

AS-INTERFACE MASTER NEWS

THE BIHL+WIEDEMANN MAGAZINE



INTERVIEW

“A global task force for on site deployments”

AS-INTERFACE AND IO-LINK

DOES IT FIT OR DOESN'T IT?



AS-Interface and IO-Link

DOES IT FIT OR DOESN'T IT?

IO-Link



sercos
the automation bus



As is so often the case with that wretched stereotyped thinking: sometimes it leads you miles away from reality. A perfect example of this is the often-heard view that AS-Interface and IO-Link are competitors. Nothing could be further from the truth. In reality, both systems play together perfectly and combine the advantages of their respective technological worlds. It has always been this way – and in the age of industry 4.0 this will become even more important.

It should be obvious that the smart factories of tomorrow will represent new challenges for sensors and actuators. This is one of the reasons why the intelligence offensive in this field began long ago. Management consul-

ting company Roland Berger estimates that, compared with 2015, the sales of intelligent sensors will double to around 30 billion units by 2020. Many of these will surely serve their time in automated vehicles – but a

continuously growing number of intelligent sensors will also be used in IoT applications and in modern production facilities.

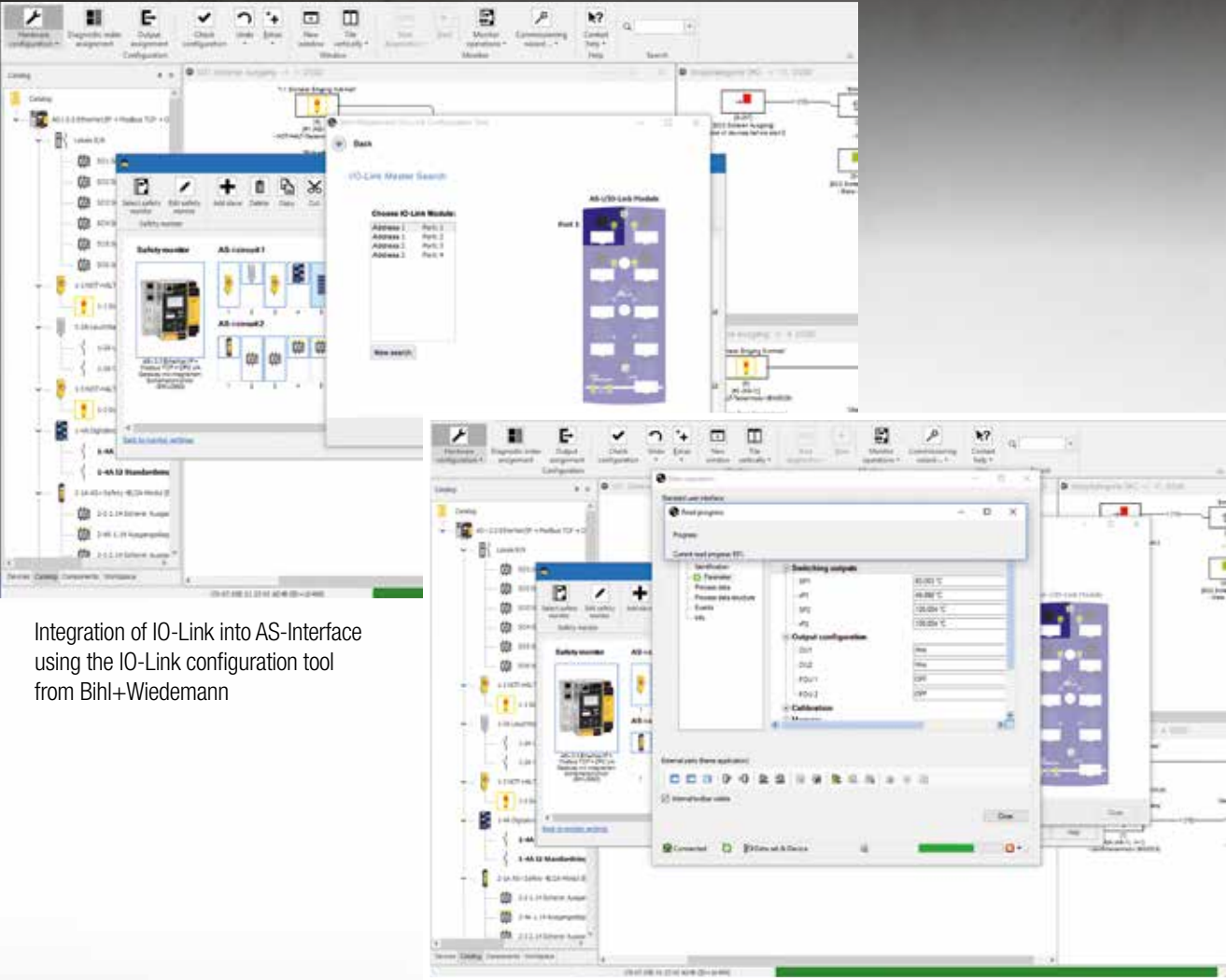
There, intelligent sensors and actuators

are already today making their advance. For good reason: because in addition to their previous core competency – namely recording variables such as temperatures – smart sensors can also be configured and

are to some extent even able to prepare and pre-process the signals. That way, threshold values can, for example, be stored in an IO-Link device and, when these limits are exceeded, corresponding information can be

transmitted. Even changes to the functions of the sensor are easy to make.

One significant element in this context: IO-Link is not a bus system, although



Integration of IO-Link into AS-Interface using the IO-Link configuration tool from Bihl+Wiedemann

masters are also a common component to which multiple devices can be connected. But in fact it is a point-to-point connection which is used in an automation environment typically below the I/O level for connecting field devices individually. This alone should make it clear how irrational the often repeated opinion is that AS-Interface and IO-Link are to be seen as competitors. For the wiring system AS-i, IO-Link can rather function as an ideal feeder, in which case the two systems play together perfectly as a true dream team.

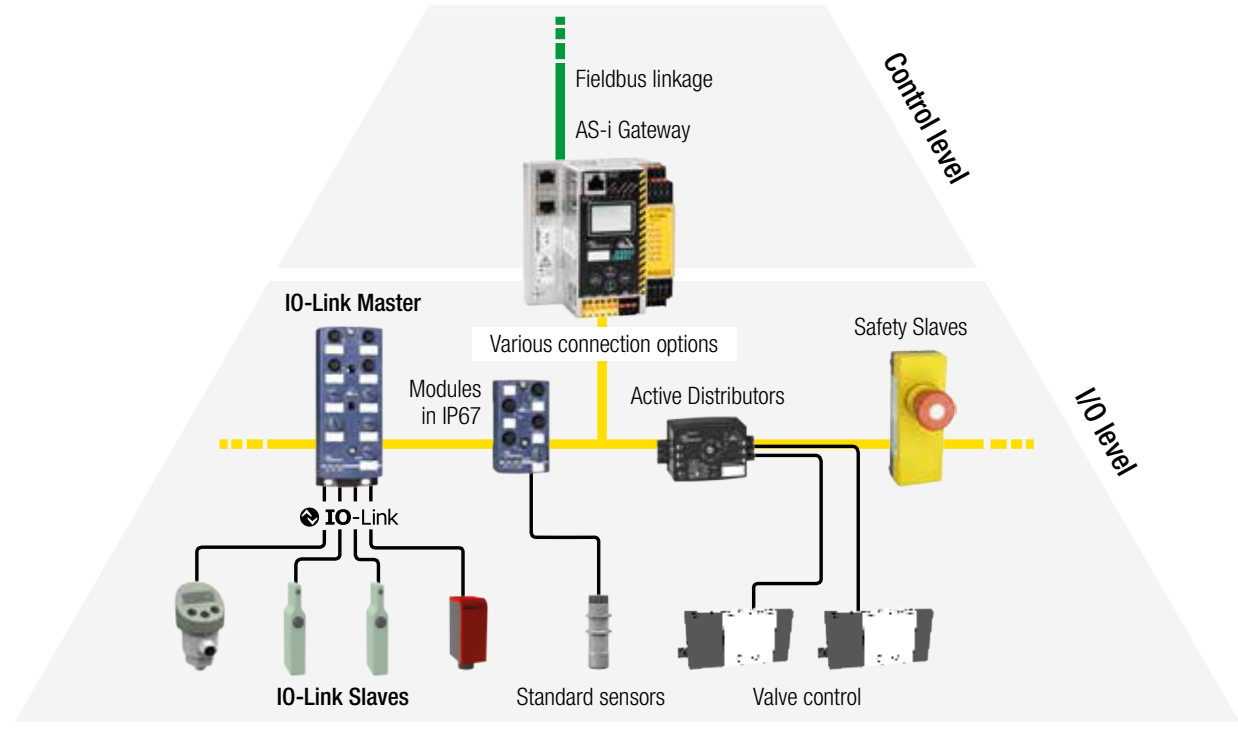
This also has to do with the fact that even in the most modern machines, far from all artificial sensory organs need to be intelligent. Thus, for the majority of sen-

sors digital I/O data is quite sufficient: a smart proximity switch for example would most likely be over-qualified in many positions. A big benefit of linking-up using AS-Interface is the fact that all data can be collected – regardless of whether it originates from intelligent sensors or from their less clever counterparts. This means the user does not need to waste time thinking about whether he may want to someday upgrade to an intelligent sensor in one location or another. And in the entire line he profits from the almost literally benefits of AS-Interface: from the typical simple AS-i installation using just one cable for data and power to the freely selectable topology and the low wiring effort up to the optimal granu-

larity of the communication system which makes all the inputs and outputs available exactly where they are needed. Since the Gateways from Bihl+Wiedemann collect all the sensor data in advance and even permit pre-processing if needed, the higher level fieldbus is also unburdened.

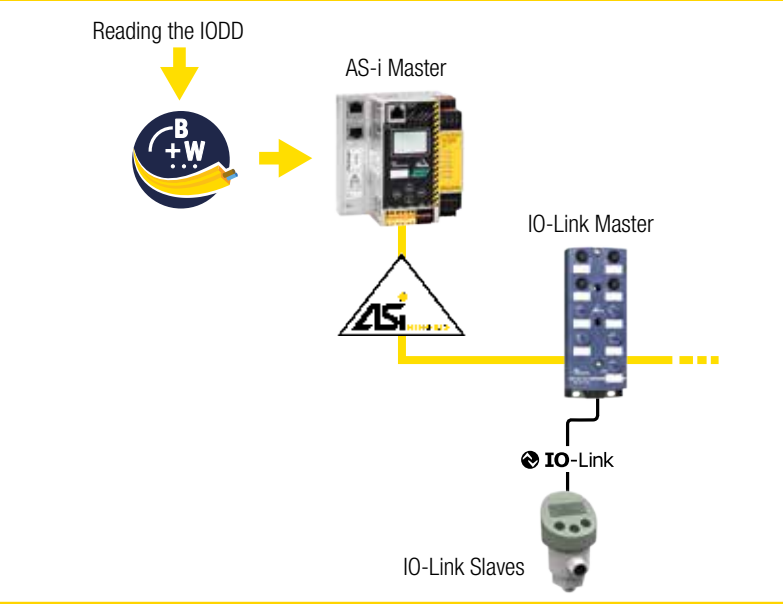
Simplicity also characterizes the configuration of the IO-Link Sensors using AS-Interface – or more precisely, using the Gateways from Bihl+Wiedemann. Here, all you need is a software program for all the sensors, regardless of how intelligent they are or who made them. The IO-Link Slaves are configured using the IO Device Description (IODD) in plain text. All the user

Integration of IO-Link into an AS-Interface network



In addition to standard sensors / actuators and safety components, IO-Link devices can also be easily integrated into an AS-i network

Configuration of an IO-Link Sensor using the AS-i network



has to do is start the Bihl+Wiedemann software and then select the IO-Link Master, the port with the desired sensor and its IODD.

Conceptually it works like this: the IO-Link Master, which collects the IO-Link Sensor data on the level below AS-Interface, is at the same time an AS-i Slave and as such is integrated into the AS-Interface network as usual. In other words: on this level the same thing happens as what one level above has always been considered the key to maximum efficiency when linking-up actuators and sensors. There, the AS-i Masters fit in as Slaves in the higher-level fieldbus. The result is an especially powerful team in which each player is doing what he does best.

Safety Technology

Motion Control meets AS-i Safety

Cost efficient wiring, freedom of topology, high flexibility – these are just a few of the advantages offered by AS-i Safety at Work, the safety solution from AS-Interface. Now PacDrive 3 users can also benefit from this simple safety technology by using the new AS-i Sercos Gateway BWU2984 from Bihl+Wiedemann. The Gateway integrates AS-i Safety in a simple manner into the automation solution for motion control based machines from Schneider Electric that runs on the automation bus Sercos III.

PacDrive 3 – automation platform with Sercos III

The PacDrive 3 system from Schneider Electric is a scalable automation platform for motion control based machines using Sercos III. It allows a wide range of servo-controlled production and packaging machines as well as automated handling equipment to be controlled. PacDrive 3 is based on the Logic Motion technology which combines PLC, motion and robotics control functionality on one hardware platform. The system is suitable for up to 130 synchronized servo axes and for up to 30 robots. A Logic Motion Controller (LMC) processes I/Os and controls servo drives centrally using Sercos III. In order to implement safety applications, a Safe Logic Controller (SLC) is used. The SLC, a Sercos Slave, exchanges safe data with safe in- and outputs as well as safe servo drives using the Sercos AT channel. Safe I/Os and safe drives are available in IP20 and IP67. Programming and archiving of projects are carried out by the engineering tool SoMachine Motion with SoMove from

Schneider Electric. As an open system, PacDrive 3 supports TCP/IP communication with higher level systems as well as incorporation of other fieldbuses and AS-i components.

AS-Interface and Sercos

With the AS-i 3.0 Sercos Gateway BWU2588 many users of Sercos have long been using AS-i technology – such as for push-buttons or for the simple connection of sensors or actuators. By using AS-i, they benefit – among other things – from the reduced installation effort, simple diagnostic capabilities and cable routing that is conform with the mechanical structure of the system. Until now it has not been possible to incorporate AS-i Safety components such as E-STOP buttons or safety interlocks into the PacDrive 3 world. The reason: the AS-i Sercos Gateway was not able to communicate safely with the Safe Logic Controller from Schneider Electric. To solve just this problem and so open the door to the world of AS-i Safety for PacDrive 3 users, the AS-i specialists at Bihl+Wiedemann have

joined together with Schneider Electric to develop the AS-i Sercos Gateway BWU2984.

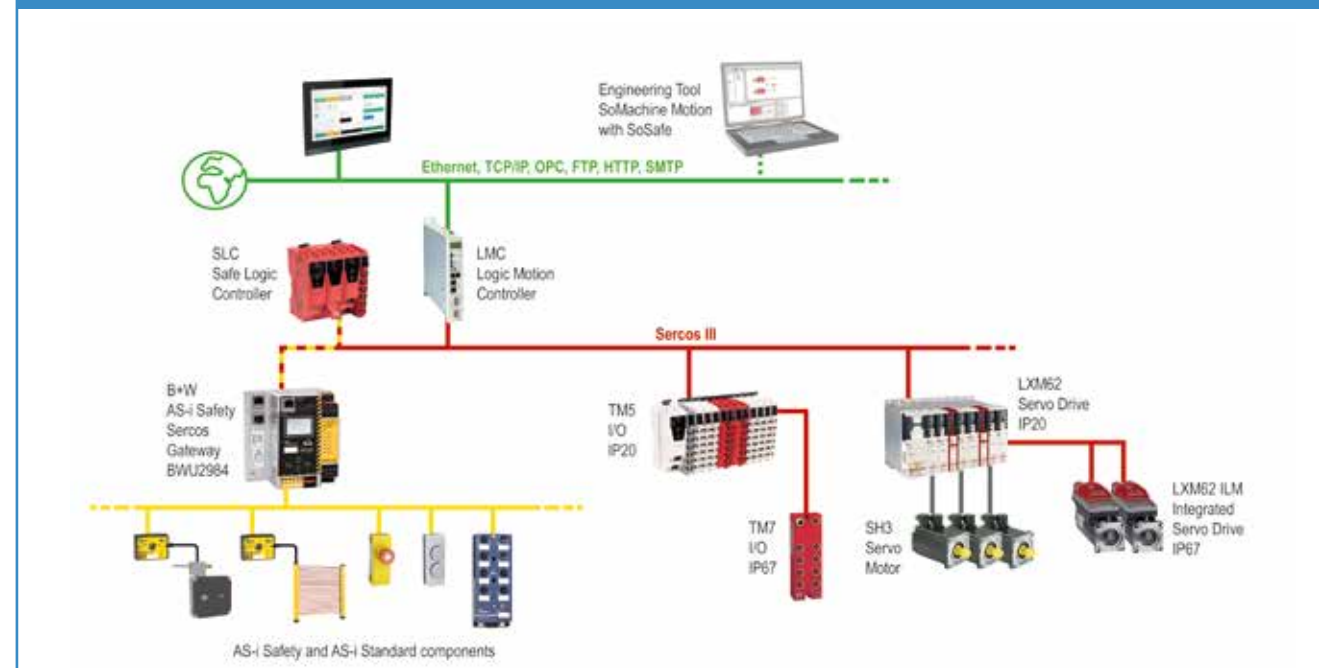
Advantages of AS-i Safety in automation technology

When it comes to the topic of safety in automation technology, safe monitoring and control of drives as well as their safe shut-down are paramount. But also important is safety in the drive surroundings. Safety interlocks, E-STOP buttons, light curtains or step mats ensure that packaging machines or robots do not represent a hazard to personnel in the vicinity of the machine. With AS-i Safety at Work, such components can be easily and inexpensively incorporated into safety applications as with no other wiring or bus system. The reasons: an unshielded, two-conductor cable, the greatest possible freedom of topology, and the typical AS-i piercing technology allowing the safety modules to be positioned exactly where they are needed.

Integration of AS-i Safety into PacDrive 3

The new AS-i Sercos Gateway BWU2984

Integration of Standard AS-i and AS-i Safety components into PacDrive 3 with BWU2984



from Bihl+Wiedemann allows the safety technology of AS-i Safety at Work to be used in PacDrive 3 applications alongside standard technology of AS-Interface.

The Gateway includes two AS-i Masters for two AS-i networks and acts in the automation solution of Schneider Electric as a Sercos Slave. The device can safely

exchange data over Sercos directly with the Safe Logic Controller. This makes the safety technology notably simpler. The Safety Monitor integrated in the Gateway monitors the safety technology in both AS-i networks and passes the data safely on to the SLC. If, for example, an E-STOP button in one of the AS-i networks is pushed, the AS-i Sercos Gateway reports this to the SLC. The safety controller can then cause the servo drives to be directly shut down. Also integrated in the new Gateway is the Safe Link technology from Bihl+Wiedemann. This allows the safety technology of different applications or systems to be combined with each other.

In the customer's interest

With the integration of AS-i Safety at Work into PacDrive 3 new possibilities are opened up to users with regard to the safety technology in their systems. The AS-i Sercos Gateway BWU2984 from Bihl+Wiedemann now allows you to combine the simple safety technology of AS-i Safety and the globally recognized automation solution for motion control based machines from Schneider Electric with each other in a most cost-effective manner.



AS-i 3.0 Sercos Gateway BWU2984 from Bihl+Wiedemann for integrating AS-i and AS-i Safety into PacDrive 3 applications

Interview with Christian Lenakakis,
Head of Commissioning, Training & Service at Bihl+Wiedemann

“A global task force for on site deployments“

Maximum system availability is one of the top priorities of modern production. Reliable devices, automated diagnostics and clean configurations are the best approach to this. But when things nevertheless come to a stop and troubleshooting by phone reaches its limit, the service team from Bihl+Wiedemann springs into action. Their manager Christian Lenakakis has given **AS-i MASTER NEWS** a look behind the scenes.

AS-i MASTER NEWS: Mr. Lenakakis, the number of installed Bihl+Wiedemann devices in the world has quadrupled in recent years. This must mean your service team is continually on the move.

Christian Lenakakis: No, not at all. Most problems reported to us can be handled by our Technical Support personnel by phone. In spite of the rapidly increasing number and complexity of the systems in which our products are installed, the success rate has for years remained constant at over 90 percent. This is also due to our new diagnostic software which significantly simplifies troubleshooting. Only when all else fails do we enter the picture – as a global taskforce for on site deployments. In addition to the service calls in emergency

situations, we are also available for commissioning and training – but as of today this is all manageable in terms of numbers.

AS-i MASTER NEWS: The low rate of service calls, of course, speaks well for the reliability of your devices and the capability of the telephone support. But why is your team not more in demand for commissioning and training?

Christian Lenakakis: This is due mainly to the fact that AS-Interface has, over time, become more complex but in no way more complicated. Although I must say that personally, I consider our training courses highly advisable even for those experienced in AS-i, since the pressures of everyday work often leave little time for becoming

familiar with the basics of the system. As far as commissioning is concerned, here we have invested much in recent years for example in quick start guides and video tutorials, which can be easily accessed on our website. They make it possible for our customers to independently commission most of the applications.

AS-i MASTER NEWS: What exactly is the purpose of the diagnostic software you mentioned before?

Christian Lenakakis: It permanently monitors the fitness of the entire network, provides concrete recommendations at the push of a button when there is an issue and makes it possible even for non-specialists to quickly solve any potential problem



themselves. If that works like it should, the user has spared himself a phone call to our support personnel. If it doesn't work, the software provides our people all the relevant system data they need to quickly identify the fault and finally eliminate it.

AS-i MASTER NEWS: What kind of cases are left then for your service team?

Christian Lenakakis: For example those situations where the AS-i network is indicating faults, but the cause of the error lies in a completely different location. As an ideal team player together with other systems, AS-Interface is increasingly used in widely branched systems. And when external interference comes into play, this can also have an effect on AS-i, even though the masters and slaves are actually working perfectly.

AS-i MASTER NEWS: So you remain engaged even when it's not your products that have caused the problem?

Christian Lenakakis: Of course. We have even gotten systems back up and running in which there was not a single Bihl+Wiedemann product installed. For us it's all about the partnership with users: if we can help our customer to achieve maximum system availability using our expertise, we will do it.

AS-i MASTER NEWS: What does your team for service calls, commissioning and training actually look like?

Christian Lenakakis: We are a team consisting of several colleagues whose normal work is in various departments. Depending

on the nature of the deployment we then decide who – including myself – goes to the customer. This ensures that we always remain flexible and can respond quickly.

AS-i MASTER NEWS: Isn't that rather unusual for a company of your size, having the team leader also take part in outside service calls?

Christian Lenakakis: That may be, but at Bihl+Wiedemann it's nothing special – here the tone is set from the top. I myself have also experienced service calls where I and Mr. Bihl stood together at the customer's machine.

AS-i MASTER NEWS: Mr. Lenakakis, we thank you for the interview.

AS-INTERFACE HIGHLIGHTS

Outlook: M8 Modules – New housing family in the range of Bihl+Wiedemann



Bihl+Wiedemann has developed a new housing family: M8 Modules in protection rating IP67

- Increased number of sensors and actuators available with M8 connection for which adapters to M12 sockets used to be required
- Same form factor as small housing of the M12 Modules (45 mm x 80 mm)
- Equipped with 8 sockets: twice the amount of sockets in the same expanse as M12 Modules
- Connection of AS-i and AUX using profile cable
- Ideal for applications with limited space (e.g. robot arms)

More flexibility in the production of Active and Passive Distributors



Bihl+Wiedemann is using an innovative injection molding process for the production of its new distributor generation: Low Pressure Molding (LPM). Thus, products can be more easily modified for specific customer needs. With LPM it is now possible to implement

- Up to 9 cable connections,
- One addressing socket,
- Three heights (19 mm, 25 mm, 35 mm).

Low Pressure Molding is used not only for the newly designed models, but is also flowing into the further development of products such as the following Passive Distributors:

- **BWU3183:** AS-i/AUX to 1 x M12 socket, right-angle, 5-pin, 19 mm deep, IP67
- **BWU3157:** AS-i, profile cable branch, 19 mm deep, IP67
- **BWU3185:** AS-i to 1 x M12 socket, right-angle, 5-pin, 19 mm deep, IP67

More Bihl+Wiedemann News at HANNOVER MESSE



Safe coupling between PROFIsafe and CIP Safety

- Safe data exchange between the safe protocols PROFIsafe and CIP Safety is now possible
- Can be implemented with the AS-i 3.0 Gateways with integrated Safety Monitor BWU3367 and BWU3683 using Safe Link
- Up to 16 bytes can be sent
- Automatic configuration using the configuration software ASIMON360
- Simply select the Gateways in the software menu



Update of diagnostic software (BW2902)

- Improvements in functionality and visual representation: ✓ Revised user

interface: optimized representation of the starting window and the window for interface settings ✓ Introduction of test data as ring buffer, duration of the buffer memory can be set, maximum duration: 7 days ✓ Reduced number of windows during a measurement as default in order to hide unnecessary information. Further information can be shown via option 'extended view' ✓ Reduction of exclusion criteria for test runs ✓ Error description and solution hints in a dedicated tab ✓ Additional tab for warnings and information

AS-i Safety Input Modules, IP20, 2SI (BWU3671, BWU3696)

- Input voltage provided from AUX (24 V auxiliary power)
- Connection via 4 x COMBICON terminals
- 22.5 mm wide
- Protection rating IP20
- **BWU3671:** 2 x 2 safe inputs for connecting: ✓ 1 x complementary optoelectronic protective device ✓ 1 x floating contact
- **BWU3696:** 2 x 2 safe inputs for connecting: ✓ 1 x optoelectronic protective device ✓ 1 x floating contact

AS-i 3.0 EtherNet/IP+Modbus TCP Gateways with OPC UA Server (BWU3734, BWU3735, BWU3736)



- EtherNet/IP, Modbus TCP and OPC UA in one device
- OPC UA server as interface for OPC UA communication
- New webserver for remote maintenance
- Extremely fast: significantly improved cycle time over Ethernet
- RPI < 1 ms, even with large data quantities
- Integrated switch
- Expanded diagnostic capabilities such as duplicate address detection, integrated earth fault and EMC monitor
- Optional with integrated compact control-

ler Control III, programming in C ■ Available as: ✓ Single Master (**BWU3734**) ✓ Double Master with 1 Power Supply for 1 AS-i network (**BWU3735**) ✓ Double Master with 1 Power Supply for 2 AS-i networks (**BWU3736**)

AS-i 3.0 EtherNet/IP + Modbus TCP+OPC UA Gateway with integrated Safety Monitor (BWU3693)

- EtherNet/IP, Modbus TCP and OPC UA in one unit
- EtherNet/IP + Modbus TCP Master + OPC UA Slave
- New webserver for remote maintenance
- Extremely fast: significantly improved cycle time over Ethernet
- RPI < 1 ms, even with large data quantities
- AS-i 3.0 Gateway with integrated Safety Monitor and Safe Link
- Double Master with 1 Power Supply for 2 AS-i networks
- Integrated switch
- 6 fast electronic safe outputs
- Chip Card for storing configuration data
- Variably configurable Assembly Object
- 3 two-channel safe inputs built-in, expandable with up to 62 two-channel safe inputs
- Applications up to SIL3, PLe

Active Distributors AS-i for SEW MOVIMOT with binary control (BWU3605, BWU3631)



- Motor Modules for control of SEW MOVIMOT drives with binary control
- Especially flat form factor, can be installed in cable duct (35 mm deep)
- Protection rating IP67
- **BWU3605:** Control of 1 x SEW MOVIMOT drive and up to 2 additional sensors ✓ 3 digital inputs ✓ 4 digital outputs ✓ In- and output voltage provided from AUX (24 V auxiliary power) ✓ Connection of AS-i and AUX using profile cable ✓ Connection of periphery using 1 x round cable/connection leads and 2 x M12 cable sockets (straight, 5-pin)

- **BWU3631:** Control of 1 x SEW MOVIMOT drive and up to 3 additional sensors ✓ 4 digital inputs ✓ 4 digital outputs ✓ Input voltage provided from AUX (I1) and from AS-i (I2, I3, I4) ✓ Output voltage provided from AUX (24 V auxiliary power) ✓ Connection of AS-i and AUX using profile cable ✓ Connection of periphery using 1 x M12 cable socket (straight, 8-pin) and 3 x M12 cable socket (straight, 5-pin)

Active Distributor AS-i for connecting Banner K50 Series EZ-LIGHT, type K50AP...F2Q (BWU3639)



- Connection of Banner K50 Series EZ-LIGHT, type K50AP...F2Q to AS-i
- Especially flat form factor, can be installed in cable duct (35 mm deep)
- 1 digital input
- 3 digital outputs
- In- and output voltage provided from AS-i
- Connection of AS-i using profile cable
- Connection of periphery using 1 x M12 cable socket (right-angle, 8-pin)
- Protection rating IP67

IMPRINT

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Bihl+Wiedemann GmbH
Flosswoerthstrasse 41
D-68199 Mannheim
Phone: +49 (621) 339960
Fax: +49 (621) 3392239
info@bihl-wiedemann.de
www.bihl-wiedemann.de

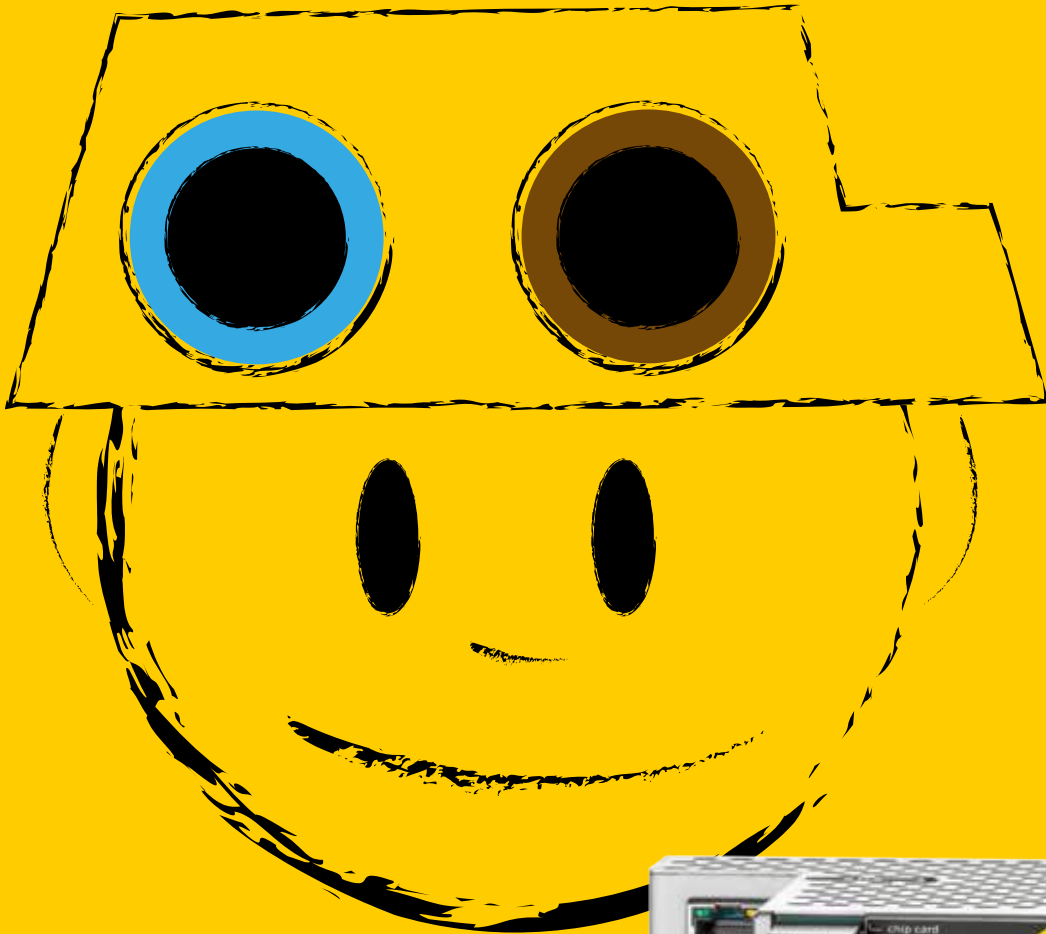
Created by

MILANO medien GmbH
Hanauer Landstraße 196A
D-60314 Frankfurt am Main
Phone: +49 (69) 48000540
Fax: +49 (69) 48000549
info@milanomedien.com
www.milanomedien.com

Edited by:

Peter Rosenberger
Phone: +49 (6201) 8438215
rosenberger@milanomedien.com

Safety@work!



hall 9, booth H01
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Simple safety technology for greater efficiency

- › Safety technology with AS-i Safety at Work: only one cable for data and power - easy to use, independent of system and manufacturer, approved
- › PLC connection via all common fieldbuses, all diagnostic data in the controller, safety and standard signals mixed
- › Safety Gateways for use as Safety Slave (in combination with a safety controller) and as Safety Master (for safely controlling drives without an additional safety PLC)
- › Safe Link over Ethernet: The simplest way of coupling many safe signals
- › Universally expandable with Safety I/O Modules + Standard I/O Modules in IP20 or IP67 and with a multitude of other modules for a wide range of applications



More information on your application safety at:
www.bihl-wiedemann.com



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