

# AS-INTERFACE MASTER NEWS

THE BIHL+WIEDEMANN MAGAZINE

## APPLICATION

**Klinkhammer: moving safely through the aisles**

## APPLICATION

**Mobile, multi-functional, modern – this is how ASi modules of all generations are addressed today**



**Safety Basic Monitor**

# COMPACT SAFETY CONTROLLER WITH GROWTH POTENTIAL

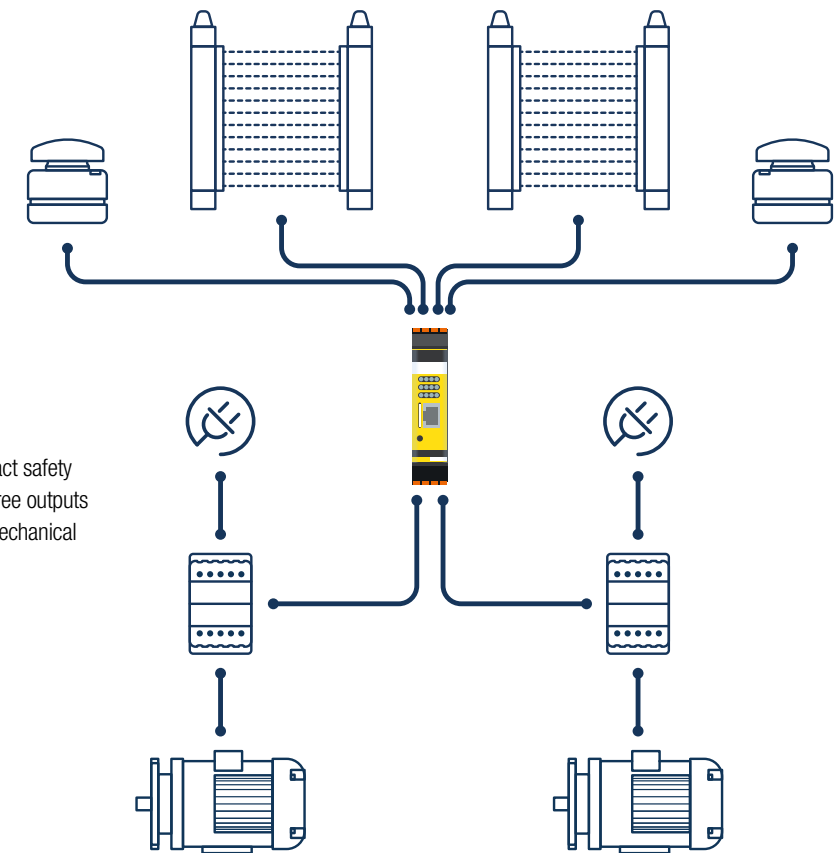


# Safety Basic Monitor: COMPACT SAFETY CONTROLLER WITH GROWTH POTENTIAL



**Used as a programmable compact safety controller with wear-free electronic outputs, the Safety Basic Monitor from Bihl+Wiedemann replaces wear-prone mechanical safety relays in simple, small applications. Yet at the same time, it offers the potential for much more: As an ASi Safety device it can not only process a significant number of safe signals and handle special applications, but also safely control and monitor a large number of distributed participants – either mounted in fixed installations or on mobile devices on the move – in a network via Safe Link Ethernet technology.**

Safety Basic Monitor:  
programmable compact safety  
controller with wear-free outputs  
as an alternative to mechanical  
safety relays.



Implementing functional safety simply and cost-effectively, regardless of the controller or fieldbus used and both scalable and future-proof is the basic starting point of the AS-Interface wiring technology. The ASi-5/ASi-3 portfolio from technology leader Bihl+Wiedemann offers all the options for such efficient solutions. Many users “start small” with the Safety Basic Monitor, for example, to initially use only its configurable safety relay functionality. If the applications and requirements grow, then the compact safety controller can also grow with its tasks - up to the full scope of performance with up to 31 connected safety modules. These can be simple safe in- or output modules as well as specialized modules for safe speed, position or analog value monitoring as well as for muting applications. The Safety Basic

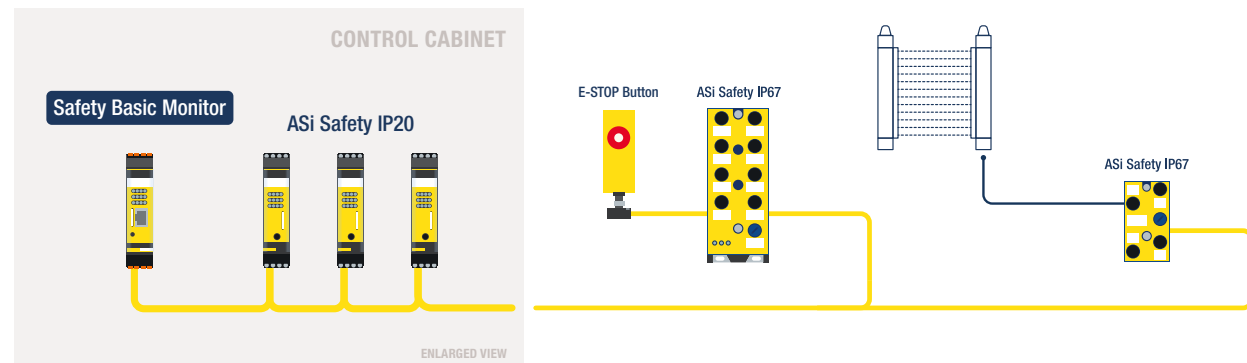
Monitor can then for example be used as the head station for distributed safety applications in modular machines or on driverless transport systems. Whether small or complex – this compact safety controller as well as the overall safety solution can be conveniently configured, parameterized and tested using the ASIMON360 PC software from Bihl+Wiedemann.

#### **Small, configurable, cost-efficient: the Safety Basic Monitor**

The compact safety controller Safety Basic Monitor with integrated safety monitor from Bihl+Wiedemann has an installation width of just 22.5 mm which makes it perfect for space-saving DIN rail mounting in control cabinets. In addition to two electronic, safe semiconductor outputs, it

provides up to four safe two-channel inputs or up to eight digital I/Os depending on the configuration. Also included are the basic functions of safe motion monitoring: safe two-channel standstill monitoring up to SIL2/PLd as well as safe speed monitoring for two or four axes that meets SIL1/PLc for a single channel or SIL3/PLe for two channels. Equipped with a variety of additional functions, for example for connecting light barriers, two-hand switches or door interlocks, the Safety Basic Monitor is a cost-effective solution for small applications – especially since such safety devices can be connected quickly and with reverse polarity protection via two-core profile cable using piercing technology. As a configuration and diagnostic interface the Safety Basic Monitor offers optionally an Ethernet TCP/IP or USB interface.





The Safety Basic Monitor as a compact safety controller can be easily expanded with safety and standard ASI modules in larger applications.

### ASI Safety provides additional functionality

When used together with the integrated ASI Master and ASI Safety Monitor, the Safety Basic Monitor can process up to 31 safe signals through additional safe in- and outputs. The sensor-supported monitoring functions for speed and standstill which are already available in the stand-alone version are supplemented with additional special applications when integrated into ASI Safety. This compact safety controller can directly accept and process the signals from special safety speed monitors for encoders which provide additional safety functions. This means you are not limited to standstill and speed – now you can also monitor speed ranges, speed direction, positions and position ranges, end positions or braking ramps. Also, malfunctions such as slippage, misalignment or shaft break can be reliably detected. As an ASI Master with integrated safety monitor, the Safety Basic Monitor can also be used for safe transmission and processing of analog values, such as in the safe monitoring of temperature, pressure or position. And finally, this compact safety controller can be combined with ASI Safety to

implement material handling functions such as muting – the temporary bypassing of an optoelectronic access protection using muting sensors in the stationery material flow – or gating – the automatic, momentary bypassing of a non-contacting protection device without muting sensors.

### Integrated Safe Link connection enables safe coupling over Ethernet

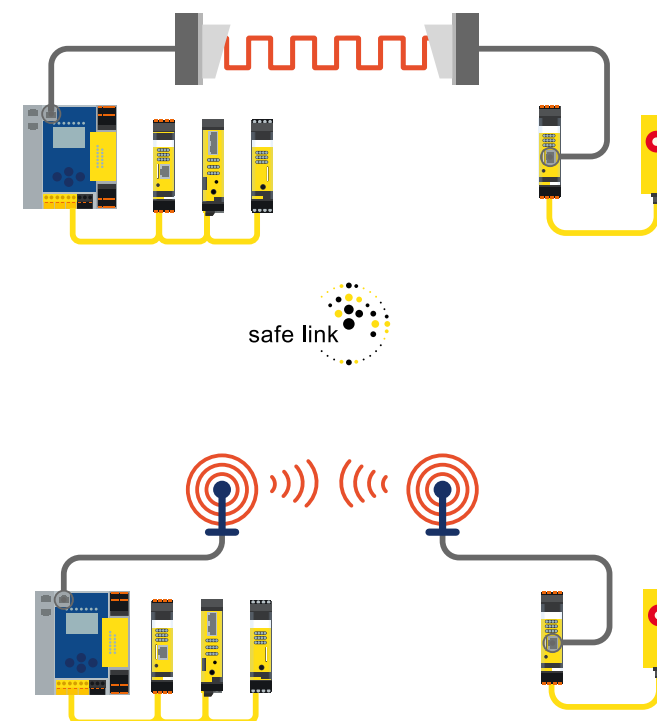
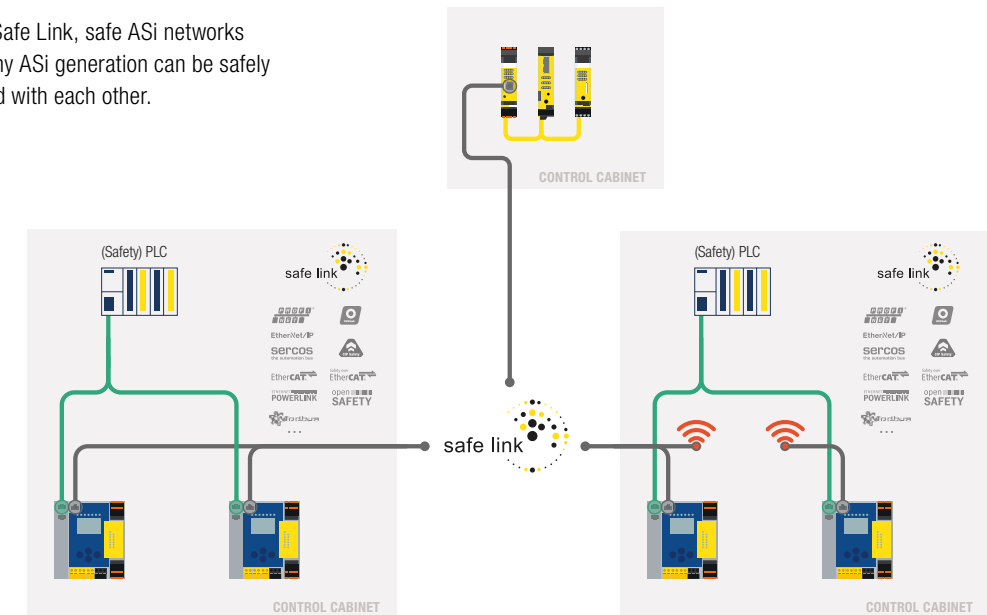
Another way to expand the range of applications is to combine the Safety Basic Monitor, which itself has only a ModbusTCP connection for diagnostic purposes, with other safety controls. These safety controls can also be Safety Basic Monitors, but also ASI-5/ASI-3 fieldbus gateways from Bihl+Wiedemann with ASI-5 and ASI-3 safety technology. These gateways not only allow safe signals and standard data to be collected and sent to the PLC over a fieldbus. There are also versions for safe fieldbuses and with FSoE master and CIP Safety Originator functionality that can be used to directly parameterize and control safety drives.

The Safety Basic Monitor as well as all the ASI Safety gateways from

Bihl+Wiedemann use their Ethernet diagnostic interface to provide safe coupling with each other – without any additional expense or hardware such as a safety PLC. Using this technology – called Safe Link – safe networks such as various system components or driverless transport systems can be connected to each other – even when using different controllers. This puts Safe Link fully in the vanguard, because in both factory and process automation the number of complex, branched applications is growing – and with them the safety technology challenge of efficiently coupling these networks with each other. Information exchange can take place both hardwired over the Ethernet diagnostics interface or wireless, for example via radio data transmission, data light barriers, 5G or in industrial WLANs.

Regardless of the size of the plant, Safe Link sub-systems can be combined into a larger overall system. Up to 31 Safety Basic Monitors or gateways with integrated safety monitor can be coupled with each other – without sacrificing performance and without the need for additional hardware. In the maximum configuration with up to

Using Safe Link, safe ASI networks from any ASI generation can be safely coupled with each other.



Wireless data exchange using Safe Link.

62 safe I/Os per gateway nearly 2000 safe signals can be exchanged to handle virtually any application. The Safe Link technology thereby meets the highest safety requirements up to SIL3/PLe. Complex plants can first be constructed independent of each other as individual machine segments, then equipped, tested and approved with the Safety Basic Monitor or an ASI-5/ASI-3 gateway for safety, and the modules later coupled to each other and placed in operation as an overall system. Once the system is running, everything is possible, from direct (unicast) communication between each device and a central manager to broadcast operation according to the principle that each device communicates with all other devices.

Safe, physically compact but large in range of functions and with potential for even more – the Safety Basic Monitor lets you handle small standalone applications cost-efficiently. Yet when combined with expanded functionalities provided by ASI Safety and Safe Link it offers all the possibilities for handling even safety-relevant requirements in complex systems reliably and ready for whatever the future brings.



# MOBILE, MULTI-FUNCTIONAL, MODERN – THIS IS HOW ASI MODULES OF ALL GENERATIONS ARE ADDRESSED TODAY

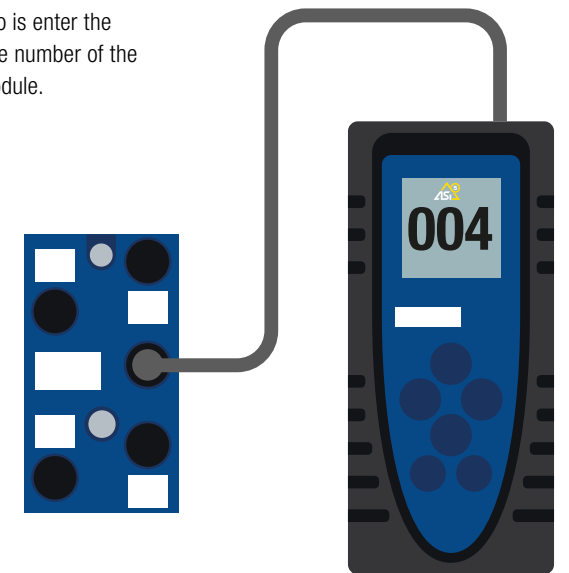
**Bihl+Wiedemann uses an agile process to further develop the ASI-5/ASI-3 Address Programming Device. New functions and features that are often initiated by feedback from users can in this process be implemented and tested in sprints and then made available to all users of already deployed devices using the field update function.**

The modern ASI-5/ASI-3 Address Programming Device BW4925 from Bihl+Wiedemann, a compact and ergonomic tool, can be used without any limitations with all ASI-5 and ASI-3 modules on the market. The same device can be used to write both ASI-3 addresses as well as node numbers and logical addresses of ASI-5 modules – the required ASI addressing cables are included in the scope of delivery. In combination with the company's software suite – ASIMON360 for safety applications and ASI Control Tools360 – the Address Programming Device shows off its virtues. Using the commissioning wizard integrated into the software you can quickly and very easily parameterize and commission modules which the device has addressed – in both small and large systems, from simple 16 I/O modules to parameterizable motor modules for frequency inverters and ASI-5 modules with integrated IO-Link masters.

## Hardware and convenience on the cutting edge

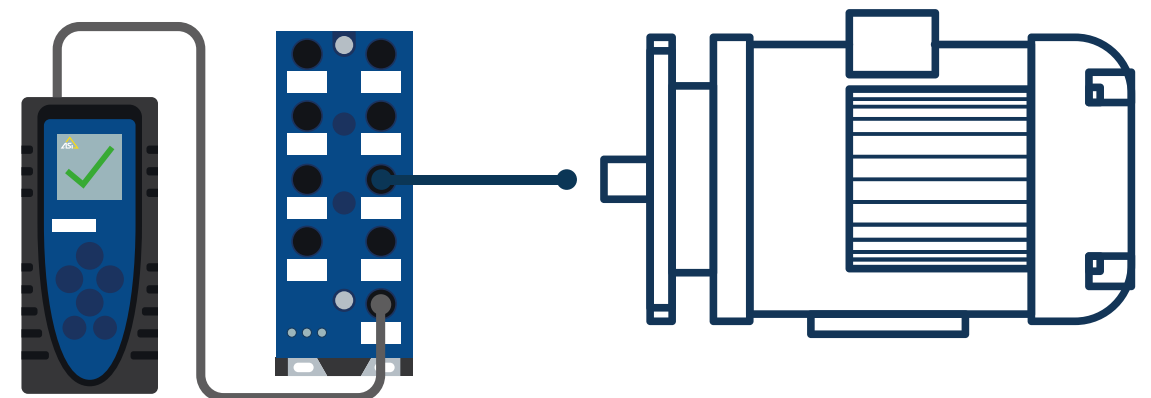
The ASI-5/ASI-3 Address Programming Device shows off its hardware technology

In addressing mode all you need to do is enter the address / node number of the connected module.



with cutting edge features. The OLED display can show razor-sharp plain text information and symbols regardless of the ambient light conditions and without glare.

The six robust buttons allow you to operate the ergonomically designed device easily with just one hand – left or right. An integrated supercapacitor provides powerful



In expanded mode it is possible, for example, to control a drive directly through the connected motor module with the Address Programming Device.



energy storage. This offers not only long service life, but can also be used for more than 200 read/write operations when fully charged – with a charging time of just around 30 minutes. Self-discharge of the supercapacitor is minimal – the Address Programming Device is still ready to use even after several months on the shelf. If needed it can also be charged during use via a powerbank through the standard USB-C connection on the device. This is used not only as a charging port, but also as a PC interface through which you can load firmware updates taking all security aspects into account.

#### Menu structure and user experience: logical, intuitive, familiar

Users of the modern ASI-5/ASI-3 Address Programming Device now achieve the desired functions by means of a newly

designed menu structure. This is based on the familiar look-and-feel of the software suites from Bihl+Wiedemann, especially when it comes to the integrated online bus information. The goal is to create a positive user experience by working with the tool in a logical, yet intuitive way. Here the Address Programming Device offers clear icon symbols, among other things for the operating status. A crescent moon, for example, is used to clearly denote standby mode. Operating and input functions are indicated clearly and are self-explanatory – no more paging through the manual is needed. Instead of cryptically formulated information the ASI-5/ASI-3 Address Programming Device uses plain text for error messaging – and in various languages.

Two operating modes are available. In the addressing mode, users have access to the addressing functions for both ASI-5 and

ASI-3 modules. The motto here: reduction to the essentials. You simply set the address or node number for the connected module. All the rest, such as logical address, profile used, parameters or even the name of an ASI-5 module is automatically set and parameterized from the PC software using the commissioning wizard.

The #-key takes the user to an expanded mode which supplements the addressing mode. Here you can read and write I/O data, i.e. inputs can be read and outputs can be set. Entering, checking or changing ASI-3 parameters is just as simple as reading and writing ASI-5 profiles. In addition, the Address Programming Device makes it possible to select profiles in the connected module and change various basic settings such as for different models and manufacturers of motorized rollers.

It is also possible – for instance – to reset ASI-5 participants to their original factory setting. Also available are numerous setting options for the ASI-5/ASI-3 Address Programming Device itself. For example, the times for the transition to stand-by mode or for completely switching off the device can be set via the menu. And in the expanded mode, such as for maintenance or service operations, you can read out both the software package ID number (SPID) as well as the article number of an ASI module. This makes it possible to display the software version of update-capable ASI devices on-site without having to be connected to the PC software.

Another special operating highlight is the ability to use the Address Programming Device to access the display of an ASI gateway directly through the device, even though the gateway is normally installed remotely in an enclosed control cabinet. The information displayed there is mirrored 1:1 on the addressing tool display

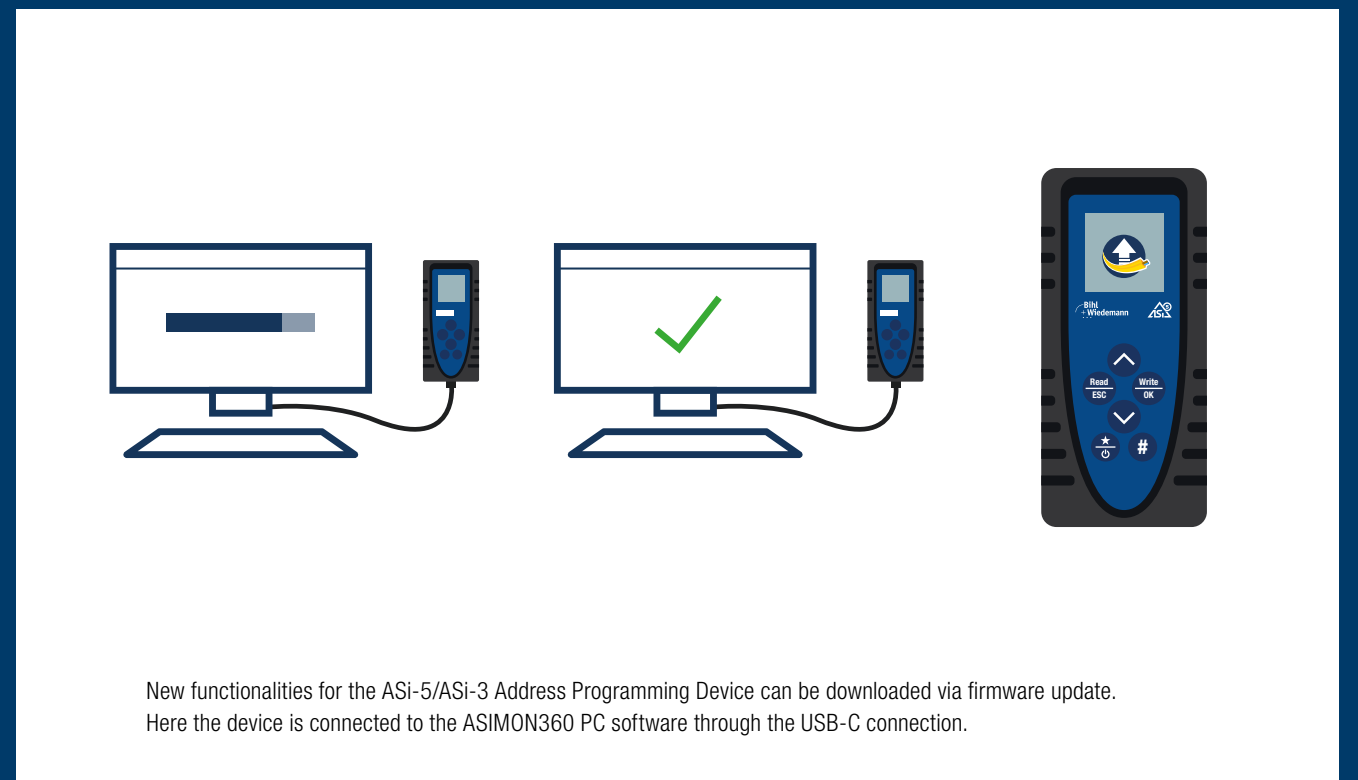
and thus can be viewed remotely. This can significantly simplify and accelerate commissioning as well as service and maintenance work.

#### Commissioning with the modern ASI-5/ASI-3 Address Programming Device – it's that easy

In general, all ASI modules can also be commissioned using just the software suites from Bihl+Wiedemann or directly through the gateway – but the ASI-5/ASI-3 Address Programming Device makes the work of commissioning an ASI circuit even easier. Once the network has been planned with respect to its hardware configuration in ASIMON360 or ASI Control Tools360, the bus participants can be quickly and easily provided with the address of an ASI-3 device or the node number and logical address of an ASI-5 module. A real bus structure does not have to be available for this purpose. After these settings have been made

locally for each individual module, all the devices are connected to the ASI gateway. Finally the software starts the commissioning wizard, which then automatically does the final configuration of all the connected devices. Additional settings are also transmitted to the ASI modules if they were already specified at the beginning of the hardware configuration.

Hardware and network planning as well as parameterization of ASI modules using the Bihl+Wiedemann software suites, wiring of ASI modules and gateways in the control cabinet using piercing technology exactly where they are used, addressing of the control cabinet and field modules with the ASI-5/ASI-3 Address Programming Device, starting the automatic commissioning wizard – and you're done! AS-Interface, the globally standardized fieldbus system for the first automation level, can be commissioned and implemented quickly, intuitively, simply and reliably – in both small and complex applications.





# Stacker crane from Klinkhammer: MOVING SAFELY THROUGH THE AISLES



Stacker crane with power rail in aisle

**ASi-5 and ASi-3 are today the standard in intralogistics – especially when it comes to drive solutions for integrating roller drives, DC motors and decentral frequency inverters. Intralogistics specialist Klinkhammer from Nuremberg has teamed up with Bihl+Wiedemann to show how their safety technology not only controls and monitors conveyor lines up to SIL3/PLe, but also efficiently realizes complete safety applications for storage and retrieval machines (S/RMs) in automated high-bay warehouses.**

The Klinkhammer Group, originally founded in 1972 in Nuremberg as an “engineering office with innovative logistics planning”, is a family-owned, medium size group with an international orientation. The focus of Klinkhammer Logistics is on designing efficient material flow in the warehouse, using holistic, automated logistics solutions. Accordingly the company offers innovative logistics concepts, installation of the warehouse technology and future-oriented software for a variety

of industries from a single source. The objective is always to develop the most economically and effective solution for the customer – taking into account all the relevant market trends and developments. With 50 years of experience in automated storage, material handling, picking and distribution technology, Klinkhammer is an innovative intralogistics provider in Europe for warehouse automation.

## Klinkhammer and AS-Interface – a long tradition

Simple installation, great functionality and flexibility, low costs – and all that with high user convenience. AS-Interface has established itself as the internationally standardized wiring system in modern conveying and material handling technology as well, to which Bihl+Wiedemann has contributed greatly with their comprehensive product range and their various hard- and software tools for commissioning the ASi networks. Klinkhammer as well has for many years relied on ASi and (ASi) Safety solutions from Bihl+Wiedemann in their material handling technology, using among other things the compact cable duct modules for motorized rollers as well as standard and safety I/O modules in IP20 and IP67. Also used are PROFINET gateways which send the I/O data as well as detailed diagnostic information directly to the control. Using the optional safety control in the gateways, the safety-related signals can be processed directly and locally, eliminating the need for a higher level safety control.

According to Alexander Ruhmann, responsible for electronic design at Klinkhammer, an essential consideration in choosing Bihl+Wiedemann was the fact that the ASi gateways (ASi master and fieldbus connection in one stainless steel housing), in contrast to the devices from other manufacturers, were early to include a display, making them significantly more maintenance-friendly. And the safety technology, even for larger material handling applications, is ideally implemented using ASi Safety according to A. Ruhmann, since it is often the case that only the data from



Klinkhammer application: Stacker crane with high rack storage

simple sensors needs to be collected but from widely different locations in the field. “Light barriers, here and there a safety light curtain, every few meters an E-STOP button, perhaps a protective door or two – ASi Safety is simply perfect for this, especially in the field of material handling”.

## Stacker crane with safety technology from Bihl+Wiedemann

Based on the positive experiences, the company has made over the past few years with ASi and ASi Safety solutions,

as well as the possibilities that these offer, Klinkhammer decided for the first time on the safety technology of a stacker crane (S/RM) for an automated high-bay warehouse with a safety solution from Bihl+Wiedemann.

In designing an approximately 2-ton and approximately 8 meter high stacker crane for containers, moving through an aisle on a rail at a speed of up to 6 m/s and using a load handling device (LHD) to automatically load and unload shelves to the left and right of the aisle at different heights,

According to industry guidelines a rack is considered a high-bay warehouse when it is 7.50 m tall or more. Automated high-bay warehouses can be operated by so-called storage and retrieval machines (S/RMs), which receive and automatically execute travel assignments over a warehouse management and material handling system. The machines are controlled by complex control systems. Via the material handling system the materials are transported to the high-bay warehouse and from there to the picking area, production or shipping. Automated high-bay warehouses were created mainly in order to save floor space, increase storage capacity, shorten the logistics chain and improve delivery quality.



the following requirements had to be met:

- The safety concept had to meet the requirements of the new EN 528 for storage and retrieval cranes
- Safe communication between the inside (the S/RM on the rail) and the outside (the control cabinet in front of the safe area at the aisle entrance and the non-travelling buffers) had to be possible to implement
- The safety solutions should function without expensive sliding contacts and without the use of an additional safety control
- Safe position and motion monitoring had to be ensured within the aisle
- Safe position and motion monitoring should be implemented using a barcode positioning system
- The safety technology should be capable of being processed locally on the S/RM
- Communication between the S/RM and control cabinet should be via data light barrier
- The position of the S/RM must be known by the control unambiguously and at all times



S/RM control cabinet with B+W safety technology

#### Safe communication between inside and outside

For (safe) communication between the control cabinet outside the active area of the S/RM and the stacker crane itself two ASi-5/ASi-3 PROFINET gateways with integrated safety monitor (BWU3863) are used. Both gateways are connected to each other via Safe Link, the safe coupling technology from Bihl+Wiedemann. Safe Link can be transmitted over standard Ethernet or the fieldbus. No additional wiring is necessary for the safety communication, and the gateway can be expanded locally over AS-Interface with

additional safe and standard I/Os. For the area between the barrier and the S/RM, i.e. where no hardwired communication is possible, a data light barrier is used. With this data light barrier, the Safe Link data and the non-safe signals can be stably transmitted optically over a distance of up to 120 m.

The second ASi-5/ASi-3 PROFINET Safety Gateway monitors the stationary safety technology. These data are made available to the second gateway on the stacker crane via Safe Link, with the gateway itself controlling the safety technology of the S/RM.

#### Safe position and motion monitoring

For safe position and motion monitoring of the S/RM, which accelerates at  $3.5 \text{ m/s}^2$  and reaches a speed of  $6 \text{ m/s}$ , an ASi Speed Monitor (BWU2849) from Bihl+Wiedemann is used.

In addition to the position of the stacker crane the ASi Speed Monitor, together with the gateway, also monitors additional safety requirements specified in EN 528. Depending on the operating mode, these can be speed, acceleration and braking ramps, rotation direction, standstill as well as safe end positions. For diagnostic and control purposes these data are sent non-safe over the fieldbus to the control.

The load handling device (LHD) on the stacker crane can remove materials from a defined location in the high-bay or precisely place them in that same location. In addition it can hand over materials removed at the aisle entrance to the conveyor belt for further transport or remove them from the belt for storage. To ensure that the throughput of goods in the high-bay warehouse is as high as possible, it is essential that the S/RM accelerates and also decelerates again as quickly as possible. However, the mechanical buffers at the beginning and at the end of the aisle can only absorb part of the maximum kinetic energy of the stacker crane. Therefore, the speed at the edge areas must be safely monitored and reduced at the right time. Ideally, this is achieved using monitored brake ramps, which can also be safely evaluated by the Speed Monitor. If the acceleration or braking behavior is not correct, the safety technology also intervenes here and ensures that the S/RM comes to a safe stop.

In contrast to the travel path within the aisle ('X-direction'), which must be safely monitored because, for example, in manual operation or commissioning mode an operator may be present in the aisle, safe monitoring of the stroke ('Y-direction') is not necessary for a container S/RM system, since only boxes are transported on the LHD. The situation is



S/RM in aisle with material handling technology

different for a palletized S/RM system, which is usually much larger and where a person can also travel upwards in a cabin. In this case, the lift also needs to be monitored in terms of safety. What at first glance sounds like a significantly more complex application can, on closer inspection, be implemented with relatively little effort using the safety solution from Bihl+Wiedemann by simply using a second ASi Speed Monitor for the 'Y direction' in addition to the Speed Monitor for the aisle.

Whether in material handling or in storage and retrieval machines – the ASi and (ASi Safety) solutions from Bihl+Wiedemann have proven and established themselves in many safe and non-safe applications. And if Alexander Ruhmann has anything to say about it, this will not change in the future – on the contrary, existing and new products as well as further technological developments still offer great potential.

Aisle door



Control panel with B+W safety technology



LHD unloading a compartment



# ASi-5 AND ASi HIGHLIGHTS

# FROM BIHL+WIEDEMANN

## Self-configuring I/O modules now available in the new cable duct housing

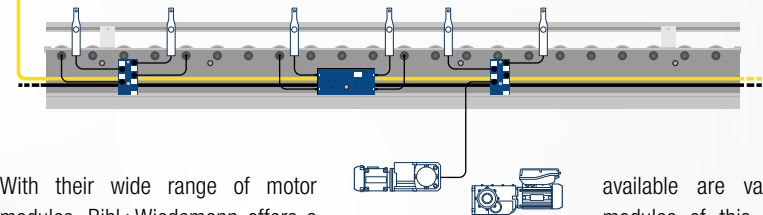


Self-configuring I/O modules are modules in which each digital signal can be used bi-directionally either as in- or output as needed with no prior configuration. This allows one and the

same module to be used in many different applications, which among other things simplifies spare parts management. Bihl+Wiedemann offers such modules which in addition provide channel-specific diagnostics, with current models available for 4, 8 and 16 digital signals in various types and form factors with IP67 and IP20 housing. The product

family now also includes two new self-configuring I/O modules for controlling motors in an IP54 housing especially developed for installation in a cable duct: one module with 16 I/Os (BWU4977) and one with 8 I/Os (BWU4979). Connection of periphery is realized using 8 or 4 M12 sockets, the connection to ASi and the supply of sensors and actuators is realized out of AUX via profile cable.

## Wide range of ASi-5 and ASi-3 drive solutions for motorized rollers, DC motors and frequency inverters



With their wide range of motor modules, Bihl+Wiedemann offers a variety of drive solutions with ASi-5 and ASi-3. This applies both to controlling motorized rollers as well as to DC motors and frequency inverters. The specially designed ASi-5 motor modules in the IP54 housing for installation in cable ducts can control up to four 48 V or 24 V motorized rollers from Interroll or two 24 V motorized rollers from Itoh Denki. Also

available are various ASi-3 modules of this type for up to two 24 V motorized rollers from these same two manufacturers. When two 48 V or 24 V Interroll EC5000 AI rollers need to be controlled in the field using ASi-5, Bihl+Wiedemann also offers the corresponding motor modules in IP67 housing. These field modules are also supplemented by a variety of ASi-3 versions, including for manufacturers such as

Itoh Denki, Rollex and RULMECA. The same applies for DC motors and frequency inverters made by leading OEMs: when performance parameters like speed, acceleration and braking as well as expanded diagnostics are important, this is efficiently accomplished using ASi-5 as well. Currently available are solutions for SEW MOVIMOT, SEW MOVI-C, NORD NORDAC frequency inverters, ebm-papst K4, Rockwell PF525, Bonfiglioli DGM/DGM-R as well as for Lenze Smart Motors and Lenze i550. And again: when less complex functions like start/stop, left-right or open/close need to be implemented cost-efficiently, Bihl+Wiedemann offers a variety of ASi-3 motor modules for many drives in various versions.

## ASi-5 Safety – certified and ready to use



The new AS-Interface safety generation is always the ideal supplement to ASi Safety at Work when many safe and standard signals

need to be used under one address. It is compatible with all previous ASi devices and components, runs in parallel on the same yellow profile cable, and can be easily integrated into existing applications with the new ASi-5/ASi-3 Safety Gateways from Bihl+Wiedemann. The new ASi-5/ASi-3 Fieldbus Gateways with integrated ASi-5/ASi-3 Safety Monitor from Bihl+Wiedemann are currently available already in various versions for PROFINET and EtherNet/IP, some with safe fieldbus and local I/Os. Development is in progress for additional versions for Ethernet/IP, Sercos, EtherCAT and POWERLINK (also together with CIP

Safety and FSoE). In addition to functional improvements, the new ASi-5 Safety Gateway generation stands out with its modern chip card, which can store a complete project – including safety and hardware configuration, parameter data for connected devices and user comments from ASIMON360. Together with the first ASi-5 Safety Input Modules with two safe inputs for floating contacts respectively optoelectronic protective devices and up to 12 standard signals, it is possible, for example, to cost-effectively connect a control panel – with several light buttons, an E-STOP button and a safety key switch - to ASi.

## ASi-5/ASi-3 Address Programming Device BW4925 from Bihl+Wiedemann with new functions



for simple operation and a built-in supercapacitor for power energy storage and fast charging even while in use, this device is contin-

The modern ASi-5/ASi-3 Address Programming Device from Bihl+Wiedemann is a compact, ergonomic tool for addressing ASi-5 and ASi-3 modules. Featuring an OLED color display, six robust buttons

uously undergoing advanced development. New functions are made available to the user via the field update function through the integrated USB-C interface. Immediately apparent are the newly designed menu structure and the unambiguous icon symbols. The standby mode for example is displayed by a crescent moon. The times for standby and turning the device off can now be set in an expanded mode, accessed using the #-key, where you can also set options such as the display language. Also available in expanded mode is direct access to connected

ASi modules for checking and changing their I/O data and basic settings or performing a factory reset of ASi-5 participants. And finally it is also possible now to use the Address Programming Device and a module in the ASi network to access the display of the corresponding gateway, which can significantly simplify and speed up service and maintenance work. The clear representation of operating and entry functions as well as the display of error messages in plain text makes operation of the ASi-5/ASi-3 Address Programming Device self-explanatory.

## IO-Link integration with ASi-5: simple, flexible, cost-effective



Connecting IO-Link devices to the control level or cloud using ASi-5 and ASi-5 Modules with integrated IO-Link Master from Bihl+Wiedemann brings with it a number of benefits. Users of this fieldbus-neutral solution profit not only from the perfect integration of IO-Link into ASi-5 and into the user-friendly configuration tools ASIMON360 and ASI

Control Tools360, but also from the freedom to choose any desired topology, the ability to reduce wiring effort without the use of assembled plugs and switches, low IP management effort as well as a smart energy supply concept. Another key benefit: you reduce costs. Because ASi-5 Modules with integrated IO-Link Master are in general not only significantly less expensive than Ethernet fieldbus modules or IO-Link hubs, they are also available on demand. For use in the field there is a finely graduated range of versions with 1, 2 and 4 IO-Link ports Class A and Class B as well as for 8 IO-Link ports

Class A. These are complemented by control cabinet modules and an OEM module with configurable terminals for 4 IO-Link ports. Thus, the user gets and pays for only the connection module equipped the way he actually needs it.

## 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 also signifi-

cantly more flexible in its application. For one thing each of the eight IO-Link master ports Class A also provides a standard I/O signal. Pin 2 on the 5-pin, M12 socket can be used to configure an additional in- or output – easily and conveniently using the company's software suite. For another, this ASi-5 module can also send 255 bytes of process data with variable data length.

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# Asi-5

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