

# AS-INTERFACE MASTER NEWS

THE BIHL+WIEDEMANN MAGAZINE

INTERVIEW

„Only advantages from  
the customer point of view“



SAVE DRIVE CONTROL

# Driven by you



Save drive control

# Driven by you

That AS-Interface is perfectly suited for interacting with virtually every available automation system is long been known. Now this passionate team player is entering new realms: with the new AS-i Safety Gateway BWU3160 from Bihl+Wiedemann drives can be safely controlled and monitored using CIP Safety on Sercos – directly and without an additional safety PLC.



**sercos**  
the automation bus



safe link

Competitors and partners? At first glance it may seem like a classic case of either-or, but on closer inspection we see clear possibilities for a both-and. Especially in Germany cooperation between competitors has a long tradition: as early as 1890 for example machine builders came together in the Verein Rheinisch-Westfälischer Maschinenbauanstalten, followed two years later by the Verein Deutscher Maschinenbau-Anstalten, predecessor of today's VDMA. Only slightly younger is the Zentralverband Elektrotechnik- und Elektronikindustrie (AVEI), which will celebrate its 100th birthday in 2018.

Even more concrete is the cooperation among companies in the various user organizations in the field of automation technology: here all the members combine their expertise to develop a common system, after which they will enter the market as competitors with their own products derived from this cooperation. At the end of the day there are only winners: the member companies because most of them could not

alone have supported the basic research, and above all the customers, who benefit from the efficient solutions that could not be offered without the cooperation of their suppliers.

**“When the customer actively demands something, we are always able to solve special tasks together with other companies”**

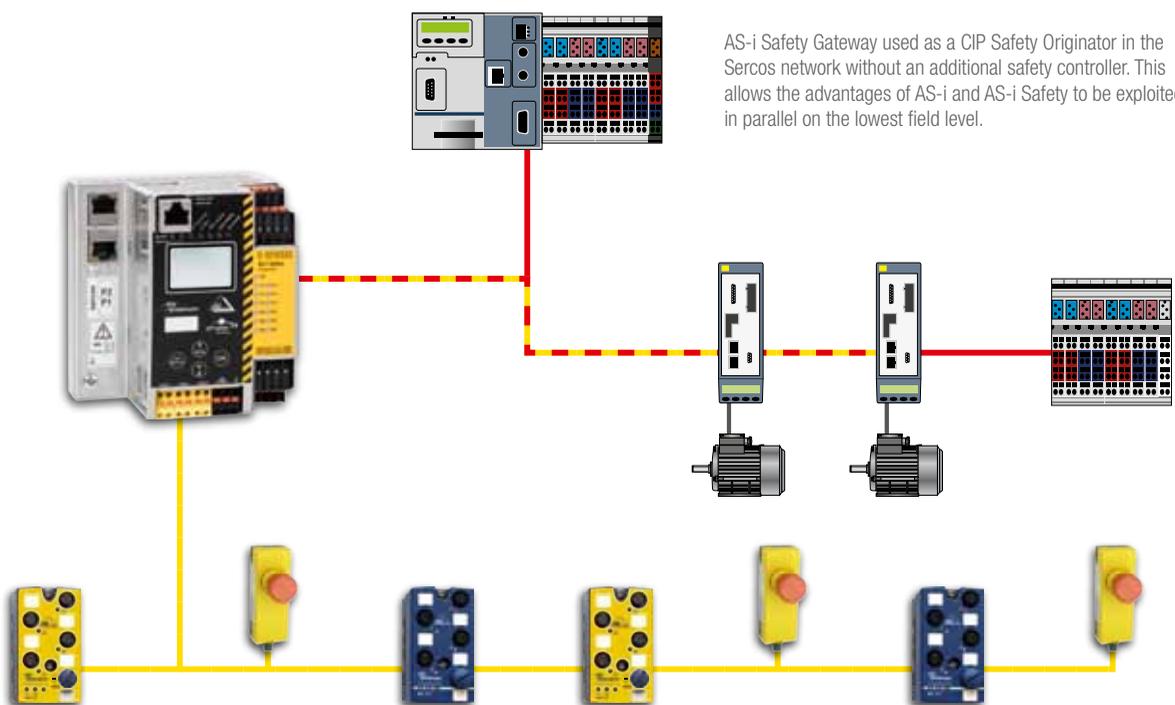
All this is of course no big surprise in the relevant industries. Less well known may be the fact that the mingling of automation specialists works supremely well not only on the level of the respective umbrella organizations, but also in very specific individual cases. “When the customer actively demands something, we are always able to solve special tasks together with other companies,” says Bihl+Wiedemann CEO

Jochen Bihl (see also the interview starting on page 8). “This means I can only encourage users and machine builders to proactively formulate their wishes and thereby stimulate their suppliers to further optimize cooperation with the products used in the machines.”

One current example is the latest AS-i Safety Gateway BWU3160 from Bihl+Wiedemann, which offers completely new possibilities for machine communication with drives: with the help of CIP Safety on Sercos this device can safely control Bosch Rexroth drives directly, and without a need for the previously required safety PLC. In the standard area the drives continue to be directed by the usual controller. But the Gateway takes over the safety part, selecting safe functions in the drive and shutting it down safely when necessary.

The impetus for developing this product came from customers, who wanted to combine the advantages of both worlds – the amazingly simple safety technology of AS-i

### AS-i Safety Gateway BWU3160 used as a CIP Safety Originator in the Sercos network



Safety and the globally recognized drive technology of Bosch Rexroth – in the most cost-effective way possible. From then on things moved rather quickly. Both manufacturers simply put their heads together and searched for a common solution to the challenge. Simply? “I must admit: solving this task was a difficult bit of work,” Jochen Bihl allows. “But it was absolutely worthwhile.”

### The product that resulted can by all rights be called a multi-talent

It's true: the product that resulted can by all rights be called a multi-talent. The new AS-i Safety Gateway for CIP Safety combines two AS-i Masters for two AS-i networks. This provides up to 62 two-channel safe inputs, with three additional ones integrated directly in the device. The safe outputs are also impressive: six fast elec-

tronic safe outputs directly in the unit speed up the process and ensure that the technological bridge from AS-Interface to CIP Safety is appropriate to high-performance drive technology. And best of all: using Safe Link, the safe coupling from Bihl+Wiedemann, the Gateway can be expanded to nearly 2000 safe in- and outputs – at no extra cost, by the way.

The Gateways features (see also page 11) are not even the whole story. CIP Safety on Sercos also reduces wiring effort and expense: there is just a single cable – the Sercos cable. This carries both the standard and safety data. And drives with integrated safety technology are connected exclusively using this Sercos cable. In other words: additional cables, for example to stop the drive safely, are not needed.

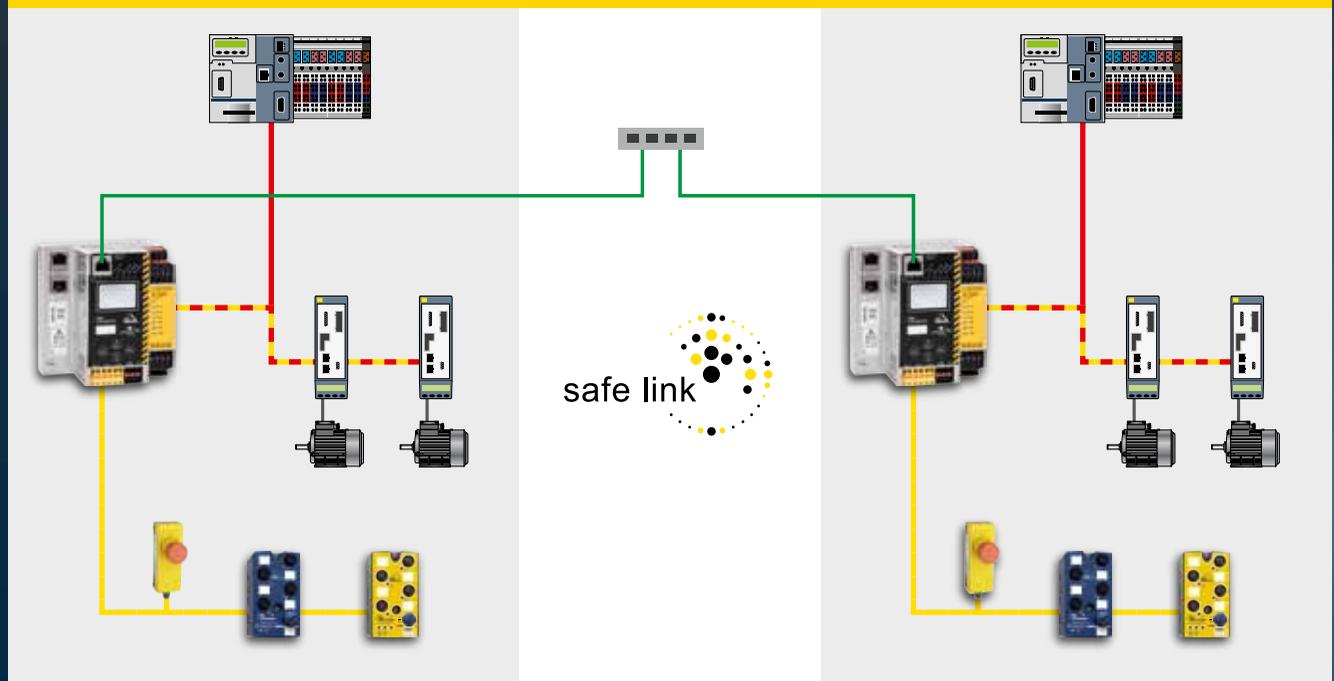
Need short response times? Et voilà: communication on Sercos is fast, because the safety program is processed directly in the Gateway and communicates with the safe drives without any detours. This also makes

programming simple and clear. The new Bihl+Wiedemann offering can be used as a so-called CIP Safety Originator without an additional host controller – with the positive side-effect that the financial outlay is simultaneously reduced by a significant amount.

Sercos users profit doubly with the AS-i Safety Gateways from Bihl+Wiedemann. On one hand safe drives are monitored in the simplest and most cost-effective way, while on the other all the benefits of AS-Interface in networking simple sensors and actuators can be enjoyed – in other words, all the strengths which AS-i has made as virtually the de facto standard throughout the world in just a short time.

**For Bihl+Wiedemann this innovation is a completion of our own product range – for AS-Interface a kind of quantum leap**

## Safe coupling of applications using Safe Link



Using Safe Link, the safe coupling over standard Ethernet from Bihl+Wiedemann, multiple drives can now be safely monitored and controlled with CIP Safety on Sercos – even when they are installed in different machines or system parts.

For Bihl+Wiedemann this innovation is a completion of our own product range designed for safe speed monitoring. Given the rapidly increasing emphasis placed on this topic, the safety specialists in the company have in recent years been working intensely on the development of especially efficient solutions. The result is a range that represents the same variety as the technological possibilities

for implementing the safety function – and as multi-faceted as the different requirements of the market: speed monitors for sensors and for encoders as well as speed monitoring in the Gateway, in the module or directly in the drive. “In the meantime,” notes co-founder and CEO Bernhard Wiedemann, “our portfolio is complete to the point where we have the right concept ready for virtually any application.”

For AS-Interface this innovation means perhaps even more – a kind of quantum leap. For the new Gateway is essentially the first AS-i component that functions not just as the safety boss for sensors and actuators and as data provider for a higher-order fieldbus, but also acts as a safety PLC to independently take on control tasks in the area of drive technology.



**EXTREME** product line

# A tough performer



**Even in the harsh industrial environment of conventional applications AS-i field modules have to withstand a lot. But what happens when enormous temperature fluctuations, strong vibrations, attacks from chemically active materials or permanent salt spray make life even more difficult? This is when the durability and toughness of devices in the *EXTREME* product line from Bihl+Wiedemann answer the call.**

For those responsible for product tests it is of course annoying to say the least. But one can only consider it as a good sign when during the simulation of extraordinary load conditions it's the test equipment that takes a knee and not the device being tested. Such a scenario is always possible in the testing lab with the so-called *EXTREME* product line from the AS-i experts at Bihl+Wiedemann. It happened once that the strong shaking during a vibration test caused several connectors on the equipment to get wedged and twisted together, resulting in hours of Sisyphus-like work to untangle them – whereas the test specimen was completely nonplussed by the whole thing. Another time a thick salt crust formed on the M12 connectors on one module, with the resulting corrosion causing the connections to fail. The module itself was not impressed by the sodium chloride attack: it continued to signal readiness throughout.

But what exactly is the *EXTREME* product line? For the harsh industrial everyday of factory and process automation the standard AS-Interface modules from Bihl+Wiedemann in both the small and the large housing are of course already well protected with their IP67 rating. But in some situations what the AS-i components have to withstand is literally abnormal.

Such is the case when the devices are located in the open air, where they have to deal with both biting cold and scorching heat – sometimes even paired with unusually high humidity and/or permanent salt spray. With cranes and spreaders in harbors for example all these things come together,

especially when their locations lie in less moderate northern or southern latitudes. But even there the AS-i modules are finding more and more use for efficiently connecting the sensors.

Nor is it exactly a walk in the park for the AS-i modules that have to sit in the moving cars of roller coasters to ensure that the ride doesn't go out of control. These units have to deal not only with temperature fluctuations and the resulting condensation, they are also subjected to very strong vibrations. And still they transfer the switching signals absolutely reliably whenever called upon.

But even within four walls all kinds of adversity can await the AS-i components. Especially in process automation they often need to withstand fierce attacks from chemically active materials. And the cold storage room in a material handling facility is anything but a cushy workplace when it comes to thermal stress.

For these and other applications under unusually extreme conditions the AS-Interface Masters from Mannheim have developed the *EXTREME* product line: devices that are so tough they continue to provide communication when other common electronic components have long since called it quits. The AS-i modules in the *EXTREME* product line defy even the most severe temperature fluctuations between minus 40 °C and plus 70 °C, and they withstand shocks up to 30g (11 ms) and vibrations at a frequency of 5-500 Hz with an amplitude of 50 mm<sub>pp</sub> / 6g without any problem.

Thanks to the maximum water shedding properties of the sealed plastic housing they offer 100% protection against moisture – even for ice formation inside the module. Coated circuit boards ensure the highest resistance to condensation.

The coated circuit boards provide flawless functionality even when the AS-i switching devices are used at sea or in coastal areas, where continuous salt spray places especially high demands on the electronics. Irreparable damage to machines or control elements which are not specifically protected is often the rule rather than the exception. But of course sodium chloride is not the only chemical enemy the high-performance components in automation technology need to be aware of. High corrosion risks lie in wait for electronic products and components in basically any reactive environment.

This is why when it comes to the endurance tests for devices with special toughness qualities, Bihl+Wiedemann places great emphasis on simulations in an environmental laboratory under conditions that nearly match those at the ultimate location. And only if the components prove for example their resistance to contact with the respective aggressive gas mixture do they receive their final accolade and promotion to the *EXTREME* product line.

The economic advantages for users of these survival experts from Bihl+Wiedemann are already apparent: reduced maintenance costs as well as increased equipment up-time and investment security – bottom line: increased productivity, doubtless the hardest currency in the field of automation.

Interview with Jochen Bihl, CEO of Bihl+Wiedemann GmbH

# “Only advantages from the customer point of view”

The story of Bihl+Wiedemann is not only one of successful competition, but rather also of beneficial cooperation. Whenever it is clearly to the benefit of the customer, the AS-Interface specialists work trustingly even with direct competitors. In a conversation with AS-i MASTER NEWS CEO Jochen Bihl explains the key opportunities and challenges of this strategy.

**AS-i MASTER NEWS:** Mr. Bihl, “what we can’t do alone we will do together,” goes the refrain of a German Top-Ten hit from a few years ago. Like your company, the singer grew up in Mannheim. Is teamwork stressed between the Rhine and Neckar more than elsewhere?

**Jochen Bihl:** That’s a really charming thought, though one I can affirm only tongue-in-cheek. Characterizing the ability for constructive interconnection as a unique characteristic of the Palatinate nature would be definitely off the mark: we work well together with cooperation partners throughout the entire country. To be honest, there are not any regional differences worth mentioning.

**AS-i MASTER NEWS:** Yet the first company you entered into partnership with is headquartered in: Mannheim.

**Jochen Bihl:** That’s true, this interconnection right at our front door does have in fact the longest tradition in the history of Bihl+Wiedemann. But the deciding factor for the origin of such cooperation are primarily strategic considerations. Regional proximity is of course – especially in an early phase of the company history – a welcome bonus.

**AS-i MASTER NEWS:** What are in general the strategic considerations for cooperation?

**Jochen Bihl:** When Bernhard Wiedemann and I founded the company over 20 years ago, development services for other manufacturers were the best way of earning the money which we could then later invest in our own products. This argument of course fell by the wayside at some point. And yet we continue to offer our broad

know-how, because our development expertise is then continually subjected to benchmarking and we are able to quickly implement great solutions together with our partners. At the same time, and thanks to our permanently growing production capacity, additional possibilities for partnership open up, since we not only design certain products and solutions, but then also produce them for our partners in large quantities. Take for example Fritz Kübler GmbH in Villingen-Schwenningen, who are using our new speed monitors for their encoders. But every level of cooperation has by now become firmly established in nearly everything we do.

**AS-i MASTER NEWS:** For example?

**Jochen Bihl:** Well, please understand that I am not at liberty to name all too many specific examples. Cooperative work

involving development projects are as a rule something highly confidential – comparable in a way with one's visit to a doctor. The respective partner alone gets to decide whether we can talk about it. Sensor specialist Turck was kind enough to give us the green light here: we recently developed an I/O block with our safety technology for them.

**AS-i MASTER NEWS:** Something that would surely interest the end user even more is the fact that when very specific applications arise you often put your heads together with colleagues from other brands to optimize the interoperability of your devices...

**Jochen Bihl:** Yes, we do this fairly regu-

larly. The starting point here is often enough the wishes of the machine builders or users. Our new AS-i Safety Gateway for CIP Safety on Sercos, used for controlling drives without an additional safety PLC (editor's note: see page 2), arose mainly because the end users wanted to combine the advantages from two worlds: the amazingly simple safety technology of AS-Interface and the globally recognized drive technology of Bosch Rexroth.

**AS-i MASTER NEWS:** How many module makers is Bihl+Wiedemann currently working with?

**Jochen Bihl:** If one includes the joint activities in the manufacturer and user associations of the various automation systems, you quickly arrive at a large number. AS-International alone has now over 350 member companies worldwide, including both global players and highly specialized high-tech firms.

**AS-i MASTER NEWS:** At first glance that sounds like a difficult dual role for the individual company. After all, the partners you are pulling together with on the one hand are also competitors in the marketplace. How does one sort that out?

**Jochen Bihl:** I don't mean to imply that this is all opportunity with no challenges. Which weighs more heavily depends surely to a large degree on the observer's perspective: from the point of a person responsible for sales, it is no fun when someone else gets an order, and it's little consolation when the order was taken by a partner company. But from our point of view it is generally strategic, technological and/or commercial considerations which take precedent. And as far as the customer is concerned it's of course strictly a win-situation: he gets a solution which would likely not have been possible without the joint efforts of his suppliers – or at least not as quickly and at such a favorable price.

**AS-i MASTER NEWS:** Mr. Bihl, we thank you for the conversation.



# AS-INTERFACE HIGHLIGHT

## Passive distributors

with and without cable protection,  
optional with fuse



## Active distributors

safety and standard AS-i  
slaves in the distributor



### New passive distributors from Bihl+Wiedemann

- Especially flat design (W x H x D: 60 x 45 x 19 mm), can be installed in cable tray
- Available with:
  - ✓ 2 x profile cable for 2 x AS-i or AS-i and AUX to round cable (BW3183, BW3185, BW3186, BW3246, BW3247) or
  - ✓ 2 x profile cable for 2 x AS-i on flat cable (BW3157)
- Round cable connection via M12 female straight (BW3247), right-angle (BW3183, BW3185, BW3246) or via round cable/connection leads
- Optional with integrated 2 x 1 A self-resetting fuse
- IP67 protection rating
- Gold plated contacts

### New active distributors from Bihl+Wiedemann

- AS-i Safety Input Module, IP67 (BW3248, BW3249) and AS-i 2I/1O Module (BW3250)
- Especially flat design (W x H x D: 60 x 45 x 19 mm), can be installed in cable tray
- 2 connections for profile cable
- Available with:
  - ✓ 1 two-channel safe input, 1 digital output, connection via 1 x round cable/connection leads (BW3248) or 2 x round cable/connection leads (BW3249)
  - ✓ 2 digital inputs, 1 digital output, connection via 2 x M12: 1 x Y-wiring + 1 x Mixed-wiring (BW3250)

## Other Bihl+Wiedemann news at SPS IPC DRIVES

### IP20 Modules for use in cabinets



- Ideal for use in cabinets
- 3-wire sensors or actuators can be connected directly to the module terminals without additional terminal blocks
- Available with ✓ 4 digital inputs, input voltage provided from AS-i (BWU3265) or AUX (24 V auxiliary power) (BWU3266)
- ✓ 4 digital inputs and 4 electronic digital outputs, output voltage provided from AUX (24 V auxiliary power) and input voltage from AS-i (BWU3267) or AUX (24 V auxiliary power) (BWU3268)

### AS-i Modules from Bihl+Wiedemann for extreme conditions



- New *EXTREME* product line expands the range of AS-i Digital Modules in IP67, M12
- Available as ✓ AS-i 4I Digital Module (BWU3145) ✓ AS-i 4I/40 Digital Module (BWU3144)
- Enables reliable and efficient communication with machines under extreme ambient conditions
- Outstanding features: ✓ 100% protection against moisture ✓ Highest resistance to salt spray ✓ High corrosion resistance against chemically active materials ✓ Assured functionality at ex-

treme temperatures from  $-40\text{ °C}$  to  $+70\text{ °C}$   
 ✓ Shock rated to 30g (11 ms) ✓ Vibration rated to a frequency of 5-500 Hz at an amplitude of  $50\text{ mm}_{pp} / 6g$  ■ Benefits: ✓ Reduced maintenance costs ✓ Increased equipment up-time and investment security ✓ Increased productivity

### AS-i 3.0 Sercos Gateway, CIP Safety on Sercos with Safe Link (BWU3160)



- Safe control of drives with safe fieldbus connection
- CIP Safety on Sercos for 2 AS-i networks, integrated switch
- Version "1 Gateway, 1 Power Supply for 2 AS-i networks"
- 2 AS-i Masters in one Gateway
- 3 two-channel safe inputs built-in, expandable to maximum 62 independent safe inputs
- 6 independent safe outputs built-in, expandable to maximum 64 independent safe outputs
- Chip Card for simple device replacement
- Applications up to SIL3/Cat.4/PLe
- Simplified handling and reduced hardware and installation costs by integration of drive, peripheral and safety bus as well as standard Ethernet in a single network instead of parallel wiring with individual lines

### New Analog Modules with 2 outputs 0 ... 10 V in IP67



AUX (24 V auxiliary power)

- Expands the range of AS-i Analog Modules in IP67, M12
- Available with: ✓ 2 outputs 0 ... 10 V, signal on Pin 1 / Pin 3 (BWU3107)
- ✓ 2 outputs 0 ... 10 V, signal on Pin 2 / Pin 4 (BWU3108)
- Output voltage provided from

### AS-i 3.0 Motor Module for Lenze Smart Motor (BWU3115)



- Expands the range of cost-saving material handling and drive solutions with AS-i
- 4I/30 Module for Lenze Smart Motor
- 2 x M12 connections compatible with Lenze Smart Motor
- 2 x M12 connections for up to 3 additional sensors
- IP67 protection rating
- Functions: ✓ Start/Stop diagnostics for the motor (Status) ✓ Speed setting (up to 5 speeds selectable) ✓ Output voltage provided from AUX (24 V auxiliary power)

### IMPRINT

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**No longer miss a bus with our Safety Gateways**

Safety Basic Monitor with Ethernet-interface - now also small Safety applications can be coupled safely

Safe Link over Ethernet

## Safety Technology by Bihl+Wiedemann

- › Safe Link over Ethernet: The simplest way of coupling many safe signals
- › Optimal PLC connection via fieldbus, all diagnostic data in the controller, safety and standard signals mixed
- › Universally expandable with Safety I/O Modules + Standard I/O Modules in IP20 or IP67, Speed Monitors for up to 40 axis, Safety Relay Output Modules



More information on your application safety at:  
[www.bihl-wiedemann.com](http://www.bihl-wiedemann.com)

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