Benefits of AS-Interface

- Save hardware by reducing I/O cards, cabinets and wiring
- Simple electronics with robust performance
- Free choice of network topology
- Quick installation, reduce maintenance and shorten testing time, fast commisioning and ability to expand the system
- Fast transmission time (max. 5 ms in worst case)
- Avoid wiring errors (no risk of faulty electrical connection)
- High resistance against EMC noise
- Fast error localization because of enhanced diagnostic data
- Reduce cost

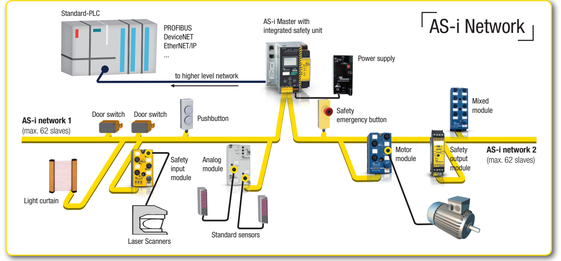
Compatibility

AS-i is fully backwards compatible.

This means that a master according to the last specification 3.0 (= M4 profile) can communicate with all existing slaves according to the different specifications 2.0, 2.11 and 3.0. This guarantees a future proof investment.

fast, easy expandable, reverse polarity protected

AS-i Network



AS-i Characteristics

Medium	Unshielded two conductor flat cable
Signal	Supply power and data in one cable with max. 8 A
Cable Length	100 m (line extension possible using a bus termination, tuners and/or repeater up to 1000 m)
Number of Slaves per Network	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	SIL 3, Category 4, PLe (EN 62061, EN 61508, EN ISO 13849-1, EN 954-1)

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Bihl + Wiedemann

THE AS-INTERFACE MASTERS

Product Overview
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.

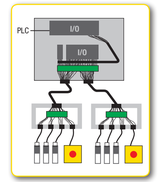
In 1995, Bihl+Wiedemann was the first company to receive a certificate from AS-International for its AS-i Master. This master is used as a reference for the certification of AS-i Slaves. Other milestones in the history of the Mannheim-based company include the realization of the first AS-i Master to 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 and China. Additional sales partners ensure that Bihl+Wiedemann is represented worldwide.

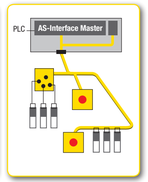
Basic Concept of AS-Interface

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 flat or round cable (AS-i cable, 2 x 1.5 mm², 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



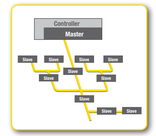
Standard signals, safety signals and power supply over one cable

AS-i Structure

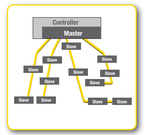
The AS-i Master/Gateway controls the AS-i network and acts as a direct link to the host such as PLC, PC, DCS, etc. A Gateway is an AS-i Master, and simultaneously a slave to higher level network (PROFIBUS, EtherNet/IP, DeviceNet, CANopen, Modbus, etc.). AS-Interface is the lowest level of the automation 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).



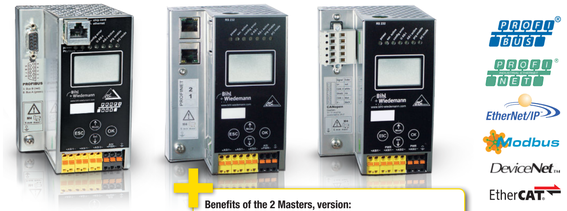
Tree topology



Star topology

Gateways

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

Safety Gateways / Safety Monitors

Gateways with integrated Safety Monitor

- 1 Master
- 2 Masters
- 2 Masters, version: "1 gateway + 1 power supply for 2 AS-i networks"
- SafeLink over Ethernet
- Up to 32 OSSDs

Safety Monitor

- 2 OSSDs
- 4 OSSDs
- Up to 16 OSSDs

Safety Basic Monitor

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

Digital Modules

Digital Input / Digital Output

- 4 inputs, 4 outputs
- 8 inputs, 8 outputs
- Single or Y wiring
- Flexible sensor supply solutions
- High current modules up to 2A per output
- Relay outputs

- IP67, M12
- IP20, 22,5 mm
- IP20 in stainless steel housing

Accessories

Passive Distributors

- AS-i
- AS-i and 24 V
- Flat cable branch

Drive Solutions / Diagnostics

AC Motors

- SEW MOVIMOT
- SEW MOVI-SWITCH

DC Motors

- Interroll
- Itoh Denki
- Rollex

Diagnostics

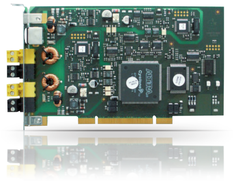
- AS-i Analyser
- AS-i Control Tools

AS-i Master / Links / Scanner

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

Rockwell Automation Encompass Product Partner Asia-Pacific - Europe

AS-i Master for PC-based automation



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

Safety Slaves

Safety Inputs

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

Safety Outputs

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

Analog Modules

Input Slaves

- 4 ... 20 mA
- 0 ... 10 V
- Pt100, Pt1000
- Thermocouples
- IP20, IP65

Output Slaves

- 4 ... 20 mA
- 0 ... 10 V
- IP20, IP65

Specialities

- Counter Modules
- Balance Controller
- Mixed Modules

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