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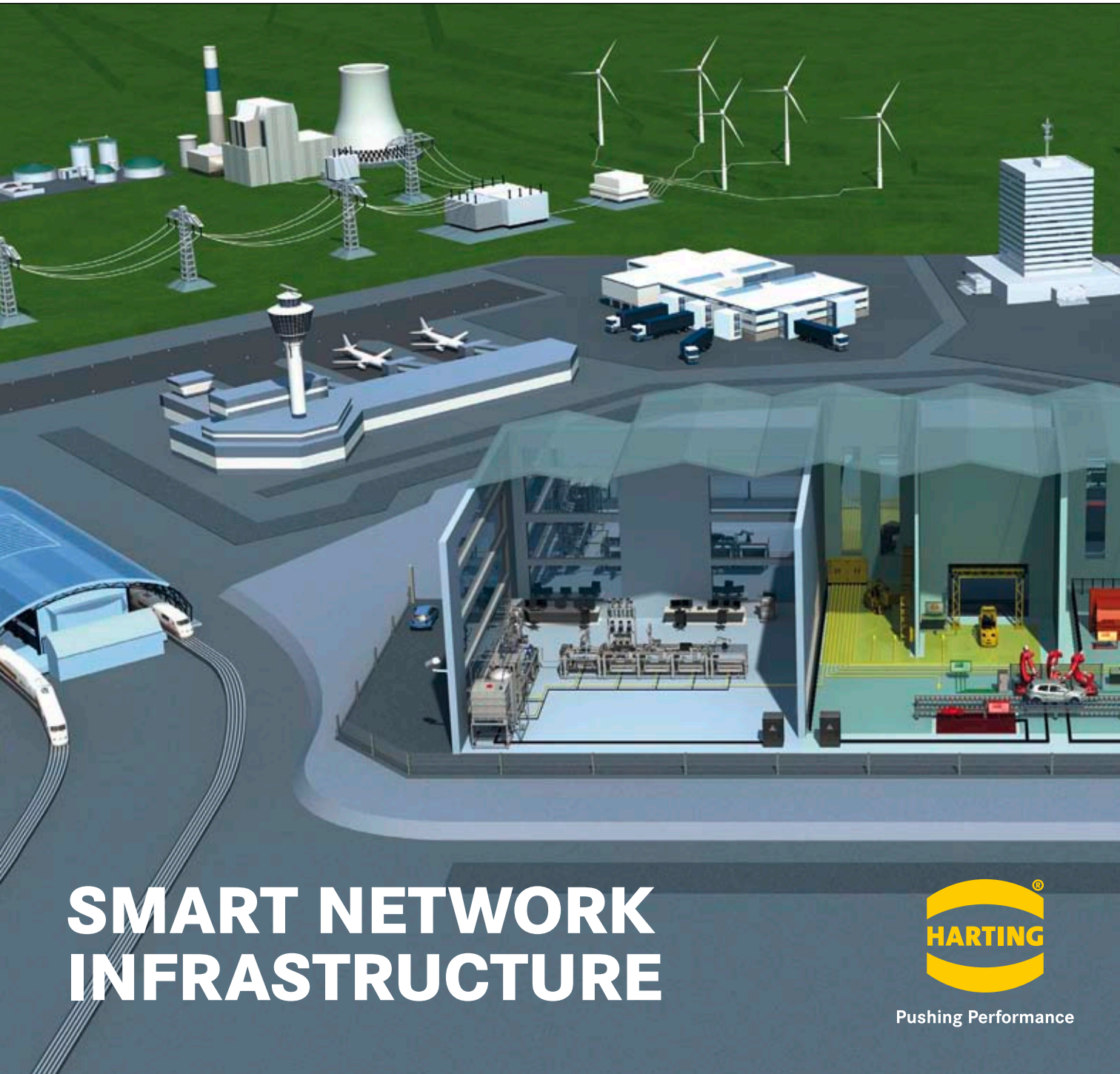
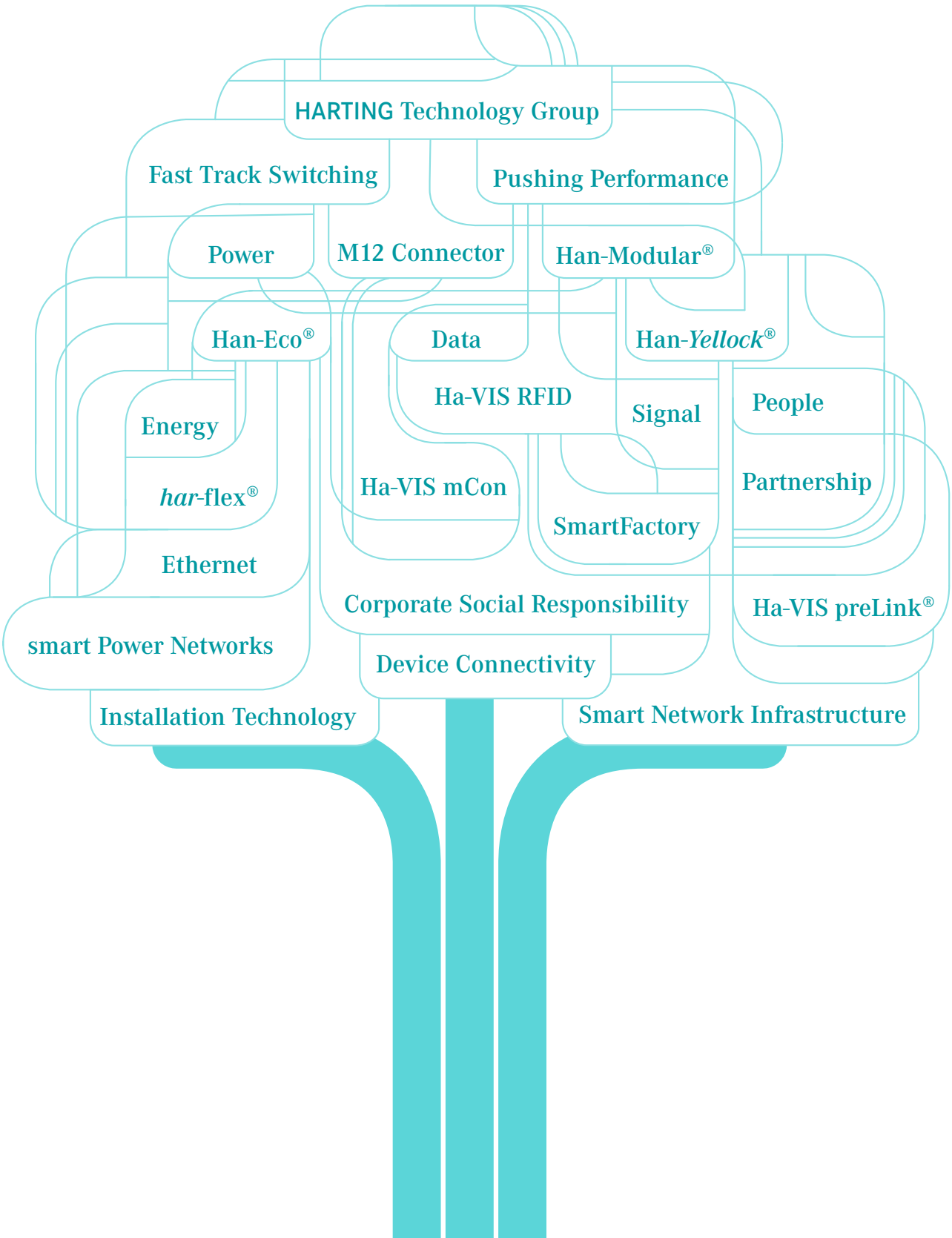
HARTING's TECHNOLOGY NEWSLETTER



SMART NETWORK INFRASTRUCTURE

HARTING®
Pushing Performance


HARTING Technology Group
Fast Track Switching
Pushing Performance
Power
M12 Connector
Han-Modular®
Han-Eco®
Data
Han-*Yellock*®
Ha-VIS RFID
Signal
People
Energy
har-flex®
Ha-VIS mCon
Partnership
SmartFactory
Ethernet
Corporate Social Responsibility
Ha-VIS preLink®
smart Power Networks
Device Connectivity
Installation Technology
Smart Network Infrastructure

What makes infrastructure smart?

HARTING has a clear focus on the essentials: we view the world through the eyes of our customers. Three lifelines, three arteries determine this world: data, power and signals. Linking these lifelines optimally with device connectivity, installation technology in the field and intelligent network in heavy duty environment – this is how we define our contribution to infrastructure and in particular, to Smart Network Infrastructure.

» ***Philip Harting,*** *Senior Vice President Connectivity & Networks*

A major shift is underway, from individual devices towards an overall view, in which infrastructure is becoming more and more important. Accordingly, infrastructure is now the vision in which every customer, every company area and therefore all HARTING employees will find themselves reflected.

In this context, a radical rethinking of infrastructure concepts is taking place. In a company committed to "New Thinking" infrastructure needs a strategy that will certainly not be able to accept one thing, namely mental blocks.

Rethinking infrastructure means finding ideal solutions for compatibility issues. New solutions always need strategies that the markets will accept. To this end, it is often necessary to overcome technological obstacles that are as weighty as the new infrastructure solution itself.

> **"We view the world through the eyes of our customers."**

There are salient examples for such situations: telephony via structured cabling only established itself after the introduction of PoE (Power over Ethernet). It was only after the emergence of PoE that it became possible to connect telephones as easily as in the analog world.

HARTING has set standards here. Take Ha-VIS preLink®, for example, which enables universal connections in the network area. Thanks to preLink® the new 8 pole M12 that is suitable for 10 Gbit applications can also be connected to conventional industrial cables for Fast Ethernet.

Accordingly, the technologies required for the transition to new infrastructure are becoming the decisive technologies – now and in future. HARTING has understood this, as it is precisely these bridging technologies that make infrastructure smart, and thereby create Smart Network Infrastructure.

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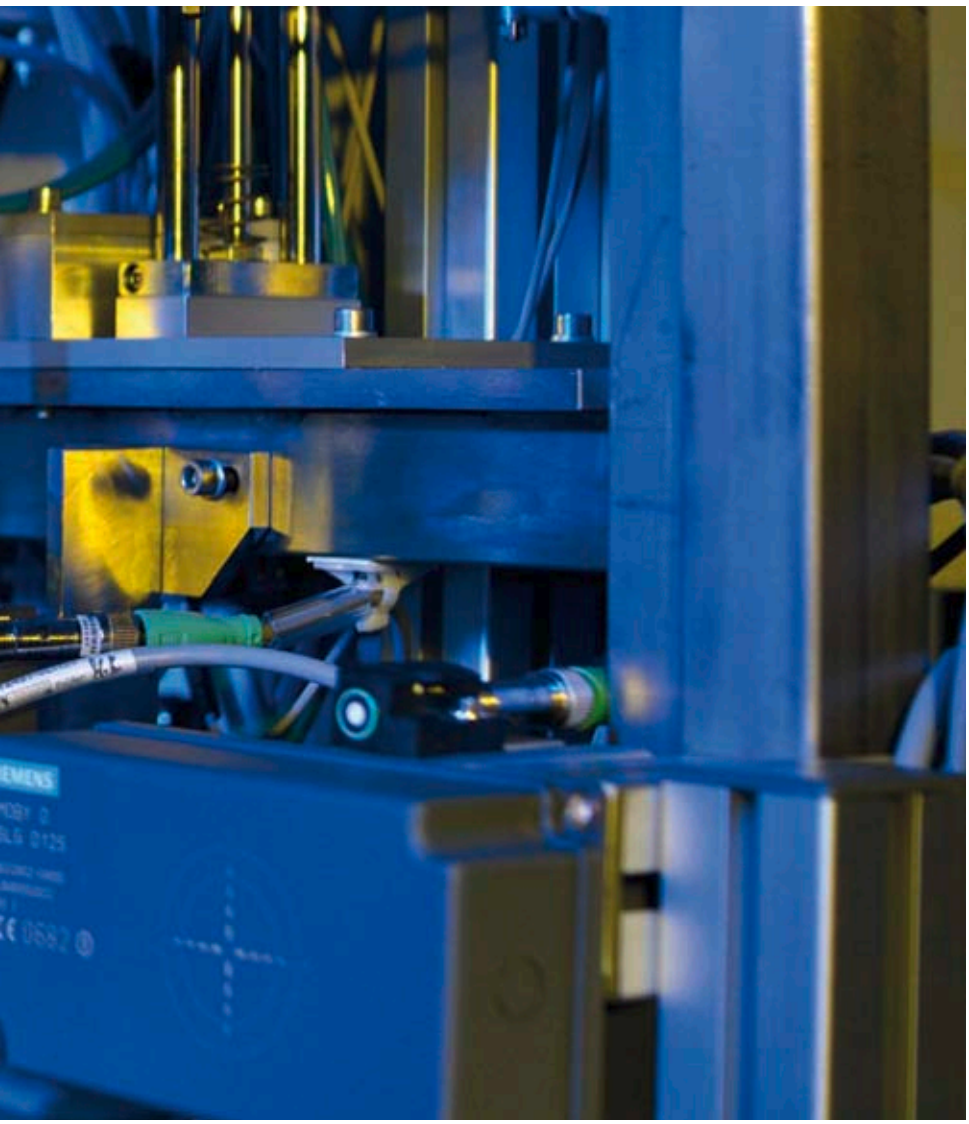
In Brief

SmartFactory – On the way to smart infrastructures

In everyday life the achievements and benefits of modern information and communication technology are truly ubiquitous. We use smartphones that not only act as telephones, but also serve as photo and video cameras, planners and navigation systems, while performing many other functions. As all of these devices are network capable, the acquired information is available throughout the entire network. Although industrial infrastructures may be far removed from such levels, the trend is inexorably shifting in the same direction.

Our guest article: » *Prof. Dr.-Ing. Detlef Zühlke, Scientific Director, German Research Center for Artificial Intelligence DFKI GmbH, Innovative Factory Systems, Kaiserslautern*



At the time the American computer pioneer Mark Weiser described the vision of "ubiquitous computing" in 1991 – computer technology pervading all aspects of life – the concept was revolutionary. In the meantime, the ideas that Weiser developed appear familiar today: computers are vanishing as clearly visible products positioned on our desks and have migrated into many objects of daily life instead. Weiser's visions have been borne out, we are living in precisely such a world in the meantime, as cameras, mobile phones, kitchen appliances and cars are all computer controlled. Miniature computers – so-called embedded systems – are what make all of this wizardry possible. Genuine progress, however, will only be achieved when these miniature computers are no longer working independently of each other, but are able to exchange information in a network. This will be possible thanks to the progress of the past ten years in network technology: driven by the huge consumer market, we have favorably priced and high performance technical devices for many application areas at our disposal. In response to this situation, automation technology is also beginning to take up these ideas.

EXAMPLE OF A MACHINE FAILURE

A machine in a manufacturing plant fails, and brings the entire production line down as a result. By way of a Bluetooth network the machine sends a message to the smartphone of its operator. The operator goes to the machine, conducts a few tests and identifies that a drive is the cause of the problem. Using the smartphone, the operator issues a prioritized maintenance and repair order, which is received at the company's maintenance center. Here, the machine error is initially checked via online diagnostics. Subsequently – via smartphone – a maintenance technician is sent off on a repair assignment. The technician takes his truck, transfers the location data to the vehicle navigation system and has the GPS guide him across the extensive company grounds to the right building. Now the indoor positioning system takes over and interacts with his smartphone to show him the way to the defective machine. Here, the technician links his tablet PC wirelessly to the machine control system and conducts a few system tests. He ascertains that a drive has to be replaced and takes a picture of the type plate with his smartphone and sends the information to the central spare parts warehouse, where the right replacement part is identified and immediately dispatched. The maintenance expert can now trace the current course of the spare part on his tablet PC and pick it up at the hall entrance and perform the repair work at the machine. Again, he uses his smartphone and checks the parts number and the version status by way of an RFID tag, in order to avoid any problems in the complex interaction of all components. Afterwards, he commissions the system via his tablet PC and monitors proper functioning on the large screen. Following the successful repair he concludes the maintenance order via his smartphone and initiates the re-order of the component at the warehouse and also makes an entry for the cost unit accounting.

FROM IDEAS TO REALITY

From a technical viewpoint it would already be possible to realize this scenario today, although companies are far removed from such scenarios. Nevertheless, the trend is shifting in this direction, although it is taking a different course than in the consumer goods area. Industrial companies expect the devices and equipment deployed to exhibit very high degrees of maturity and extremely high levels of reliability. Industrial users will also want to be certain that a replacement smartphone will also be available ten years from now and will not – as is customary today – be replaced after nine months by a successor model that may differ significantly from its predecessor.

What is helpful in the consumer goods area is also expedient in the industrial arena. In 2004 a group was formed of representatives of industry and the science community to discuss the effects and application areas of smart information and communication technologies. This gave rise to the idea of a SmartFactory, which was realized as of 2005 as a research and demonstration center in Kaiserslautern.

THE SMARTFACTORY INITIATIVE

A test and demonstration facility is a central element of the SmartFactory in which a production process for the

> "Industrial companies expect the devices and equipment deployed to exhibit very high degrees of maturity and extremely high levels of reliability."

manufacture of liquid soap has been realized with industry typical components. The production line handles the pretreatment of the soap, followed by coloring, filing into bottle and labeling.

The production line is operated by the association "Technology Initiative SmartFactory KL e.V." which currently comprises 15 notable members from the industrial arena and the science world. The main aim of the initiative is to build up a manufacturer independent test and demonstration factory, in which the potentials of new technologies for factory operations can be investigated and further developed. In this context, it is not the aim to replace people by automation technology, but to provide the best possible support in work by way of "ubiquitous computing".

This real-life, industry typical production process forms a foundation on which various research disciplines can conduct their work in the direction of the "Factory of the future"

Digital product memories: In order to control the filling process, a RFID chip (Radio Frequency Identification) is attached to every bottle and contains all of the relevant parameters of the order and the production process. In this way, every product has its own memory. In the future, "Smart" products will influence their environment by way of M2M communication (Machine-to-Machine) and enable more efficient manufacturing processes.

Wireless communication systems also improve the flexibility and agility of factories. Installation and modification input decreases when conventional cable based communication systems can be reduced. In an industrial environment, however, the demands made on a wireless network are much higher than in other areas: reliability and safety take

top priority and consequently require comprehensive planning and control of the radio bands.

In the case of cable connection the location of a device is implicitly known. When many cable connections are dispensed, the question as to the machine location takes on greater significance. Especially when mobile operating systems are used, the context of an operating situation plays an important role: certain plant or system functions can only be activated when the operator is in the vicinity of the system. In the SmartFactory three different real-time indoor locations and tracking systems are installed which can help guide a maintenance technician to a defective device, or provide an operator with various relevant information for specific tasks depending on the given location on the production line or system.
Self-configuring automation systems are a further step in the direction of convertible and flexible factories. "Plug-and-play" mechanisms can also be used in factories to a certain extent. New standards and abstract models of the components deployed are the preconditions for this.

BECOMING SMART

With the help of today's embedded system technologies many simple field devices can become "smart objects" and offer their functions within the automation network similar to web servers. This technically viable consistency of information and functions from the field level through to the planning level will incur changes in company IT structures: the strictly hierarchical automation pyramid will develop into a convergent network, with access extending across the various control and planning levels. Similar to the "Internet of objects" in which more and more real-life, physical objects are mapped and matched by their virtual representation in the IT world, an image of an increasingly networked and integrated "Factory of objects" is already beginning to emerge.

In future, the issues of IT security will certainly play a greater role than to date, in order to safeguard the data security and integrity of IT and production systems against external as well as internal threats.

Prof. Dr.-Ing. Detlef Zühlke, Scientific Director, German Research Center for Artificial Intelligence DFKI GmbH, Innovative Factory Systems, Kaiserslautern

Future structures

The term infrastructure is being constantly expanded. In future, infrastructure will refer to the structure underlying the processes and will thereby form their platform. Fielding new technologies, HARTING is laying a strong foundation.

» *Andreas Huhmann, Strategy Consultant Connectivity & Networks, Germany,* HARTING *Technology Group, Andreas.Huhmann@*HARTING*.com*

Today's expansion of infrastructures by network platforms factors in the increasing networking and integration of our world. The dividing lines between producers and users, senders and recipients are dissolving in new infrastructure concepts – which have far reaching implications. Infrastructure is becoming consistent and permeable all the way through to end devices, and is connecting a wide range of different company applications, especially in the manufacturing industry. Based on the existing infrastructure, solutions for these extended demands and requirements would be far too complex or not at all possible. New intelligent infrastructures are called for which make these new challenges easier to master and control.

HARTING focuses on target markets in the industrial arena, in transportation, power generation and distribution as well as in communication technology. In all of these markets functional units are connected with each other in a comparable manner, in order to exchange data, power and signals – the lifelines of the applications. Connecting these lifelines optimally by providing connectors on the device side, the installations in the field and building up intelligent systems for networking outlines HARTING's contributions to infrastructures.

THE FUTURE OF INFRASTRUCTURES

Applications are being integrated into increasingly complex value creation processes. While each market formerly defined its own lifelines in a proprietary manner, the shift towards achieving consistent and transferrable solutions is evident today. In the data area Ethernet is playing the mediating role between applications, as Ethernet has the capability to integrate applications within an overall system. The HARTING Technology Group has played a central role in the development of uniform infrastructure platforms and will continue to play this role in future too.

Today, Ethernet is used for conventional IT as well as for automation applications, and is establishing itself as a universal standard. The transition of field bus infrastructures to open Ethernet networks presents obstacles, as the installation philosophy and the planning of the automation infrastructures deviate significantly from the infrastructures of IT applications.

> "In order to ensure that compatibility does not obstruct innovations, bridging technologies are becoming the actual keys to new infrastructure solutions."

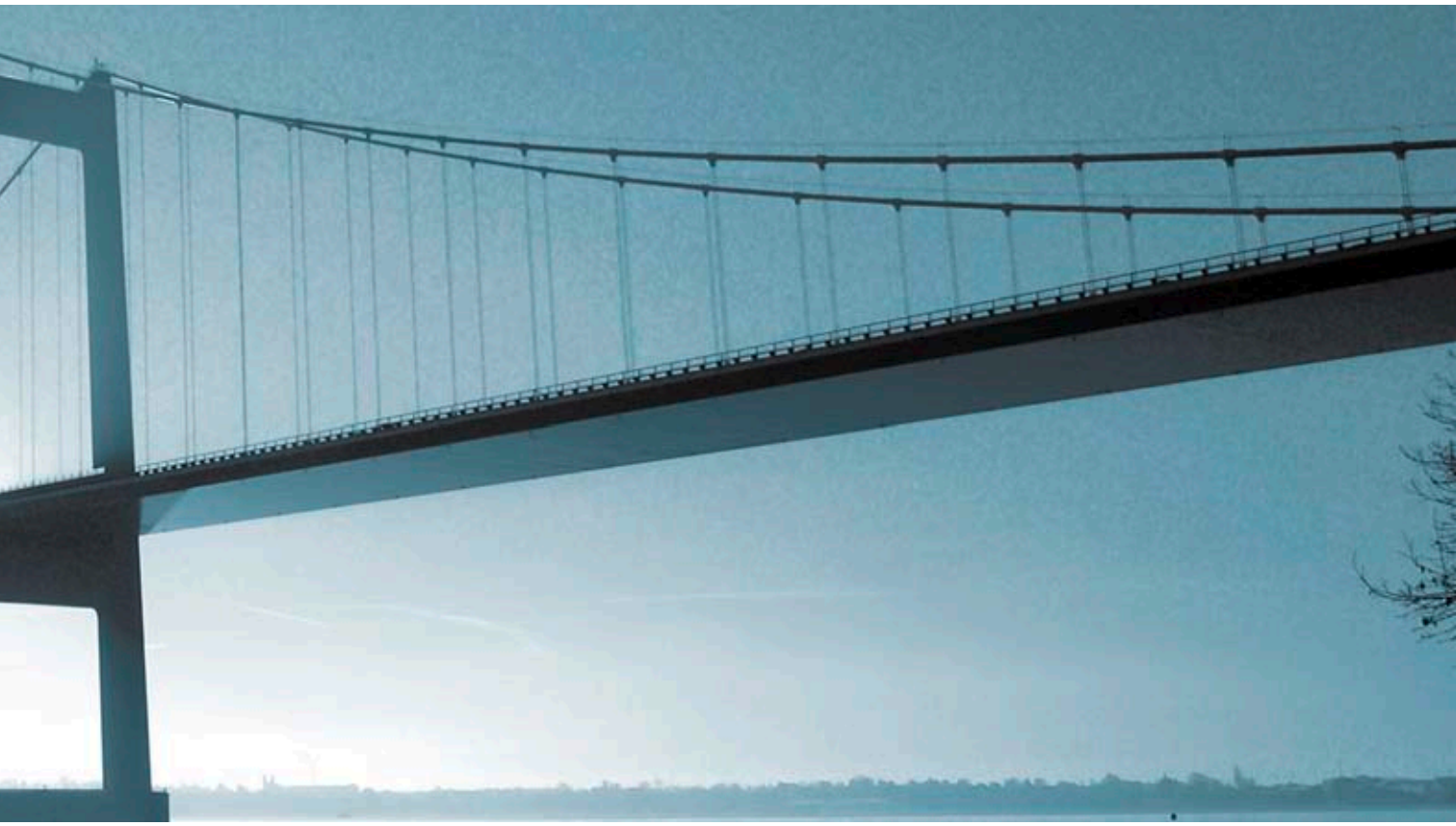
HARTING's Automation IT concept solves the problems here: Automation IT takes over the specifics of fieldbus based infrastructures and thereby retains the relevant demands of automation, while drawing on an innovative Ethernet infrastructure at the same time.

CHANGE AND PRESERVATION AS INFRASTRUCTURE SUCCESS FORMULA

Infrastructures should ensure a long service life, guarantee compatibility, while also offering perspectives thanks to their inherent flexibility and expandability. Consequently, infrastructures have a contradictory nature: on the one hand, they are structurally conservative – in a positive sense – as a long service life and compatibility guarantee the sustained value of investments. On the other hand, infrastructures must offer flexibility in order to master the tremendous challenges of the future, as in automation or the energy sector, for example.

Therefore, the tasks at hand call for combining the altered infrastructures with concepts that allow users the integration of existing technologies. In most instances, intelligent infrastructures are necessary to achieve these adaptation capabilities.

In a communication network with different applications this means active management with intelligent network components. In order to ensure that compatibility does not obstruct innovations, bridging technologies are becoming the actual keys to



> **"Infrastructures should ensure a long service life, guarantee compatibility, while also offering perspectives thanks to their inherent flexibility and expandability."**

new infrastructure solutions. In many instances, these bridging technologies present higher technological demands than the actual new infrastructure solution itself.

There are many positive examples of this. A prominent example is Internet telephony or VoIP. Fast Track Switching (FTS) is also a bridging technology for Automation IT. The old fieldbus infrastructure secured real-time and determinism based on the network. The aim was to make this performance that is essential in industrial environments available in a convergent Ethernet network in a convenient and simple manner. The HARTING FTS switches accomplish precisely this.

On an entirely different and much simpler level, HARTING has provided a bridging solution for adapter connectors: in the transition from two-paired to four-paired cabling the HARTING M12 connector with Ha-VIS preLink® provides the bridging element – and the foundation for the new Type X M12 connector for PROFINET.

In the industrial arena the demand for high energy utilization efficiency is a central factor, as today's energy consumption patterns are not transparent, and future decentral power feeding will present new demands on distribution and storage structures. In conventional power distribution solutions power consumption is difficult to assign and track via cabling. The distribution is designed as a star topology – representing a tremendous waste of resources due to the redundant use of copper cables and the high cable losses.

Replacing passive energy distribution by intelligent networks is the key to processes characterized by higher energy efficiency. HARTING has created the concept for smart Power Networks to achieve these aims and objectives.

Smart Infrastructures imply the efficient and economical use of resources in connection with high operational safety and reliability. This represents a tremendous leap forward. With Smart Network Infrastructure HARTING is providing a sound foundation. ■

Smart Network Infrastructure

High levels of cost reduction and increased efficiency can only be achieved with intelligent networks. Both objectives can be attained through the intelligent management of data, signals and power in the logistics, production, food and energy supply and individual traffic sectors: lower costs and higher efficiency. The HARTING Technology Group has developed a powerful concept in the shape of Smart Network Infrastructure.

» *Dr. Michael Groß, Managing Director* ICPN / RFID, *Germany,* HARTING *Technology Group, Michael.Gross@*HARTING*.com*

Advanced network concepts now draw on a considerable number of technology solutions: high-speed sensor technology, RFID, intelligent switches for data traffic control, smart analysis, visualization software and powerful network components are key technologies with intelligent linking.

The efficiency gains achieved with these new concepts improves the energy balance sheet, makes for more economic use of natural resources and helps to reduce greenhouse gas emissions.

DATA NETWORK ARCHITECTURE

We live in an information age: machines are now intelligent, processes globalized, and communications resources surround us everywhere. Information technology has generated an immeasurable volume of data and information via countless applications and structures and has made it accessible, but what has really changed? Are we really any smarter? Do we make better decisions? Do we apply the right information in our decision-making?

Unfortunately, not often enough: decisions are based on gut feeling and experience, even though the right information for our decisions is available somewhere in the depths of the networks. Decisions are now only made quicker than before, but the quality of these decisions has hardly changed. What we need now is transparency and universal availability of the appropriate data. We lack the concepts and structures for making the right data and information fully available at the appropriate times.

FREEING THE NETWORKS

Until now, Network Infrastructure has merely been seen as a simple connection between intelligent devices. Traditionally closed network architectures have been increasingly opened up through interfaces and gateways. But these concepts no longer meet expectations for ubiquitous data and information access.

This is now changing; in modern concepts such as cloud computing, The Internet of Things and ubiquitous computing, the role of Network Infrastructure is evolving increasingly towards being an independent active element, actively supporting and advancing processes. System cabinets are disappearing, and the demand for unrestricted access to system resources and data makes the usual separation between the various network domains seem like an anachronism: globalization is promoting new system concepts.

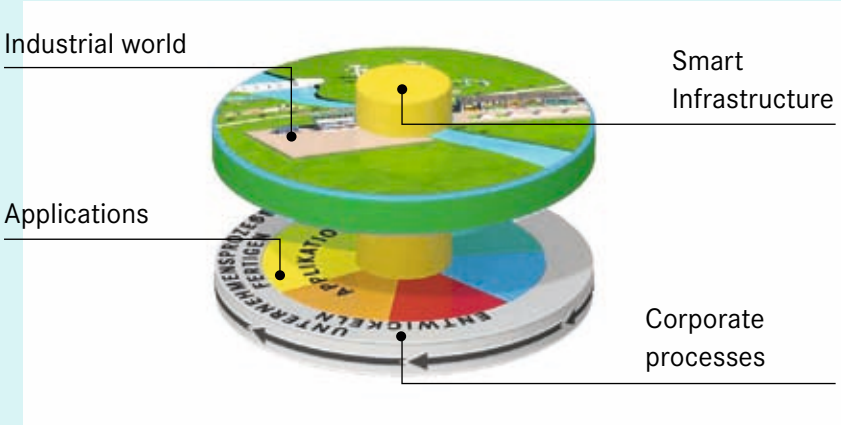
It is already clear to us now that timely access to all the appropriate information delivers a leading edge over competitors, and companies that are capable of using information in the right way operate more efficiently and make a greater number of correct decisions.

The Smart Network Infrastructure concept developed by the HARTING Technology Group frees up data and signal networks through the pure configuration and combination of passive components into a function-critical core element of modern process chains. Local and regional infrastructures are becoming a core component of our environment, increasingly independent of users. This makes parallel use of the same infrastructure by a range of different applications with varying service quality requirements a possibility.

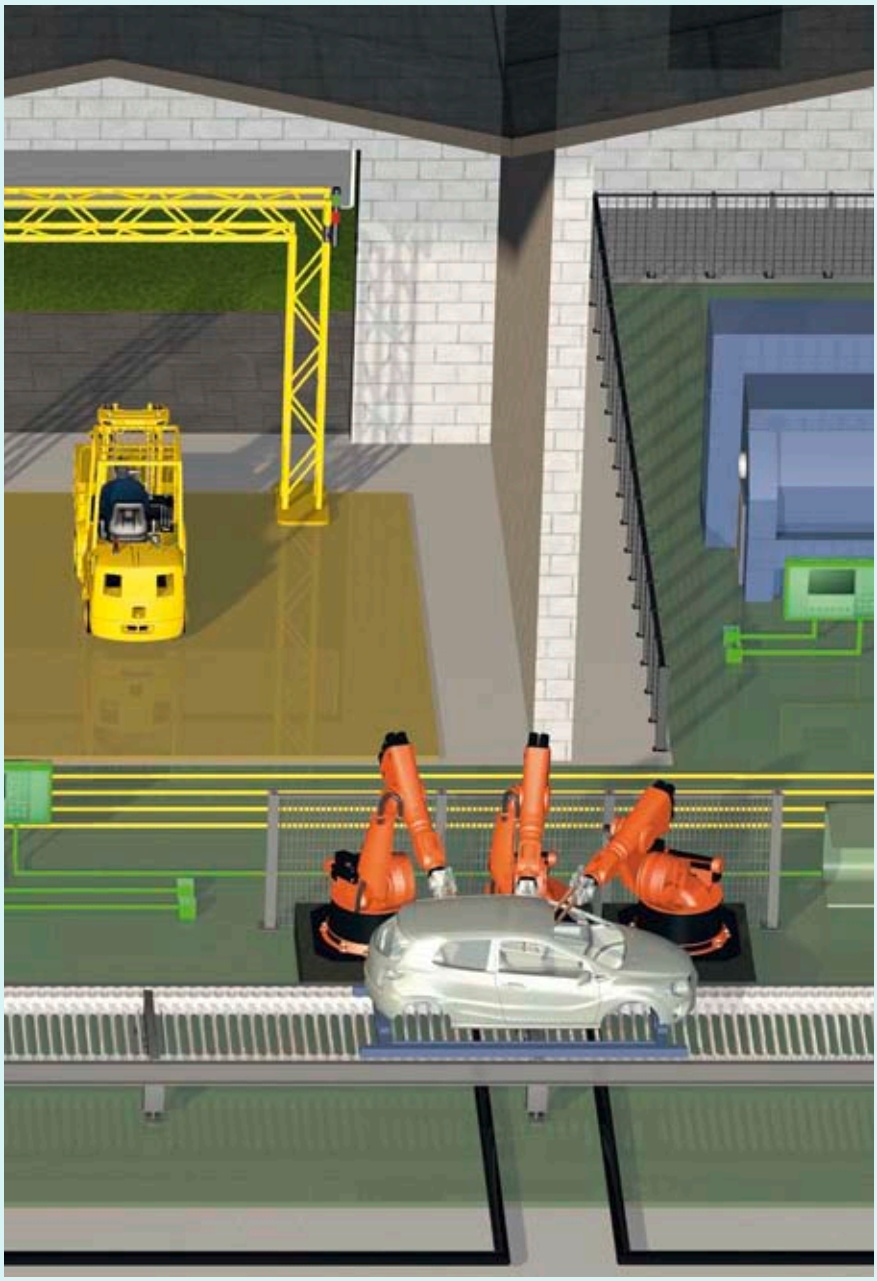
> **"High levels of cost reduction and increased efficiency can only be achieved through intelligent networks."**

SYNCHRONIZATION OF VIRTUAL AND REAL PROCESSES

For example, wireless or wired sensors for Auto ID technologies such as RFID and image recording sites can identify the data and signals of many objects and process them in real-time –



The Smart Network Infrastructure connects the real with the virtual world (HARTING Electric GmbH & Co KG, 2011).



vehicles, people, supply lines etc, are a few examples.

Status information is accessed independently of how it is subsequently used and made available in the Network Infrastructure in a standardized exchange format. As data is made available independently of any real purpose and as a service for potential processing entities, new procedures for preparation, filtering and transport within the Network Infrastructure need to be established. Such middleware, which has already been used in RFID technology, has now acquired core importance for network infrastructure performance levels.

Continuously upgraded software solutions within the Network Infrastructure evaluate the constantly growing flow of data almost simultaneously and make the results available as services to users, either unchanged (event data) or pre-processed (complex event data). Monitoring and management platforms generate and convey function-specific data of the appropriate quality, compiling it as business events and delivering it in analyzable form for super-ordinate control functions. Applications relying on real-time event processing, complex event processing (CEP), pattern recognition and rule-based dynamic control functions are now becoming part and parcel of this Smart Network Infrastructure.

UBIQUITOUS NETWORK INFRASTRUCTURE ACCESS

Due to the demand for ubiquitous information access via roaming devices such as smart phones, tablet PCs and notebooks, it is becoming less clear where, when, how and which data will be required. Such ubiquitous data access is now part of our world and is no longer attributable to specific applications or defined processes, as it was in the time of proprietary data networks. This means that the Smart Network Infrastructure now takes on new features, making it different from previous data and signal transmission architecture:

The demand for real-time Ethernet (deterministic data transmission) can no longer be restricted to individual cells and proprietary data islands and control units, but must be met via ubiquitous application-specific solutions.

> "The HARTING Technology Group has developed a powerful concept in the form of Smart Network Infrastructure."

REAL-WORLD ANALOGY

An analogy from the real world can help to explain this concept: the road network runs on a wide range of bandwidths, extension stages and management resources (lights, traffic signs and charges). It is used by many different people at different speeds and times, which can all be captured as statistics, but not predicted in detail.

The Smart Network Infrastructure is similar to street traffic, where lights are switched to green or a flashing blue light gives priority access. Infrastructure costs apply and peak utilization periods alternate with periods of lower usage. Prioritized data packets from surveillance sensors have to be able to work in real time to capture slow mass data from a download. In addition to this, they have to meet requirements for varying performance levels and architectures via wireless, power line, copper and fiber optic cables. Bandwidth congestion also has to be bypassed through dynamic routing and, last but not least, it must be possible to generate traceable user-specific billing. Dynamic rule-based data and signal transport within a Smart Network Infrastructure now ranks as a key technology for modern communications.

Where followed through consistently, this model can be used for the three process lifelines: Data, Signal and Power. With the new energy concepts, power is now seen as a managed resource and no longer as an endlessly available basic entity attributable to no specific process, it now needs to be incorporated into process management.

Technologies such as RFID, Fast Track Switching (FTS) and Switched Ethernet over Power (SEoP) are helping to create these integrated Smart Network Infrastructure of the future. The harmonization and synchronization of the virtual process view with the real world is therefore moving a big step nearer. ■

BENEFITS

- Smart Devices: active components within the Network Infrastructure, which are able to regulate and control the generation and transport of data, signals and energy through internal process power based on autonomous logic. Examples of this are: manageable switches, manageable WLAN access points, RFID readers and smartphones.
- Smart Objects: passive components, which have their own identity via a unique tag and changeable memory therefore being able to communicate with active components. Examples of this are: containers fitted with transponders and passive R/W transponders.
- Smart Applications: software that can recognize Data, Signal and Power streams, then communicating with infrastructure components following rules in order to carry out the appropriate functions.

Accessing new worlds

A new standard and new shielding solutions are opening up the Gigabit world for the M12 connector.

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

In the industrial context of Fast Ethernet technology, the M12 connector has cemented its undisputed importance - and rightfully so. Its ruggedness and versatile utility characterize the M12, which is, after all, used to transmit signals, data and power.

ADAPTATION TO THE GIGABIT RANGE

Now there is talk of adapting the M12 to requirements in the area of 1 to 10 gigabits by using 8-wire cables (8-wire Ethernet) with a different cable construction. The construction, which requires pair-wise shielding and an overall shield, is called a PIMF design (Pairs in Metal Foil).

NEW STANDARD

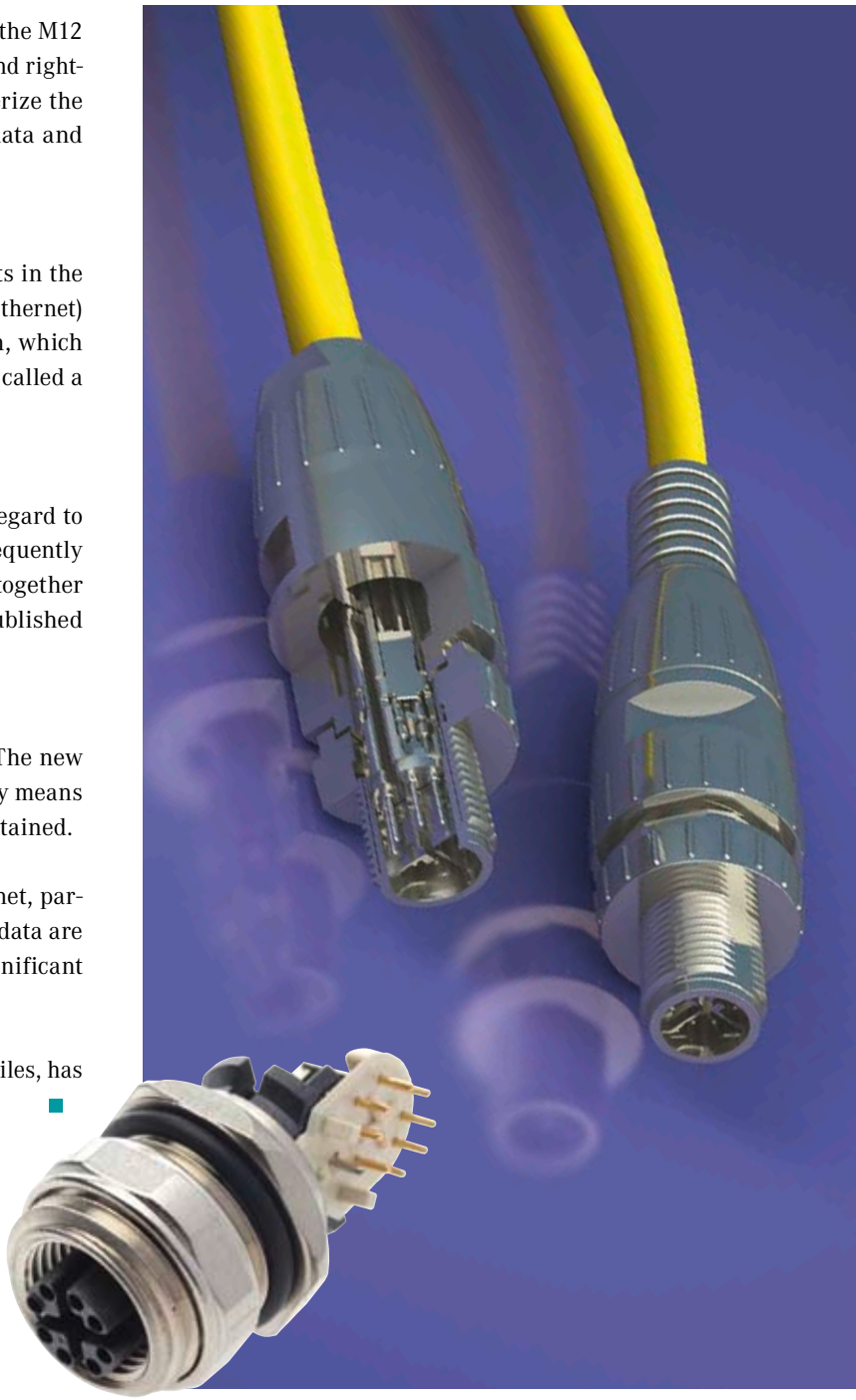
In order to satisfy the stringent requirements with regard to NEXT, FEXT, insertion loss and return loss and consequently comply with Cat. 6_A, HARTING is setting a standard together with established competitors. The latter has been published internationally as PAS 61076-2-109.

X-CODING

This is a new mating face, with so-called X-coding. The new design shields the individual pairs from one another by means of a shielding cross, while pair-by-pair shielding is retained.

The X-coding ensures the transition to Gigabit Ethernet, particularly for applications in which large quantities of data are transmitted or evaluated. The design is especially significant for the design of vision and monitoring systems.

PROFINET, one of the leading Ethernet automation profiles, has also already opted for type X. ■



Pushing Performance!

The packaging machine industry makes extremely high demands on networks. Top-level performance and availability must be secured on the highest possible levels. The HARTING Ha-VIS Fast Track Switch enables all this – also in open Ethernet communication scenarios.

» Anja Dienelt, Product Manager ICPN, Germany, HARTING Technology Group, Anja.Dienelt@HARTING.com

International machine building companies are increasingly making the change to Ethernet as a consistent, integrated communication platform for their machine and plant controlling solutions. In order to successfully deploy Ethernet in automation, the stringent demands of such applications must be met in terms of performance, flexibility, availability and determinism. Especially in markets in which a high cycle time plays a key role in determining the quality of the application, network performance is crucial.

> "The Fast Track guarantees the demanded transmission times of automation data and thereby secures availability."

An example from the industrial arena demonstrates the issues at hand: in an application in the market of packaging machines conventional standard Ethernet switches were initially used to network modular machines, as it appeared that the network speed in this segment was sufficient to adequately control and manage several drives, IOs and HMIs for visualization and operation. In order to achieve vertical and horizontal integration the machine modules were connected to devices of other modules via external switches as well as with the corporate network.

FROM THEORY TO PRACTICE

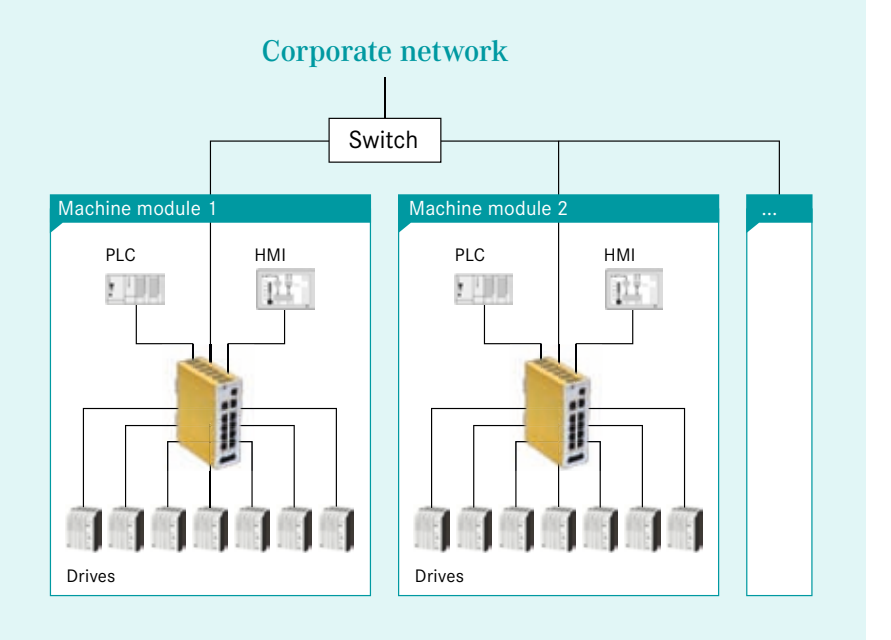
In actual practice, however, problems were encountered in spite of careful planning. The controller repeatedly reported network errors in irregular intervals, so that machines had to be halted and rebooted. Such errors are especially fatal when no obvious cause can be found, while high availability is absolutely essential. Operators of automation systems are naturally concerned with eliminating such errors.

HARTING'S SOLUTION

Following some considerable efforts the answer was found in the implementation of a HARTING Fast Track Switch (FTS) solution. The FTS registers the automation data and forwards the critical data in a high priority and accelerated mode – independent of the other network traffic, thereby ensuring that control signals are always received on time.

By way of defined fields in headers, the Fast Track Switch identifies an EtherNet/IP or PROFINET frame, for example. Instead of handling this data with the usual store and forward mode, the switch goes over to cut-through mode, which

translates as a considerable performance boost. In addition, automation frames can overtake non-automation frames if the latter should obstruct the course of high-priority data - on their way on the fast track. Thanks to this concept, Fast Track Switches deliver the high performance solutions the packaging industry demands. The Fast Track guarantees the demanded transmission times of automation data and thereby secures availability. ■



Smart Power

The intelligent utilization of energy is the key to the future of energy supply concepts and infrastructures. With smart Power Networks, HARTING has developed the next generation of Smart Network Infrastructure. As a result, Smart Grids for industry are becoming a reality.

» *Andreas Huhmann, Strategy Consultant Connectivity & Networks, Germany,* HARTING *Technology Group, Andreas.Huhmann@*HARTING*.com*
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The efficient management of energy is the foundation for the sustained success of industrial companies. Within the context of the new orientation of energy policies, the central role of energy in the production process has attracted stronger attention on the part of the general public. Reliable supply on the one hand, and responsible and cost conscious handling on the other, rank as key success factors of companies.

Today, energy issues are usually viewed from the one-sided perspective of energy procurement. Therefore, the reduction of primary energy consumption by energy controlling is the paramount objective. In this context, however, the actual company processes are often neglected. As a result, the focus must be placed on process-based energy saving options, as in such cases where energy is wasted during downtimes or intermissions, for example.

The sustainable utilization of energy also raises the question of the efficiency of the entire company processes, which can only be achieved by the introduction of new structures in the supply, distribution and consumption systems: the decentralization of energy supply that will prevail in modern energy policies needs an intelligent energy management, in which conventional system components make their contributions thanks to new functions. This trend will gain increasing momentum due to legislative regulations (e.g. based on the EN 16001/ ISO 50001) and energy cost pressure.

Whether we look at cost pressures or sustainability: saving energy and ensuring its efficient use – without restricting availability – remains the paramount task of energy management. Therefore, the steering of energy streams within a consumer network will rank as a vital issue.

SMART POWER NETWORKS

Consequently, the HARTING Technology Group has placed the key issues of smart grids within the context of industrial applications. With the introduction of smart Power Networks the company has developed an intelligent and flexible concept that brings a new quality to energy management in the industrial arena.

The foundation here is formed by network management, which thereby also entails the communication between the active network components and the HARTING smart Power Units.

Showcasing smart Power Networks at the Hannover Messe 2011

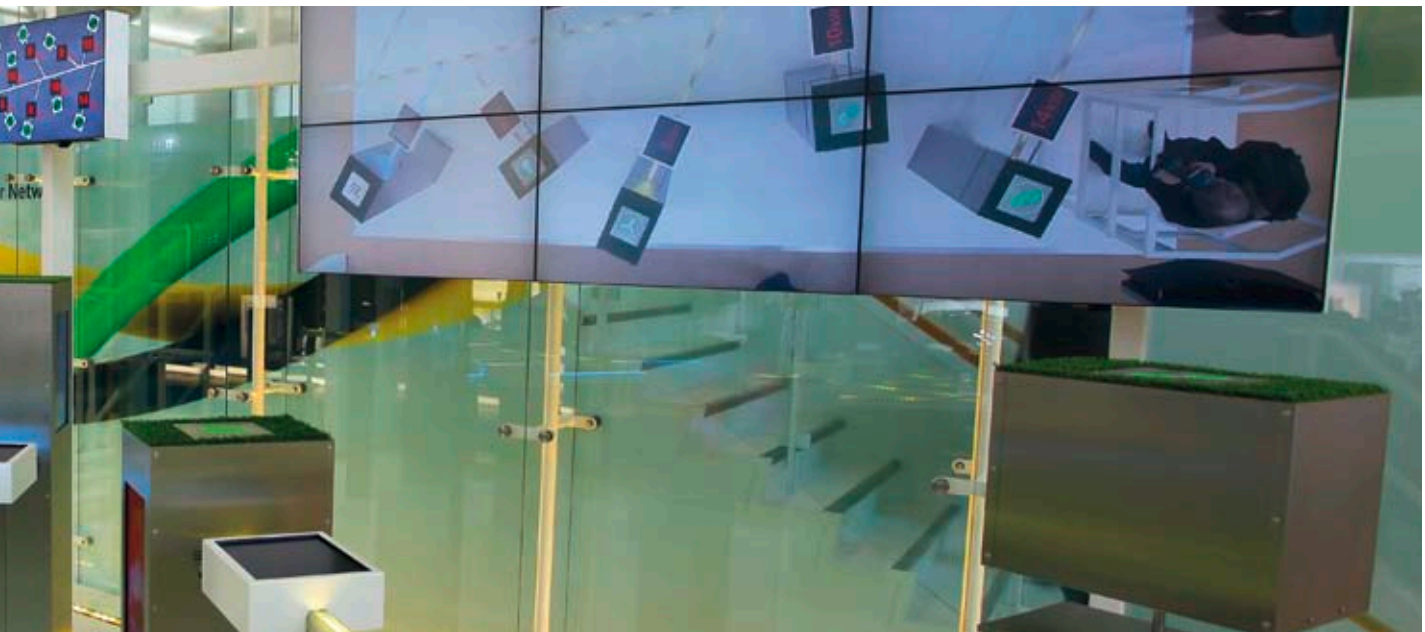
HARTING is pursuing two approaches here:

1. Power Networks: Integration of the power management into the network management

HARTING provides Ethernet switches that record measurement data on power consumption at any points throughout the power distribution network and transmit the data via Standard Ethernet. As the majority of plant and system segments, machines and automation cells are integrated into corporate wide networks today, there is no need for additional network nodes. The information gathered in the switches is made available to a wide range of different company applications. This includes automation, but also facility management systems, as well as MES and ERP systems.

2. smart Power Networks: Integration of communication into the power network

A separate communication structure does not allow any statements on the actual topology of energy distribution. This disadvantage can be eliminated by the combination of power transmission and communication in a single cable. By using SEoP (Switched Ethernet over Power), HARTING is relying on a Standard Ethernet solution. With the help of SEoP technology, the proven Ethernet management functions can be deployed. LLDP (Link Layer Discovery Protocol) allows the determination of the network topology. The knowledge of the topology helps to considerably simplify additional functions, such as diagnostics, for example. This allows users to concretely localize poor connection lines, or ascertain unduly high power consumption. It is also conceivable that the topology is switched actively in order to realize flexible infeed concepts, which will become necessary in connection with



considerably increased energy recovery from individual processes.

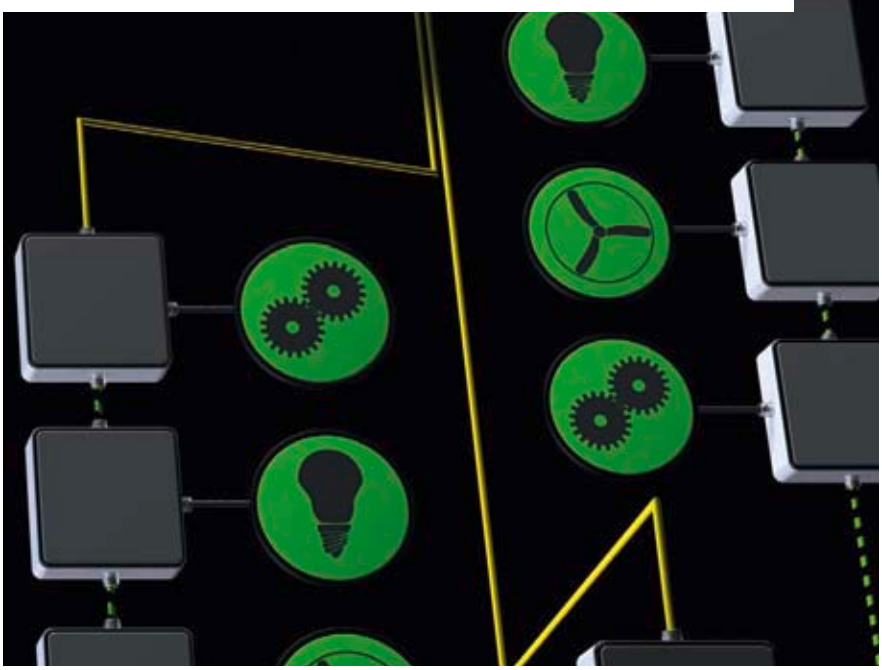
With both concepts HARTING is supporting intelligent distribution in the low voltage range up to 400 volt.

The ensuing effects are comprehensive; Thanks to the smart Power Networks concept, the flow of power throughout the company organization becomes transparent all the way through to individual machines, systems and plants. This opens up a number of different possibilities, such as the monitoring and the analysis of the consumption profile, which leads to the optimization of energy consumption. In this way, costs can be allocated directly to individual process steps. It also becomes possible to achieve an adjusted control of the energy flows of several processes via the company's control room.

TECHNICAL SOLUTIONS

Drawing on smart Power Networks, HARTING connects components that are based on the series of the mCon switches and feature additional energy functions. Measuring devices for other types of energy apart from electricity, for such as thermal energy, can be integrated. In addition, there is the coordinated controlling of the energy flow of several processes, in order to achieve the optimization of energy management of the entire system. The energy flow data is stored, processed and communicated. The aim is to support customers in their precise process analysis, which is the foundation of the optimization of energy utilization. The analysis of connected data enables the overall consideration of the energy flows and the control and steering of individual consumers.

> "Saving energy and ensuring its efficient use – without restricting availability – remains the paramount task of energy management."



The technological innovation consists of the convergence of modern Ethernet technology with interfaces to conventional energy consumption measuring and recording, which are designed for open extension options.

At the same time, HARTING is further developing SEoP (Switched Ethernet over Power) technology and will be integrating this technology and the resulting additional functions in a further series of products. In order to evaluate the new functions HARTING is engaging in cooperation activities with DFKI (Deutsches Forschungszentrum für Künstliche Intelligenz, German Research Center for Artificial Intelligence) and is testing smart Power Networks in the SmartFactory. The SmartFactory, a vision of the "Factory of the Future" is a manufacturer independent research and demonstration plant, that can be freely modified and extended. The modular structure of the SmartFactory fits in perfectly to the HARTING smart Power Networks concept.

In an initial step, each manufacturing module is fitted with a smart Power Unit. At the SPS/IPC/DRIVES 2011, trade fair taking place in Nuremberg from November 22 to 24, 2011, HARTING will be presenting the initial results.

HARTING regards smart Power Networks as a consistent logical step. Now that the Smart Network Infrastructure vision of efficient company processes has been implemented with the data lifeline, the concept is now transferred to the power lifeline. In this context, smart Power Networks forms a convergent platform for all applications. These approaches are essential if the efficiency of the overall company processes is to be boosted. ■

All-rounder

The performance capabilities of data network technology are constantly expanding. Consequently, network structures will have to cope with the constant emergence of ever new demands. In response to this situation, the HARTING Technology Group has created the perfect connection concept, namely Ha-VIS preLink®.

» *Rainer Schmidt, Head of Product Management ICPN Cabling, Germany,* HARTING *Technology Group, Rainer.Schmidt@*HARTING*.com*

Flexibility, future security, durability and reliability of connector technology are essential factors in the expansion of network structures. Therefore, HARTING has now launched a new connector concept. Cable connections and mating faces have been separated so that high performance data cables with a data throughput of up to 10 Gigabit Ethernet can be combined with different mating faces.

> **"The assembly is rapid, extremely process-safe and avoids installation errors."**

Add to this the rapid and simple assembly and handling: the termination block of the Ha-VIS preLink® is connected to the cable in a single operation. The assembly is rapid, extremely process-safe and avoids installation errors. This provides users with potentials to optimize assembly sequences, as pre-assembled cable lines can be used. Moreover, the use of cabling that is precisely tailored to the installation location delivers materials savings and facilitates the transportation of parts and components.

The manufacturers of prefabricated building elements are well aware of such advantages: thanks to the very compact dimensions of HARTING Ha-VIS preLink®, pre-assembled cabling can be pulled through standard empty conduits. Data outlets can be connected reliably within a matter of seconds – without the need for specially trained experts.

The Ha-VIS preLink® system is also deployed throughout the entire HARTING Ethernet product portfolio. Serving these applications, HARTING has created a new industrial connecting block dubbed HIFF (HARTING Industrie Form Faktor). The miniaturized HIFF terminal block is suitable for industrial applications and enables the universal utilization of Ha-VIS preLink® in PushPull, Han® 3 A as well as in the Han-Modular® System. ■

Circuit board heroes

Miniaturization, flexibilization and increased performance for data transfer present a complex challenge for connectors on circuit boards. The HARTING Technology Group meets these requirements with its *har*-flex® connector product portfolio, and new designs have now been added to the range.

» *Michael Seele, Global Product Manager, Germany,* HARTING *Technology Group, Michael.Seele@*HARTING*.com*
Dr. Alexander Rost, Managing Director HARTING *Electronics, Germany,* HARTING *Technology Group, Alexander.Rost@*HARTING*.com*

Technology trends in industrial and consumer sectors are immensely diverse. Miniaturization is a central factor: smaller and smaller chips with higher levels of performance make it possible to produce increasingly compact device designs. The usual configurations can be dispensed in the meantime, which means that circuit boards are not only getting smaller, but the rigid layout is disappearing, too.

INCREASED COMPLEXITY

In spite of the different ways and sectors they are used, modern industrial devices are often designed into the same housings to save costs. Functional differentiation is achieved through the structure and composition of the devices themselves. Built-in components, mainly in the connection technology sector, therefore need to be even more flexible – so they can be inserted without changing the interfaces in any fundamental way. Modularization and user-friendly components mean that a great number of variants of the same device are now possible.

HARTING *har*-flex® Mezzanine connectors, available in both straight and angled variants offering a modular design of the device, are being used for an increasing number of applications. The *har*-flex® variant for ribbon cables makes it possible to create a wide range of board layouts in the device. Developers even have the freedom to produce new housing designs, as the previous layout and its rigid right angles no longer apply. All *har*-flex® connectors can be freely combined and adapted to the housing.

For example, *har*-flex® connectors are perfect for all devices fitted with a man-machine interface. Depending on the configuration, displays and buttons must be flexibly combined with the board. This is enabled by the *har*-flex® connector with ribbon cable junction for Insulation Displacement Connection technology.

Connectors need to provide compatible and consistent solutions, irrespective of whether they are used for board-to-board or cable-to-board applications.

PERFORMANCE FIREWORKS

Today's devices and machines need to be extremely effective and powerful. Major systems and networks are being increasingly equipped with backup structures and controls. Machine status has to be analyzed on site and controls need to be directly accessible. On-site response times are speeding up, and not just in terms of staff users. Automated control mechanisms such as camera inspection are increasingly accessing processes independently on a continuous basis – in real time if possible.

In view of this situation, components and machines need to be equipped with increasingly intelligent and rapid control elements. Data transfer rates within the device need to be as fast as those for the external receiver, especially due to the demands of image processing. Central control systems must be supplied with sufficient levels of data and information.

Data and information consistency plays a central role in an increasingly automated and Ethernet dependent world. *har*-flex® connectors meet the requirements for the latest transfer protocols such as Gigabit Ethernet and PCI Express. Data transfer rates of up to 3.125 Gbit are easily achievable. *har*-flex® connectors can be fitted in both switch cabinets and mobile devices.

It is now merely a minimum requirement for the overall system to stand up to harsh industrial environments. Miniaturization is not enough on its own, and load capacity must also be high, as end users will not tolerate restrictions to performance or availability. Impact, vibration, dust and water are not allowed to have any influence on operational reliability – which obviously has significant repercussions on the device, machine


HARTING
HARTING
HARTING
HARTING

Picture by courtesy of Bernecker + Rainer Industrie Elektronik Ges.m.b.H.

and components. The rugged, compact design of *har*-flex® ensures reliable operation, also under most adverse conditions. It combines service capability of the latest computers with the durability of industrial devices.

Systems also need to be extremely user-friendly and easy to maintain. Devices and machines are configured in a modular fashion and it must be possible to replace components quickly and easily, with minimum input in terms of time and staff. Any errors must be identified accurately as soon as they arise, reducing stoppages and downtime. Connectors such as *har*-flex® provide this level of flexibility for devices.

The decentralized structure of modern facilities brings enormous benefits right from the design stage, and these also have a positive effect on costs: machines no longer have to be incorporated in the overall system for functionality testing. System and function capability can be ensured on a stand-alone basis.

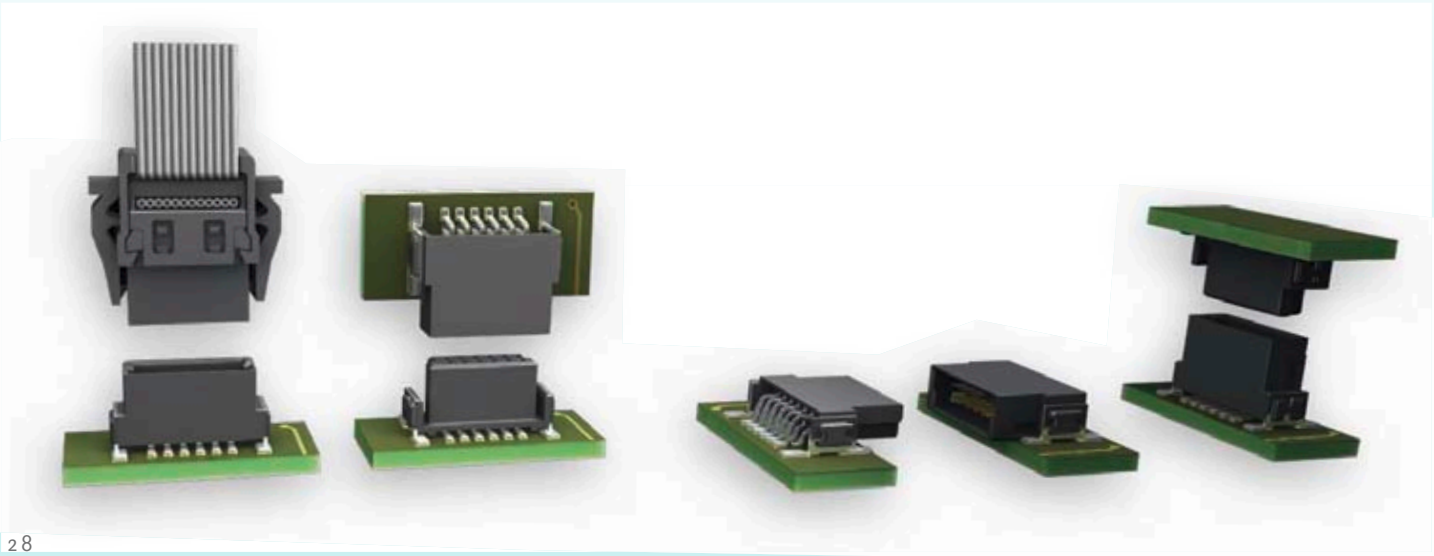
SMART FELLOWS

This requirement is also met by increasing decentralization in industrial automation and larger production machines. Larger components and machines are fitted with decentralized control elements that allow the activation of these components and machines directly on site and out in the field.

Machine status enquiries, logs and analysis of error reports and damage correction are all diverted to the individual components and machine. This reduces the load on networks and central controls.

Consequently, components and machines need to be equipped with ever more intelligent control elements without reducing the demands of the industrial environment. Data transfer rates also need to be stepped up at the same time in order to supply central controls with sufficient information and data they need for accurate facility and production control procedures.

The introduction of the new *har*-flex® product portfolio has attracted a great deal of attention on the international market. Especially users from the industrial automation technology sectors see significant benefits for their applications. *har*-flex® has already been designed in a number of new devices. ■



Simple. Successful.

First introduced in 2004, HARTING's PushPull connectors have sold in their millions. The user-friendly design has proved extremely successful and is constantly being adapted for new applications. Flexibility, robustness and high serviceability are the keys to the success of the PushPull concept.

» *Matthias Fritsche, Global Product Manager, Germany,* HARTING *Technology Group, Matthias.Fritsche@*HARTING*.com*
Lennart Koch, Global Product Manager, Germany, HARTING *Technology Group, Lennart.Koch@*HARTING*.com*

The PushPull connector has an intuitive design that provides a secure connection, giving access to the three essential lifelines of industry: Data, Signal and Power. This user-friendly connector can be plugged and released again quickly and easily. It plugs in securely, preventing any errors; you can see and feel it lock into position, and this is also confirmed by an acoustic signal (a clearly audible click). The inner circular locking mechanism ensures that it locks permanently into the device in a mechanically stable manner. PushPull can be universally tailored to specific customer requirements.

AMAZINGLY VERSATILE

PushPull connectors are available as a plastic or metal version to suit the required application. PushPull can be supplied with standard connector faces such as RJ45, USB, SCRJ or even power. The choice of available plug inserts ranges from 1/10 gigabit Ethernet signal and data to 690 V / 16 A power, therefore meeting all regular industrial application requirements.

USEABLE ANYWHERE

Thanks to their compact design, PushPull connectors are excellent for device connection applications. They are ideal for use with all types of industrial electronics devices, from sensors to controls and industrial processors, which are not kept in a control cabinet, but at a decentralized location out in the field or even in outdoor unprotected sites. This connector can be used in almost all markets, including plant automation, industrial devices, machinery, power and transportation. The technical requirement for the device interface is generated via the network and the integration mode is dictated by the design of the device that is to be connected to the PushPull product.

According to the guidelines of the PROFIBUS User Organization (PNO), Han® PushPull (variant 14 acc. to IEC 61 076-3-117) is the preferred connector for decentralized automation out in the field for electrical and optical data transmission and power supply. In addition to this organization, Automation Initiative of German Domestic Automobile manufacturers (AIDA) has also set the Han® PushPull connector as standard. This ensures that PROFINET-controlled automobile production plants are all configured the same way.

The HARTING PushPull (variant 4 acc. to IEC 61 076-3-106) connector is the only international standard connector for generic industrial building cable networks in protection class IP 65/67. It is also the smallest connector in the IP 67 high protection class that can be used with RJ45 and LC Duplex. ■

Easy

Bombardier is a leading player in the railway industry. In developing the TRAXX AC Lok product family further, Bombardier has implemented Han-Eco®, a long-term effective solution that reduces costs thanks to its simplicity.

» *Gero Degner, Product Manager, Germany,* HARTING *Technology Group, Gero.Degner@*HARTING*.com*
Andreas Mehringer, Global Account Manager Bombardier, Germany, HARTING *Technology Group, Andreas.Mehringer@*HARTING*.com*

An industrial innovation can only be described as sustainable if it is economically successful and can be used to continuously improve and develop customer products and processes.This is demonstrated by the collaboration between the HARTING Technology Group and Bombardier Transportation to develop the new generation of the successful TRAXX AC Lok product family.

One aim in the design of the new generation of alternate current locomotives was to standardize the components used, and minimize weight and therefore trim costs at the same time. Fundamental improvements had to be made in terms of Total Cost of Ownership.

BOMBARDIER'S NUMBER ONE PERFORMER

Over the last decade, Bombardier's top performer, the TRAXX AC locomotive, has become the cornerstone of an entire fleet of locomotives in view of a large number of identical parts and standard engine room design. It is manufactured in large numbers for Deutsche Bahn AG, but also other European rail operators, private railways and leasing companies.

The Last Mile Diesel is a new addition to this recently developed product generation, which now dispenses with the need to change locomotives for marshaling operations or stations with dual systems, where there is no continuous electrification in most cases.

The new design of electric interfaces in the locomotive engine room relies entirely on the benefits offered by the Han-Eco® connector series from HARTING.

Han-Eco® is at work at the modular interfaces of the medium-voltage cablingsystem,linkingventilators,pumps and other auxiliary units in the locomotive engine room. Major factors that swung the decision in favor of Han-Eco® were the reduced weight, the mechanical compatibility with the Han® B series in terms of integration parameters, the minimized number of individual components and greatly simplified assembly process, requiring no tools whatsoever.

Using Han-Eco® led to significant costs reductions, as it was possible to reduce design, warehousing and assembly costs.

FEATURES

HARTING Han-Eco® housings are made from fiber-glass reinforced high-performance plastic that is highly resistant to environmental conditions and mechanically robust. They are also lighter than comparable metal housings.

The material also meets strict fire protection requirements such as V0 classification to UL 94 and F2 / I3 to NFF 16 101. The range consists of four design sizes – 6B, 10B, 16B and 24B – and will systematically include base housings and protective covers by the end of the year. ■

> “With Han-Eco®, HARTING developed a long-term effective solution that reduces costs thanks to its simplicity.”

Hot and cold

The quality of molded parts produced in the injection molding process is greatly determined by tooling temperature control. Precision is an essential factor in the manufacturing process, and depends on the reliable connection of components via flexible connector interfaces such as Han-*Yellock*®.

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

MOLDED PARTS PRODUCTION

Temperature control is an important factor in injection molding, and can be used to control the look and exact dimensions of molded parts. Controlled heating of the tool improves flow characteristics and protects the plastic materials from thermal damage. The used interface is an extremely important part of the temperature control device and the injection-molding machine.

THE HAN-*YELLOCK*® INTERFACE

Optimized temperature control requires a combination of signal and bus technology, temperature sensors and power transfer. This makes it possible to control valves, heat up convector fluid and generate a range of temperatures. Han-*Yellock*® combines all of these different requirements in a modular housing.

Han E® and Han CC® Protected Modules are used for power transfer. Ratings of 40 A and 830 V provide sufficient reserves for efficient convector fluid use. Temperatures are recorded by sensors with iron constantan wiring. This combination of materials must also be used inside the connector, which is easily possible with Han E® DIN IEC 584 type J pins. Using a Han DD® module ensures signal transfer between machine and temperature control device.

The individual modules can be assembled without the use of tools and inserted easily into an adapter frame, forming a modular insulator block.

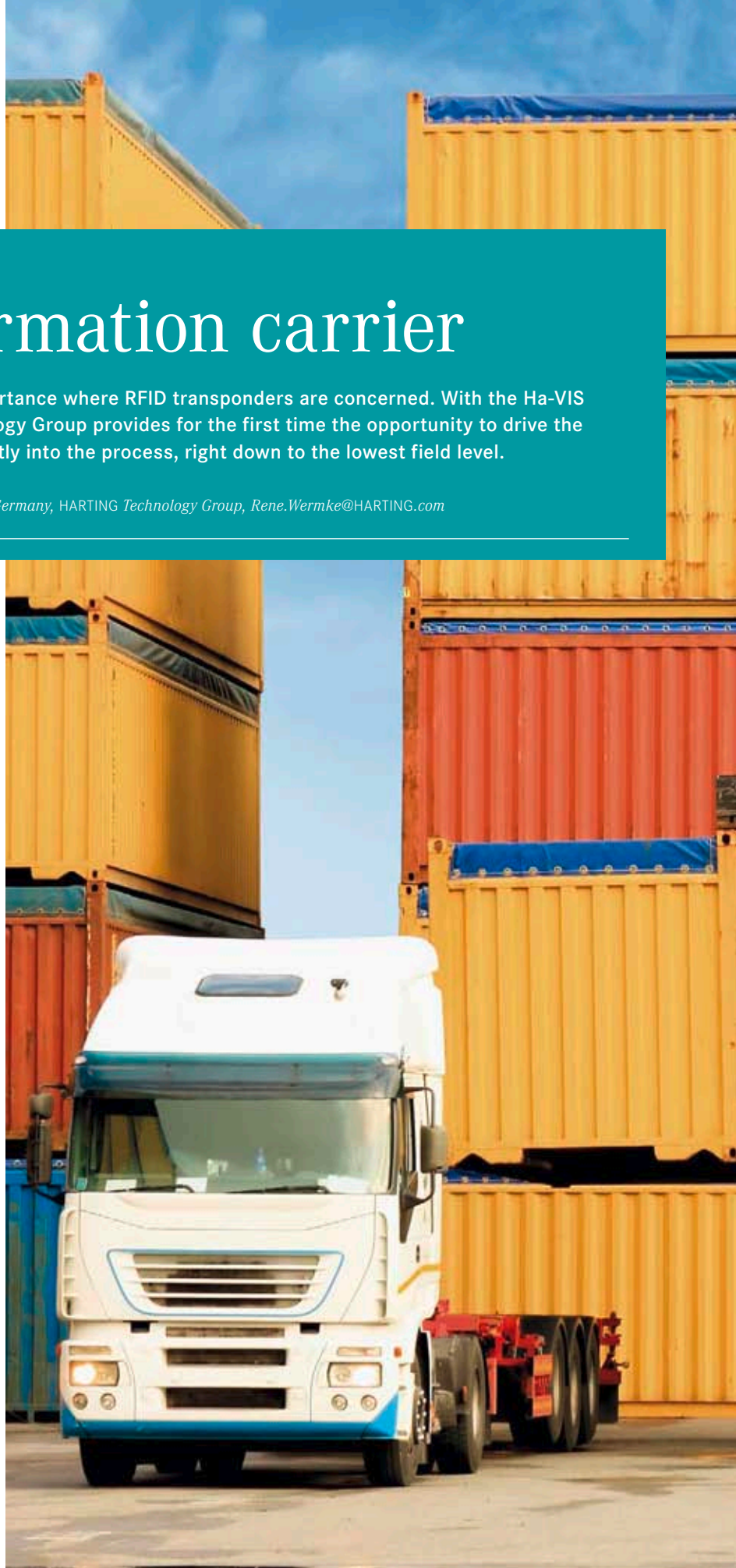
SYSTEMS CONNECTION

The production of modern molded parts demands a perfect interplay between different individual machines. These systems are made to be modular and flexible because of the requirement for frequent tooling changes. This concept has been taken up in connection technology.

Modern connector systems, such as Han-*Yellock*®, link similarly to modular machine components via individual modules, giving a wide range of electrical options. The aim is to reduce the overall number of interfaces down to a single connector. Fast release and connection for reconfiguring temperature control devices and protection against faulty connection reduces the potential for error when bringing machines on line, thus increasing process stability. ■

INFO

Temperature control devices bring the connected appliance to the desired temperature via a convector fluid and keep it constant. Examples of devices are die-casting molds, plastic injection molds and rubber injection molds.



Robust information carrier

Secure information flow is of prime importance where RFID transponders are concerned. With the Ha-VIS RFID transponders, the HARTING Technology Group provides for the first time the opportunity to drive the information chain directly and permanently into the process, right down to the lowest field level.

» *René Wermke, Product Manager RFID Transponder, Germany,* HARTING *Technology Group, Rene.Wermke@*HARTING*.com*

Accurate automation control, process transparency, reduced down time and costs are the central focus of all efforts to deliver RFID technology with the greatest reliability. The HARTING Technology Group has achieved a major step forward in this respect with the Ha-VIS RFID transponder.

In their function as "permanent transponders", HARTING Ha-VIS RFID transponders have an extremely long operating life. As "hard tags", they are also made for use on metal in the harshest environmental conditions. Moreover, Ha-VIS RFID transponders come under scrutiny at the end of production, which, in addition to quality control, also offers the opportunity to measure read range and load customer-specific data.

RFID TAKES OFF

A collaboration with the aviation industry takes center stage in this development: Originally, the Ha-VIS VT 86 transponder was designed specifically for the aviation industry, operating over

long periods to cover the maintenance procedures and logistics processes encountered in air travel. One key requirement: the transponder needs to be readable throughout the world.

On this basis, the HARTING Technology Group developed a RFID transponder which is not only suitable for aviation but which will also be successful in the transportation, machinery/automation and energy markets. Design, size, performance and resistance to extreme environmental conditions exceed all previous market standards.

Furthermore, a flexible assembly concept has been developed. In addition, it is possible to stick the transponder to a surface. For industrial applications, it allows flexible and versatile mounting options, as locations, substrate profiles and materials can vary immensely depending on the application. All kinds of fixing options are possible, such as integration in specification plates, screwing, gluing or riveting.

PROSPECTS

In the future transponder functionalities are set to increase considerably. Chip manufacturers are not just working on high-capacity memory, but also creating new functional areas. This is paving the way between today's RFID technology and an autonomously operating transponder that receives sensor signals such as acceleration, light, temperature and humidity, saving it and transferring it to a super-ordinate process. The possibilities are endless. From monitoring a cold chain of perishable food to measuring vibrations in constructions – all this is the future of RFID – and therefore the future of HARTING Technology Group RFID technology. ■

Applications of local subsidiaries

RU

A2075 SoNet ultrasound flaw detector

Han-Modular® and Han® R15 connectors at work in ultrasound flaw detectors

The Russian company Acoustic Control Systems relies on Han-Modular®, Han® R15 and DIN 41 612 type M and type H connectors in its control systems for contactless ultrasound flaw detectors. The detectors are used for searching for flaws on the surface or inside metal pipe walls, for example, to identify corrosion and de-lamination damage to oil and gas pipelines.

» *Andrey Kulaev, Market Manager Automation, Russia,*
HARTING *Technology Group, Andrey.Kulaev@*HARTING*.com*

US

Compact system for acoustic microscopes

A manufacturer of acoustic microscopy and micro-imaging systems, (AMI) Sonoscan Inc. had developed a new acoustic microscope and needed a power supply capable of generating an enormous number of different voltages. The Fastline™ P300™ C-SAM® requires signal and control cables and up to 120 different connections. The company started looking for a compact connector system to solve this problem – and found the Han-*Yellock*® 60 from HARTING to be the ideal solution. This also enabled the manufacturer to reduce the stock of replacement parts considerably and solve a number of other production problems. The locking button ensures that that the connector cannot be opened and the device can be activated safely.

» *Steve Elrick, Area Sales Manager, North America,*
HARTING *Technology Group, Steve.Elrick@*HARTING*.com*

CZ

HARTING Han® HC Modular 650 in forging equipment

Czech automation and robotizing supplier DEL a.s. from Žďár nad Sázavou has delivered the complete electrical control system for a hydraulic free form forging device. The system consists of a press, forging manipulator and crane, which acts as a guiding machine and is deployed in the forging process. A forging device with a direct current motor is attached to the crane. The required features of easy disengagement and removal were achieved with a drive control unit and removable connection using HARTING Han® HC Modular connectors.

» *Kamila Holečková, Customer Service, Czech Republic,*
HARTING *Technology Group, Kamila.Holeckova@*HARTING*.com*

CZ

Han-Modular® ECO for brush cutting machines

Dvořák – Svahové sekačky s.r.o., a leading Czech brush cutter manufacturer, has developed a new cutter for photovoltaic power plants. The cutter is capable of radio-controlled trimming grass under solar panels where there is little room for maneuver. Consequently, the Spider needed a light, user-friendly and compact connector. The new HARTING Han-Modular® ECO IP 65 with plastic housing and DDD module with 17 contacts proved the perfect solution for these demands.

» *Kamila Holečková, Customer Service, Czech Republic,*
HARTING *Technology Group, Kamila.Holeckova@*HARTING*.com*

US

Connectors for foil stamping machines

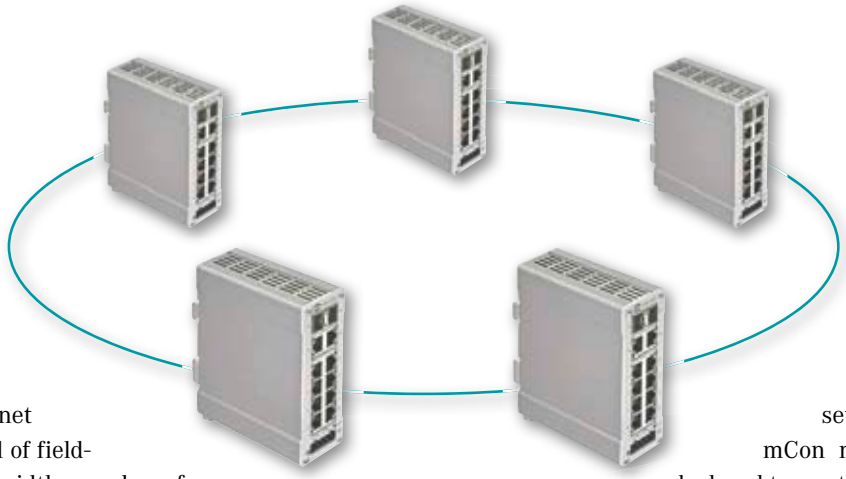
A good example of how modern connectors can help towards improving machine design is the upgrade of the DMS Inc. FR series foil-stamping machine. The modular construction of Han-*Yellock*®, enabling a number of applications for alternating and continuous current and control signals, meant that DMS could incorporate up to 16 different connections. This beneficial feature led to the decision to run the entire I/O control cable system via Han-*Yellock*®. This simplified press assembly and product change procedures, while updating the look of the machine at the same time. Errors and problems caused by cables winding around the machines can now also be avoided.

» *Steve Elrick, Area Sales Manager, North America,*
HARTING *Technology Group, Steve.Elrick@*HARTING*.com*

The intelligence is in the networks

Industrial standards for Ethernet demand high availability, reliably and excellent performance in applications and networks. Fielding a portfolio of managed switches, the HARTING Technology Group is offering ideal solutions for such scenarios. The unique user-friendly web configuration, that does not require the installation of additional Java applets, reflects the consistent customer orientation of HARTING.

» *Oliver Opl, Product Manager, Germany,* HARTING *Technology Group, Oliver.Opl@*HARTING*.com*



The networking and integration of industrial applications by Ethernet surpasses the potential of fieldbus systems: the bandwidth, number of ports and therefore the available services and possibilities are many times higher by comparison with fieldbus environments. Moreover, Ethernet offers a uniform communication standard and impresses with its convenient, cost efficient and application neutral usability.

Failsafe performance, intelligent data transfer, comprehensive control, steering functions and detailed diagnostics have long been standard in office communication and are now entering the industrial arena thanks to the Ha-VIS mCon switches. In most applications it is absolutely essential to have an overview of all network activities and operations at all times. In order to enable smooth, trouble free data transmission, events in general and errors in particular must be signaled in a precise manner, in order to take adequate measures with immediate effect. The failure of a communication path, for example, should be indicated and repaired as quickly as possible. The intelligent managed mCon switches provide the option of signaling such events by e-mail or via SNMP-traps to a remote monitoring station. Rapid rectification of faults prevents extended and costly downtimes.

ALWAYS READY FOR ACTION

In order to ensure the availability of the network, rapid and precise error detection enabling rapid intervention will not suffice. In addition, the network must be redundant in design. In the case of a link error the network will be immediately available again, without service action being necessary. The Ha-VIS mCon by the HARTING Technology Group ensures precisely this redundancy.

Users can adjust all of the necessary settings of the Ha-VIS mCon management software deployed to meet their specific demands at all times. The configuration and management of mCon switches are simple, and access is possible by way of various input options – via SNMP-tool, network management software or very conveniently by way of the web interface. The multi-function push-button in the new mCon series represents a very convenient and unique option for commissioning and service support, enabling certain basic settings to be made without additional tools.

> **"The high demands made on reliability and security mean that managed Ethernet switches will have to increasingly gain performance and will also become more and more complex."**

In this way, the intelligence of industrial applications is shifting more and more towards decentral components, and the majority to intelligent infrastructure components such as Ethernet switches. The high demands made on reliability and security mean that managed Ethernet switches will have to increasingly gain performance and will also become more and more complex. The Smart Network Infrastructure (SNI) fielded by the HARTING Technology Group meets these demands, and what is more, they will be exceeded in future by further reaching, intelligent infrastructure solutions. ■

Trust creates connections

People – Power – Partnership: HARTING is the first German company to have successfully passed the audit according to the core topics of ISO 26000, based on the Austrian ONR 192500 regulations, as well as the Spanish RS 10 specifications. With this recent step the company is underlining its commitment to responsible action according to the principles of economy, ecology and society.

» *Gisela Eickhoff, Personal Assistant of Dietmar Harting President/Partner, Germany,* HARTING *Technology Group, Gisela.Eickhoff@*HARTING*.com*

In view of finite natural resources and the entitlement of future generations to a healthy environment worth living in, responsible action and conduct is accorded high priority in society today. End consumers as well as industrial customers are increasingly questioning on what basis products are manufactured and what their associated impact and implications are. Responsible and values oriented action is expected of companies today. In its corporate vision the HARTING Technology Group makes a firm commitment to acting sustainably and creating values for people.

The acceptance of responsibility for society and the resulting ways of acting that consider consequences extending beyond individual generations do not represent new guidelines of conduct. Indeed, this was already one of the core elements of Social Market Economy. Its founder, Ludwig Erhard, the first Minister of the Economy of the Federal Republic of Germany, defined the obligation of market economy to also adhere to social

> "Transparency and credibility"

goals. In his words, the economy should "be advantageous and highly beneficial to mankind" (Ludwig Erhard: Wohlstand für alle (Affluence for All), 1957).

The HARTING Technology Group assumes responsibility for society in many different ways: in-house, the participation of employees in company success by way of target and goal agreements is notable. Moreover, the company supports and promotes science through the establishment of endowed chairs as well as many different types of engagement in the East Westphalia-Lippe region – to cite just a few of the respective activities.

MANAGEMENT SYSTEMS WITH A TRADITION

Within the company, sustainability aspects and responsible action also take top priority: especially the consistent orientation of quality, environmental protection and occupational health and safety to international standards makes important contributions. Here, HARTING looks back on a long tradition: the main plant has been certified to ISO 9001 since 1990. In 1995 – one year after the Article 20a concerning the protection of the environment was added to Germany's constitution – the first environmental audit was conducted. Based on this, the EMAS Certificate was obtained in 1996, as well as the ISO 14001 Certificate in 1997. In the occupational health and safety area HARTING meets the stipulations of OHSAS 18001. HARTING is consistently pursuing this course with the certification of social responsibility – according to the core topics of ISO 26000 based on ONR 192500 as well as RS 10. The HARTING companies in Germany that are active in the Connectivity & Networks areas have now obtained this certification.

ISO 26000 AS FOUNDATION

With this step HARTING has deliberately taken the demands of an international standard on board in order to offer all participants – customers, manufacturers, suppliers and other stakeholders – greater transparency and build up even stronger credibility with regard to the company's entrepreneurial action. ■

THE BASIC PRINCIPLES OF ISO 26000:

1. Accountability
2. Transparency
3. Ethical conduct
4. Respect of stakeholder interests
5. Respect of the rule of law
6. Respect of international standards of conduct
7. Respect of human rights

THE CORE TOPICS OF ISO 26000 ARE:

1. Organization management
2. Human rights
3. Labor practices
4. Environment
5. Fair company and business practices
6. Consumer concerns
7. Integration and development of the community

Guidance on social responsibility, ISO 26000: 2010 (E)

Han-*Yellock*® awarded by US magazine

Han-*Yellock*®, the HARTING connector featuring a totally new design, was recently distinguished with the "Product of the year" accolade by the American "Electronic Products Magazine". It's first award from overseas impressively documents the product's international success.

HARTING RFID tag grabs the "Golden Mousetrap Award"

The US magazine "Design News" has singled out HARTING's UHF RFID for the "Golden Mousetrap Award" for technological innovation and creativity in product design. HARTING developed the RFID transponder together with the project partners Lufthansa Technik Logistik, Lufthansa Systems and the Center for Intelligent Objects at the Fraunhofer Institute for Integrated Circuits (IIS). The innovative material involved was one of the key features that positioned the product among the winners.

HARTING is a climate protection company

At the HARTING Technology Group environmental protection is an integral part of the company culture lived in day to day operations and activities. In acknowledgement of the company's strong commitment, HARTING has now been admitted to the official group of "climate protection companies". Thanks to their outstanding innovative strengths, the members play a key role in climate protection and energy efficiency. In this way they are not only improving their competitive position, but also demonstrating responsibility for the foundations of life of future generations.

KLIMASCHUTZ UNTERNEHMEN
DIE KLIMASCHUTZ- UND ENERGIE-EFFIZIENZGRUPPE DER DEUTSCHEN WIRTSCHAFT

We are always available to answer your questions

Do you have any questions, wishes or suggestions?
We are always pleased to hear from you: presse@HARTING.com

HARTING Trade Show Calendar

Nov 22 - Nov 24, 2011	Germany, Nuremberg, SPS/IPC/DRIVES 2011
Dec 6 - Dec 7, 2011	France, Nantes, IMA
Dec 6 - Dec 8, 2011	Russia, Ekaterinburg, PTA-Ural
Jan 18 - Jan 20, 2012	Japan, Tokyo, InterNepcon
Feb 7 - Feb 9, 2012	United Arab Emirates, Dubai, Middle East Electricity Exhibition
Feb 13 - Feb 16, 2012	North America, Anaheim, CA, MD&M West
Feb 15 - Feb 16, 2012	Great Britain, Farnborough, Southern Manufacturing and Electronics 2012
Mar 07 - Mar 09, 2012	China, Guangzhou, SPS - Industrial Automation Fair Guangzhou 2012
Mar 13 - Mar 16, 2012	Korea, Seoul, aimex
Mar 20 - Mar 23, 2012	Czech Republic, Brno, AMPER 2012
Mar 21 - Mar 23, 2012	India, New Delhi, Convergence
Mar 27 - Mar 29, 2012	Italy, Torino, Expoferroviaria
Mar 29 - Apr 1, 2012	Turkey, Istanbul, WIN World of Industry Part 2
Apr 15 - Apr 20, 2012	Germany, Frankfurt, Light+Building 2012
Apr 23 - Apr 27, 2012	Germany, Hanover, Hannover Messe 2012

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Pushing Performance

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