Product Overview
by Bihl+Wiedemann

Bihl
+Wiedemann

THE AS-INTERFACE MASTERS

About Bihl+Wiedemann

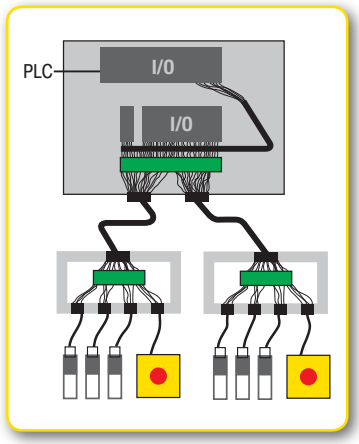
Bihl+Wiedemann GmbH, founded in 1992 by Jochen Bihl and Bernhard Wiedemann, is a highly specialized, internationally operating engineering company based in Mannheim. It is among the leading providers of safety technology and electronic components for automation technology with AS-Interface.

In 1995, Bihl+Wiedemann was the first company to receive a certificate from AS-International for its AS-i Master. This master is used as a reference for the certification of AS-i Slaves. Other milestones in the history of the Mannheim-based company include the realization of the first AS-i Master to comply with specification 3.0, the presentation of the first AS-i Master in a stainless steel housing with extended diagnostic functions (2004) and the joining of the AS-Interface safety consortium (2005). Since then, Bihl+Wiedemann has also been among the industry leaders in the area of safety technology with AS-i Safety at Work.

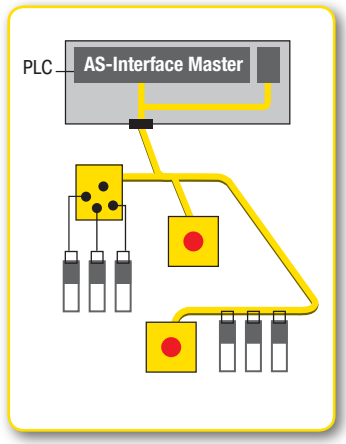
In addition to its headquarters in Mannheim, the company has subsidiaries in Turkey, Denmark, USA and China. Additional sales partners ensure that Bihl+Wiedemann is represented worldwide.

Basic Concept of AS-Interface

AS-Interface is an industrial networking solution for automation systems. It is designed for connecting simple field I/O devices such as binary ON/OFF and analog, as well as safety I/O devices according to EN ISO 13849-1, EN 61508. Using only a two conductor profile or round cable (AS-i cable, 2 × 1.5 mm^2, 16 AWG) to connect all slaves to the master using a free topology. This is the main advantage of this system compared to conventional, parallel wiring, where every single signal has to be wired directly to the control system.
Data and power are available in the same AS-i cable. Every slave or module has its own address for accessing its data. The slaves can be addressed from 1 to 31 (single slaves), or, with extended addressing, there are 62 slaves available (1A to 31A and 1B to 31B). Single slaves and modules with extended addressing can share the same AS-i network.



Conventional wiring



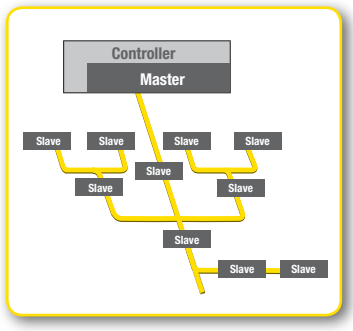
Standard signals, safety signals and power supply over one cable

AS-i Structure

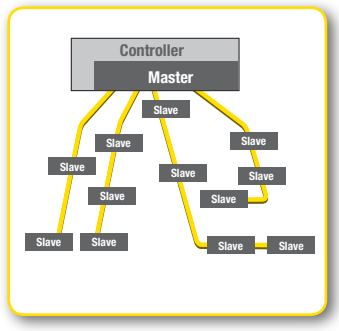
The AS-i Master/Gateway controls the AS-i network and acts as a direct link to the host such as PLC, PC, DCS, etc. A Gateway is an AS-i Master, and simultaneously a slave to higher level network (PROFIBUS, PROFINET, EtherNet/IP, DeviceNet, CANopen, Modbus, etc.). AS-Interface is the lowest level of the automation pyramid intended for Actuator/Sensor networking. It uses bit-wise communication for most common binary field devices (sensor: push button, selector switches, etc.). The level above AS-i is a device level which is an implementation of complex field devices, sensor, and actuator where data exchange occurs mostly byte-wise. Field level is the highest level in the automation hierarchy connecting production facilities at one location and plants at different locations.

AS-i Topology

AS-i supports free topology such as Star, Ring, Linear, Tree and Mesh network (see examples below).



Tree topology



Star topology

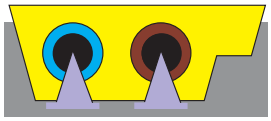
Benefits of AS-Interface

- Cost savings from minimal installation effort and reduced use of I/O cards, control cabinets and cables
- Robust, globally standardized industrial bus with over 32 million nodes that have already been installed
- Simple electronics with robust performance in industrial quality
- Free choice of network topology
- Quick installation, reduced maintenance and shorter testing time,
- Fast commissioning and ability to expand the system
- Fast transmission time (max. 5 ms)
- No more wiring errors, thanks to profiled cables (no risk of improper electrical connection)
- High resistance against EMC noise
- Fast error localization because of enhanced diagnostic data

Compatibility

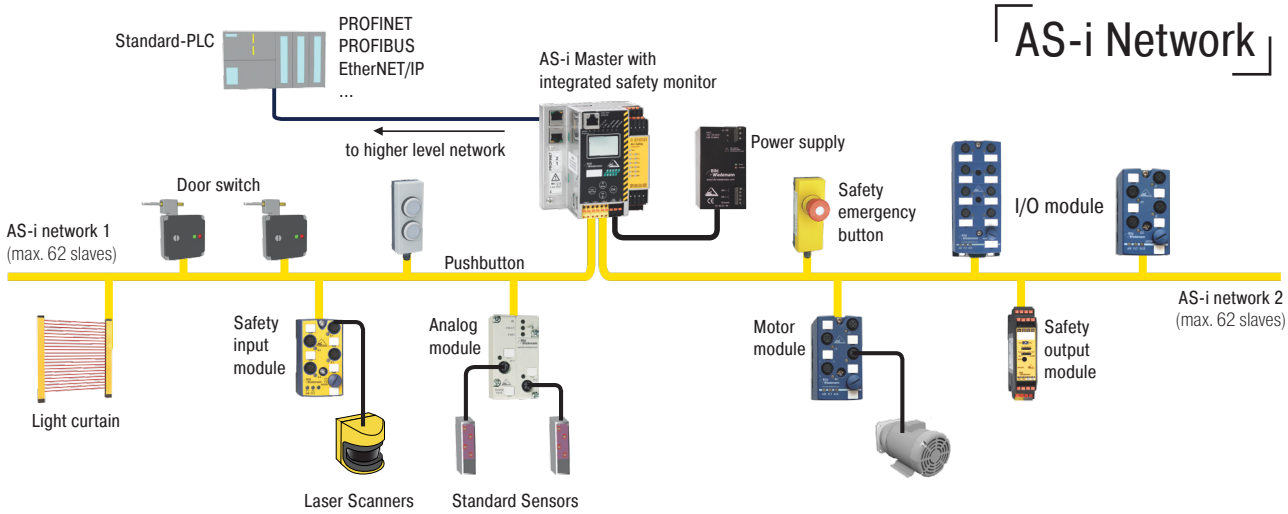
AS-i is fully backwards compatible. This means that a master according to the last specification 3.0 can communicate with all existing slaves according to the different specifications 2.0, 2.11 and 3.0. This guarantees a future proof investment.

Just Plug In



Thanks to the yellow profile cable and piercing technology, AS-i modules are easy to ex tend and protected against polarity reversal.

AS-i Network



AS-i Features per Line

Medium	Unshielded two conductor profile cable
Signal	Supply power and data in one cable with max. 8 A
Cable Length	100 m (extensible up to 1000 m)
Number of Slaves per line	up to 62
Number of I/O Binary	up to 248 Inputs and 248 Outputs
Number of I/O Analog	up to 124 Inputs or Outputs
Cycle Time	153 µs/slave
Transmission Rate	167 kbits/second
Error Protection	Identification and repetition of faulty frames
Supported Topology	Tree, Star, Ring, Linear, Linear with taps and Mesh
Safety	up to SIL 3, Category 4, PLe (EN 62061, EN 61508, EN ISO 13849-1, EN 954-1)

Gateways

- 1 Master
- 2 Masters
- 2 Masters, version: “1 gateway + 1 power supply for 2 AS-i networks“

Benefits of the 2 Masters, version: “1 gateway + 1 power supply for 2 AS-i networks”:

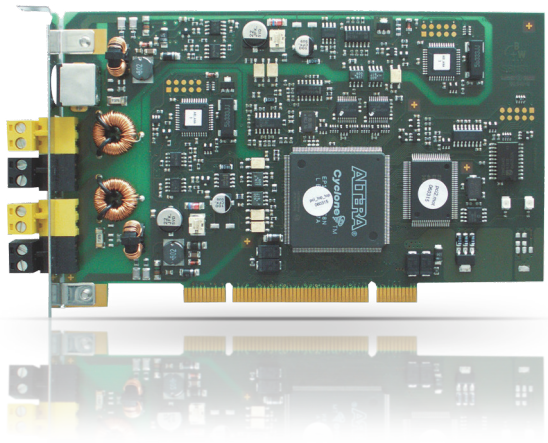
- Lower investment, lower installation effort, more space in the service cabinet
- Only one connection to each, the power supply and the higher level bus
- Separation of power supply and AS-i network possible
- No additional 24 V power supply

PROFIBUS
PROFINET
EtherNet/IP
Modbus
DeviceNet
EtherCAT
CC-Link
CANopen
sercos the automation bus

AS-i Scanner for Allen-Bradley ControlLogix, CompactLogix and MicroLogix 1500

Rockwell Automation Encompass Product Partner Global

AS-i Master for PC-based automation



- PCI
- PC2
- PC104
- OEM Module
- M-Module

Safety Gateways / Safety Monitors

Gateways with integrated Safety Monitor

- ASi-5 / ASi-3 Master in one device
- 1 gateway, 1 power supply for 2 ASi networks
- Up to 3 x 2-channel safe inputs built-in, expandable by up to 62 x 2-channel safe inputs
- Up to 6 fast electronic safe outputs

Gateways for Safety PLC

- PROFIsafe via PROFIBUS or PROFINET
- CIP Safety via EtherNet/IP
- CIP Safety via Sercos
- Safety over EtherCAT (FSoE)

Safety Basic Monitor

- Ideal for small applications
- Stand alone solution
- Expandable over AS-i
- Up to 8 OSSDs

Safety Slaves

Safety Inputs

- For floating contacts
- For OSSD outputs
- For speed monitoring
- E-STOP / Pushbutton Modules

Safety Outputs

- Relay outputs
- Electronic outpı
- Mixed Input/Output Modules
- Safe Contact Expanders

Digital Modules

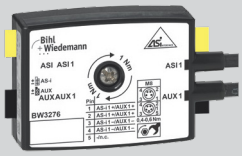
Digital Input / Digital Output

- Up to 16 digital inputs
- Up to 8 digital outputs
- M12 connection: single, Y or mixed
- flexible sensor supply
- Modules with up to 2 A per output

IO-Link

- IO-Link Port Class A and IO-Link Port Class B
- In 1,27 ms up to 16 bit user data available
- IP67, M12
- IP20, 22,5 mm

Passive Distributors



Analog Modules

Input Slaves, Output Slaves, Specialities

- 4 ... 20 mA
- 0 ... 10 V
- Pt100, Pt1000
- Thermoelemente
- IP20, IP67

- Counter modules
- Up to 4 x 2-channel inputs or 4 x 1-channel inputs
- IP20, IP67

Safety Analog Input

- 4 ... 20 mA
- 0 ... 10 V
- Pt100
- Thermocouples
- IP20

Active Distributors

- Safe input modules
- Digital I/O modules

Drive Solutions / Diagnostics

AC Motors

- SEW MOVIMOT
- SEW MOVI-SWITCH
- Separate mounting
- Simple maintenance

DC Motors

- Interroll
- Itoh Denki
- Rollex
- RULMECA

Diagnostics

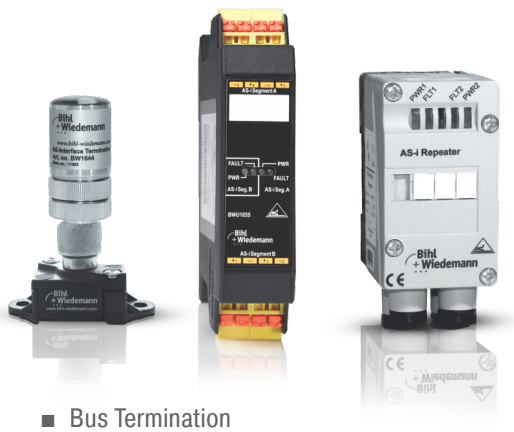
- AS-i Analyser
- AS-i Control Tools

Power Supplies / Circuit Extensions

Power Supplies

- Single phase
- 3 phases
- 24 V to AS-i
- 1,8 A, 2 A, 4 A, 8 A
- Decoupling unit for 2 networks

Circuit Extensions



- Bus Termination
- Tuner
- Repeater

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Bihl+Wiedemann GmbH

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Leading with AS-Interface since 1995

In 1995 Bihl+Wiedemann was the first company to receive a certificate from AS-International for their ASi Master. The Master is now used as a reference for the certification for ASi slaves.

Other milestones in the company's history include the introduction of the first ASi Master for specification 3.0, the release of the first ASi Master in a stainless steel housing with expanded diagnostic functions (2004), and the membership in AS-Interface's Safety Consortium (2005). Since then Bihl+Wiedemann is among the top names in the field of safety technology using ASi Safety at Work.

Numbers and facts

- Founded in April 1992
- Headquarters in Mannheim
- 230 employees
- The AS-Interface Masters
- Functional Safety

International Subsidiaries and Distributors

Additionally to the company's headquarters in Mannheim, Bihl+Wiedemann has subsidiaries in the USA, Turkey, Denmark, and China. International sales partners ensure Bihl+Wiedemann's presence around the world.


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