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AS-INTERFACE MASTER NEWS

THE BIHL+WIEDEMANN MAGAZINE

TECHNOLOGY

Drive and Material handling technology with ASi-5: Expanded portfolio and performance

APPLICATION

ASi-5 at SPAX: (Future-)Safe solutions

APPLICATION

Always up to date

SAFETY

EVEN MORE CUSTOM MADE SAFETY SOLUTIONS WITH ASi-5 SAFETY

Bihl + Wiedemann

ASi

SAFETY

EVEN MORE CUSTOM MADE SAFETY SOLUTIONS WITH ASi-5 SAFETY

Versatility in a product range means flexibility in the application. And if even then the technology generations – we're talking about ASi Safety at Work and ASi-5 Safety – complement each other perfectly, then we have the best requirements for offering customers highly tailored safety solutions for the greatest number of applications and plant sizes – also from a cost and effort perspective.

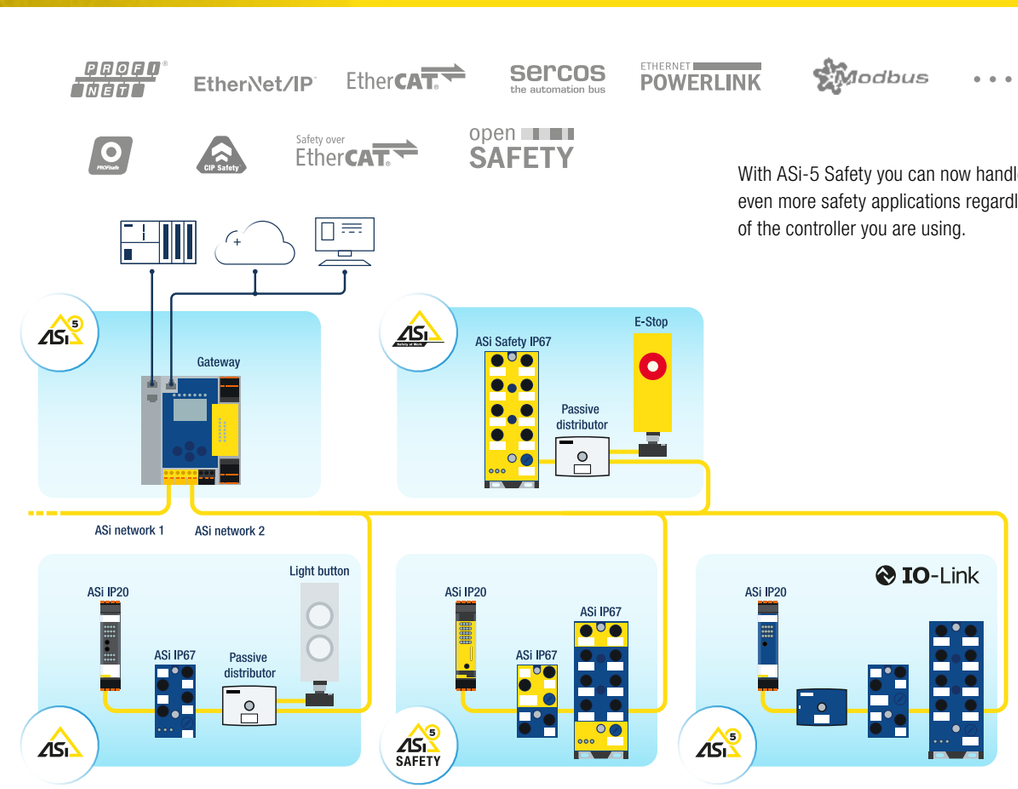
AS-Interface: Predestined for functional safety

Power supply and communication via one single yellow profile cable, simple and reverse polarity protected wiring using piercing technology, no plugs or pre-assembled cables, no special connection technology, no special switches – no other wiring technology makes it possible to integrate large numbers of individual components or devices in machines and plants as cost effectively and efficiently as AS-Interface. And this applies not only to standard signals, but for safe signals as well, both of which can be transmitted over the same cable.

Implementing machine safety efficiently and with technical convenience is one of the central issues for users today. With ASi Safety at Work and the new standard ASi-5 Safety this can be accomplished as simply, cost effectively and individually as never before, because these two safety generations of AS-Interface are ideal complements to each other. Wherever applications are less complex and only one or just a few two-channel safe signals need to be transmitted, ASi Safety at Work is the ideal solution. But when the need is to collect both safe and non-safe signals in the field, connect safe high-end sensors, solve more complex safety applications, send a large amount of safe bits from various modules or use diagnostic and additional information, then ASi-5 Safety is the right supplement to ASi-3 Safety. Not only because it offers significantly greater transmission speeds and data bandwidths, but also because ASi-5 Safety enables much more efficient addressing of the devices.

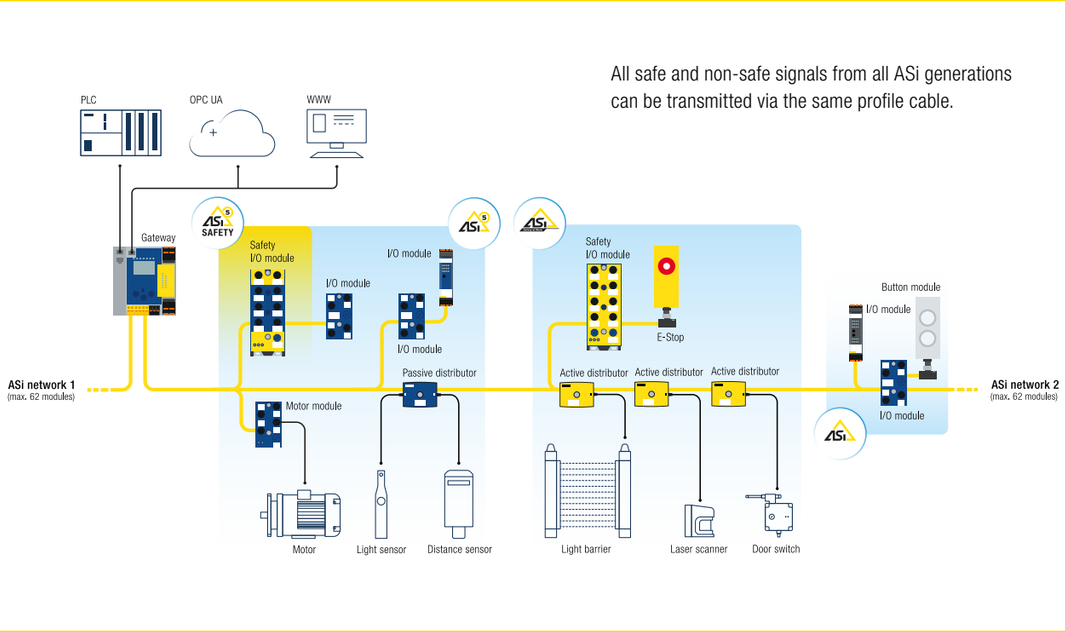
Fine granularity means extraordinary scalability

The underlying technology advantages are an essential aspect of the success of ASi Safety in making machines and systems safe. In addition, Bihl+Wiedemann as a complete ASi provider offers a product range whose fine granularity opens up many possibilities. This can be seen for example in the connection modules for safe inputs in the field, where the modules provide one, two, four or eight safe signals. This means that the design can be planned according to the needs and thus also optimized in terms of costs. And should changes be required later, these can also be incorporated just as needed, which in total can significantly reduce the costs for unused safe inputs or outputs. Another example is the Safety Basic Monitor from Bihl+Wiedemann. Configured using the ASIMON360 PC software, it can either replace special safety relays for standard applications and thereby act as an autonomous compact safety controller implementing more complex logic connections, or process in the Safe Link environment – together with Safety Gateways – many safe signals in highly complex systems. Here again the Bihl+Wiedemann product range offers the right products for any plant and application size, while at the same time Safe Link enables safe coupling of safe ASi networks of any generation. The system architecture on the I/O level is completely independent from the later subsequent fieldbus connection – the safety application is essentially implemented in the machine and then integrated as a solution into the respective machine controller using the corresponding safe fieldbus gateways from Bihl+Wiedemann. This allows a PLC independent safety technology to be implemented.



With ASi-5 Safety you can now handle even more safety applications regardless of the controller you are using.

Picture: Bihl+Wiedemann GmbH; iStock Ludmila Chernetska



ASi Safety: Open for individual applications

In the context of safe machine monitoring, the Bihl+Wiedemann solutions allow you to implement individualized safety-related tasks. One of these is safe speed monitoring. With the company's speed monitors you can combine and solve at the same time safe motion control functions according to EN 61800-5-2:2017 such as rotation speed, standstill, direction of rotation or speed up to SIL3/PLe together in an application. Another task for safety-related speed monitoring is the detection of machine defects such as shaft break, misalignment, slippage or overspeed. And there is yet another safety application that is widely used in storage and material handling technology: the muting function. Muting is the brief suppression of a non-contacting safety device such as a light barrier or light curtain for allowing permitted objects or persons to pass. A special component in the ASi safety monitor ensures that the settings of this intrinsically complex procedure is reduced to just a few entries, making implementation and operation as convenient as possible.

More efficient addressing and documenting with ASi-5 Safety

It's not only the significantly better transmission characteristics and diagnostic possibilities as well as technology security with respect to the expected connection of IO-Link Safety that makes ASi-5 Safety an ideal complement to ASi Safety at Work – also key is the ability to address the devices in the network more efficiently. Whereas ASi-3 Safety allows a maximum of 31 safe in- or outputs per ASi network, with ASi-5 Safety a single ASi node number (ASi address) can be used to exchange up to 16 safe in- and outputs as well as further non-safe signals at the same time. In summary, ASi-5 Safety thereby significantly expands the number of connectable safe and non-safe signals per master while reducing effort and overhead costs compared with ASi Safety at Work through more efficient addressing of the ASi modules. The Overhead costs can even be further reduced if single-channel safety according to SIL2/PLc is sufficient in the application. In this case, two-channel safe inputs can also be used separately.

Bihl+Wiedemann is already using many of these technological innovations in their first ASi-5 Safety I/O modules, which have two two-channel safe inputs and 12 standard I/Os. Another advantage of ASi-5 Safety: you can read out all the data from the project planning – safety and hardware configuration, parameter settings, user comments, etc. – at a later time from the new ASi-5/ASi-3 Safety Gateways. These data are then always available in situ as a representation of the specific plant situation, and no longer needed to be searched for in the IT system when for example service is required.

Cyber security: ASi-5 Safety ensures the highest level of data security

Because of its great significance in process and production stability, the subject of data security has great relevance in industrial environments. Here ASi-5 Safety – like ASi-5 – offers for two reasons the greatest degree of data security: One, data transmission uses OFDM (Orthogonal Frequency-Division Multiplexing). This method of dynamic frequency assignment makes recording of the sent messages highly difficult and only possible if the entire context of the connection establishment between ASi master and ASi device is known. In practice this makes ASi-5 and ASi-5 Safety virtually safe from eavesdropping. Two, the ASi-5/ASi-3 Safety Gateway provides decoupling between TCP/IP and ASi-5 as well as ASi-5 Safety, i.e. the fieldbus and field levels. The fact that the gateway is the only connection to TCP/IP means that it is the sole cyber security component, while much lesser safety requirements need to be placed on the modules and devices in the ASi circuit. This represents a significant simplification when it comes to continuous network security.

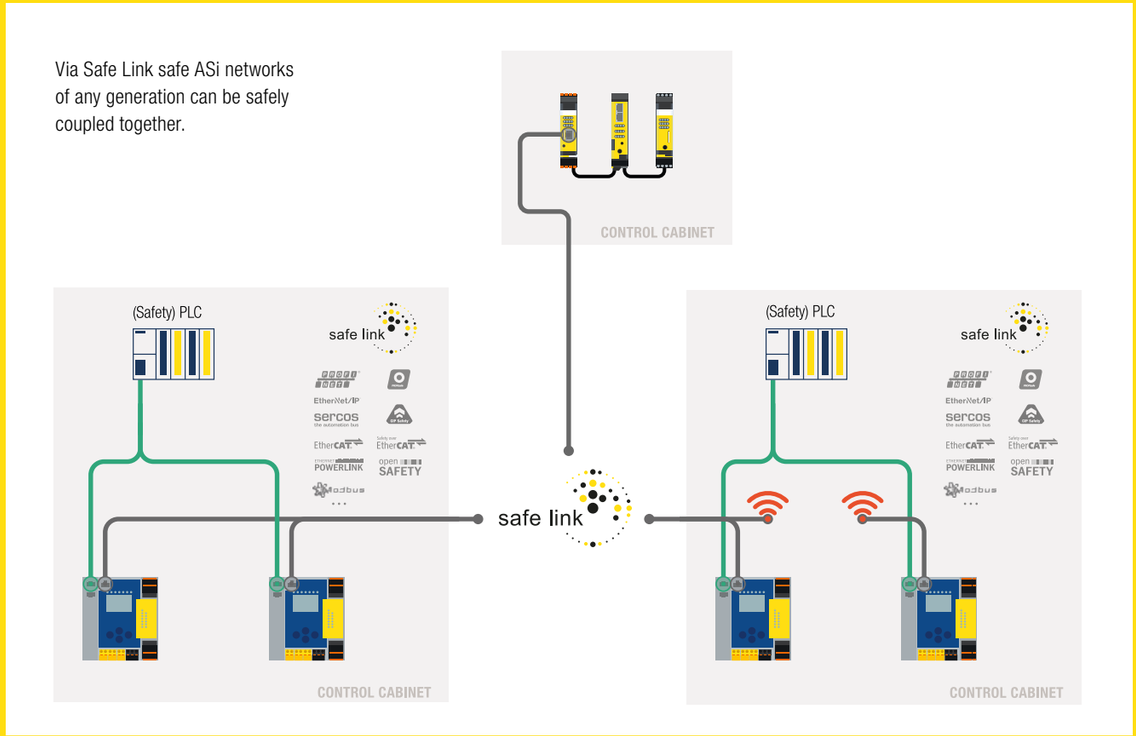
User-friendly software helps to implement safety projects

To be able to use ASi Safety at Work and ASi-5 Safety just as easily both for small projects and for large machines, for simple tasks as well as for more complex or individual applications, Bihl+Wiedemann has placed great emphasis on a user-friendly software suite. This primary goal in the development of this intuitive ASIMON360 software program was to provide the user of both ASi Safety at Work and ASi-5 Safety with the same user experience and maximum operating convenience in planning, parameterization, commissioning, diagnostics and maintenance of the safe devices of the ASi network as well as the entire plant. To this end the software includes an integrated hardware catalog for facilitating the planning and configuration of ASi networks as well as the parameterization of ASi modules from a PC. The necessary safe ASi-3 and ASi-5 modules are inserted into a virtual control cabinet using drag-and-drop. During offline configuration the software continuously performs plausibility checks, for example with respect to the number of devices in the ASi circuit, the presumed current draw or the expected data quantities. The commissioning wizard then – depending on the module preparation – supports fully automated addressing, parameterization and commissioning of all the ASi modules. Following commissioning the online bus information in ASIMON360 can be used to simulate, diagnose and monitor the behavior of the in- and outputs. All the devices can be selected and accessed individually and their parameters modified live by the user. Possible errors in the ASi network are directly viewable and help settings for problem solving are displayed.

Solution space continues to expand

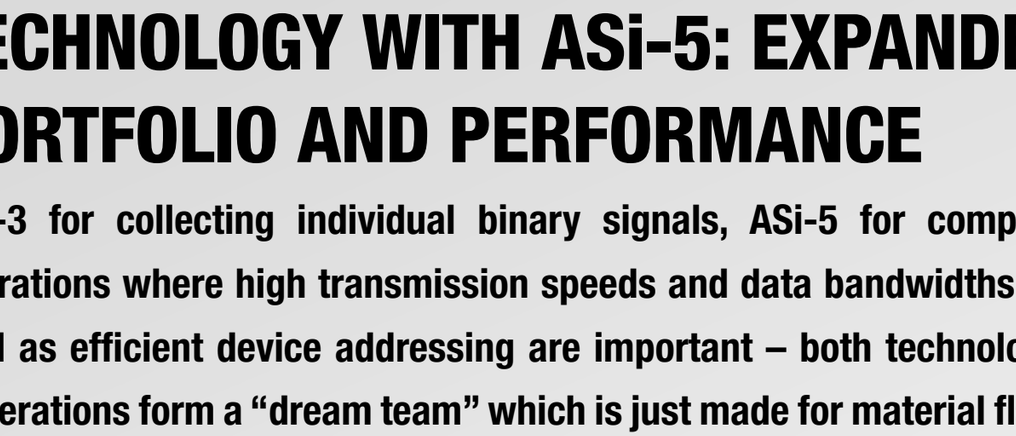
Speed, data bandwidth, addressing efficiency and diagnostic capabilities – but also new gateways and modules from Bihl+Wiedemann – are allowing the solution space in safety technology using ASi-5 to become ever larger. Definite contributors to this will be the development and realization of more complex modules with more safe in- and outputs – a feature already on the agenda.

And so the success story continues…



DRIVE AND MATERIAL HANDLING TECHNOLOGY WITH ASi-5: EXPANDED PORTFOLIO AND PERFORMANCE

ASi-3 for collecting individual binary signals, ASi-5 for complex operations where high transmission speeds and data bandwidths as well as efficient device addressing are important – both technology generations form a "dream team" which is just made for material flow plants. With a new 24 V brake chopper, a new housing family which is perfect for installation in cable ducts, and the expansion of the product range to include additional drive manufactures, Bihl+Wiedemann now offers even more efficient automation solutions with AS-Interface.



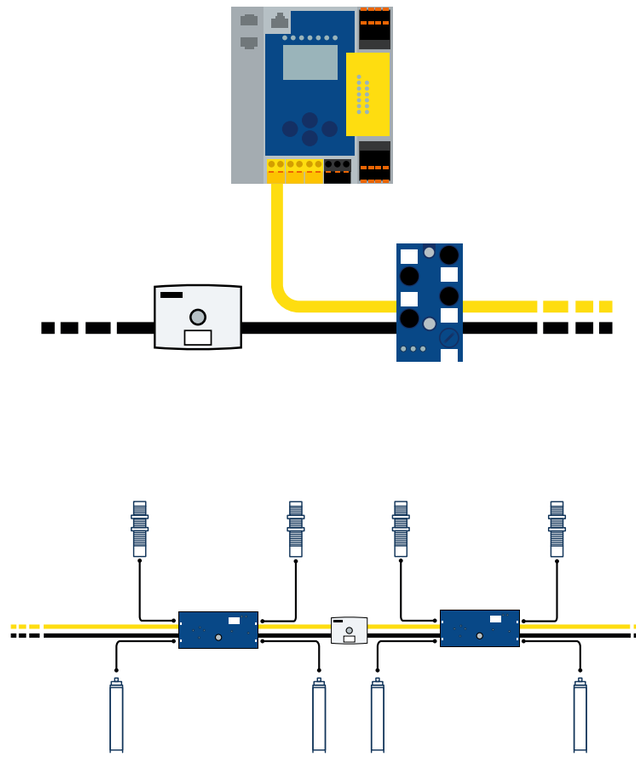
Bihl+Wiedemann offers a variety of options for drive technology.

Back in spring of 2022 the company drew great attention when they presented their ZPA solution for zero pressure accumulation in buffer and accumulation lines of stationary material flow systems. Zero pressure accumulation with Bihl+Wiedemann enables autonomous and PLC independent integration of motorized rollers, DC motors and frequency inverters from various manufacturers and in different power classes while at the same time providing detailed and fieldbus-independent diagnostics. The modules for manufacturers of motorized rollers such as Interroll, Itoh Denki and RULMECA and for suppliers of DC motors and frequency inverters such as Lenze, SEW-EURODRIVE and NORD DRIVESYSTEMS that have been available in the portfolio to date have now been joined by modules for drives from Rockwell Automation, ebm-papst and the Italian drive and electric motor specialist Bonfiglioli. This makes the Bihl+Wiedemann systems solutions for ASi-3 and ASi-5 compatible with drive infrastructures that are standard in modern material flow plants everywhere. The portfolio is rounded out with other new developments such as the new 24 V brake chopper for limiting voltage feedback to the supply line, and the new ASi-5 cable duct modules.

New 24 V brake chopper manages feedback of generative energy

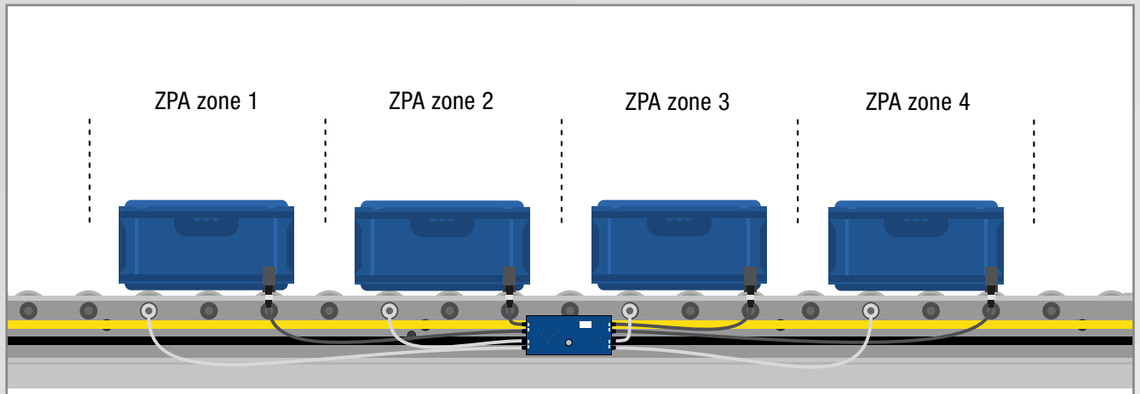
The new BWU4915 brake chopper in protection class IP67 limits the overvoltage when operating 24 V roller drives that results when braking the drive caused by feedback on the AUX line. It prevents undesired mains interruptions or error messages caused by overload. Each brake chopper is able to compensate the overvoltage of at least 2 rollers simultaneously, in many cases even more. The module is simply and quickly connected to the black AUX profile cable using piercing technology – with the flat housing of the module perfect for installation in the cable duct and other types of cable guides. Two integrated LEDs on the module enable quick and easy on-location diagnostics by indicating whether a voltage is correctly applied and whether energy that has just been actively fed back is compensated.

The new BWU4915 24 V brake chopper can compensate overvoltage on at least two motorized rollers at the same time.



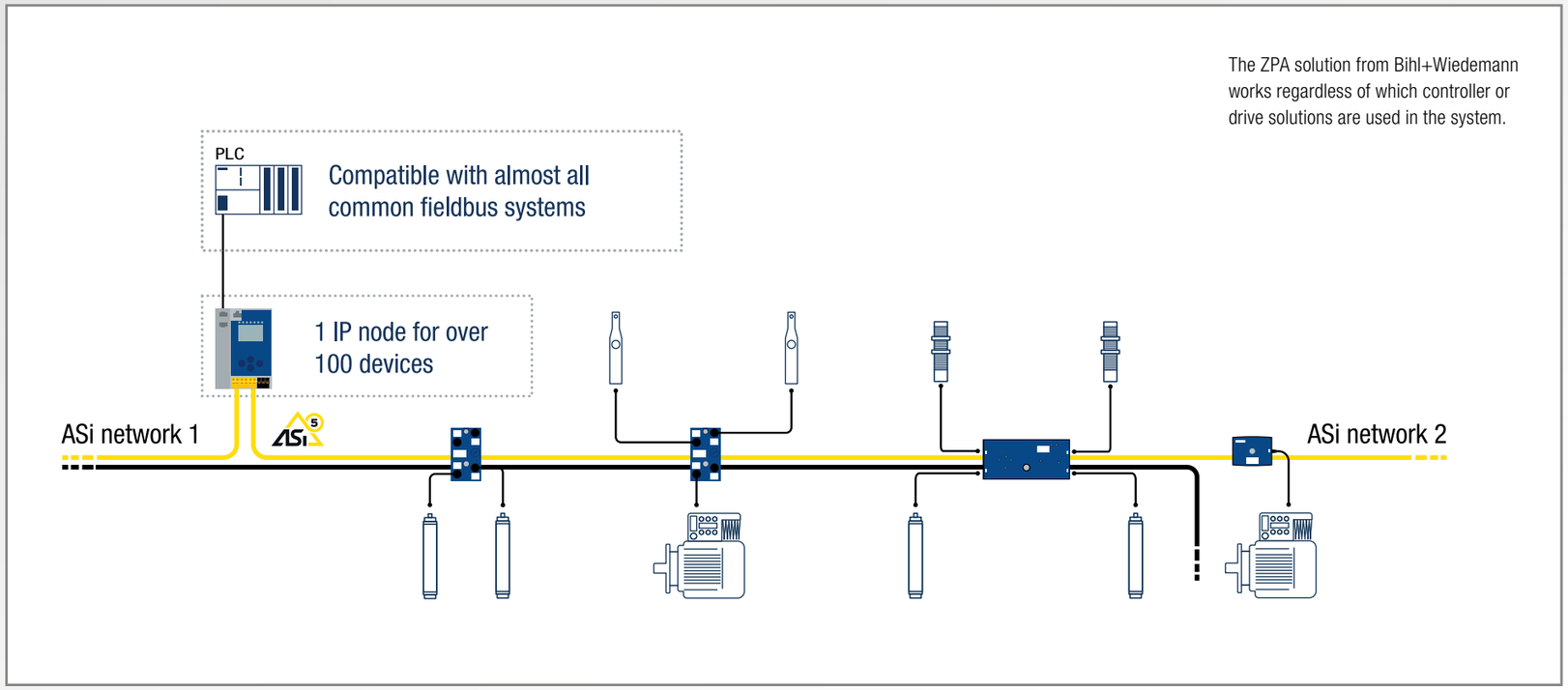
Integrate up to four motorized rollers flexibly and cost effectively

The new BWU4893 and BWU4894 ASi-5 cable duct motor modules for 24 V and 48 V make connecting quantities of roller drives in an application even more elegant and cost-effective. The type of construction and dimensions of the housings as well as the integrated cables for sensors and motors were optimized for simple, space-saving installation in the cable duct along the material flow line. Up to four motorized rollers and up to eight sensors can be connected and supplied on each module. Each of the four rollers can – as is typical for ASi-5 – be individually and thus extremely flexible controlled – and all under a single ASi-5 node number (ASi address). Various status LEDs provide assistance during commissioning, and during operation permit simple diagnostics of the inputs in case of a motor fault. Protection degree IP54 takes into account the conditions inside a cable duct – which with a specified temperature range of -30 °C to +70 °C enables the use of the new motor modules in both cold and deep-freeze environments and in conveying lines characterized by corresponding higher ambient temperatures.



With the new ASi-5 cable duct modules from Bihl+Wiedemann up to four ZPA zones can be controlled independently of each other.

Of particular interest for material flow applications with these modules is the ability to write the speed as well as the start and stop ramps steplessly with cycle times down to 1.27 ms – ideal for demanding applications. But in addition each of the new ASi-5 cable duct modules provides the option of up to four autonomous ZPA zones – conveniently using the PC software from Bihl+Wiedemann, without the need for a higher level controller and the associated programming effort and regardless of which drive solution is used in the plant. Together with the likewise available ASi-5 cable duct modules for two motors, the number of unused motor connections is minimized and wiring costs reduced.



The ZPA solution from Bihl+Wiedemann works regardless of which controller or drive solutions are used in the system.

AS-Interface, the perfect wiring technology for drive solutions

The classical advantages, such as

- ✓ reduced wiring effort thanks to the ASi cable,
- ✓ the ability to connect ASi modules exactly where they are needed using mistake-proof piercing technology,
- ✓ the free selection of line, tree, ring or star topology when designing the plant layout,
- ✓ transmission of standard and safety signals on the same cable

as well as the wide range of products and their easy integration using the Bihl+Wiedemann PC software with its hardware catalog for drag-and-drop system configuration, parameter cloning for faster commissioning of identical drives, ZPA parameterization and commissioning wizard have all been essential factors in AS-Interface establishing itself as an internationally standardized wiring system in drive technology as well. While the above arguments apply to all ASi generations, i.e. for ASi-3 as well, which is ideal for simple applications such as collecting binary signals, the new standard ASi-5 offers even more benefits, in particular

- ✓ greater data bandwidth,
- ✓ faster transmission rates,
- ✓ significantly more efficient addressing of the ASi devices (just one IP node for over 100 ASi modules)
- ✓ the ability to integrate intelligent IO-ink devices, as well as
- ✓ expanded channel-specific diagnostics, even more comprehensive and detailed error messages and solution prompts.

Thanks to the OPC UA server integrated in the gateway, the key information about the ASi network – process data and diagnostics – are also available for typical Industry 4.0 applications. In addition, cyclically important performance characteristics such as supply voltage and the actual motor current are transmitted. In practice motor modules are of course often used only in ASi-3 or ASi-5 applications, but in many cases mixed installations make a great deal of sense – such as when a simple indicator light is controlled by ASi-3 but the frequency inverter by ASi-5.

Standardized and safe: The user experience

Thanks to the wide range of motor modules and gateways, drive solutions using AS-Interface from Bihl+Wiedemann are independent of which controllers or drives are used in the system. Any already developed ASi installation can be ported in its entirety, for example to a different automation environment. In addition, thanks to standardized drive profiles, drive technology always seems to be the same with Bihl+Wiedemann – simple and convenient, regardless of which drive is used. The comfortable user experience also applies when parameterizing frequency inverters and DC drives made by different manufactures. This is ensured by a transparent parameter channel in the PC software from Bihl+Wiedemann. The freely available parameters and values are first stored in the motor module based on the manufacturer documentation, and then loaded into the drive at commissioning. This means the drives can be parameterized and placed in service using ASi directly and without any additional software or a direct connection to the drive. If a large number of drives need to be parameterized, this is easily accomplished using copy-and-paste in the PC software. This can significantly reduce the amount of time required. The highest availability during operation is ensured by the additional backup in the motor modules and in the ASi master, since storing of the parameters enables smooth spare parts replacement while at the same time preventing errors when replacing motors or motor modules.

Smart automation platform for material flow

AS-Interface is not only a simple and secure connection technology for automation components in the field – probably no other wiring technology makes it possible to integrate individual components such as devices into conveying systems in large numbers as cost effectively and efficiently. AS-Interface from Bihl+Wiedemann is even more – high-performance gateways and modules make ASi-3 and ASi-5 a smart automation platform on the lower field level – with variable connectivity to higher level fieldbus systems and control levels such as found in storage and material flow technology, in conveying and sorting systems or in picking systems.

APPLICATION:

ASi-5 AT SPAX: (FUTURE-)SAFE SOLUTIONS

Pictures: SPAX International GmbH & CO. KG

Not only customers of SPAX, the world's leading manufacturer of screws and connection technology, rely on durability, safety, quality and user friendliness. The company itself also sees these as factors which are just as elemental as future security – especially when it comes to the machines used to produce their products. Not least for these reasons the internal mechanical engineering department at SPAX, which maintains and renews the production machines – especially presses and rollers – decided for ASi and ASi-5 solutions and Bihl+Wiedemann as partner.

SPAX International GmbH & CO. KG is part of the corporate group ALTENLOH, BRINCK & CO and specialized in modern connection technology. The name SPAX has for over 50 years stood for „Made in Germany" quality. Around 500 employees near Ennepetal, a city next to the Ruhr area, are involved in producing up to 50 million screws per day, making the company with its familiar green packaging the market leader in Europe and a premium brand around the world.

Everyone knows the SPAX screw, which is offered in countless variations and sizes. But how and with which machines are they produced? The manufacturing process of a SPAX screw begins with cutting pieces of the original material to length from a rolled wire coil. The head of the screw is then formed in a press and compression process. Here the head type is also determined, e.g. Philips-tip. Then the thread and tip are rolled onto the so-called press nail. Finally the screw is hardened and coated before it can make its way to the customer.

SPAX uses a variety of identical or similar machines for manufacturing screws.

Quality with (future-)safety: Retrofit with AS-Interface from Bihl+Wiedemann for presses and rollers

In the production of their screws SPAX uses a variety of identical or similar machines – presses and rollers that were made as early as the 1970's and 1980's, but which are so solidly constructed that they are simply mechanically and electronically refurbished at regular intervals to bring them up to the latest technological state. Here the company has its own in-house mechanical engineering group with its own personnel for upgrading between eight and twelve machines per year.

Since presses and rollers are machines whose operation can be inherently hazardous to workers, the subject of machine safety has played an important role right from the start. Compared with the 1970's and 1980's, when for example two-hand relays were the norm, safety requirements have in the meantime been significantly enhanced. This is why over ten years ago, SPAX had sought a solution for implementing safety technology in a way that meets current requirements, that is future- and expansion-secure, and which takes up as little physical space as possible – since with 70 to 80 presses and the associated control cabinets space alone is a decisive criterion.

They found what they were looking for at Bihl+Wiedemann, specialists in automation solutions with AS-Interface and ASi Safety at Work. The Mannheim-based company convinced Sascha Roloff, Head of Maintenance at SPAX and his team not only with its safety technology solutions and ease of wiring of standard signals, but also through its expert on-site assistance and technical support. "It became quickly clear to us that Bihl+Wiedemann outside sales people are not peddlers, but rather full-fledged application engineers," says Roloff. "We got expert support in all matters and decisions from the very outset, and in a relatively short time developed a solution that met our requirements perfectly."

Safety first – one solution for many machines

Safety technology plays an important role in various places with the machines used at SPAX. On the machine itself it is important that operators can only open guard doors and covers if all potentially hazardous motion has stopped. This is guaranteed on one hand by the ASi Safety Active Distributor (BWU3565) in IP67, which is mounted directly to the machine and which is used to simply, quickly and safely integrate the safety door switch into the ASi network using the familiar profile cable. On the other hand, safe monitoring of standstills takes place. This is accomplished either using a Safety Basic Monitor (BWU2700 or BWU2852) or a Safety Gateway from Bihl+Wiedemann, each of which can be mounted in the control cabinet. Other safety-related tasks that the ASi Safety Gateway can perform include two-hand operation of the presses and rollers as well as the connection of E-Stop buttons.

For SPAX safety technology using ASi Safety at Work has a number of benefits even beyong the simple, flexible and cost-effective wiring technology. Since the majority of the presses and rollers are nearly identical and differ only in slight configuration variants that can be enabled separately, the solution for one machine is transferrable to the others. This means first that as a rule for all the machines can be used the same products with the same functionality at the same location. And secondly, control cabinets can be fully constructed and tested in advance, making it possible to store them ready-to-use. When a machine has then been mechanically and electronically overhauled, the control

Press with control cabinet.

cabinet can be simply connected up, saving an enormous amount of time. Thirdly, this means that once the safety program for a machine has been saved in the ASIMON360 software suite, it can be easily copied for use in other machines. Finally, the result is that things are made quite easy for personnel who are responsible for maintenance and modernization of the presses and rollers, for example when it comes to troubleshooting. Why? Because they can apply the knowledge about ASi and ASi Safety learned in regular training courses with Bihl+Wiedemann outside sales persons directly from one machine to another. "The cooperation from our colleagues at Bihl+Wiedemann that we have experienced here in the SPAX electronics workshop is really something special," says Sascha Roloff. "Regardless of whether we're bringing our people up to speed on the newest state of AS-Interface, working together on the best solution, or testing new developments – such a partnering relationship from both sides and the advances made are something one seldom experiences."

In addition to safety technology, another topic solved by AS-Interface was the monitoring of pressure, temperature and flow. Especially when it comes to presses and rollers, where proper lubrication of the machine is always critical for efficient functioning and to prevent damage, these parameters need to be continuously monitored. Here the decision was made early to employ the ASi digital modules from Bihl+Wiedemann, since they can be used in parallel with the safety technology on the same cable and monitored via the same ASi gateway.

ASi-5 and OPC UA: Ready for Predictive Maintenance and Industry 4.0

How foresighted the decision was to use AS-Interface for the safety technology and the monitoring of pressure, temperature and flow became evident in 2019. It was then that SPAX made the decision to make their production Industry 4.0 capable. In this context the maintenance department at SPAX was also given the assignment to develop a concept for making the presses and rollers ready for Predictive Maintenance. The goal was to get more information from the machines about their condition and feed this information into an IT solution using a standardized protocol so that the current condition of the machine and, when needed, any action recommendations could be derived. Ideally this would involve as few modifications to the existing configuration of the presses and rollers and their control cabinets as possible. After deep-diving discussions and tests a solution was developed together with Bihl+Wiedemann that could be implemented while meeting nearly every formulated requirement. A contributing factor was that at the end of 2018 with ASi-5 the newest AS-Interface generation was brought to the market, which is downward compatible with all previous ASi generations, has the necessary high data bandwidth and short cycle times for sending even the data from IO-Link sensors. In addition, Bihl+Wiedemann has in the meantime equipped all their new ASi gateways with an OPC UA interface for making the data directly accessible to the IT while bypassing the controller.

Safety technology in the control cabinet: ASi Safety Gateway (left) and Safety Basic Monitors (center) from Bihl+Wiedemann.

What does this mean in detail for the presses and rollers at SPAX? The complete safety technology can be left just as it was – simply the previous ASi Safety Gateway has to be replaced with the ASi-5/ASi-3 PROFINET Gateway (BWU3863) including its integrated safety monitor and OPC UA server. The configuration effort required is extremely minimal. And instead of the ASi digital modules, now the ASi-5 Modules (BWU4067) with integrated IO-Link Master with four Master Ports are used and connected to the already installed IO-Link compatible sensors for pressure, temperature and flow and are likewise parameterized using the ASIMON360 software. These few and simple changes now make predictive maintenance possible, since the connected IO-Link devices no longer provide just digital values, but rather process and diagnostic data as well which are send to the IT through the OPC UA server in the ASi-5/ASi-3 Gateway. This allows SPAX for example to recognize early whether and how the pressure, temperature and flow are changing and react as needed to prevent expensive machine downtimes or even damage.

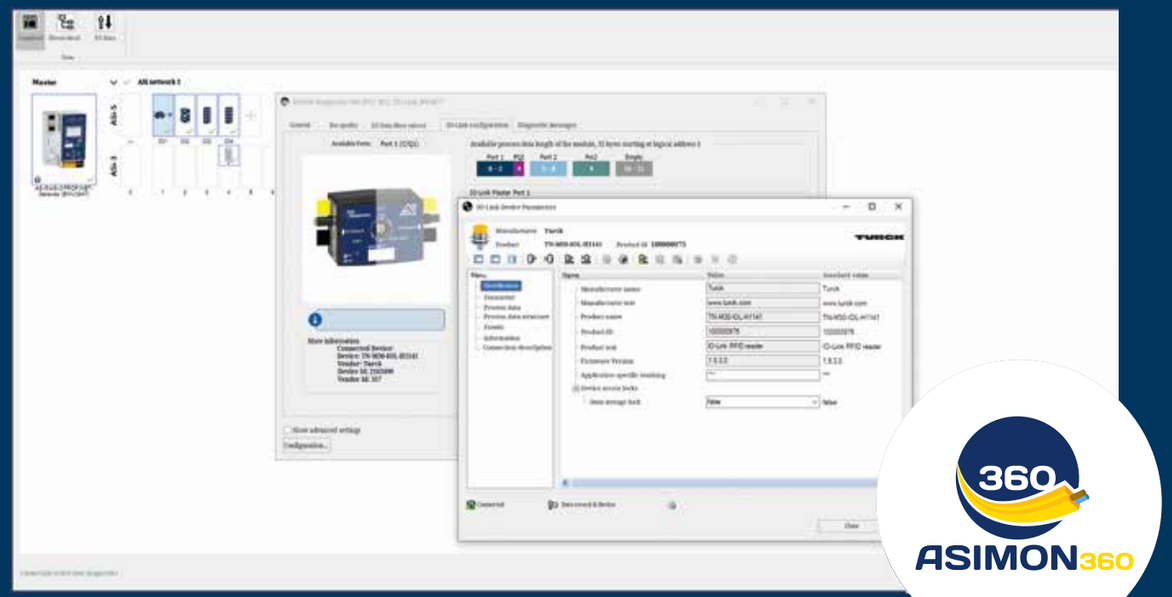
As far back as 2020 SPAX began to make the first machines "ready for predictive maintenance" in line with the commonly developed solution, and since then retrofitting of the presses and rollers is proceeding step by step. And after this already so successful cooperation, Sascha Roloff can already say: "When the next large project involving robotics applications is coming up, we will again be relying on the solutions of our partner Bihl+Wiedemann."

Active Distributor ASi Safety (BWU3565) in IP67 for simple, fast and safe integration of a door switch into the ASi network using the profile cable.

Process and diagnostic data from IO-Link sensors for pressure, temperature and flow can now be used in ASi-5 for predictive maintenance.

IO-Link sensors are incorporated using the ASi-5 Modules with integrated IO-Link Master with four Master Ports from Bihl+Wiedemann.

ALWAYS UP TO DATE



IO-Link integration using ASIMON360.

As simple as it is to connect devices in AS-Interface networks using the profile cable and piercing technology, so challenging could be the configuration for complex automation solutions such as zero pressure accumulation or muting. With Bihl+Wiedemann you don't notice any of this, since the user interfaces of the software products – and thereby the overall user experience – is being constantly improved. The same applies to the company's devices such as the ASi-5 Module BWU4386 with eight IO-Link Master Ports.

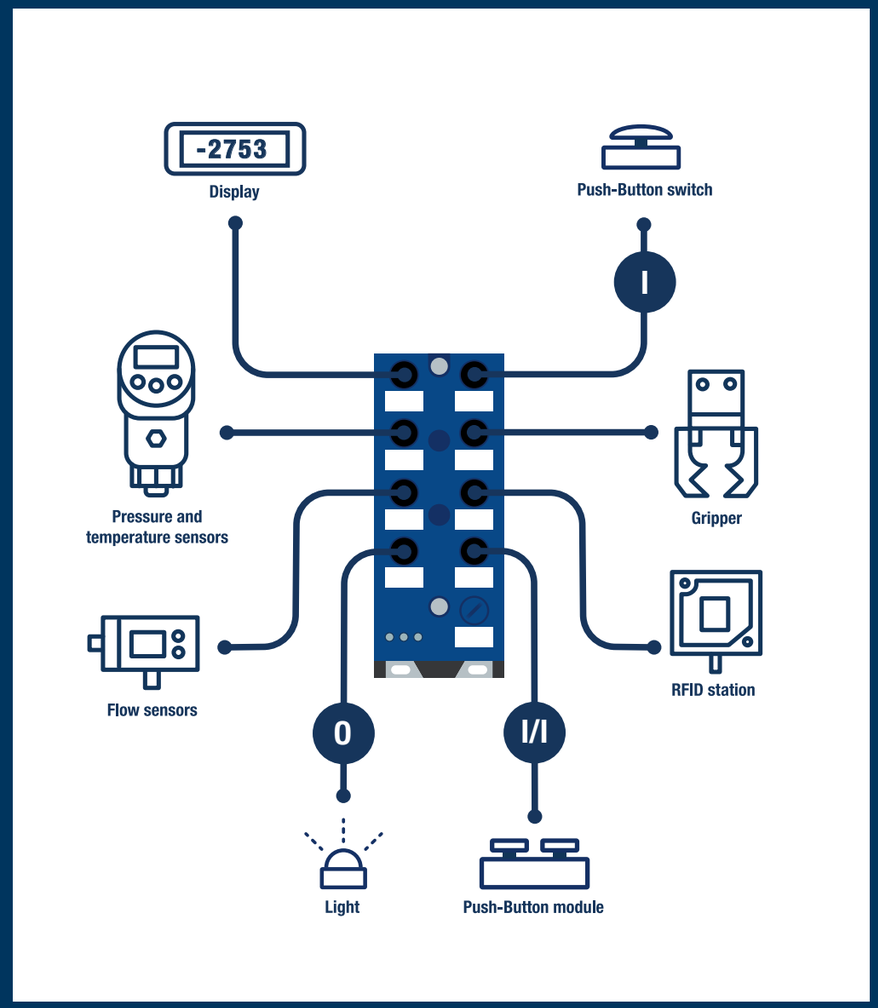
Good technology like ASi-3, ASi-5 or IO-Link gets on one hand even better when it is easy to further develop, optimize and update it. On the other hand it gets also even better when the operator never even notices the technological complexity that resides in the background, whereas the user interface enables simple, clearly structured and intuitive operation to provide a positive user experience. And good technology gets even better when ongoing enhancement of the firmware and the PC configuration software also takes into account feedback and suggestions from users. Which is how things are done at Bihl+Wiedemann, where both the device firmware and the PC software are continually improved in interaction with customers.

Responding flexibly to customer demands and market conditions with firmware updates

In these times when many components are in short supply and all delivery times are long, Bihl+Wiedemann has recognized the potential that firmware updates can offer. They always make it possible for the company to make new ASi devices available to users at an early stage for testing, to integrate customer wishes on short notice, to implement and validate new functionalities and thereby to reduce the time-to-market of the solution for all. Prototypes and products remain always with the customer and can – simply through firmware updates via internet taking into account all the important security aspects – be improved efficiently and with time savings together with the later users. Service and support can benefit from this approach as well, since in many cases sending hardware back and forth is no longer necessary in favor for a quick firmware update. Close cooperation with customers – such as when implementing their first ASi application, at (first-time) commissioning of prototypes or testing series products as part of a system configuration – ensures that the firmware gets continually more robust. In some cases even non-specified settings or values can be "compensated", e.g. at IO-Link products from other manufacturers.

PC software focuses on positive user experience

The continual improvement in the usability of the software tools has as its goal that users enjoy working with it and have a positive user experience. When further developing user interfaces particular emphasis is placed on representing more complex, autonomous control functions as simply as possible. ZPA, zero pressure accumulation for buffer sections in stationary conveyor systems, or the safety function muting for



The ASi-5 Module BWU4386 with eight IO-Link Master Ports uses, when needed, Pin 2 for configuring an additional in- or output on any port.

securing hazardous areas with continual material feed are two examples of applications with complex configuration and logic which can be implemented simply with the help of the intuitive software suites from Bihl+Wiedemann without the need for PLC programming. A feedback function in the latest software releases ensures that the desires and requirements of customers are better identified, understood and ultimately realized. This way the careful checking and clustering of feedback are used to turn individual suggestions into innovations for every user of ASi and IO-Link modules offered by Bihl+Wiedemann.

Cost-effective and flexible to use: BWU4386 with eight IO-Link Master Ports

Yet another example of how customers can benefit from the combination of continuously improved PC software and product development is the ASi-5 Module BWU4386, the first 8-port IO-Link Master that gets connected using profile cable and piercing technology. The device is constructed such that each of the eight IO-Link master ports class A provides not only its function as an interface for IO-Link devices but also a standard I/O signal. Pin 2 of the five-pole M12 port socket can thus be configured if needed as an additional in- or output – easily and conveniently using the software suite from Bihl+Wiedemann. The continual further development of the PC software user interface also ensures here that the user can make all the settings as intuitively as possible and is not even aware of the complexity in the background.

The ASi-5 Module BWU4386 with eight integrated IO-Link Master Ports is in contrast to comparable IO-Link masters with eight ports not only more flexible, but also more cost-effective. Comparing the module costs in a system with other IO-Link masters, users can expect connection costs of less than 25 Euros per port. With as few as ten IO-Link devices this means a savings of up to 18% - or even 60% for 200 devices. Similarly clear are the cost advantages in a system comparison with IO hubs from other manufacturers.

Supply IO-Link device class A with two-conductor cable directly out of ASi-5

One of the latest product highlights from Bihl+Wiedemann is the new ASi-5 Module BWU4748 with integrated IO-Link Master Class A for one IO-Link device. The active distributor enables the supply of the connected IO-Link device directly from ASi, with no additional auxiliary power required. Connected with piercing technology on the ASi profile cable, the two-conductor ASi line becomes an IO-Link communication interface which transmits both power and data on the same cable. Typical use cases for such connections include suspended conveyors or shuttle systems – in other words, locations where it is difficult to bring auxiliary power to the sensor.

Whether firmware updates, software with optimal user experience or new hardware in the form of products for ASi-5 and IO-Link – Bihl+Wiedemann always has customer and user satisfaction in view when developing all of their products. Because only in this way can come impulses which yields technologically lasting and future-proof innovations.

ASi-5 AND ASi HIGHLIGHTS FROM BIHL+WIEDEMANN

First ASi-5/ASi-3 Fieldbus Gateways with integrated ASi-5/ASi-3 Safety Monitor

With the new ASi-5/ASi-3 Safety Gateways from Bihl+Wiedemann, ASi-5 Safety can be easily integrated into existing applications in the future. It is then possible to use both safe and non-safe signals under one address. And the new chip card generation now offers space for the full documentation of a complete project configured and parameterized using ASIMON360.

Article	Local safety I/Os*	ASi networks	PROFIsafe / CIP Safety	Fieldbus
BWU3952	✓	2	–	PROFINET
BWU3953	✓	2	✓	PROFINET
BWU3954	✓	1	✓	PROFINET
BWU3955	✓	1	–	PROFINET
BWU3973	–	2	✓	PROFINET
BWU3974	–	1	✓	PROFINET
BWU3957	✓	1	–	EtherNet/IP
BWU3958	✓	2	–	EtherNet/IP

*Safety I/Os local in the gateway

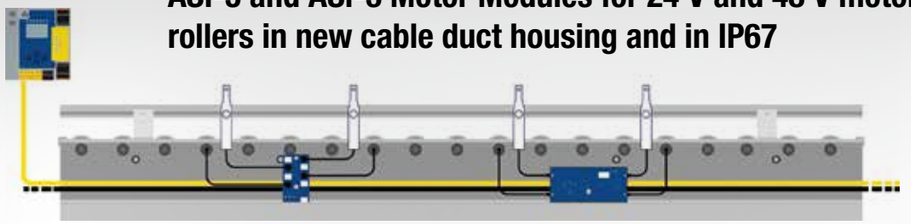
New product family of I/O Modules – Security of supply even in large quantities

Supply interruptions for components remain a great challenge in automation technology that are not likely to improve in the short term. To ensure that Bihl+Wiedemann customers will even in the future be able to procure I/O modules in sufficient quantities, the company has developed a new product family. When designing the new I/O modules attention was paid to two points in particular: on the one hand only components that are available in large quantities even in challenging procurement markets were used, and on the other hand the modules were developed based on a high-performance yet cost-effective technology. This allows them to be produced efficiently in large quantities for assured availability – and at attractive prices as "Bihl+Wiedemann's Choice" articles. The new I/O modules are designed so that they can be used in many different applications, thereby greatly simplifying order and spare parts management. As input modules they feature from four to 16 inputs, which depending on the module can be supplied at up to 2000 mA out of AUX or up to maximum 120 mA out of ASi. When used as output modules with four to 16 outputs up to 1 A per output can be switched.

ASi-5 Modules with integrated IO-Link Master

Article	Type	Number of IO-Link Ports	IO-Link Port Class A	IO-Link Port Class B	Analog inputs (4 .. 20 mA)	ASi connection	Supply of IO-Link Ports	Periphery connection	Protection rating
BWU4748	Active distributor	1	1	–	–	Profile cable	ASi	1 x M12 cable socket	IP67
BWU4088	Active distributor	1	–	1	–	Profile cable	AUX	1 x M12 cable socket	IP67
BWU4077	Active distributor	2	1	1	–	Profile cable	AUX	1 x M12 cable socket	IP67
BWU4067	Field module	4	2	2	–	Profile cable	AUX	4 x M12 socket	IP67
BWU3897	Field module	4	2	2	–	M12	AUX	4 x M12 socket	IP67
BWU3819	Field module	4	4	–	–	Profile cable	AUX	4 x M12 socket	IP67
BWU3899	Field module	4	4	–	–	M12	AUX	4 x M12 socket	IP67
BWU4386	Field module	8	8	–	–	Profile cable	AUX	8 x M12 socket	IP67
BWU3843	Control cabinet module	4	Configurable connectors		–	Push-in terminals	AUX	Push-in terminals	IP20
BWU4775	Control cabinet module	4	Configurable connectors		4	Push-in terminals	AUX	Push-in terminals	IP20
BWR4771	PCB module	4	Configurable connectors		–	Wiring pin, straight	AUX	Wiring pin or termination board	IP00

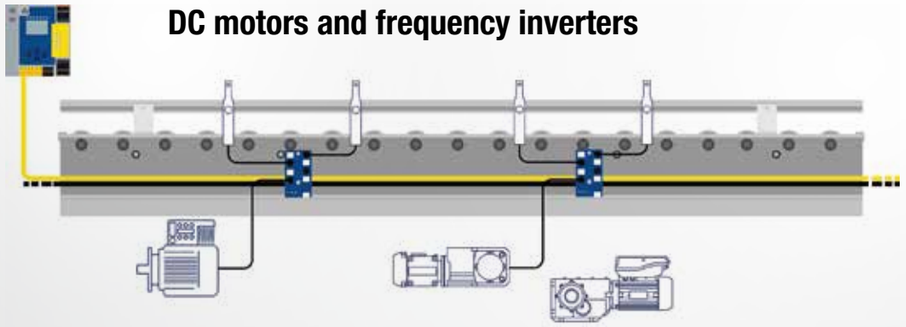
ASi-5 and ASi-3 Motor Modules for 24 V and 48 V motorized rollers in new cable duct housing and in IP67



To control 24 V and 48 V motorized rollers via ASi-5 and ASi-3 Bihl+Wiedemann offers a wide range of motor modules. Complementing the two ASi-5 Motor Modules BWU4212 and BWU4246 in IP67 housing for controlling two each 48 V or 24 V motorized rollers type Interroll EC5000 AI and other ASi-3 modules for roller drives made by other manufacturers such as Itoh Denki, Rollex or RULMECA, the company has added a new product family in a special IP54 enclosure for installation in cable ducts. All modules are connected to ASi and AUX using the profile cable. The motorized rollers are supplied out of AUX via M8 cable sockets, the inputs for connecting sensors are supplied out of ASi.

Now available for Interroll drives are ASi-5 Cable Duct Modules for controlling 4 x 48 V motorized rollers (BWU4894), 4 x 24 V motorized rollers (BWU4893), 2 x 48 V motorized rollers (BWU4726, BWU4721) and 2 x 24 V motorized rollers (BWU4722) as well as an ASi-3 Module for 2 x 24 V motorized rollers (BWU4768). For Itoh Denki roller drives the Bihl+Wiedemann range currently includes an ASi-5 Motor Module (BWU4739) as well as two ASi-3 Modules (BWU4942, BWU4769) for controlling 2 x 24 V motorized rollers each.

ASi-5 and ASi-3 Motor Modules for DC motors and frequency inverters



DC motors and frequency inverters from leading manufacturers can also be controlled directly via ASi. The Bihl+Wiedemann range also offers a large selection of ASi-5 and ASi-3 motor modules for various requirements. When performance parameters such as speed, acceleration and braking behaviour as well as expanded diagnostics are required during operation, DC motors and frequency inverters can be efficiently controlled today using ASi-5. Here, in addition to solutions for Lenze and SEW MOVI-C, Bihl+Wiedemann's range also includes ASi-5 Motor Modules in IP67 with four M12 connections for controlling one of the following drives each: SEW MOVIMOT (BWU4068), NORD NORDAC frequency inverter (BWU4371), ebm-papst K4 (BWU4370), Rockwell PF525 (BWU4369) and Bonfiglioli DGM/DGM-R (BWU4388). Whereas the drives and the two additional digital outputs are supplied via a separate AUX profile cable, the ASi profile cable is used for data transmission and supply voltage for the four additional inputs used to connect additional sensors. Yet another ASi-5 Module for controlling a SEW MOVIMOT is the BWU4377, a module in IP67 with four digital inputs which is supplied fully out of ASi. If a binary control of a SEW MOVIMOT is required for less complex functions such as start/stop, left-right run or open/close, this can be implemented cost-effectively using the following ASi-3 modules: the out of ASi supplied Modules BWU3135 with additional two inputs plus an output, and BWU2912 with two additional inputs as well as its AUX supplied counterpart BWU2956.

First modules for ASi-5 Safety

With their two Input Modules BWU4209 for floating contacts and BWU4210 for optoelectronic protective devices Bihl+Wiedemann presented the first products using ASi-5 Safety technology at the Hannover Fair. ASi-5 Safety runs in parallel on the same profile cable and is the ideal addition for ASi Safety at Work when for example multiple safe signals or a combination of safe and non-safe signals need to be sent.

Both ASi-5 Safety Modules with protection category IP67 have two safe two-channel inputs and 12 self-configuring I/Os for non-safe signals. Depending on the need this allows a wide variety of applications to be realized, such as an extremely cost-effective connection between ASi and a control panel with multiple illuminated buttons, an E-Stop button and a safe key switch. In the future, the range will be successively extended so that one module each will be available for two floating contacts, for two optoelectronic protective devices and for the combination of floating contact/OSSD: as IP67 field module with four additional standard inputs and outputs as well as IP20 control cabinet module, IP67 field module and PCB module with 12 additional standard inputs and outputs each.

ASi-5/ASi-3 Address Programming Device from Bihl+Wiedemann

To incorporate ASi devices from any generation in the field simply into ASi networks, Bihl+Wiedemann has developed a modern ASi-5/ASi-3 Handheld Address Programming Device. Optimized for easy addressing of ASi-3 and ASi-5 modules, the device features an OLED color display, six rugged buttons for ease of operation, and a durable, powerful energy storage component (supercapacitor) for quick charging with simultaneous use. The Handheld Address Programming Device can be fully charged in around 30 minutes, and using the included addressing cable, ASi addresses (ASi-3) and node numbers (ASi-5) for 70 modules can be assigned after just ten minutes of charging time. Charging uses a standard USB-C interface which also serves as a PC interface for connecting to the Bihl+Wiedemann software suites. This interface can also be used for firmware updates, for example to expand the function scope.

ASi-5 Module with eight integrated IO-Link Master Ports

With its eight IO-Link master ports class A the ASi-5 Module BWU4386 from Bihl+Wiedemann is not only an economical alternative to comparable Ethernet-based fieldbus modules or IO hubs, but is also significantly more flexible to use, since each of the eight IO-Link master ports class A also provides a standard I/O signal. Pin 2 on the five-pole M12 port socket can be used to configure an additional in- or output – conveniently using the company's software suite.

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