AS-INTERFACE
MASTER
NEWS

THE BIHL+WIEDEMANN MAGAZINE

INTERVIEW
New ASi-5 Safety products open new fields of application

APPLICATION
"Easy ASi": Planning, configuration, operation and diagnostics made easy

ASi-5 AND ASi-3:

THE BEST MIX FOR MODERN DRIVE TECHNOLOGY

Bihl+Wiedemann

ASi-5 AND ASi-3:
THE BEST MIX FOR MODERN DRIVE TECHNOLOGY

Connection of all network participants with power and communication through one single, yellow profile cable; simple and reverse polarity protected wiring using piercing technology; no plugs or pre-assembled cables; no special connection technique; no special switches while also offering safety "on board" – no other wiring technology makes it possible to integrate both individual components and devices in large quantities into material handling systems so cost-effectively and efficiently. Storage and material flow technology, conveying and sorting equipment, shuttle pallet storage equipment, picking systems, stacker cranes and other crane technology – conveyor machinery, systems and equipment are inspiringly simple to connect with AS-Interface. Whereas the established and widely used ASi-3 standard scores points in the collection of digital I/O signals and implementing functional and passive safety technology, ASi-5 with its high transmission speed and great data bandwidth offers all the prerequisites for solving more complex applications in material flow systems. Added to this is a high degree of future-proof capability – thanks to the options for integrating intelligent sensors with IO-Link and for Industry 4.0 communication via OPC UA. Not to mention the fact that you can deploy ASi Safety at Work to also provide full integration of safety technology for personal protection in material handling systems up to SIL3 and PLe.
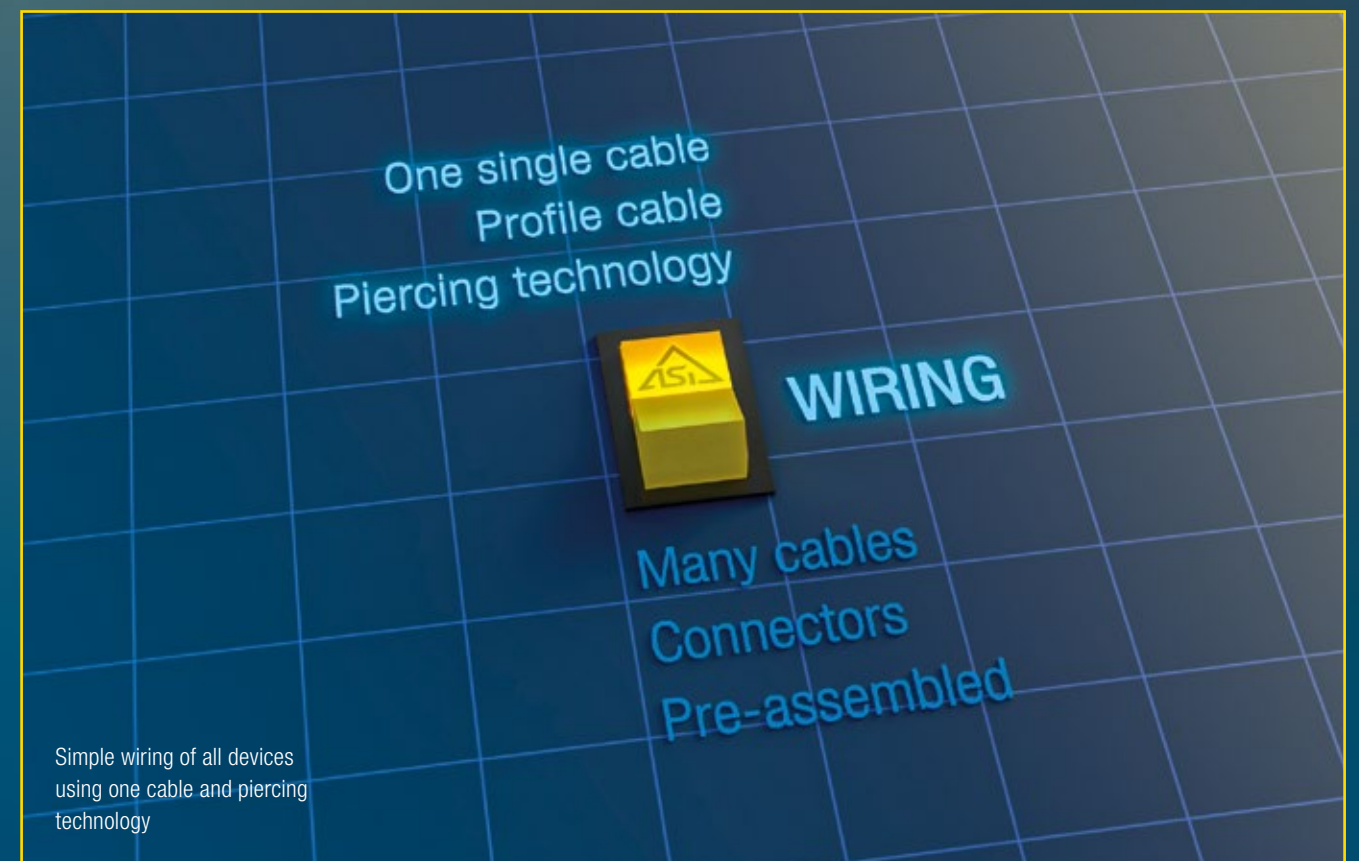
Open for all control concepts and communication requirements

As a complete ASi provider Bihl+Wiedemann offers a portfolio that opens up many vistas and flexibility for material handling. For one thing it takes into account the requirements of different drive concepts and manufacturers, and for another its fine granularity of the available modules and its compatibility with both ASi-3 and ASi-5 enables custom tailored solutions from the single binary signal from a light barrier to large, fast-transmission data quantities such as are generated by scanners, RFID readers or encoders.

The versatility of this portfolio from Bihl+Wiedemann can be seen for example in the electric drive technology as it is used in automated material flow systems. AC motors with frequency inverter from companies like Lenze, SEW-EURODRIVE or NORD DRIVESYSTEMS are the standard for drives in many conveying technology systems. In the simplest case they can be driven in binary fashion using ASi-3 components. Less complex functions like start/stop, left-right run or open/close can be implemented very economically with cost-effective modules – particularly as the pin configuration can be adapted to the respective drives, making plug-and-play solutions possible.

AC motors with frequency inverter where the controller has access to performance parameters – such as speed or acceleration and braking behavior – can today be efficiently controlled using ASi-5. The ASi-5

They are often several kilometers long – the automated material flow lines for modern material handling systems in logistic centers or in complex production environments. And always found there: all kinds of sensors, switches, measuring devices, scanners, drives, control panels and safety systems. Large stretches, many devices, both standard and safety signals as well as simple and complex tasks – ideally all within one single application. Just the environment for which the wiring technology AS-Interface has been created, with its combinable ASi-5 and ASi-3 solutions as the perfect mix for any requirement.

One single cable
Profile cable
Piercing technology

WIRING

Many cables
Connectors
Pre-assembled

Simple wiring of all devices using one cable and piercing technology

Motor Modules from Bihl+Wiedemann not only provide CANopen, RS485, Modbus TCP and IO-Link interfaces, they also offer compatibility with various fieldbus interfaces. Speeds or defined acceleration and delay profiles, so-called ramps, can be cyclically and steplessly activated and changed. For example it is possible to adjust the transport speed both to the object itself and to the conveying line to provide careful delaying and acceleration – say with objects having a high center of gravity at risk of tipping, or at the entry of a conveyed material and when it exits a curved section, a machine or a hoist. This form of serial control also offers the option of expanded diagnostics: the yellow ASi cable can be used to transmit information such as current power consumption and temperature along with detailed status messages from the frequency inverter to the ASi-5/ASi-3 fieldbus gateway and use the diagnostic data per OPC UA directly in Industry 4.0 applications like predictive maintenance. Another standard drive solution in material handling are roller drives powered by 24 VDC or 48 VDC. Once again: simple applications with start/stop, left-right drive or open/close can be efficiently and cost-effectively implemented

using the established ASi-3 solutions. For more complex applications the Bihl+Wiedemann portfolio includes special ASi-5 Motor Modules for motorized roller drives from companies like Interroll, Itoh Denki and RULMECA – but on request other manufacturers and drives can also be served using the appropriate ASi-5 solutions offered by the company. Common to all is that the modules control the motorized rollers directly – without the necessity of an additional controller – through ASi. Now each ASi module can fully power two

roller drives simultaneously and link them to the data communication channel. This control method also makes it possible to change speeds and ramps cyclically and steplessly. The ramps for delaying and acceleration of the line can also be stored individually for each drive as parameters. And finally, the ASi-5 Modules with integrated IO-Link Master from Bihl+Wiedemann enable devices such as intelligent actuators – i.e. smart drives with IO-Link – to be simply connected to the system controller via ASi-5. The fine-grained scalability of the

Future-proof design and safety – with ASi from Bihl+Wiedemann also for drive technology

connected modules with one, two, four and eight IO-Link master ports help to reduce costs – the user only needs to invest in the IO-Link ports he actually needs. This technical and economic efficiency is simply not possible in this form today using IO-Link fieldbus modules that are typically equipped with eight IO-Link master ports and an individual Ethernet interface.

Implementation of AS-Interface – success experiences guaranteed

As wiring technology, AS-Interface can fully exploit all its strengths when used in drive technology. The ASi-3 and ASi-5 portfolio from Bihl+Wiedemann combines the performance capability of fieldbus technologies with the advantages of an uncomplicated wiring process for field devices. Add to this the fact that Bihl+Wiedemann assists in many ways in the planning and commissioning of ASi installations, enabling even ASi newbies to enjoy fast results. The company's software suites with their integrated hardware catalog ensure not only simple and errorless project planning and commissioning of ASi networks, but also efficient addressing and

parameterization of the ASi modules in the field – among other things through the ability to copy module settings as often as desired. If multiple frequency inverters with the identical parameterization are used in a system, the values only need to be saved once and can then be copied to all the other devices. Also: in contrast to PROFINET, only one IP address and one webserver is required for all devices in order to control for example up to 124 frequency inverters or up to 248 roller drives. When it comes to addressing the devices in-place in a material handling application, the new ASi-5/ASi-3 Address Programming Device provides valuable services: it lets you assign bus device address fast and easily without requiring an actual bus structure to be in place. Another functionality within the software suite from Bihl+Wiedemann which many users appreciate is the online bus information. This lets you address devices simply from the PC, parameterize them live and monitor in- and outputs. The user knows directly what actual effects the new settings have for error-free functionality of the material handling system to allow immediate optimization if needed. The

two software solutions ASIMON360 and ASi Control Tools360 – the latter without the safety functionality – make planning, configuration and parameterization of ASi networks especially convenient, reliable and fast. The numerous diagnostic tools with their wide selection of representation options provide for continuous monitoring, maintenance and error clearing. In addition to being precise error descriptions, these are above all concrete recommended solutions that save time and ensure efficient error clearing. And when systems are handed over, even detailed test reports are created in PDF format and saved with the machine documentation.
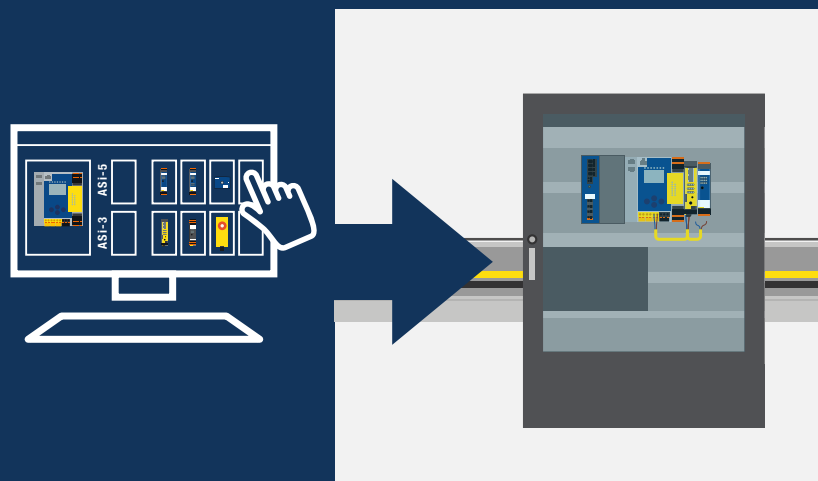
Easy to install, high functionality and flexibility, low cost – all that plus great user convenience: AS-Interface has established itself as an internationally standardized wiring system in modern conveying and material flow technology as well. The mix of drive solutions with ASi-5 and ASi-3 which Bihl+Wiedemann offers for integration of roller drives, AC motors and frequency inverters as well as the various hard- and software tools for creating ASi networks have contributed greatly to this success.

Different solutions for different requirements

Drive solutions from Bihl+Wiedemann – regardless of the "world above"

APPLICATION

"EASY ASI": PLANNING, CONFIGURATION, OPERATION AND DIAGNOSTICS MADE EASY

Simplicity – this is the promise of AS-Interface. An assurance upon which ASi professionals as well as users of the wiring technology for whom ASi-5 and ASi-3 is new territory can rely. Because Bihl+Wiedemann offers a whole range of useful tools for simple planning, installation, addressing, commissioning and diagnostics of ASi applications: software suites whose programs make planning, configuration and commissioning of ASi networks easy, a new ASi-5/ASi-3 address programming device for the best in-place user experience as well as diagnostic tools that are also suitable for release measurements and the acceptance of systems.

Simplicity is everything – this is the basic thought behind AS-Interface since the very beginning. It applies to all ASi generations up to ASi-3, and even more so for ASi-5 as the current technology standard which for the past three years or so has found success throughout the world of complex machines and systems while accelerating smart, digitalized automation concepts. Installers and commissioning engineers alike have long enjoyed the many benefits of the yellow ASi profile cable:

✓ One cable for data and power – no parallel wiring with its cable bundles
✓ Available by the roll where it is always available as needed – no stocking of different cable variants
✓ Simple connection of modules using piercing technology
✓ Reverse polarity protection thanks to asymmetrical cable geometry
✓ System- and manufacturer-neutral
✓ Free topology of the ASi network
✓ Modules are quickly and easily connected, replaced, moved or added – even at a later stage

And these are just the key features. But AS-Interface is far more than the cable itself, rather it's a matter of what you are able to accomplish with it – namely intelligently and economically network sensors, actuators and controllers for machines and systems. To this end Bihl+Wiedemann has not only devoted great effort in their development of high-performance hard- and software tools; the company also applies the experience gathered from a large number of already installed ASi

Simple planning and configuration of ASi networks using the hardware catalog in the software suites from Bihl+Wiedemann

modules and solved applications. The primary development goal has been to offer the user maximum ease of use in the planning, parameterization, commissioning, diagnostics and maintenance of the individual ASi devices as well as the overall system.

Intuitive and secure setup of ASi networks

To make the planning, configuration, parameterization and commissioning of ASi networks as convenient and secure as possible in the fastest possible time, Bihl+Wiedemann offers Software Suites with two intuitive software programs: ASi Control Tools360 and ASIMON360 – the latter including safety aspects for the transmission of both safe and non-safe data over the same cable. Both software tools support ASi-3 and ASi-5 components equally and enable simple integration of IO-Link devices.

The Software Suites feature an integrated hardware catalog that makes planning and configuration of ASi networks and parameterization of ASi modules in the software significantly easier. The necessary ASi-3 and ASi-5 modules are moved via drag-and-drop from the catalog into a virtual control cabinet. Which level of technology is used is determined by the respective function. To integrate binary signals from a light curtain, only an inexpensive ASi-3 module is basically needed. When something like complex inverters or intelligent IO-Link devices must be integrated, ASi-5 offers the required data bandwidth and transmission speed.

During offline configuration the integrated commissioning wizard continuously performs plausibility checks, such as the number of devices in the ASi network, the presumed current draw, or the expected data quantity. If permissible values are exceeded, the software recommends additional ASi circuits. Once an ASi network is then activated, the online bus information can be used to simulate, diagnose and monitor the behavior of the in- and outputs. This shows you
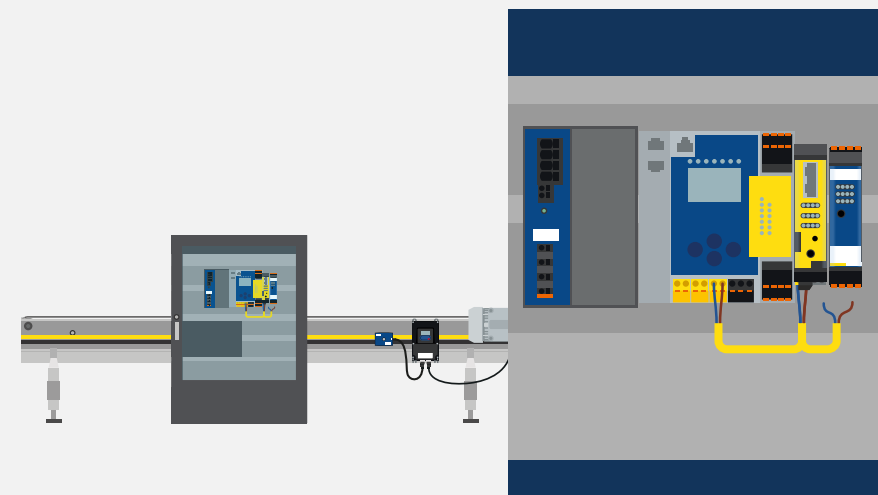

Simple wiring of ASi modules in the control cabinet

immediately what effects the current settings of the ASi modules are having. Possible errors in the ASi network are directly viewable, all the devices can be individually selected and their parameters modified live by the user.

Modules with drive profiles simplify integration

Bihl+Wiedemann has developed specific profiles for a number of drives from various manufacturers and stored them in the software suites. The company has also defined their own manufacturer-neutral profiles. For customers of drive manufacturers this has the virtue that when there are delivery bottlenecks for example, there is the flexibility to switch suppliers and still be able to easily integrate the new drives into their ASi networks. The profiles are hard-coded in the Bihl+Wiedemann ASi modules are sent between the ASi device and the sensor
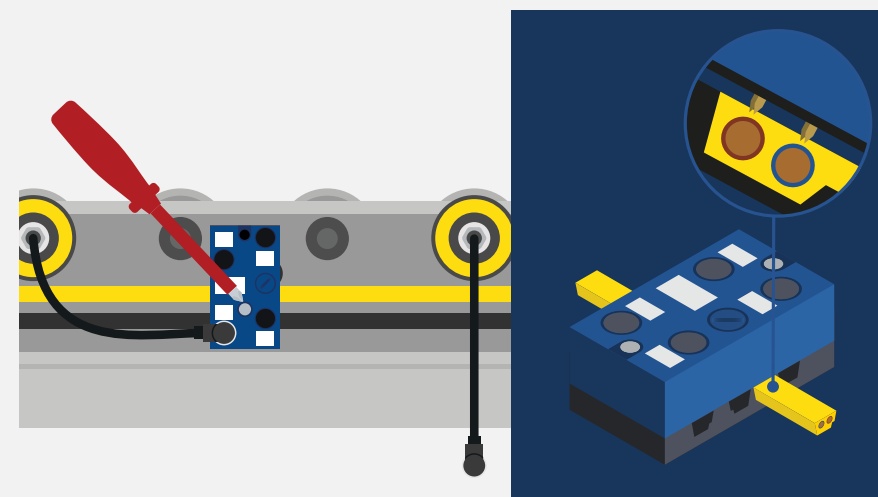
Simple installation of ASi modules in the system using piercing technology

or actuator as soon as communication is started. Each ASi-5 device provides sufficient space for a variety of profiles. Additional profiles can be updated or added via firmware update. Another simplification is the storing of parameter sets for ASi-5 devices and their peripherals in the software. Once parameterized these settings can be copied to other modules or even used as a template which is available even between different projects. The parameters are retained redundantly in the ASi network: in the sensor or actuator, in the ASi device and in the ASi gateway. This means in case of an error – wherever it might occur – the parameters are quickly and automatically loaded into the replacement unit.
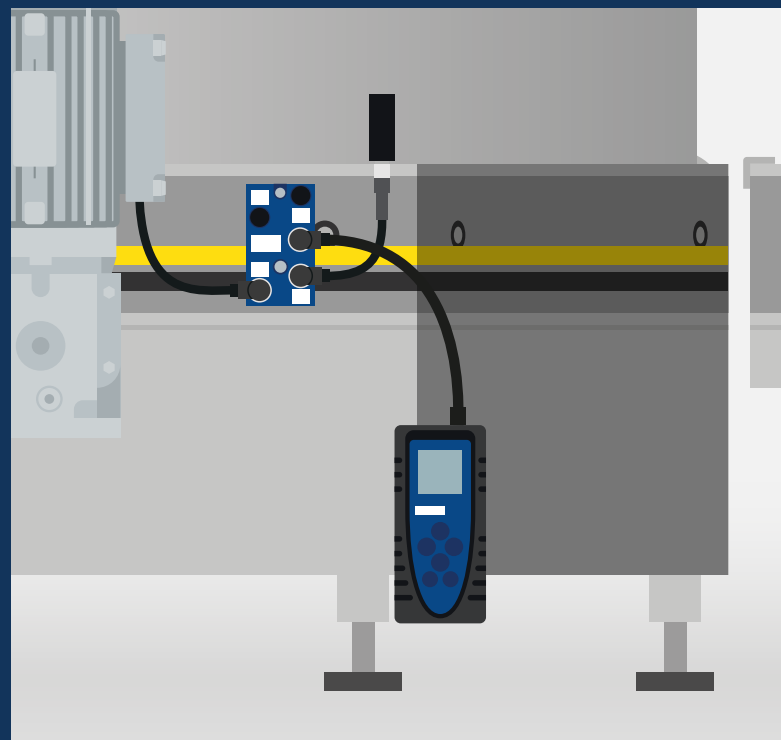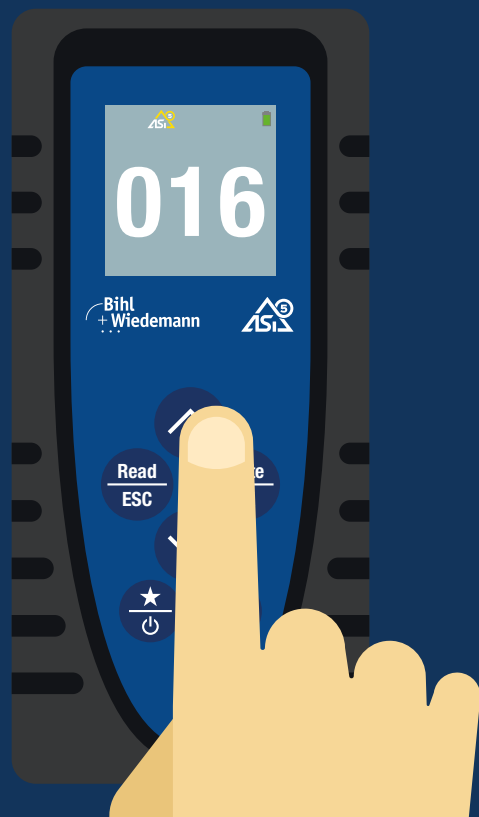
New address programming device offers maximum operating convenience

Whether electrical design engineer, programmer, installer, commissioning engineer or maintenance technician, Bihl+Wiedemann is always looking over the shoulders of the people who actually use ASi to gather valuable ideas for improvements and innovations. So it is also for the new portable ASi-5/ASi-3 Address Programming Device used for conveniently addressing ASi-3 and ASi-5 devices and for automatic configuring to the ASi master. Whereas features such as attractive design, pleasant look and feel or elegant handling were barely considered in previous address programming devices, the new unit for in-place use does emphasize these aspects: a slim exterior, comfortable feel, great operating convenience and perfect user experience. Several advanced product features are combined in the unit. Visually striking is the OLED color display which ensures pinpoint clarity of settings and information in any ambient and lighting situation. Inside the handy address programming device a supercapacitor serves as a high-performance energy storage component. Fully charged in just 30 min-

utes, users can address around 120 ASi modules. As capacity begins to drop, a ten-minute quick charge suffices to assign an additional 70 addresses or node numbers. The new ASi-5/ASi-3 Address Programming Device can be connected to a PC using a standard USB-C interface – not only for charging, but above all to be able to use the familiar parameterization, diagnostic and testing tools in the Bihl+Wiedemann software suites. The interface is also used for expansions of the functionality in the form of firmware updates, giving the device additional future viability. And so anyone wanting to combine the advantages of decentralized addressing of ASi devices with the virtues of central configuration and parameterization in the ASi network will find their wishes met in the new ASi-5/ASi-3 Address Programming Device and software suites from Bihl+Wiedemann.
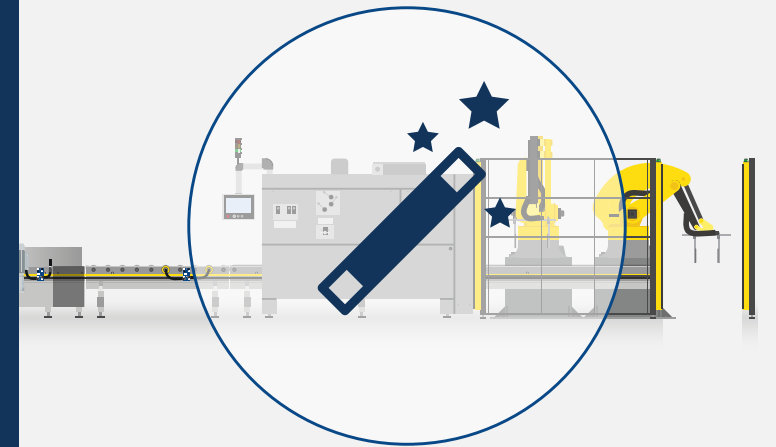
As soon as the devices have been installed in the field and addressed, the software suites can be used to place the ASi

Simple commissioning of ASi applications using the commissioning wizard

network in service. Here again comprehensive plausibility checks are performed. Does the planning in the software correspond to the installed and addressed reality on the machine? Are the correct devices connected, are there too many or too few? Were the correct devices removed from an existing maximum configuration or added to an existing configuration? Whether the user is an ASi pro or ASi newbie, whether it's the first or an ongoing series of projects – Bihl+Wiedemann supports users in many ways when commissioning the software suites. There is no simpler way to plan, wire, address and commission ASi networks – not to mention the fact that previous ASi-3 users can just download the newest program version to upgrade to ASi-5.

Diagnostic tools ensure high availability of ASi networks

Diagnostics are the prerequisite for ensuring machine availability and productivity – an indispensible aspect. Whether commissioning, monitoring and maintenance or troubleshooting and error clearing – Bihl+Wiedemann offers many diagnostic tools with a wide range of display and representation possibilities. They provide not only precise error analyses but also concrete suggestions for fault elimination.

It all starts with the configuration. When devices are selected from the hardware catalog included in the software suites, the expected network and fieldbus load is automatically checked for example. This permits any possible planning errors to be prevented at the earliest possible stage. The commissioning wizard, which guides the user intuitively through addressing and configuration of the ASi modules, immediately alerts him to any discrepancies or errors in commissioning. As part of the continuous system monitoring the ASi network is always checked for possible errors. Information about the quality of the installation as well as data communication are collected and checked for example in order to prevent any problems due to deteriorating transmission properties early on. Ring buffers enable continuous tests for tracking down even sporadic events in the ASi network. Peripheral, configuration and telegram error lists are read out and processed cyclically through the use of ring buffers. With the help of the online bus information as an integral component of ASi Control Tools360 and ASIMON360, the user can easily diagnose modules and analyze safe in- and outputs as well as Safe Link connections. The OPC-UA interface, which is standard on all ASi-5/ASi-3 gateways from Bihl+Wiedemann, all the various machine and diagnostic data can

be accessed and used by means of a cloud application, a local MES server or a visualization tool. The likewise integrated webserver enables fast system diagnostics, even remotely, while the gateway display enables spontaneous diagnostics in-place without the need for additional software. Many ASi modules from Bihl+Wiedemann are also configured for channel-specific diagnostics. This allows the user to quickly localize, identify and clear errors such as an output short circuit or an overload on a device.

But the diagnostic tools are used not only for commissioning or regular maintenance intervals and predictive maintenance, but also for inspection and acceptances of equipment. Configurations and installations can be checked for possible errors prior to the machine being delivered. The tools are also used for release measurements: detailed test reports are automatically generated which can be included with the machine as PDF files or digital machine documentation.

With their intelligent hard- and software tools whose operability and user experience are continually improved, Bihl+Wiedemann ensures perfect support of the user in setup, operation and maintenance of ASi networks. ASi made easy.

Easy assigning of ASi addresses (ASi-3) and node numbers (ASi-5) with the new address programming device from Bihl+Wiedemann

Interview with Bernhard Wiedemann, Managing Director of Bihl+Wiedemann GmbH

New ASi-5 Safety products expand application range

Bernhard Wiedemann,
Managing Director at Bihl+Wiedemann

Greater data bandwidth, faster transmission speeds, expanded diagnostic – all the possibilities offered by ASi-5 as a wiring technology on the lowest field level are what many wish for when integrating ASi Safety devices as well. In the interview Bernhard Wiedemann, Managing Director of Bihl+Wiedemann in Mannheim, Germany explains how ASi-5 Safety will supplement the established technology of ASi Safety at Work

ASi MASTER NEWS: The future is always an origin story. This applies as well to the implementation of functional safety using AS-Interface. How would you describe the topic of safety in the developmental context of ASi-3 and ASi-5?

Bernhard Wiedemann: When in 1990 AS-Interface was initiated by several companies as a system for networking sensors and actuators, we were technologically still far from being able to use bus systems in general for functional safety, nor was the desire there. This did not change until around ten years later, so that functional safety was then integrated into ASi subsequently. But at the same time is was a milestone for the fieldbus itself in terms of being able to collect the signals from simple safety sensors in the field and send them together with non-safe signals through the ASi profile cable. This made AS-Interface the first system to make safety technology practical on a fieldbus. Which in turn was a significant factor in driving the success of ASi.

In contrast, safety was a fundamental consideration in all the technical developments that have led to ASi-5, making possible the most efficient integration possible of even complex safety sensors and applications. Work on the ASi-5 Safety Stack, such as the transmission mechanisms and protocols, was therefore already concluded when the actual ASi-5 specification was presented at SPS 2018. And at the latest since TÜV NORD certification of the ASi-5 Safety Monitor Reference Firmware for use in ASi-5 Safety Monitors and ASi-5 Safety devices in January 2019 ASi-5 Safety has been de facto applicable in actual products.

ASi MASTER NEWS: Does this mean that safety products for ASi-5 will come to market faster than with the previous ASi generations?

Bernhard Wiedemann: Absolutely. Before the end of this year – which is barely three years after the new technology standard was introduced – we will introduce the first ASi-5 products for functional safety.

ASi MASTER NEWS: What will happen in the future with ASi Safety at Work now that the first ASi-5 Safety products are being brought to market? Will ASi-3 Safety be discontinued in favor of ASi-5 Safety?

Bernhard Wiedemann: We are proceeding under the assumption that ASi Safety at Work and ASi-5 Safety will both be available over the next years. Approximately 80 percent of the safety-related applications are less complex, often requiring only one single two-channel safe signal to be transmitted – for example from an E-Stop button. And for this ASi Safety at Work is still perfect. In these scenarios ASi-5 Safety is neither superior nor less expensive. But things do look different when multiple safe signals or a combination of safe and non-safe signals need to be transmitted. Then ASi-5 Safety with its high speed and large data bandwidth as well as its expanded diagnostics is the optimal supplement to ASi Safety at Work – as is the case already for ASi-3 in standard applications.

ASi MASTER NEWS: What does this mean for the user?

Bernhard Wiedemann: Like ASi-3 and ASi-5 in the non-safety area, ASi Safety at Work and ASi-5 Safety run completely in parallel on the same profile cable. This means you can use both safe and non-safe signals from all the ASi generations in the network at the same time. The benefit to the user is ASi-5 Safety also provides the simple and cost-effective installation technology of AS-Interface. There are mainly two reasons for this: for one, ASi-5 Safety lets you use one address for up to 16 safe bits and other non-safe signals. In addition, and perhaps even more important for the user, ASi-5 Safety modules with one or two safe inputs and multiple non-safe I/O points cost virtually the same as comparable I/O modules that are non-safe only.

ASi MASTER NEWS: ASi-5 Safety is finished and certified. And represents an expansion to ASi Safety at Work, especially in terms of the data bandwidth and presence of both safe and non-safe signals. Doesn't this mean that it now provides all the options for integrating IO-Link Safety devices as well in the future?

Bernhard Wiedemann: Correct. ASi-5 technology will allow you to collect safe IO-Link signals in the field cost-effectively and efficiently. And if they are available, the great data bandwidth of ASi-5 will enable even high-performance IO-Link Safety devices to be integrated into ASi networks without any restrictions. ASi-5 Safety, which is already fully developed and certified, then represents an ideal shuttle for integrating safe IO-Link Safety devices into higher automation levels where safety functions are also implemented. We are good to go.

ASi MASTER NEWS: Let's summarize: ASi Safety at Work can handle safety-related standard applications, whereas ASi-5 Safety will also enable realization of high-end applications with IO-Link Safety. Does this mean that mixed systems are the optimum solution?

Bernhard Wiedemann: In my view this will be one of the trends. If you only need to process individual safe signals such as an E-Stop button, ASi-3 Safety will remain your first choice both in terms of cost and technology. Where there is greater density of safe and non-safe signals in an application – regardless of whether you are dealing with individual signals or complex safety sensors – ASi-5 Safety represents a perfect supplement to ASi Safety at Work both economically and technologically.

ASi MASTER NEWS: Of course this presumes that the corresponding modules are available. What is the situation at Bihl+Wiedemann in this respect?

Bernhard Wiedemann: In terms of technology we are quite far along – thanks also to the fact that we have had the specification and certification from TÜV for three years already. We are currently working on an ASi-5 Safety gateway as well as a module with two safe 2-channel inputs and 12 self-configuring I/Os for non-safe signals. This module allows, for instance, the connection of a control panel with several light buttons, an E-Stop button and a safe key switch to ASi at extremely low cost. We will be introducing both the ASi-5 Safety gateway and the I/O module at this year's SPS. Plus, we are already working on additional ASi-5 Safety modules in IP67, IP20 and as a circuit board version. And as is always the case at Bihl+Wiedemann, I fully expect that unique customer requirements will result in additional new products. A look at our portfolio and specialized offerings tells you how driven we also are by our customers.

ASi MASTER NEWS: Thank you for the conversation, Mr. Wiedemann.

Certification of the ASi-5 Safety Monitor Reference firmware by TÜV NORD granted nearly three years ago

ASi-5 AND ASi NEWS FROM BIHL+WIEDEMANN

ASi-5/ASi-3 Gateways with 8 A decoupling coils and 30 V power supplies – a combination with many interesting advantages

Bihl+Wiedemann has added ASi-5/ASi-3 Gateways with two ASi networks and two 8 A decoupling coils to its portfolio which have been especially designed for large ASi-3 and ASi-5 applications with many devices. The company now also offers 30 V power supplies especially developed for ASi-5 communication.

Combining the two new family members results in many interesting benefits for the user:

✓ Seamless ASi-5 communication – all new power supplies have been optimized for use with ASi-5/ASi-3 Gateways and were extensively tested with them.
✓ Reduced costs – especially since the data decoupling function is now integrated in the ASi-5/ASi-3 Gateways, making the 30 V power supplies more economical than previous ASi power supplies.
✓ Space savings in the control cabinet – the 30 V power supplies can be placed side-by-side and are significantly more compact compared to the ASi power supplies with decoupling coils.

✓ Detailed diagnostics in the gateway– thanks to the integrated ASi current measurement the power consumption of the ASi installation can be permanently monitored.
✓ Field update capability – firmware and security updates are installed tamper-resistant and new functions are quickly available.
✓ Integrated OPC UA server and webserver – data from the field level can be transmitted directly to Industry 4.0 applications. The webserver enables fast diagnostics of the system and remote maintenance.

New ASi-5 Modules with integrated IO-Link Master

✓ Comfortable parameter setting using Bihl+Wiedemann software suites
✓ In 1.27 ms up to 4 x 16 bits of user data available
✓ Up to 32 bytes of cyclical process data

Article	Type	Number of IO-Link Ports / IO-Link Port Class A	IO-Link Port Class B	Analog inputs (4 .: 20 m A)	Connection of ASi	Supply of IO-Link Ports	Connection of periphery	Protection rating
BWR4771	Circuit board module	4	Configurable header	–	Header, straight	AUX	Header or termination board	IP00
BWU4386	Field module	8	8	–	M12	AUX	8 x M12 socket (5-pin)	IP67
BWU4748	Active distributor	1	1	–	Profile cable	ASi	1 x M12 cable socket (straight, 5-pin)	IP67
BWU4775	Cabinet module	4	Configurable terminals	4	6 x COMBICON plug	AUX	6 x COMBICON plug	IP20

ASi Cable Duct Module in new Cable Duct Housing

Article	Type	Digital inputs	Digital outputs	Input voltage	Voltage for outputs, motorized rollers or drive electronics	Connection of ASi	Connection of periphery	Protection rating
BWU4721	ASi-5 Module for control of 2 x 48 V motorized rollers	4	–	ASi	AUX	Profile cable	2 x M8 snap-in cable socket, straight, 5-pin (motors) / 2 x M8 cable socket, straight, 4-pin (sensors)	IP67
BWU4722	ASi-5 Module for control of 2 x 24 V motorized rollers	4	–	ASi	AUX	Profile cable	2 x M8 snap-in cable socket, straight, 5-pin (motors) / 2 x M8 cable socket, straight, 4-pin (sensors)	IP67
BWU4769	ASi-3 Module for control of 2 x 24 V motorized rollers Itoh Denki (PM500XE/XP, PM605XE/XP)	4	–	ASi	AUX	Profile cable	2 x M8 snap-in cable socket, straight, 5-pin (motors) / 2 x M8 cable socket, straight, 4-pin (sensors)	IP67

ASi Motor Modules

Article	Type	Digital inputs	Digital outputs	Input voltage	Voltage for outputs, motorized rollers or drive electronics	Connection of ASi	Connection of periphery	Protection rating
BWU4370	ASi-5 Module for control of 1 x EBM-Papst K4	4	2	ASi	AUX	Profile cable	4 x M12 socket, 5-pin	IP67
BWU4371	ASi-5 Module for control of 1 x NORD NORDAC FLEX inverter	4	2	ASi	AUX	Profile cable	4 x M12 socket, 5-pin	IP67
BWU4369	ASi-5 Module for control of 1 x Rockwell PF525 inverter via RS485	4	2	ASi	AUX	Profile cable	4 x M12 socket, 5-pin	IP67
BWU4377	ASi-5 Module for control of 1 x SEW MOVIMOT	4	–	ASi	–	Profile cable	4 x M12 socket, 5-pin	IP67
BWU4201	ASi-5 Module for control of 1 x SEW MOVIMOT	4	2	ASi	AUX	ASi via M12	4 x M12 socket, 5-pin	IP67
BWU4068	ASi-5 Module for control of 1 x SEW MOVIMOT	4	2	ASi	AUX	Profile cable	4 x M12 socket, 5-pin	IP67
BWU3135	ASi-3 Module for control of 1 x SEW MOVIMOT	2	–	ASi	ASi	Profile cable	4 x M12 socket, 5-pin	IP67

Active Distributor ASi-5 Motor Module

Article	Type	Digital inputs	Digital outputs	Input voltage	Voltage for outputs, motorized rollers or drive electronics	Connection of ASi	Connection of periphery	Protection rating
BWU4718	Control of 1 x SEW MOVI-C frequency inverter	1	–	ASi	–	Profile cable	1 x M12 cable plug, D-coded, straight, 4-pin	IP67

Passive Distributor AUX

Article	Type	Flat form factor, can be installed in cable duct	Internal fusing	Connection of profile cable	Connection of periphery	Cable	Protection rating
BW3513	IP67, 19 mm deep	yes, 19 mm deep	8 A fuse	1 x AUX	1 x M12 power cable socket, straight, T-coded, 4-pin	1,0 m	IP67
BW3766	IP67, 19 mm deep	yes, 19 mm deep	1 A, self-resetting	2 x AUX	1 x M12-cable sockets, straight, 5-pin	1,0 m	IP67
BW3381	IP67, 19 mm deep	yes, 19 mm deep	1 A, self-resetting	2 x AUX	1 x round cable / leads	3,0 m	IP67
BW3763	IP67, 25 mm deep	yes, 25 mm deep	4 A fuse	2 x AUX (galvanically isolated)	2 x M8 cable sockets, straight, 4-pin	1,5 m	IP67
BW3738	IP67, 25 mm deep	yes, 25 mm deep	–	2 x AUX	1 x M16 power cable plug, straight, 3-pin	0,8 m	IP67
BW3568	IP67, 25 mm deep	yes, 25 mm deep	–	2 x AUX	1 x M12 power cable socket, straight, T-coded, 4-pin	1,0 m	IP67
BW4247	IP67, 25 mm deep	yes, 25 mm deep	2 x 8 A fuse	2 x AUX (galvanically isolated)	1 x M12 power cable socket, straight, L-coded, 4-pin	1,0 m	IP67
BW4765	IP67, 25 mm deep	yes, 25 mm deep	2 x 8 A fuse	2 x AUX (galvanically isolated)	1 x M12 power cable socket, straight, T-coded, 4-pin	1,0 m	IP67
BW4252	IP67, 25 mm tief	yes, 25 mm tief	–	2 x AUX (galvanically isolated)	1 x M12 power cable socket, straight, L-coded, 4-pin	1,0 m	IP67

ASi-5 Safety Input Module, IP67, M12, 2SI/12I/12O

■ 2 x 2-channel safe inputs (SIL 3, Cat. 4) ✓ For floating contacts (BWU4209) ✓ For optoelectronic protective devices (BWU4210) ■ Up to 12 digital in- and outputs ■ Y connection ■ In- and output voltage out of AUX ■ Connection of periphery via 8 x M12 sockets, 5-pin ■ Connection of ASi using profile cable ■ 1 ASi-5 address ■ Protection rating IP67

ASi Safety I/O Module, IP67, M12, 1SI/1SRO/1I (BWU4379)

■ 1 Release circuit (2 x relay outputs) ■ 1 x 2-channel safe input (SIL 3, Cat. 4) for floating contacts ■ 1 digital input ■ Input voltage out of AUX ■ Output voltage out of ASi ■ Connection of periphery via 4 x M12 sockets, 5-pin, no length restriction for the connection cable (loop resistance 150 Ω) ■ Connection of ASi and AUX using profile ■ 2 single addresses + 1 AB address (ASi-3) ■ Protection rating IP67

Active Distributor ASi-5, IP67, 1 RGB/RGBW LED Stripe (BWU4101)

■ 1 output for RGB/RGBW LED Stripe ■ Output voltage out of AUX ■ Connection of periphery via 1 x round cable/leads (cable length: 0.2 m) ■ Connection of 1 x ASi and 1 x AUX using profile cable ■ Connection of ASi using profile cable ■ Flat form factor, can be installed in cable duct (installation depth ≥ 35 mm) ■ LED status indicator ■ 1 ASi-5 address for connecting RGB/ RGBW LED stripe to ASi ■ Protection rating IP67

Active Distributor ASi-3, IP67, self-configuring 4I/AO (BWU4727)

■ 4 digital signals can be used as desired as in- or outputs, i.e. up to 4 digital in- and outputs possible ■ In- and outputs powered from AUX ■ Connection of periphery via 2 x M12 cable sockets (straight, 5-pin) ■ Cable length 1 m ■ ASi connection using profile cable ■ Flat form factor, can be installed in cable duct ■ LED status indicator ■ 1 AB address

ASi-5 Circuit Board Module, self-configuring 16I/O (BWR4736)

■ 16 digital signals can be used as desired as in- or outputs, i.e. up to 16 digital in- and outputs possible ■ Inputs powered from 24 VDC ext. ■ Outputs powered from AUX, max. 350 mA per output ■ Connection of periphery via header, straight ■ Connection of ASi via header, straight ■ LED status indicator ■ 1 ASi-5 address

2-channel Power Limiting Device, limited energy circuit (< 100 W) (BWU4189)

UL optimized

■ 2 x inputs (galvanically isolated) on 2 x UL-certified, current limited (< 3 A) limited energy circuit conformal outputs (galvanically isolated) ■ Internal protection via electronic self-resetting fuses ■ Operating voltage ASi or 19...32 VDC ■ 6 x COMBICON connections ■ Terminals for in- and outputs ■ Optimized for control cabinet installation ■ Protection rating IP20

ASi-5/ASi-3 openSAFETY via POWERLINK Gateway (BWU3865)

■ with integrated Safety Monitor ■ 2 ASi-5/ASi-3 masters ■ 6 digital inputs or 3 x 2-channel safe inputs (SIL 3, Cat. 4) ✓ Expandable by up to 62 x 2-channel safe inputs ✓ max. 1922 x 2-channel safe inputs in combination ■ 6 Release circuit (6 x electronic safe outputs ✓ Expandable to max. 64 safe outputs ✓ max. 1984 safe outputs combined ■ 1 power supply for 2 ASi circuits ■ openSAFETY via POWERLINK and Safe Link ■ OPC UA server ■ Diagnostics and configuration via Ethernet diagnostic interface ■ Duplicate address detection ■ ASi fault detector ■ Programming in C optional ■ Protection rating IP20