under the most extreme conditions.

MULTIPLE USES
The Han® M Plus series will be available starting in fall 2014 in the standard sizes 6B, 10B, 16B and 24B. The housings are locked with two Han Easy-Lock® crossevers, each consisting of two stainless steel levers and a connecting plastic actuator. Also important for the user: the new connector with the special surface protection is based on the proven Han® M standard. Thus, the housing of the Han® M Plus is plug-compatible with that of the Han® M standard.

Han-Modular® modules and Han® inserts can be used in both housings and can be used in place of each other, if necessary.

The PU coating replaces the seals at the transition between the housing halves and the flange of the bulkhead mounted housing. The Han® M Plus series is extremely robust and highly ozone- and UV-resistant. HARTING has also successfully tested the material for its resistance to a selection of standard cleaning agents. The material is fire resistant and meets the R22 requirements set of the EN 45545 train fire safety standard. As a result, these specially protected connectors are suitable for vehicles with a hazard degree of HL2.

IN BRIEF
- New, extra robust housing range
- Polyurethane coating protects against mechanical and chemical influences
- Improved impact resistance
- Fields of application include maritime, railways, transport and wind energy

Han® M Plus for extreme outdoor applications.
In September of this year WDR embarked on modernizing the technology installed at its Cologne studios. The studios required connectors used with connection columns to integrate the two circuits for lighting pipe motors and spotlights. Here, the broadcaster has opted for the size 10 Han-Yellock®.

Deploying the connector in combination with Han-Quick Lock® contact inserts not only enables both circuits to be plugged in with one cable. “We achieve an overall better workflow for our lighting technicians,” says Ingo Lück, Project Leader for Service and Planning at WDR Television in Cologne.

The Han-Yellock® 10 is very user-friendly. “The Yellock connection can be easily disconnected with one hand. You only have to press on the yellow push button,” says Lück. With the previous technology, every time the lighting technician had to reposition a lighting pipe he or she had to unplug and then plug back in, i.e. two actions were required. Reverse polarity protection is another important argument in favor of the Han-Yellock®.

No contacts require crimping during setup and tools are no longer necessary, since for safety reasons the use of tools is prohibited in the space above the sets. Studio technicians require only a screwdriver for installation and maintenance of the Han-Quick Lock® contacts.

The first television studios at WDR are slated to be renovated at the end of the year. Overall, approximately 500 hanging lighting pipes will be replaced.

Great reception for Han-Yellock®

Broadcaster WDR uses Han-Yellock® as a standard connector in lighting technology employed in its television studios. One-handed operation was decisive in this decision: with Han-Yellock®, lighting technicians can set up feeds to spotlights and lighting pipes with just one hand.
“Smart” and Reliable Connection for the Industrial Lifelines

Improved maintenance, integrated connection and ‘smart’ design were the key factors to select Han-Yellock® to connect robot with controller.

» Yoshihiro Kimura, Field Sales Engineer, HARTING Technology Group, Yoshihiro.Kimura@HARTING.com

Palletizer robots, which load pallets, are indispensable in production plants as well as in logistics and transport industries for efficient delivery and transference. As they often operate in factories and warehouses exposed by extreme temperature and dusts, the installed components must offer reliable function even in harsh environments, along with easy maintenance as well.

Okura Yusoki Co., Ltd., a leading manufacturer of transport equipment and logistics system chose Han-Yellock® connectors from HARTING for their new palletizer robot.

Han-Yellock® provides protection class of IP65/IP67 and an internal locking mechanism with push buttons instead of conventional locking levers to ensure reliable connection while enabling space-saving installation and one-hand operation. Okura Yusoki Co., Ltd. adopted Han-Yellock® to transmit signal and power between robot and controller. The modules of the housing mounted on robots can be disassembled and reassembled not only from mating side but also from termination side, which makes servicing very simple.

By combining wide range of modules, the connector can integrate multiple signal transmissions and power supplies each in one housing, which led to fewer connection points.

Okura Yusoki Co., Ltd. also adopted the compact Han-Yellock® 10 for the option of the robot. The standardised use of the Han-Yellock® series has realised “smart” design, which is consistent and functional.

IN BRIEF

• Capable to integrate multiple signal and power connections
• Convenient servicing through flexible assembly
• Design that is both functional and elegant

Customer was looking for integrated connections.

 tec.News 27: Applications
The demands on the infrastructure of a cable television network are steadily growing – in particular, extremely high data rates are required since the infrastructure must support multiple applications. Thus it makes sense to implement telecom industry standards which offer high transmission bandwidth, e.g. AdvancedTCA® (Advanced Telecom Computing Architecture), which has generated high acceptance.

The development of a 40 Gb/s backplane requires the selection of appropriate connectors and a suitable base material for printed circuit boards. In order to ensure the backplane’s performance, design rules must be defined on the basis of computer simulation and must achieve a balance between cost and performance. The connector for the backplane and daughter-card is determined by the requirements in the base specification and the application.

Once HARTING Technology Group and the PICMG (PCI Industrial Computer Manufacturers Group) had successfully established the interconnect limit values for the signal transmission parameters in the specification via a series of signal integrity simulations, HARTING developed and produced a 40 Gb/s backplane whose performance was verified via extensive testing.

The backplane characterization was performed on the basis of the PICMG’s 3.1 R2.0 “Ethernet/Fiber Channel for AdvancedTCA® Systems” specification. One of the main tasks was to define the backplane physical layer interface, which needs to support 10 GBASE-KR and 40 GBASE-KR4 Ethernet characteristics. During the associated testing, HARTING Technology Group performed the bulk of these signal integrity simulations within the PICMG. The 40 Gb/s backplanes are now slated for series production.

Markus Witte, Chief Design Engineer, HARTING Technology Group, Markus.Witte@HARTING.com

Similar to telecom infrastructure, in a cable television network video, audio and internet telephony services are all bundled and transmitted via a cable. A new infrastructure for cable television is now enabling the convergence of Internet protocol-based services on a single platform (CCAP - Converged Cable Access Platform). HARTING Technology Group has developed a 40 Gb/s backplane that permits extremely fast data transfer rates.

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 IN BRIEF

- A new infrastructure for cable television enables the convergence of internet protocol-based services on a single platform.
- Ensure balance between cost and performance
- 40 Gb/s backplane for fast data transfer rates
Optimized connector design

Clean solution

Hygienic safety is priority number one in the food industry – which has far-reaching effects on the entire production system. HARTING Technology Group is currently launching a connector series that eliminates existing limitations in system design while making new approaches possible.

» Frank Quast, Head of Product Management Han®, HARTING Technology Group, Frank.Quast@HARTING.com

The food industry imposes extremely demanding requirements. As a result, production and packaging is divided into three zones: the product contact area, the splash zone, and the product-free zone.

The product-free zone is the area of the plant where products are already packed and as a result are protected against contamination. Existing HARTING connectivity products can be used here, and as such there are no restrictions with respect to plant and system design. However, the same does not hold true for the product contact area and splash zone. Here, all surfaces must be designed as flat as possible and with no gaps or spaces, failing which so-called dirt pockets would be present in which food residues might become trapped. This could, in turn, create an unacceptable bacterial load in the plant.

In addition to these design specifications, daily cleanings are mandatory. Plants are often cleaned with high pressure and steam cleaners containing aggressive acid or alkaline-based cleaning agents, which means that standard components are not suitable for use.

**SPECIAL SOLUTION FOR THE FOOD INDUSTRY**

HARTING connectors from its Han® F&B series have been designed in an environmentally optimized manner for the vicinity surrounding the splash area. The patented design is characterized by large radii and smooth surfaces, in accordance with EHEDG guidelines. The material consists of PP plastic, which is resistant to ECOLAB-certified detergents and is FDA approved. All soft product components are blue, which enables quality-monitoring camera systems to consistently and reliably detect detached sub-components. Both the IP67/IP69K protection classes and surface properties of the HARTING F&B connector can withstand the long-term impact of daily cleaning agents.

A new connector that’s really bringing momentum to plant components in the food and beverage sector.
VERSATILITY OF USE
The central advantage of the Han® F&B connector system lies in its versatility in contact transmission. HARTING offers more than twelve different contact inserts for the transmission of bus systems, signals and power contacts up to 40 amps. This large portfolio is rounded out by electrical transmission and fibre optic technology, each with different termination technologies.

This versatility opens up completely new possibilities in the design of previously hard-wired plant components. Components such as film winders, exhaust systems, heating and cooling units can be produced in pluggable design. In future, machine units will be able to be modularly designed. Downtime is being drastically reduced by “plug and play” components, and reduced commissioning times are cutting costs.

IN BRIEF
- Transmission path for electrical and fibre optic technology
- Cost-optimized design
- FDA approved materials

ANNOTATIONS / ABBREVIATIONS
EHEDG - European Hygienic Engineering and Design Group
A consortium of equipment manufacturers for the food industry, food processing companies and research institutes.

FDA - Food and Drug Administration
Governmental agency in charge of food oversight and drug approval in the United States of America.

ECOLAB - Ecolab Inc.
A global provider of products and services in the areas of industrial cleaning and hygiene for breweries, agriculture, food manufacturers, laundries, hospitals and contract cleaners.
Differentiated Product Strategies

A striking example of this is the automotive industry. While car manufacturers in years past could satisfy the market with relatively few models, today we are experiencing completely new vehicle classes being offered in order to meet customer preferences for more individualized products. The market has broadened, while ever smaller consumer groups are seeing their specific purchase and utilization needs attended to. Industry is responding to this by linking platform strategies with differentiation efforts that meet specific customer requirements.

Industry 4.0 is the central concept under which classical industry is evolving at a high speed. A key point of this development is the pronounced individualization of products, a trend which nevertheless requires highly flexible mass production.

The demands placed on production systems in industrial environments are growing in the wake of an ever increasing number of product variants. The challenges faced here include an extensive product range, smaller production lots and shorter throughput times.

However, this causes far-reaching changes in industrial production, which becomes more flexible but cannot allow costs to rise. This results in new system and plant concepts, in particular the installation of modularly built machines and manufacturing plants with ever more frequent change-over processes and tool changes that are increasingly taking place automatically.

For applications in the measurement and testing technology fields, each test step requires one mating cycle.

This means that the electrical interfaces must be more frequently plugged in and disconnected while avoiding subjecting them to significant wear processes. Applications in the measurement and testing technology fields present similar requirements, where each test step is accompanied by a mating cycle.

Furthermore, mobile machines and equipment are typical applications where electrical connections must be plugged in daily or repeatedly disconnected. In addition to the industrial environment,
medical technology is a well-known application area for such mobile devices.

DEMAND FOR DURABLE CONNECTORS
In order to be able to reliably perform such frequent plugging and unplugging in applications over a long period of time, the affected equipment, machines and systems require equally durable, flexible and robust interfaces that ensure the reliable transmission of power, data and signals even under frequent plugging-in and disconnection.

For these areas of application, HARTING Technology Group developed the new Han® HMC connector series. This series belongs to the Han® family of industrial connectors, which has proven itself millions of times the world over thanks to features such as robustness, reliability, durability, ease of use and flexibility. The new connector means that the Han® family will now also be used in applications requiring a capacity of more than 10,000 mating cycles.

IN BRIEF
- Equipment, machines and plants/systems need durable, flexible and robust interfaces.
- Frequent plugging-in and disconnection without significant wear processes.
- Han® HMC for applications associated with over 10,000 mating cycles.

The Han® B series has proven itself millions of times over and forms the technical basis of the Han® HMC.
The Help Points, being installed on columns or walls inside stations allow passengers to communicate with the station booth for information and the transit system’s control center for emergencies. The center can identify the station where the call originates and address each Help Point individually. All stations will have Help Points by 2019, a deployment of over 6,000 units, replacing an old, unreliable analog intercom with poor voice quality.

The vertical Help Point is a state-of-the-art technology, including the flexibility and durability of HARTING’s PushPull connector lineup. Distributing electrical signals within the narrow Help Point enclosure required a connector slim enough (< 20 cm) for that space yet rugged enough for the challenging transit environment. The Help Point’s manufacturer, Boyce Technologies, had used Han® 3 A connectors in previous transit communications projects, but their external bail made them a difficult fit here. Instead, Boyce found the desired fit and connectivity in Variant 4 PushPull connectors with their internal locking mechanism.

Boyce swaged the cast PushPull RJ45 insert into a custom chassis it had created for the Motorola access point that provides dual band WiFi and VoIP. PushPull models like an RJ45 cable assembly, 7-pin Hybrid and 10-pin Signal are being employed in various variants. “We were able to use PushPull connectors for every single thing we wanted to do, whether it was controlling gates, or fans, whether it was Gigabit Ethernet, Power over Ethernet, fiber, AC or DC power. We were able to come up with a use for every single Variant 4 and every single pin,” says Boyce president Charles Boyce. Their durability has surprised subway officials who had doubted they would stand up to the rigors of the transit environment. In fact, says Boyce, “there has not been a single failure of any PushPull cable assembly, any connector, any pin, anything at all.”
Smart power sensors

for Industry 4.0 and e-mobility

Network-compatible power sensors are making intelligent, industrial-strength energy management systems a reality.

— Dr. Lutz Tröger, Head of Corporate Technology Development, HARTING Technology Group, Lutz.Troeger@com

Electrical systems in industry, transport and households are increasingly displacing fossil fuel powered engines and equipment. The reasons are obvious: electrical energy can be produced without harmful CO₂ emissions, is available on demand and is relatively inexpensive. Germany’s “energy transition” policy has massively stepped up this trend.

Still, it is not enough to generate electrical energy in wind, water or solar power plants – it has to be transported, stored and distributed. In addition, a new requirement has emerged along with the transformation of energy systems: increasingly, energy must be managed.

To perform these tasks with maximum efficiency, while achieving maximum resource savings, intelligent control systems need to be supplied with precise information about energy flows.

HARTING Technology Group has developed power sensors for direct network integration for use in intelligent energy management and monitoring systems in the Smart Grid, Industry 4.0 and e-mobility.

Current measurement takes place based on a compensated Hall sensor, whereby data can be digitized and pre-processed directly within the sensor. This allows the relay of both raw data with precise information about current flow as well as user data for higher systems, e.g. threshold violations. The information obtained can be made available over a PoE-compatible IPv6 Ethernet Interface (Power over Ethernet), meaning the sensors seamlessly fit into the Internet of things.

Digital sensor data make intelligent energy management systems possible.

IN BRIEF

• Simple and cost-effective installation – thanks to PoE
• Digitization and preprocessing of data directly inside the sensor
The HARTING RFID (Radio Frequency Identification) Sensor Transponder has now been enhanced to offer extended functionality. In addition to the ID (the component or component designation), the transponder is also capable of transmitting sensor data. Consequently, the RFID application opens up a completely new area of application.

In future, UHF (Ultra High Frequency) technology will need to be able to directly act as a control system in the vertical integration of production processes – much in the context of Industry 4.0. Consequently, in addition to transmitting its unique ID, the object or device equipped with an RFID transponder will also determine and wirelessly transmit its current status via attached sensors. The biggest advantage of this UHF-based control system is passive operation. This means the activation of the analog sensors takes place up to a range of 2.5 meters, on the other hand, while the additional data are transmitted to the reading device in passive mode. For this reason, the system does not need a power source on the transponder side.

This provides significant advantages in customer applications. Mobile parts that do not have an uninterrupted power source can now be comprehensively monitored using the HARTING RFID control system – completely maintenance-free.

**APPLICATION**

This can be illustrated by way of a safety-critical example: locks on chairlifts are used to secure passengers and consequently should be consistently and exhaustively monitored. Whereas this was previously possible only with enormous effort, such monitoring can now be easily implemented without extensive conversion or maintenance effort.
With RFID transponders, this becomes a simple matter. Upon entry inside the stations while getting off/getting on, the state of the bar on the gondola changes from “closed” to “open”. Before the chair is allowed to start again, this state must first be electronically recorded as having changed from “closed” to “open” again. To avoid the effort associated with an active radio system that would have to be maintained at regular intervals (battery change), HARTING RFID transponders with external sensors and limit switches are used. These now transmit the status changes within the station.

A decisive advantage of this system is the integration of additional data. With the HARTING RFID Reader RF-R500, all the conditions to provide the full functionality of a higher-order system are already in place. This offers customers the further advantage of enabling them to perform integration in e.g. a PLC by means of OPC-UA using just a few commands.

**IN BRIEF**

Mobile parts that do not have an uninterrupted power source can now be comprehensively monitored using the HARTING RFID control system.
Technology that inspires young people

» Gisela Eickhoff, Personal Consultant Dietmar Harting, HARTING Technology Group, Gisela.Eickhoff@HARTING.com

RoboCup is characterized by international and national competitions. The goal: have a team consisting of robots beat the reigning FIFA World Cup champions by 2050. Since 2007, HARTING Technology Group has provided its support as sponsor of the RoboCup German Open. In addition, the company awards the HARTING Open Source Prize, since it is a key requirement that the knowledge base be shared after every sporting competition based on an open source approach.

The RoboCup Dance Challenge comprises an ancillary discipline to football-centered events and is intended to generate enthusiasm for technology and programming among young people. Here, the German champion squad, which is supported by HARTING, has made it their goal to integrate the movements of a robot into a single storyline. For the RoboCup World Championship in João Pessoa, Brazil, the team had its robot perform synchronously to a radio play conceived by the squad.

Watch the German champions team in their preparations for the RoboCup World Championship on our HARTING Youtube channel.

IN BRIEF

Read and win!

Capture your most precious moments with one of the world’s most versatile cameras! HARTING is giving away a compact GoPro Hero 3 action cam to one lucky participant. To be eligible to win, simply answer the following question:

What is the biggest advantage of using Han-Yellock® in the WDR television studios?

Just click on the following link to participate in the sweepstake: www.HARTING.com/tecNews-onlinesurvey

The entry deadline is January 31, 2015.

Good luck!

Your tec.News Editorial Team

By participating in this promotional event, the user accepts the following Privacy Policy: The user gives HARTING permission to send prize notifications by e-mail for the duration of the sweepstake. All data will be used exclusively for promotional purposes and will be deleted following completion of the sweepstake, provided that HARTING is not legally obligated to store the data for a longer period of time. This applies e.g. to the data of winners for tax purposes. Upon final completion of the promotion, such data will be marked with a block flag and will be deleted following expiration of the legally prescribed retention period. Consent may be revoked by the user at any time with future effect. Data will be deleted immediately once the user has revoked his or her consent, provided HARTING is not legally obligated to store the data beyond that point in time. Participation in the sweepstake shall remain unaffected. In addition, data will not be disclosed to third parties.
HARTING Trade Show Calender

11.11. – 14.11.2014 Germany, Munich, electronica
11.11. – 13.11.2014 Brazil, São Paulo, Negócios nos Trilhos
22.11. – 24.11.2014 USA, Las Vegas, NV, LDI
25.11. – 27.11.2014 France, Paris, Salon des Maires (SMCL)
25.11. – 28.11.2014 China, Shanghai, bauma
26.11. – 28.11.2014 Germany, Nuremberg, SPS/IPC Drives
02.12. – 05.12.2014 Russia, Moscow, Electricheskie Seti-2014
03.12. – 05.12.2014 Japan, Tokyo, SEMICON Japan
03.12. – 06.12.2014 Indonesia, Jakarta, MANUFACTURING INDONESIA
22.01. – 28.01.2015 India, Bangalore, IMTEX
10.02. – 12.02.2015 USA, Anaheim, CA, MD&M West
10.02. – 12.02.2015 Great Britain, Farnborough, Southern Manufacturing & Electronics
25.02. – 27.02.2015 Russia, Rostov-on-Don, Electro-2015
03.03. – 08.03.2015 Taiwan, Taipei, Taiwan International Machine Tools Show (TIMTOS)
05.03. – 07.03.2015 Turkey, Istanbul, Eurasiarail 2015
09.03. – 11.03.2015 China, Guangzhou, SPS – Industrial Automation Fair Guangzhou
17.03. – 19.03.2015 China, Shanghai, electronica
24.03. – 27.03.2015 Korea, Seoul, Automation World
24.03. – 26.03.2015 France, Lille, SIFER 2015
24.03. – 26.03.2015 Russia, Moscow, Automation 2015
01.04. – 01.04.2015 Spain, Barcelona, INTEGRA
13.04. – 17.04.2015 Germany, Hanover, Hannover Messe

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