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AS-INTERFACE MASTER NEWS

THE BIHL+WIEDEMANN MAGAZINE

INTERVIEW

Best Practice – ASi-5 with Bihl+Wiedemann

SAFETY

Passive Safety up to SIL3/PLe: Good reasons to become active!

Benefit immediately:

ASi-5: The targeted alternative to Ethernet on the field level

Bihl + Wiedemann

ASi

Benefit immediately:

ASi-5: THE TARGETED ALTERNATIVE TO ETHERNET ON THE FIELD LEVEL

Tired of expensive network components requiring their own individual Ethernet connection? No time for complex planning of the Ethernet connection with expensive and cumbersome wiring and maintenance for ports that don't even get used? How can you justify expensive, pre-assembled cables, connectors and switches when they're no longer necessary – keyword: significantly reduced material costs? No need for complicated commissioning or M12 cables that were ordered too short? Would you prefer cost-effective field modules that can be wired quickly and cost-efficiently in any topology, that are always up and running and whose design ensures errorless installation? Then ASi-5 is exactly right for you.

Innovations always have staying power if they remove previous limitations, provide a new benefit, simplify things without compromise or reduce costs – or all of the above. And if they are available as is the case with ASi-5, the fieldbus technology for the first automation level. Only Bihl+Wiedemann offers more than 70 ASi-5 products – from ASi-5/ASi-3 gateways for a variety of fieldbus environments using self-configuring digital I/O modules, to a 1-port IO-Link master. A wide yet finely scaled product portfolio that enables perfect and future-proof automation solutions.

ASi-5: Here and now instead of future dreams

The need for a more efficient infrastructure grew in many fields no later than the introduction of Industry 4.0, the beginning of digitalization in machine and systems building and the advancement of intelligent sensors and actuators. Increased speed and greater data bandwidth were therefore the core development goals for ASi-5. In terms of its performance, the blossoming first three years of the technology being on the market have already shown that the new AS-Interface generation fully meets the demands on network integration for nearly any field device.

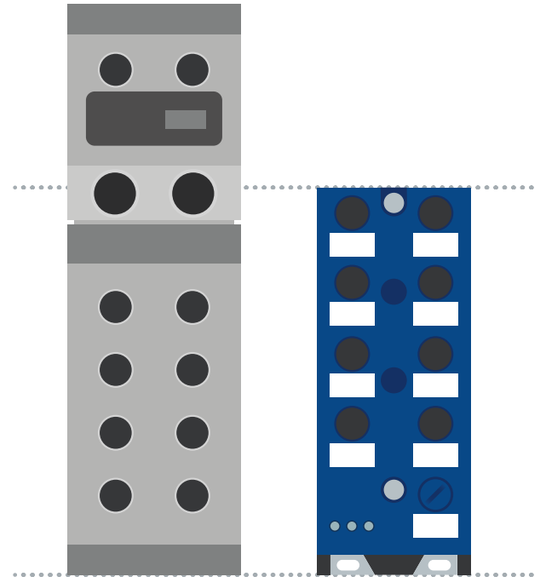
This makes ASi-5 a true alternative to Ethernet solutions wherever the latter are too cumbersome and too costly. They are also often over-dimensioned in terms of transmission performance for the majority of field devices – unless extremely large quantities of data need to be transmitted at particular locations in the field, like with an HMI or a camera. Using a sledgehammer to crack a nut comes to mind. Of course even in the Ethernet field some more favorable alternatives are in development, but it remains uncertain when the gap between the controller and the field level can be closed in terms of product technology as well in order to enable a consistent Ethernet connection.

ASi-5: Starting instead of waiting!

ASi-5 on the other hand already makes so much possible; the more so as the technology has long since grown out of its infancy and has been fully and intensively tested in the field. It has established itself as a valid alternative to Ethernet in numerous applications – as shown by many practical examples from intralogistics. Warehousing and material handling technology, conveying and sorting equipment, shuttle systems, picking systems, storage and retrieval systems, AGV and crane technology – equipment, machines and systems such as these, which used to require PROFINET, can now be easily equipped with ASi-5. You can already benefit today from a lean, simple and efficient infrastructure for data traffic and energy supply in the network which when needed can be adapted flexibly and without great effort or expense to new requirements. And all without compromise: the familiar functionalities and diagnostic capabilities of Ethernet are equally available with ASi-5.

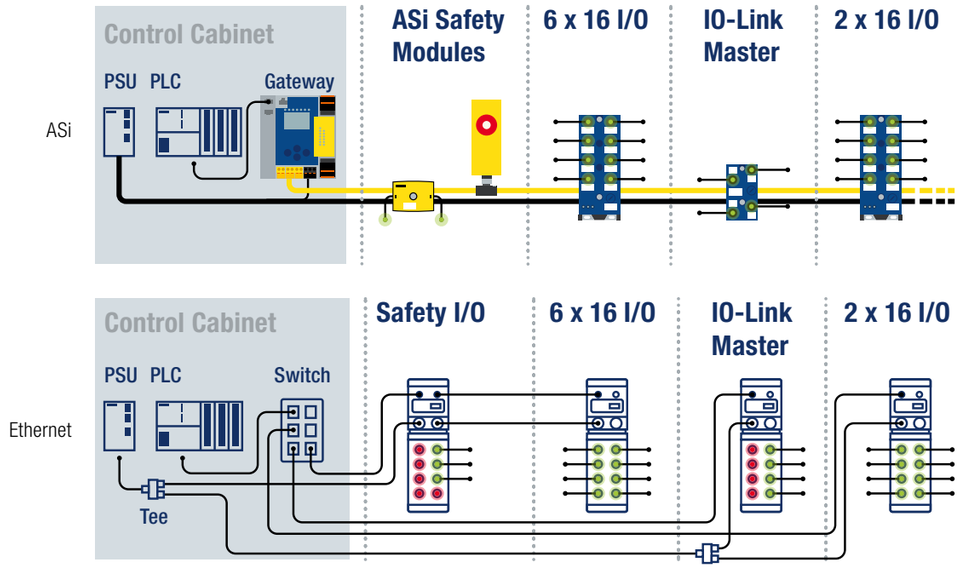
The main reason for the success of ASi in general was and remains the simple wiring concept – no connectors, no pre-assembled cables, no special advanced planning effort, no significant logistic issues in the warehouse and at the construction site. The ASi cable is available by the roll and can be trimmed to length, eliminating unnecessary cable runs. The modules are connected using the unique piercing technology – vertically guided pins penetrate the profile cable to ensure a maximally safe physical and electrical contact. Extra connectors? Additional switches? Forget them all. It could hardly be more simple, flexible and cost-efficient.

Size comparison: Fieldbus module vs. ASi-5 module (with 8 ports each)



Compared with Ethernet-based fieldbus modules, similar ASi-5 modules using piercing technology are both less costly and significantly more compact.

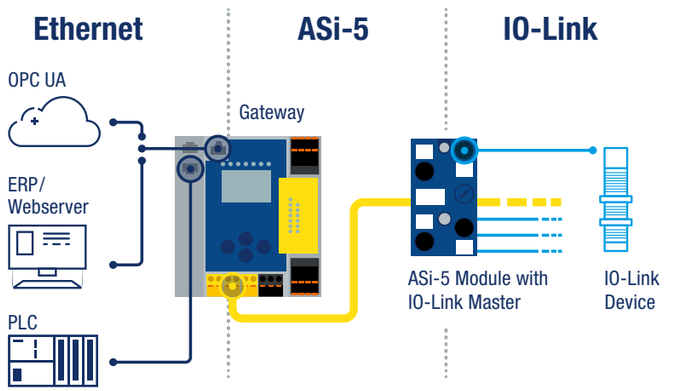
Palletizer: Perfect solution with ASi vs. alternative approach using Ethernet



So what exactly can ASi-5 do, and what does it do better than...

... currently available Ethernet solutions at the field level? Quite a bit. A webserver for example – integrated in the gateway – can operate up to two ASi networks with up to 96 ASi modules each which for their part are able to connect various peripherals such as IO-Link devices, sensors, actuators, valves or drives. With Ethernet, each of these network components requires its own fieldbus connection, whereas with ASi-5 a single connection suffices, along with a single IP address and a single IP configuration. And the connected modules require no expensive electronics for an integrated Ethernet interface, making them generally much less expensive. All this represents an enormous savings in hardware and commissioning – especially since, on the software side, ASi-5 also offers functionalities like automatic configuration, automatic device detection, an overview of all the devices on the fieldbus, as well as differentiated diagnostic capabilities with clear help functions. In actual operation you enjoy fast, redundant data exchange with the field devices for rough machine performance.

ASi-5 solutions from Bihl+Wiedemann: Consistent from the sensor up to the "world above"



Safe connectivity in the "world above"

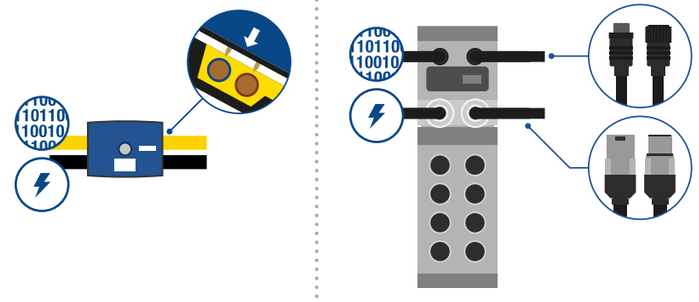
Unbeatable as a wiring system and interface for the first field level, ASi-5 offers global uniformity in the "world above" as well – that is the world of programmable logic automation systems and thereby in commonly found fieldbus environments such as PROFINET, EtherNet/IP, EtherCAT, POWERLINK or Sercos. Also onboard as a direct MES-ERP interface – for example for production planning or condition monitoring using cloud applications – is the communication and interface standard OPC UA. It is manufacturer- and platform-neutral, and can be effectively combined and used with the above fieldbuses while also supporting comprehensive safety mechanisms. Together with the ASi-5/ASi-3 gateways from Bihl+Wiedemann, ASi-5 offers full external data safety. Add to this functional as well as passive safety up to SIL3 and PLe, and you have personal protection in your system on top of it all.

ASi-5 in practice: Palletizers

It's interesting that ASi-5 is now gaining applications that previously were – due to the lack of suitable alternatives – Ethernet domains. We have explained why this is above. The reality of it is shown in the example of a palletizer equipped with ASi-5. Installed in the machine are a total of 92 digital sensor signals for object detection, an IO-Link valve terminal with 24 valves, nine roller conveyor drives, a safety light barrier, two E-STOP buttons, two IO-Link signal lamps and an IO-Link height detection sensor.

In order to network all these devices with Ethernet you would have needed the following field modules at minimum – each with its own Ethernet interface: an Ethernet IO-Link master with eight ports, eight Ethernet I/O modules and an Ethernet safety module with 8 ports and long cables to the light barrier and to the two E-STOP buttons. The cost to the machine builder would have then included not only 10 often over-dimensioned modules, but also 10 individual Ethernet interfaces – whereby some of the safety ports and IO-Link ports would still have gone unused. In addition, the commissioning personnel would have needed various manufacturer-specific tools – an additional impediment that demands the corresponding expertise.

ASi: Piercing technology and profile cable instead of connectors and pre-assembled cables



ASi-5, by contrast, needs no separate module interfaces – the Ethernet connection of the entire application is made via one single interface on the ASi-5/ASi-3 fieldbus gateway. The components are also less expensive and can be installed with far less wiring effort. Commissioning is also far simpler. For one thing just one IP address needs to be configured and the software suite from Bihl+Wiedemann automatically handles various functions in setting up the network. Accordingly, the palletizer was equipped with one ASi-5/ASi-3 fieldbus gateway with integrated safety monitor, eight ASi-5 I/O modules, two ASi safety modules as well as an ASi-5 module with four integrated IO-Link master ports. All these devices were easily connected to the ASi profile cable using piercing technology. No special cables or expensive tees were needed – once again representing significant cost savings.

Ethernet in the field? ASi-5 from Bihl+Wiedemann is the smarter way to go!

The presented application proves it: the broad product range from Bihl+Wiedemann already offers the possibility to replace many Ethernet modules on the field level with ASi-5 without sacrificing any functionality or safety. Also contributing to the overall benefits are the new, self-configuring ASi-5 I/O modules with the typical short cycle time and channel-specific diagnostic capabilities, which are technologically on the same level as Ethernet or IO-Link but also offer significantly easier and less costly wiring. Likewise, the ASi-5 modules with integrated IO-Link master: compact, finely graduated in the number of ports provided and therefore generally more cost-effective compared with Ethernet-based modules. And finally, industry 4.0 concepts are often easier and smarter to implement by using ASi-5. Because, for one thing, efficient incorporation of IO-Link devices was from the very beginning a central focus in the development of ASi-5. For another, with the OPC UA server which Bihl+Wiedemann has integrated in their ASi-5/ASi-3 fieldbus gateways a future-proof interface to the IT level also becomes a standard on board. There's no doubt: it's time to refocus, and make a fresh, targeted start with ASi-5!

Safety technology

PASSIVE SAFETY UP TO SIL3/PLE: GOOD REASONS TO BECOME ACTIVE!

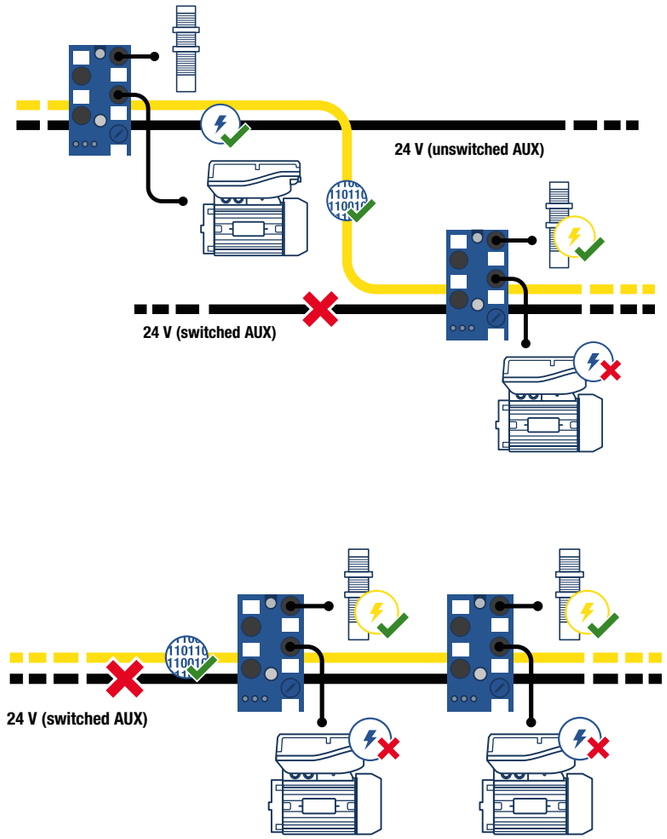
Less complexity, significant cost benefits and know-how in functional safety technology – all of which are strong points for the safety solutions from Bihl+Wiedemann. With passive safety the company located in Mannheim is adding another tool to their safety lineup – with the possibility to guarantee highest safety standards using SIL3 and PLe.

Application possibilities for passive safety

Functional safety in connection with traditional, Ethernet-based fieldbus solutions means - from a control and wiring perspective - that each single actuator has to be wired using a pre-assembled connection cable and provided with its own safe output. This can be accomplished , for example, by using the ASi safety gateways and Safe Link from Bihl+Wiedemann, whereby nearly 2,000 safety signals can be safely coupled to each other over Ethernet. The advantage of these solutions is obvious: maximum flexibility within the entire safety-related topology, since each actuator can be turned off individually. But is this individual voltage isolation even necessary for example for every single motorized roller in a conveyor line or each individual actuator on a packaging machine?

Might it not suffice under some circumstances to simply turn off entire actuator groups at once? And what then happens with the communication to the actuator when it is turned off for safety reasons over Ethernet? Exactly! In such a case the data connection is dead – the modules cannot be accessed or read, and diagnostics or qualified error reporting is no longer possible. Which goes entirely against the principle of industry 4.0, nor is it compatible with digitalized IT structures within future-proof machine concepts. Also, you will not find much enthusiasm among decision makers when it comes to the value-diminishing, increased hardware and wiring expenses of a direct fieldbus termination for each individual actuator.

Using different AUX potentials within one system



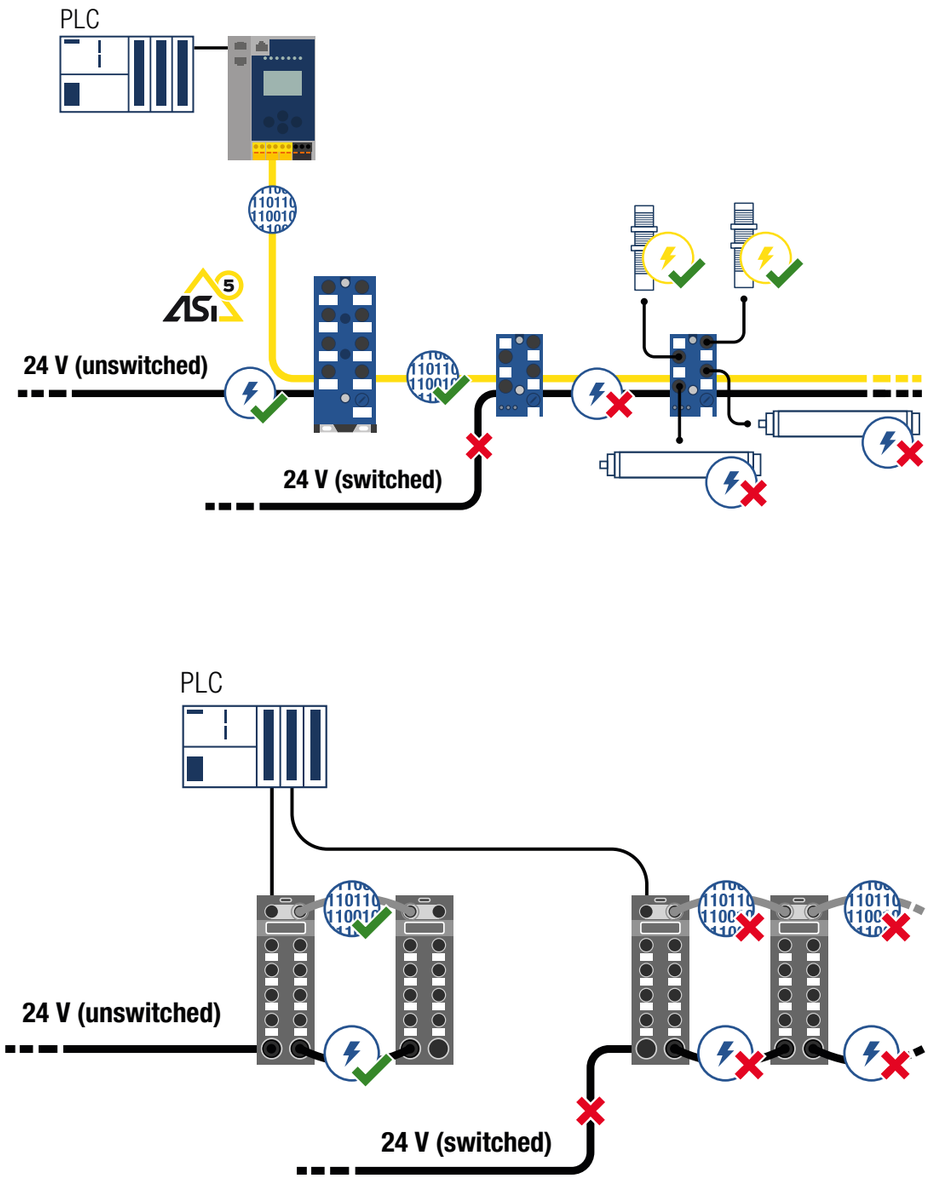
Questioning and optimizing safety concepts

Blanket criticism of individual safety-based shut-off of single actuators is hardly called for – in many scenarios, whether in an Ethernet or ASi network, this may well be the best approach, for example to meet safety-technical standards and ensure machine safety. The safety experts at Bihl+Wiedemann also know this from their own experience. But more and more machine and system builders are questioning their safety concepts: they recognize that maximum flexibility such as what is offered by individual safe outputs is not always necessary – for example when entire groups of actuators have to be safely shut off at the same time anyway due to process or machine considerations.

Passive safety: Standards demand exclusion of cross-wiring

Passive safety presumes that the power supply for communication and for sensors be galvanically isolated from the actuator supply. This should also prevent cross-wiring and in general exclude faults between the auxiliary power for the actuators (AUX) and the external potential – the power supply via ASi – so that when shut-off is required there is also a guarantee that the power supply of a drive train will also be disconnected. This is not a given in most standard wiring schemes where M12 round cable is used. Based on Machine Directive 2006/42/EC this is specified and prescribed in greater detail in the safety standards EN ISO 13849-1 and EN 62061. This also means that just one single non-passively safe module in the topology results in the system as a whole no longer have a passively safe structure – as in so many other situations, safety technology is only as strong as its weak-

Communication and sensor supply when AUX is shut off in ASi and in Ethernet-based systems



est link. Depending on the application a precise safety review of the entire relevant cabling path can essentially demonstrate that any fault situation will always result in a safe condition – but such a broad undertaking can mean considerable effort and expense. Unnecessary effort, since there is a more simple and more elegant way - with ASi and products from Bihl+Wiedemann that are suitable for passive safety.

Passive safety technology with ASi – the perfect alternative

The idea of passive safety technology with ASi is based on the premise that firstly, all connected actuators are controlled and can be turned off individually through their respective non-safe output, and secondly that when necessary entire groups of actuators can be disconnected from the power supply with a single safe output. ASi as the globally standardized fieldbus for the first automation level is ideal for this, since the ASi wiring concept is not only highly economical – compared with traditional fieldbus wiring technology it offers cost advantages of up to 68 percent. But also because the yellow ASi profile cable for control signals and power up to 8 A can be routed separately from the black AUX profile cable for auxiliary power up to 20 A. This concept automatically satisfies the requirement for galvanic isolation of the power supply for communication and sensors from the power supply of the actuators. And with Bihl+Wiedemann the user no longer has to worry about meeting the safety standards: nearly all the new ASi-5 modules, for example those with integrated IO-Link master, and many of the ASi-3 modules offered by the company meet the requirements for passive safety – which is indicated explicitly in the data sheets for the respective products.

Safety is ensured…

The modules from Bihl+Wiedemann allow for passive safety up to SIL3 and PLe. When the auxiliary power in the black profile cable is turned off, the connected actuators are no longer supplied and can no longer carry out hazardous movements. But they remain continuously accessible, since the yellow profile cable continues to supply power to the sensors and to the bus communication and, unlike many Ethernet-based solutions, thereby enables signal transmission even in switch-off condition. This makes it possible to access modules – and often the connected peripherals as well – and to read diagnostic information for example, which can indicate possible fault causes.

… and economy as well

Whether yellow or black – the ASi profile cables can be manufactured cost-efficiently as standardized bulk product and kept on rolls. They do not require pre-assembly like round cable for field buses and need no special M12 connection for sensors and actuators – these are simply and reliable connected to the ASi cable using piercing technology. In addition the black AUX cable with its up to 20 A capacity can handle significantly more auxiliary power than typical M12 round cable configurations. A lot of current for low “transmission costs” – ideal for motors in material handling applications, but also for integrating IO-Link solutions.

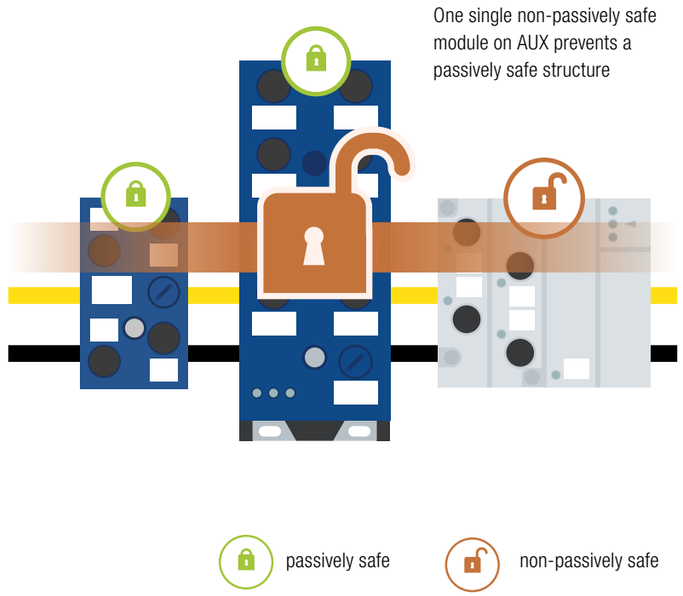
Instead of having to sacrifice an expensive safe output for each individual actuator, establishing passive safety on the controller side requires only a safety monitor with local outputs and a contact expansion module in order to turn the supply voltage off centrally – a much preferable alternative from a cost standpoint.

Safety technology from one single source

Passive safety from Bihl+Wiedemann is an interesting approach to implementing safety solutions where it is appropriate with technical and economical efficiency – with integration capability in all common controller worlds.

In many cases this allows the safety technology as offered by the company in such a wide range – thanks to Safe Link including in more complex applications with safe coupling between multiple gateways and overarching safety functions – to be effectively expanded.

Passive safety – time to let Bihl+Wiedemann show you how to get started!



Interview with Paul Werge, Product Manager at Bihl+Wiedemann

Best Practice – ASi-5 with Bihl+Wiedemann

As pioneers in introducing ASi-5 technology, Bihl+Wiedemann can look back on nearly three years of product and user experience. Many new products, continual improvements and added functionalities, feedback from users about their experience and the recognition that ASi-5 is today in many cases the more efficient alternative to Ethernet-based solutions in the field. This and more are covered in the interview with Paul Werge, Product Manager at Bihl+Wiedemann.

Paul Werge, Product Manager at Bihl+Wiedemann

ASi MASTER NEWS: High speed, great data bandwidth, cost-effective components, a broad range of products from the very start, reduced wiring effort, simple integration of intelligent peripherals with IO-Link, industry 4.0 communication via OPC UA – it's all representative of the ASi-5 solutions from Bihl+Wiedemann. What from the customer perspective are the decisive reasons for the market success of the new ASi generation? And how has your portfolio developed along with the actual user experiences?

Paul Werge: That varies from user to user. The reduced wiring effort with ASi is in general an important argument for many, since this directly reduces the hardware costs and the effort required for wiring, sometimes by even more than half. But this applies not only to ASi-5 solutions, rather also to ASi-3 installations. And one shouldn't forget that for many applications ASi-3 is technologically wholly sufficient and still the more cost-effective solution. Significantly for many users is also the ability to use the high speed and data bandwidth of ASi-5, for example to integrate drives, IO-Link devices or fast counter modules without having to continue relying on expensive Ethernet solutions. Users who are already working with ASi-3 were of course excited about our ASi-5/ASi-3 gateways which link both worlds together without having to go to any special trouble. The width and depth of our ASi-5 portfolio also supports partial or successive retrofitting of machines with the new technology. There is also the option with Bihl+Wiedemann of integrating the safety technology at the same time – regardless of the size of the application and to exactly the extent required – for many a key advantage. Of course, since the launch of ASi-5 many user experiences and customer wishes have flowed into our products. As just one example we could mention the self-configuring I/O modules for up to 16 signals, which enable the user to drastically reduce the part number count. Since these modules do not have to be configured, but are simply installed using plug-and-play, this product family has developed into a "one size fits all" solution for economical I/Os.

For both new users and existing customers we have at the same time created a "Bihl+Wiedemann's Choice" range. This selection consists exclusively of best practice products which combine a maximum degree of user experience, are available from stock in large quantities, and can be shipped immediately. The goal behind this is to emphasize the respective customer advantage from the perspective of the entire AS-Interface system and make it as simple for the customer as possible to make the best selection for his system. I should also mention that we were able to sharpen our pencils a bit more for these preferred modules given the manufactured quantities, so that especially when it comes to standard applications, Bihl+Wiedemann products are not only faster, but also also more cost-effective.

ASi MASTER NEWS: On the subject of best practice, we should also mention not only the simplified product selection but also commissioning. What kind of specific improvements have been realized here that make commissioning or even planning of ASi applications easier?

Paul Werge: To make working with ASi-5 as simple as possible for our customers we allow experience to flow into the corresponding software tools. Our PC software with the integrated hardware catalog and the electronic commissioning wizard is further developed just as continually as our diagnostic software. The user experience design is always modified and improved to create an even more positive user experience. For example Bihl+Wiedemann has covered all the "Dos and Don'ts" simply and clearly in a detailed installation guide – into which of course a great amount of experience and expertise has flowed. Together with the technical support provided by our in-house experts, this ensures perfect support from project planning to commissioning. In order to be able to simply integrate ASi participants in the field on-site, we have developed a new ASi-5/ASi-3 address programming device (see p. 12). The design goal behind this was "keep it simple". The user should be able to concentrate only on the essentials, namely assigning addresses and participant numbers. The commissioning as such then runs automatically through our hardware catalog based PC software. Along with this the user also has diagnostic software at his disposal. This is used mainly for commissioning and maintenance intervals and provides concrete error information and direct proposed solutions. It makes both prophylactic error prevention as well as diagnosis of specific errors during operation, making it just as suitable for the release process of a system as for its simple maintenance. Commissioning of ASi has never been as easy as it is now.

ASi MASTER NEWS: And in actual operation – what does it look like in terms of product updating of the installed hardware and improvement of the user experience?

Paul Werge: Our products always leave our facility at the latest state of the art. Now that we have passed beyond the theory phase and been able to gather a great deal of practical experience over the past three years, we can say with confidence today that our ASi-5 products, especially the ASi-3/ASi-5 gateways are well established in their functionality and free of any growing pains. Of course ongoing technological improvements mean there is often a gap between the current product generation and the base already installed at the customer. This is why as part of our continuous product upkeep we make functional improvements available to all customers who are already using ASi-5 via firmware updates. They benefit from the experiences other customers have had with our products in a wide range of applications to be sure, but we do as well. And so, when we together with a customer develop new features and functions, these can be applied by other uses anywhere in the world by easily updating their devices with the click of a button using our PC software. Filling in security gaps is another aspect of the firmware update, as we always make use of the newest encryption technologies to reliably minimize the security risks.

ASi MASTER NEWS: The subject of future-proofing which you just mentioned is something many users associate with topics such as industry 4.0, Smart Factory or digitalization. Thanks to OPC UA you seem to be ideally situated with your ASi5/ASi-3 gateways.

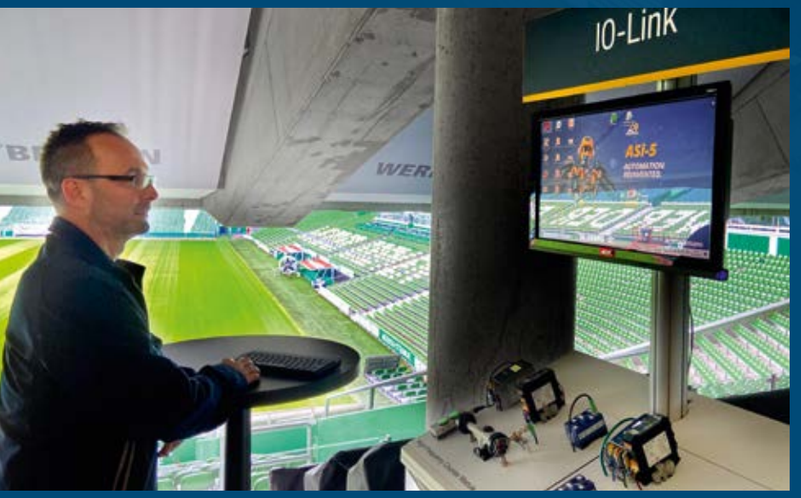
Paul Werge: I'm glad you see it that way. OPC UA as an interface for direct data exchange from the equipment up to higher IT levels with ERP or MES functionality or even all the way up to the cloud – with all of today's as well as possible future applications – this for us is the state of the art communication for the industrial environment. We have had great experiences in projects where the customer are using the integrated OPC UA server in our gateways. It's a globally standardized interface, is simple and intuitive to use. Data transmission is parallel to the fieldbus and features the most up-to-date encryption technologies. Of course we are also able - when requested - to offer other options and solutions, but at the moment this is hardly needed – especially since OPC UA will likely grow into the universal communication standard for industry 4.0 and the Industrial Internet of Things.

ASi MASTER NEWS: Consistent application of best practice and a technological pioneer in every respect – that seems to sum it up. Many thanks for the conversation

ARENA TOUR BY BIHL+WIEDEMANN:

ASI-5 WORKSHOPS AS IN-PERSON EVENT

There is no substitute for direct contact between partners who are cooperating on a technological level. Bihl+Wiedemann therefore are hosting their ASi-5 workshops in-person in the form of an Arena Tour which is finding great favor with participants.



Live and in colour“ is how participants in the Arena Tour of Bihl+Wiedemann experience not only the football stadium fascination. They also discover why AS-Interface is the right choice for a great variety of automation tasks and how ASi-5 is showing the way to the digital future. Experts show in-person how simply an ASi-5 network can be planned and ASi-3 as well as ASi-5 can be gotten up and running. Included in the workshops is an explanation of the technological basics of ASi-5 and the advantages of the new ASi-5 products from Bihl+Wiedemann, but also how ASi safety has been added to ASi-5. Live demos are used to explain how IO-Link devices can be integrated cost-effectively, how ASi-5 is integrated into the PROFINET world and how roller drives and converters are controlled using ASi-5. Participants can test the technology themselves on demonstration panels and for example see the benefits of ASi-5 for themselves, such as setting ramps for controlling drives – all against the impressive backdrop of a stadium. An ASi cable connected to an ASi-5/ASi-3 fieldbus gateway is placed across all of the participants tables. This allows all the participants to connect an ASi-5 module during the presentation and commission the application together with each other.

The starting point of the tour was the Veltins Arena in Gelsenkirchen on September 1, 2020. Even at this initial event it became quickly clear how enthusiastic the numerous participants were about the personal interaction. The first attendees even arrived at the arena an hour early. The mood was exceedingly positive, and a highly constructive discussion atmosphere was created while adhering to hygienic considerations, where solution approaches for automation tasks could be discussed in person. All participants reported feeling safe and were glad for the opportunity to meet with experts.

Concrete inquiries and specific questions characterized the discussions not only at Schalke arena, but also at the following events in the tour on September 9 in the wohninvest Weser Stadium in Bremen, on October 1 in the Lanxess Arena in Cologne, and on October 14 in the Allianz Arena in Munich. Here again the interest in topics was so great that for example in Bremen the last participants did not leave the workshop until an hour after the official end of the event.

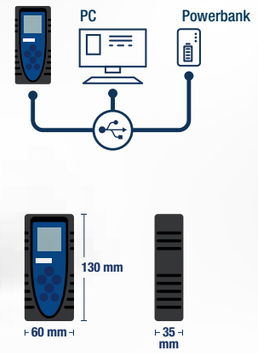
Included in all the Bihl+Wiedemann workshops was a tour of the respective arena. Here participants could sniff the stadium atmosphere and get a look behind the scenes of a soccer stadium.

The workshops provide many opportunities for intensive networking with others and for exchanging information with the presenters and ASi specialists from Bihl+Wiedemann. Because of the great success of this concept, the Arena Tour of Bihl+Wiedemann will resume in 2021 – with the next dates to be announced soon.

ASi-5 AND ASi NEWS FROM BIHL+WIEDEMANN

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

- ✓ Supports ASi modules of any generation, incl. ASi-5
- ✓ Optimized for simple addressing without additional mobile terminal devices
- ✓ Six solidly designed keys for simple operation
- ✓ Modern OLED color display
- ✓ Standard USB-C port for power supply and as PC interface
- ✓ Modern power storage (supercapacitors) for fast charging and longer lifespan
  - Operating period: 120 read/write operations from fully charged supercapacitor
  - Power supply: supercapacitor charging time for 70 modules approx. 10 minutes, fully charged in approx. 30 minutes



New 30 V Power Supply Generation for ASi-5

Bihl+Wiedemann will soon be using a newly developed 30 V power supply generation.
This has been especially designed for ASi-5 communication and is therefore ideal for mixed ASi-5/ASi-3 applications.

The new product family of 30 V power supplies from Bihl+Wiedemann includes the following article numbers (in parentheses):

30 V power supply, 4 A	30 V power supply, 8 A	30 V power supply, 16 A	30 V power supply, 3 A
			
1-phase, 100 ... 240 VAC (BW4218)	1-phase, 100 ... 240 VAC (BW4219) 3-phase, 400 ... 500 VAC (BW4220)	1-phase, 100 ... 240 VAC (BW4221) 3-phase, 400 ... 500 VAC (BW4222)	1-phase, 100 ... 240 VAC (BW4223) Suitable for UL Class 2

All six new 30 V power supplies have been optimized and fully tested for use with the ASi-5/ASi-3 gateways from Bihl+Wiedemann. Errors that typically occur with power supplies have been reduced to a minimum in the areas relevant to ASi-5 and ASi-3. Since data coupling has been integrated into the ASi-5/ASi-3 gateways already, the new 30 V power supplies are not only less costly than previous ASi power supplies, they are also significantly more compact. And because they can be installed flush with each other, they save valuable space in the control cabinet. Lastly, together with the ASi-5/ASi-3 gateways one can always keep an eye on supply currents and voltages of ASi installations.

The new 30 V power supplies can be used not only in mixed and pure ASi-5 applications, they are also highly useful with traditional ASi-3 gateways in the “1 Power Supply, 1 Gateway for 2 ASi Circuits” configuration. Previous ASi power supplies are still available as replacements for existing applications, but when designing a new system or for upgrading an existing machine Bihl+Wiedemann recommends changing over to the new 30 V power supplies in conjunction with ASi-5/ASi-3 fieldbus gateways.

ASi-5 self-configuring I/O Modules from Bihl+Wiedemann

An example for maximum flexibility and cost efficiency of ASi-5 applications are the self-configuring I/O modules from Bihl+Wiedemann, allowing use of up to 16 digital signals distributed as desired as in- or outputs. The two ASi-5 modules BWU4230 and BWU4231 in IP67 each has 16 I/Os. Depending on the application this makes up to 16 digital in- and outputs possible, for example to link 12 distance sensors and four valves in a packaging machine. The application possibilities range from motor control to signal indication to control panels. The modules do not require pre-configuring and their functional use can be changed without the use of additional software. Another advantage are the various diagnostics capabilities. Channel-specific diagnostics allows an output short circuit or overload on the sensor supply to be detected on any terminal. And with cyclical feedback the status of any set digital output can be read, allowing errors to be quickly localized and cleared.

In addition to the modules with 16 digital signals, the product family of ASi-5 self-configuring I/O modules also includes the 8 I/O module IBWU4232 in IP67 and the 16 I/O module BWU3884 in IP20. Also available is the BWU4727, a digital ASi-3 module with self-configuring connections in an active distributor housing. The fact that many different applications can be handled using one and the same module not only simplifies spare parts management. The self-configuring I/Os from Bihl+Wiedemann are also less expensive than comparable Ethernet or IO-Link based solutions and make possible reductions in wiring costs of up to 70% compared with round cable solutions.

Bihl+Wiedemann's Choice: The following modules are recommended for use together with ASi-5 self-configuring I/O modules:

IP67 ASi-5 Modules
- 8 x M12, 16I BWU3890

IP67 ASi-3 Modules
- 2 x M12, 2I/2O, BWU3497
- 4 x M12, 4I BWU2725
- 8 x M12, 4I/4O BWU2810

IP20 ASi-5 Modules
- 16I BWU3874

IP20 ASi-3 Modules
- 4I BWU2723
- 4I/4O BWU1938
- 8I BWU2721
- 8I/8O BWU2490

Drive Solutions

ASi-5 Cable Duct Motor Modules

✓ For connecting 2 x Interroll AI motorized rollers
✓ In the new cable duct housing

Article	Type	Digital inputs	Digital outputs	Input voltage	Output voltage	Connection of ASi	Connection of periphery	Protection rating
BWU4721	Control of 2 x 48 V motorized rollers	4	–	ASi	AUX (48 V)	Profile cable	2 x M8 snap-in cable socket, straight, 5-pin (motors) 2 x M8 cable socket, straight, 4-pin (sensors)	IP67
BWU4722	Control of 2 x 24 V motorized rollers	4	–	ASi	AUX (24 V)	Profile cable	2 x M8 Snap-in cable socket, straight, 5-pin (motors) 2 x M8 cable socket, straight, 4-pin (sensors)	IP67

ASi-5 Motor Modules

Article	Type	Digital inputs	Digital outputs	Input voltage	Output voltage	Connection of ASi	Connection of periphery	Protection rating
BWU4370	Control of 1 x EBM-Papst K4	4	2	ASi	AUX	Profile cable	4 x M12 socket, 5-pin	IP67
BWU4371	Control of 1 x NORD NORDAC FLEX inverter	4	2	ASi	AUX	Profile cable	4 x M12 socket, 5-pin	IP67
BWU4369	Control of 1 x Rockwell PF525 inverter	4	2	ASi	AUX	Profile cable	4 x M12 socket, 5-pin	IP67
BWU4377	Control of 1 x SEW MOVIMOT	4	–	ASi	–	Profile cable	4 x M12 socket, 5-pin	IP67

Active Distributor ASi-5 Motor Module

Article	Type	Digital inputs	Digital outputs	Input voltage	Output voltage	Connection of ASi	Connection of periphery	Protection rating
BWU4718	Control of 1 x SEW MOVI-C frequency socket	1	–	ASi	–	Profile cable	1 x M12 cable plug, D-coded, straight, 4-pin	IP67

ASi-5/ASi-3 Fieldbus Gateways

✓ ASi-5 master and (high-performance) ASi-3 master in one unit
✓ Field update capable for tamper-proof firmware and security updates
✓ OPC UA server and integrated webserver

Article	Fieldbus	Number of ASi networks	1 Power Supply, 1 Gateway for 2 ASi networks, economical power supplies
BWU3847	PROFINET	1	yes, 4A/ASi network
BWU3852	PROFINET	2	yes, 4A/ASi network
BWU3848	PROFINET	1	yes, 8A/ASi network
BWU4257	PROFINET	2	yes, 8A/ASi network
BWU3849	EtherNet/IP+Modbus TCP	1	yes, 4A/ASi network
BWU3851	EtherNet/IP+Modbus TCP	2	yes, 4A/ASi network
BWU4019	EtherNet/IP+Modbus TCP	1	yes, 8A/ASi network
BWU4258	EtherNet/IP+Modbus TCP	2	yes, 8A/ASi network
BWU3854	EtherCAT	1	yes, 4A/ASi network
BWU4016	POWERLINK	1	yes, 4A/ASi network

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ASi-5

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