



Product Catalog

- AS-i Masters/Gateways/Links/Scanners
- AS-i Slaves
- AS-i Accessories/Diagnosis/Development
- Other Fieldbusses/Master Simulators
- AS-i Safety at Work



Zertifikat Certificate

Das AS-Interface Produkt
The AS-Interface product

Grundlage des Zertifikates ist die Complete Specification (V 3.0), die aktuelle Prüfordnung und die Zertifizierungsrichtlinie der AS-International Association e.V..

Die Baumusterprüfung des Referenzproduktes wurde durchgeführt im **AS-Interface Prüflabor des Steinbeis Transferzentrum Leipzig**.

Die Baumusterprüfung und die Herstellererklärung wurden für gut befunden.

Die Verantwortung für das Produkt verbleibt beim Hersteller.

The Certificate is based on the Complete Specification (V 3.0), the actual test requirements and the certification guideline of AS-International Association e.V..

The type test of the reference product was performed by the AS-Interface test laboratory at the Steinbeis Transferzentrum Leipzig.

The type test and the manufacturer declaration have been approved to be good.

The manufacturer is responsible for his product.

AS-i 3.0 PROFIBUS Gateway in Edelstahl
AS-i 3.0 PROFIBUS Gateway in stainless steel
der Firma
of the company

Bihl+Wiedemann GmbH

in/at D-68199 Mannheim

wurde gemäß der Complete Specification (V 3.0) mit dem Profil **M4** entwickelt.
has been developed according to the Complete Specification (V 3.0) with the profile **M4**.

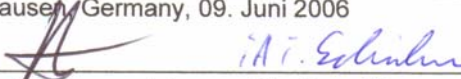
Das Produkt hat die Bezeichnung
The Product has the designation

**BWU1567, BWU1568, BWU1569,
BWU1599, BWU1600, BWU1601,
BWU1653, BWU1654, BWU1655,
BWU1773, BWU1774, BWU1775,
BWU1776, BWU1777**

Dies Produkt darf mit dem Zertifizierungslogo und der Nummer der Zertifizierungs-urkunde (ZU-Nr.) gekennzeichnet werden.
This product may be marked with the certification Logo and the Number of the certification document (ZU-No.).



Gelnhausen, Germany, 09. Juni 2006


Zertifizierungsstelle – certification office
AS-International Association

1 AS-i Masters/Gateways/Links/Scanner

1.1 AS-i Masters in general	11
In General	11
„AS-i-Control“ Mini PLC for AS-i 13	
AS-i Gateways/Links	14
1.2 AS-i Masters/Gateways/Links/Scanner	15
AS-i 3.0 PROFIBUS Gateways in Stainless Steel	18
AS-i 3.0 PROFIBUS Gateways in Stainless Steel	23
AS-i 3.0 DeviceNet Gateway in Stainless Steel	25
AS-i 3.0 CANopen-Gateways in Stainless Steel	27
AS-i 3.0 Modbus Gateway in Stainless Steel	29
AS-i 3.0 EtherCAT Gateways in Stainless Steel	31
AS-i 3.0 Ethernet/IP + Modbus TCP Gateways in Stainless Steel	33
AS-i 3.0 PROFINET Gateway in Stainless Steel	35
AS-i 3.0 Ethernet Gateways in Stainless Steel (Modbus TCP)	37
AS-i 3.0 EtherNet/IP Gateways in Stainless Steel	39
AS-i 3.0 RS 232 Master in Stainless Steel	41
AS-i 3.0 Master/Scanner for Allen-Bradley ControlLogix	42
AS-i 3.0 Master/Scanner for Allen-Bradley CompactLogix/MicroLogix 1500	43
AS-i PROFIBUS Gateway in IP65	44
AS-i/CC-Link Gateway	45
AS-i/Modbus Plus Gateway	46
1.3 AS-i-Master OEM-Module/PC-Boards	47
Overview AS-i Masters OEM Modules/PC Boards	47
AS-i Master for PC based Automation	48
AS-i 3.0 PCI Board	49
AS-i PC2	50
AS-i/PC104 Master	51
AS-i Master M-Module	52
AS-i-Master OEM-Modul	53
Evaluation Kit for the AS-i Master OEM Module	54
1.4 Software	55
AS-i Control Tools	56
Control III, Programming in C (mini-PLC)	57
Software/Drivers for AS-i Masters	59

2 AS-i Slaves

2.1 AS-i Digital Modules	61
AS-i 3.0 Modules in Stainless Steel	62
AS-i 3.0 Modules in IP67 (M12)	65
AS-i Analog Module, 2 inputs Pt100 + 4 digital inputs/outputs in IP67 (M12)	69
2.2 AS-i-Analogmodule	73
AS-i Analog Modules	75
AS-i Analog Modules IP20	76
AS-i Analog Module: 2 analog Inputs	83
AS-i Analog Module: 2 analog Outputs	84
AS-i Module: 4 Pt100/Pt1000 Inputs	85
AS-i Analog Module: 2 Pt100 Inputs + 2 Relais Outputs	86
AS-i Balance Controller	87
AS-i 3.0 Analog Module: 2 analog Inputs (M12)	88
AS-i 3.0 Analog Module: 2 analog Inputs (M12)	90
AS-i 3.0 Analog Module: Analog Input and Output Module (M12)	91
AS-i Analog Module: 4 analog Inputs (M12)	93
AS-i Analog Module: 4 analog Inputs (M12)	95
AS-i Analog Module: 4 Pt100 Inputs (M12)	97
2.3 OEM Modules/AS-i Special Slaves	99
OEM Modules/AS-i Slaves for Special Solutions	102

AS-i 3.0 Analog Module: 2 analog Inputs	103
AS-i 2I/2O AB Module	104
AS-i 4I/3O AB Module	106
AS-i 4I/4O Module	107
AS-i 4I/4O OEM Module	108
AS-i 4I/4O Module, galvanical separated	109
AS-i 4I/4O Module with LEDs	110
AS-i 6O-AB Module	112
AS-i 8I Module	113
AS-i 8I/8O Module, AS-i 16I/16O Module	114
AS-i OEM Slave with serial Interface	116
AS-i OEM Power Supply Module	117
2.4 Specialities	119
AS-i 3.0 Universal Module in IP65	120
AS-i Counter Modul: A/B inputs	122
AS-i Counter Module: 1-Channel Input	124
AS-i Counter Module (0 - 15): 1 Channel Input	125
AS-i Analog Module: 2 Inputs for Leuze ODSL 30 Distance Sensors	126
AS-i/AS-i Coupler in IP20	127
AS-i Code Block	128
AS-i/AS-i Coupler in IP65	129
2.5 Drive Solutions with AS-i	131
AS-i Drive Solutions	132
Cylindrical AS-i Actuator 1I/3O, additional 24 V	133
AS-i Slave for Frequency Inverters	134
AS-i 3.0 4I/4O Module for MOVI-SWITCH	135
AS-i 3.0 Motor Module for 2 Roller Drives, speed setting of AS-i parameter	136
AS-i module for two motors e.g. Interroll, Itoh Denki series 50XE/XP, POWER MOLLER (R) BRUSHLESS 24VDC etc.	138
2.6 AS-i Building Automation	141
AS-i EnOcean Slaves	142
AS-i Modules for controlling dampers actuators	143
AS-i Module for controlling 230 V blinds	147
AS-i 4I OEM Module for building services engineering	149
AS-i Modules for building services engineering	150
AS-i 4I Module for building services engineering	151
AS-i Output Module for building services engineering, 2 analog and 2 digital outputs	153
AS-i 4I/4O OEM-Module for building services engineering	155
AS-i MP Bus Master	157
3 AS-i Accessories/Diagnostics/Commissioning	159
3.1 Diagnostics/Commissioning	159
AS-i Analyser Innovation Step 2	160
AS-i Address Programming Device	161
3.2 AS-i Repeater/Tuner/Bus Termination	163
Circuit Extension	164
AS-i Tuner, AS-i Bus Termination	166
AS-i Repeater with bus termination IP20	168
AS-i Repeater IP20	169
AS-i Repeater IP65	170
AS-i High Power Repeater IP20	171
3.3 AS-i Power Supplies	173
AS-i Power Supplies	175
AS-i Power Supply 1,8 A	176
AS-i Power Supply 4 A/8 A	178
AS-i Wide Range Power Supply 8 A	179
24 V to 30 V AS-i Power Supply in Stainless Steel 2 A	181

4 A/8 A Power Supply for AS-i Master in Stainless Steel	182
4 A Power Supply with 3 Phases for AS-i Master in Stainless Steel	184
8 A Power Supply with 3 Phases for AS-i Master in Stainless Steel	185
AS-i Power Supply Decoupling Unit for 2 AS-i Networks.....	186
AS-i Power Extender.....	187
AS-i Module for Power Decoupler	188
3.4 AS-i Profile Cables/Passive Distributors/Substructure Modules/Accessoires	191
AS-i Profile Cable.....	193
AS-i Passive Distributor	194
AS-i Substructure Module	195
AS-i Stripping Tools	196
Data Transmission Cords	197
3.5 Development/Manufacturing of AS-Interface Components	199
AS-i 3.0 Function and EMC-Tester Master	200
AS-i 3.0 SAP4, SAP5, AASI and ASI4U Programming and Test Tool.....	201
AS-i Slave Evaluation Board on basis ASI-SW+	202
4 Other Fieldbusses/Master Simulators	
4.1 Master Simulators	205
PROFIBUS DP Master Simulator, PROFIBUS UART	206
PROFIBUS DP Master Simulator	206
Serial PROFIBUS DP Master	207
DeviceNet Master Simulator	208
CANopen Master Simulator	209
Interface Converter RS 232C/RS 485.....	210
USB - RS 232 Interface Converter.....	211
4.2 Other Fieldbuses/Couplers	213
PROFIBUS Option Board	214
CAN/PROFIBUS Coupler	215
CANrho/PROFIBUS Coupler	215
CAN/InterBus Coupler	216
5 AS-i Safety	
5.1 AS-i Safety	217
AS-i Safety	223
5.2 AS-i Gateways with integrated Safety Monitor	225
AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor, 16 Release Circuits	227
AS-i 3.0 PROFINET Gateways with integrated Safety Monitor	233
AS-i 3.0 EtherNet/IP+Modbus TCP Gateways with integrated Safety Monitor	237
AS-i 3.0 EtherCAT Gateways with integrated Safety Monitor	241
AS-i 3.0 Gateways, PROFIsafe über PROFINET oder PROFIBUS	244
5.3 AS-i Safety Monitors	249
AS-i Safety Monitors in Stainless Steel.....	250
Safety Basic Monitors	254
Safety Basic Monitor Starter Kit	256
Safe contact expander	257
AS-i Safety Monitor	260
AS-i Safety Monitors, 1 or 2 Release Circuits.....	260
5.4 AS-i Safety Slaves	263
AS-i Speed Monitor.....	266
Speed Monitor head unit and Speed Monitor for 2 axis	267
Connecting cable for Speed Monitor.....	268
Adapter for Speed Monitor	269
AS-i Safety 4I/2O Module with 8 / 4 safety Inputs and 2 (4) electronical safety outputs in IP20	270
AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM- and 2 / 1 Safety Inputs.....	272
AS-i Safety Relay Output Module with Diagnostic Slave and 1 EDM input	276
AS-i Safety Output Module with Diagnostic Slave, 1 EDM input, 3I and 3O.....	280

AS-i Safety Input Module (M12), IP67	284
AS-i Safety Input Module for optoelectronic protective devices or floating contacts, IP20.....	286
Emergency stop- and push button modules	288
AS-i Safety OEM Slave	290
AS-i Substructure Module in IP67	294
5.5 AS-i Safety Accessories	297
Programming software ASIMON	298
Interface cables	298
Chip cards	299

The Company

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 employees in several European countries. Additional sales partners within Germany and abroad ensure that Bihl+Wiedemann is represented around the world.

Factors of success

Bihl+Wiedemann's international success is based on

- Innovative, technologically advanced, high-quality products
- The know-how and competence of highly educated, experienced specialists
- Very fast response times to inquiries and customer requests
- The high flexibility of a lean organization

Range of products and services

The range of products and services offered by Bihl+Wiedemann GmbH includes

- The development and production of safety-related products for automation applications
- The development and manufacture of AS-Interface products based on proprietary technologies
- Application consulting in the areas of AS-Interface and AS-i Safety at Work
- Training in the areas of AS-Interface and AS-i Safety at Work
- Certification of AS-i networks
- Troubleshooting in AS-i networks
- Development of customer-specific automation solutions
- Customer-specific developments and production of fieldbus interfaces and components for nearly all common systems

Portfolio

In the Bihl+Wiedemann portfolio, you will find the following for the area of safety technology with AS-i Safety at Work

- Stainless steel gateways with integrated safety monitor for almost all common bus systems and Ethernet solutions
- PROFIsafe gateways
- Safety monitors for all system sizes
- Rotation speed monitors
- Safe input and output modules in IP20 and IP67
- Safety OEM slaves
- Extensive accessories

In addition, Bihl+Wiedemann also offers

- AS-i masters/gateways/links/scanners for connection to all common controls
- AS-i slaves
- AS-i analog modules in various housing designs (IP20, IP65, IP67) for current, voltage, weight and temperature
- OEM modules in various designs with a variety of interfaces
- AS-i modules in IP20 with stainless steel housing
- Counter modules
- Motor modules in a variety of sizes in IP67
- Universal modules in IP65
- AS-i slaves for building automation
- AS-i tuner, AS-i repeater (in IP20 and IP65) and bus terminations for cable extensions
- Configuration and diagnostic tools (soft- and hardware) for AS-Interface
- Power supplies
- Accessories

Customers

When you select products from Bihl+Wiedemann, you're in the company of many renowned users in factory, process and building automation, as well as in the areas of machine construction and transportation (ship, rail, road). The products are used in safe and non-safe applications in machines and systems of all sizes, e.g., conveyor lines, high-bay warehouses, packaging machines and machine tools.

Certification in accordance with DIN EN ISO 9001

Quality management has had top priority at Bihl+Wiedemann for many years. The company is certified in accordance with DIN EN ISO 9001.

AS-Interface

AS-Interface (abbreviation for Actuator/Sensor-Interface) is an internationally accepted standard for fieldbus communication and is the world market leader on the sensor/actuator level, now with more than 16 million installed nodes.

The simple wiring system consists of four components: the AS-i master, an AS-i power supply, the yellow AS-i cable and the AS-i slaves. The sensors and actuators are directly connected to the AS-i cable by means of piercing technology. This is a two-core, unshielded cable via which both the power as well as the function and safety signals are transmitted. This eliminates the need for complex parallel wiring. The AS-i Master organizes the data traffic on the network and establishes the connection between the AS-i circuit and the higher-level control as a gateway. It is treated by the higher-level fieldbus as a slave. Thus, the integration of an AS-i network in an existing fieldbus or Ethernet system is no more complicated than the integration of a standard slave.

AS-Interface offers the following advantages to the user:

- Simple operation:
the system can be operated and maintained without any significant training or special service personnel
- Free topology:
with AS-Interface, lines can be laid according to the mechanical structure of the system (linear, star, tree, or ring structure)
- Fast and flexible integration and simple expandability:
new bus subscribers can be connected directly to the yellow cable by means of penetration technology without any complicated cable fabrication
- Trouble-free integration of new slaves through standardized profiles
- High availability and interference resistance
- Enormous time savings during planning, installation, expansion and service compared to parallel wiring
- Manufacturer-independent compatibility though certified products

Safety technology with AS-i Safety at Work

Safety-related aspects play an important role in more and more automation solutions – above all where the safety of persons is affected by dangerous movements. Relevant guidelines can be found in the EU Machinery Directive (Directive 2006/42/EC) or in the industrial safety regulations of the respective countries.

With the Safety at Work-concept from AS-Interface, it is even possible to seamlessly integrate safety-related components – safe sensors and actuators as well as safety monitors - in nearly all common automation systems. The advantage of AS-i Safety at Work compared to conventional safety solutions is that both safe as well as non-safe signals can be transmitted on one and the same line. The previously required double infrastructure is, thus, as unnecessary as the costs that were associated with the complicated individual wiring.

The safe AS-i components can be used exactly like any standard slave at any position in the AS-i network and together with standard-AS-i-components without restriction. The safety components are likewise handled by the AS-i master as regular AS-i slaves. Between one another, however, the safe sensors, safe actuators and the safety monitor maintain a special communication connection.

AS-i Safety at Work is approved for applications that satisfy safety requirements SIL3 in accordance with IEC (EN) 61 508 or PLe in accordance with EN ISO 13 849-1:2006.

Engineering development services

On top of its large product range, Bihl+Wiedemann GmbH also offers its clients individual hardware and software solutions in the sector of automation technology – from the initial concept of product development to the full-scale production or, selectively, at each intermediary stage.

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In General



There's always one that fits....

AS-i Masters are the heart of each AS-i application. They are the link to the superior system and therefore the most complex node of the AS-i. Bihl+Wiedemann - The AS-i Masters - offers a wide range of AS-i Masters to give the user the best solution for each application. If it is necessary to connect AS-i to a special PLC, PC or some other CPU, Bihl+Wiedemann has got the right AS-i Master.

If you need up to now there is a range of more than 70 different types of AS-i Masters available with a wide variety of interfaces to the host system:

AS-i Gateways/Links

AS-i Gateways act as a Master for the AS-i and as a slave for the higher level fieldbus, e.g. PROFIBUS, InterBus, CAN, Ethernet. From the point of view of the higher level fieldbus the AS-i Gateway acts as a fieldbus slave with modular I/O, which converts the data between the AS-i and the superior fieldbus system. AS-i Gateways offer the best possible solution to connect decentral AS-i networks to a specific PLC via a fieldbus. AS-i Gateways with "AS-i Control" functionality can optionally preprocess the AS-i data within the gateway.

AS-i Control

Beside using the Bihl+Wiedemann AS-i Masters as Gateways can be used as stand-alone-controllers for small AS-i applications. There is no need for an additional PLC.

AS-i Masters for PC based automation

The technology within PC systems (both hardware and software) has developed greatly with the price reduction in the industry. This is one reason why PC based systems have been used in ever wider applications, including industrial automation. In addition automation solutions have increasing access to PC based systems for graphical representation and control. In particular the connection between PC system and fieldbus offers the possibility for very powerful and inexpensive solutions. The high-quality industrial I/O devices are put to use decentrally while the PC is used as an efficient hard- and software basis for the purposes of control and visualization. The use of AS-i with PC systems is facilitated by the range of interface possibilities such as PCs in combination with soft PLCs, own application software. Especially in that field Bihl+Wiedemann offers the all common hard- and software interfaces for PC based automation with AS-i.



PCI Board with 2 AS-i Masters

Identical operation of all Masters and Gateways

In spite of this big range of different AS-i Masters and AS-i Gateways, all devices are operated identically. This means: A person who knows one Bihl+Wiedemann AS-i Master can operate them all.

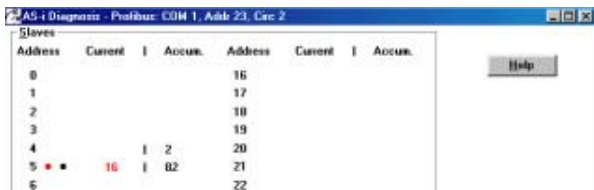
Starting-up, debugging and setting up of the AS-i parameters on the AS-i can be accomplished by using only push-buttons, LEDs and display. With the help of the push-buttons and the display, slave addresses can be programmed, several faulty AS-i slaves can be detected and actual configurations on the AS-i network can be stored. Integrated status-LEDs inform the user of the current operating condition at any time.

All AS-i Masters and AS-i Gateways can be put into operation with the use of the windows software "AS-i Control Tools". The PC software communicates with the AS-i Master via the serial or parallel interface of the PC. The communication uses the protocol of the respective fieldbus (PROFIBUS, DeviceNet, Modbus, B+W-Protocol etc.). E. g. putting an AS-i/PROFIBUS Gateway into operation with a PC requires only a simple PROFIBUS Mastersimulator. That way, the Gateways can be operated even with notebooks via the respective fieldbus interface, without there being a need for additional expensive hardware.

Advanced AS-i diagnostics

Bihl+Wiedemann AS-i Masters offer AS-i diagnostics which go far beyond the standard diagnostics of the AS-i specification. With Bihl+Wiedemann AS-i Masters it is no problem to detect occasionally occurring configuration errors at the AS-i. Furthermore there is the possibility to judge the quality of the data communi-

cation on the AS-i cable. And all that without any additional expert tools.



AS-i Diagnostic - Profibus: COM 1, Addr 23, Crc 2

Slaves		
Address	Current	Accum.
0		
1		
2		
3		
4		
5	16	02
6		

Help

Display of error counter and configuration errors with the help of the AS-i Control Tools

AS-i according to specification 3.0

Easy design, dramatically reduced installation costs, high integrity and good diagnostics, these are different reasons that effected the success of AS-i as the simplest automation networking solution. But good things can still be improved. For this reason the AS-International Association completed the new AS-i specification 3.0 as early as 1998 to integrate further requirements of the market into the system.

Already today Bihl+Wiedemann can offer AS-i Masters according to the specification 3.0. Some V3.0 AS-i Master are compatible

with the existing standard AS-i Masters. As long as you do not use the functions of the new specification the V3.0 AS-i Masters run as V2.04 Masters. The user does not notice any difference. Regarding to the downward compatibility the following points have to be mentionend:

- The AS-i Masters can be used with old slaves.
- Existing PC software can be used.

When will the rest of B+W Masters be deliverable as V3.0 Masters?

In Bihl+Wiedemann AS-i Masters the change to specification 3.0 is achieved by means of using a new software only.

The advantages are obvious:

- The change of existing products to V3.0 is very simple.
- You can resort to established hardware.

This means that finally V3.0 AS-i masters and gateways can be made available to your requirements very quickly.

„AS-i Control“ Mini PLC for AS-i

Bihl+Wiedemann AS-i Masters can be delivered with or without Mini-PLC.

AS-i Control is a PLC-functionality integrated into the B+W AS-i Masters¹. It forms a Mini-PLC with up to 256 inputs and outputs per AS-i circuit together with commercial AS-i I/O modules.

In combination with B+W AS-i Masters according to the new specification 3.0 AS-i Control supports also the extension to 62 AS-i slaves per AS-i network, the evaluation of AS-i peripheral faults as well as the automatic data exchange with AS-i analog modules according to the standardized profile 7.3.

In that way up to 248 digital inputs and outputs and 124 analog values can be processed via AS-i.

Integrated in an AS-i Master with serial interface AS-i Control is the ideal mini-PLC for stand alone solutions for smaller machines or plants.

Using AS-i Control in Gateways, i. e. the AS-i/PROFIBUS DP Gateway, you are capable to preprocess the actuator-sensor-data within the Gateway. This way the hierarchically higher PLC is relieved. Thus AS-i Control helps decentralizing the control task.

Typical applications are the fast execution of time critical operations directly within the Gateway.

Complete parts of plants or machines can be controlled independently by the Gateway.

Implemented in PC boards AS-i Control relieves the PC from the time critical control tasks. With the PC boards AS-i PCI Board with 2 AS-i Masters, AS-i PC2 and AS-i PC104 with AS-i Control the control program is running on the AS-i board so that the PC processor is not stressed by the hard real time requirements of a control task. The full efficiency of the PC can be used for visualizing data, archiving data, etc.

The PLC program for AS-i Control can be edited with a commercial PC and is downloaded to the AS-i Master afterwards. The following programming tool is available: the easy-to-use Windows software AS-i Control Tools for commissioning and programming AS-i Control in IL.

Mini-PLC description	
Program memory (EEPROM)	16 KB (AS-i-PCI board 4 KB)
Data memory (bit/byte flags)	8 KB
Remanent data memory	128 Bytes
Cycle time (1 KBit /1000 word instructions)	1,8 ms/2,0 ms up to 16 ms/18 ms depending on device
Voltage of insulation	≥ 500 V
Processing	
Control commands	very close to STEP5
Additional operation	call of AS-i Master functions
Flags/registers	8 KB
Number of counters/timers	1024 each
Counter/timer resolution	16 Bit
EMC directions	according EN 50 081-2, EN 61 000-6-2
Programmable time values	1 - 40 950 ms
Inputs/outputs	up to 248 E, 248 A, 124 analog values via AS-i slaves
Programming	
Programming languages	AWL
Programming device	PC
Programming platforms	Windows 95/98, Windows NT, Windows 2000
Programming tools	AS-i Control Tools
Bus connections	PROFIBUS, Modbus, ISA, PC104, PCI

Accessories:

- Software AS-i Control Tools for AS-i Master in Stainless Steel (art. no. BW1602, see Seite 56)

1. AS-i Master is used here as a generic term for AS-i Gateways, AS-i PC boards and other AS-i Masters.

AS-i Gateways act as a Master for the AS-i and as a slave for the higher level fieldbus. From the point of view of the higher level fieldbus the AS-i gateway acts as a fieldbus slave with modular I/O. The modules of this fieldbus slave can be mounted decentrally and are connected via the intelligent AS-i cable. If you substitute the I/O modules by one or more AS-i gateways you can use the AS-i slaves right at the place where the actuators and sensors are located. In that way there is no parallel wiring between the respective fieldbus I/O module and the sensors and actuators. Installation and cable costs can be reduced again in this way because the AS-i concept is to optimize the networking of binary sensors and actuators. With AS-i it is also very easy to prepare a whole machine in your factory, separate it into several parts and rebuild it very quickly at your customer's site. This installation can even be done by the end user because of the quick and simple installation.



Field housing in IP20

You can built up parts of plants decentrally and put them together as logical units with the help of AS-i gateways. With the superior fieldbus system big distances, e.g. from the cabinet to the application, can easily be bridged. An AS-i gateway which is located in the application offers the possibility to interface AS-i to the

respective PLC. No matter which PLC the machinery builder has to use the structure of the plant from the AS-i gateway to the sensors and actuators remains constant. In that way the planning, installation, commissioning and documentation can be the same with every machinery.

Only the communication between the PLC and the AS-i gateway changes. For these reasons Bihl+Wiedemann has developed AS-i Gateways to the following fieldbus systems:

- **PROFIBUS DP**
- **InterBus**
- **DeviceNet**
- **CANopen**
- **CANrho**
- **Ethernet TCP/IP**
- **Modbus Plus**
- **Modbus (RS 232, RS 485, RS 422)**
- **CC-Link**
- **LON**
- **B+W protocol (RS 232, RS 485, RS 422)**

With one of all these Gateways it is always possible to connect AS-i to all common PLCs.

The use of AS-i Gateways in high protection category IP65 facilitate the creation of new plant concepts in which cabinets and preswitch boxes can be saved. That is why AS-i is an useful alternative for applications with more than 20 I/O points.

With all Gateways it is possible to access all AS-i data via the respective fieldbus interface. With the use of the internal mini-PLC "AS-i Control" the host can intervene in the execution of the program via the respective fieldbus interface. The reaction times can be lowered and the hierarchically higher PLC is relieved using the PLC functionality.

Overview AS-i-Masters/Gateways/Links/Scanner

Housing	Fieldbus	Art. No.	Characteristics	P.
	AS-i 3.0 PROFIBUS Gateway in Stainless Steel	BWU1567	1 AS-i Master, PROFIBUS slave	18
		BW1653	1 AS-i Master, PROFIBUS slave, Class 1 Div 2	
		BWU1773	1 AS-i Master, PROFIBUS slave, without RS232 diagnostics interface, without duplicate address' recognition	
		BWU1568	2 AS-i Masters, PROFIBUS slave	
		BW1654	2 AS-i Masters, PROFIBUS slave, Class 1 Div 2	
		BWU1774	2 AS-i Masters, PROFIBUS slave, without RS232 diagnostics interface, without duplicate address' recognition	
		BWU1569	2 AS-i Masters, PROFIBUS slave, 1 gateway + 1 AS-i power supply for 2 AS-i networks	
		BW1655	2 AS-i Masters, PROFIBUS slave, Class 1 Div 2 1 gateway + 1 AS-i power supply for 2 AS-i networks,	
		BWU1746	Basic Master, 1 AS-i master, PROFIBUS slave	
		BWU1891	1 AS-i Master, PROFIBUS slave, with decoupling coils	22
	AS-i 3.0 PROFIBUS Gateway in Stainless Steel	BWU2544	1 AS-i Master, PROFIBUS slave, Ethernet diagnostics interface	23
		BWU2545	2 AS-i Master, PROFIBUS slave, Ethernet diagnostics interface	
		BWU2546	1 AS-i Master, PROFIBUS slave, Ethernet diagnostics interface, 1 gateway + 1 AS-i power supply for 2 AS-i networks	
	AS-i 3.0 DeviceNet Gateway in Stainless Steel	BWU1818	1 AS-i Master	25
		BW1824	1 AS-i Master, Class 1 Div 2	
		BWU1819	2 AS-i Masters	
		BW1825	2 AS-i Masters, Class 1 Div 2	
		BWU1820	2 AS-i Masters 1 gateway + 1 AS-i power supply for 2 AS-i networks	
		BW1826	2 AS-i Masters, Class 1 Div 2, 1 gateway + 1 AS-i power supply for 2 AS-i networks	
	AS-i 3.0 CANopen Gateway in Stainless Steel	BWU1821	1 AS-i Master	27
		BWU2225	1 AS-i Master, temperature range: -25 °C ... +55 °C	
		BWU1822	2 AS-i Masters	
		BWU1823	2 AS-i Masters 1 gateway + 1 AS-i power supply for 2 AS-i networks	
	AS-i 3.0 Modbus Gateway in Stainless Steel	BWU1641	1 AS-i Master, Modbus Slave	29
		BW1656	1 AS-i Master, Modbus Slave, Class 1 Div 2	
		BWU1642	2 AS-i Master, Modbus Slave	
		BW1657	2 AS-i Master, Modbus Slave, Class 1 Div 2	
		BWU1643	2 AS-i Master, Modbus Slave 1 gateway + 1 AS-i power supply for 2 AS-i networks	
		BW1658	2 AS-i Master, Modbus Slave, Class 1 Div 2 1 gateway + 1 AS-i power supply for 2 AS-i networks	

AS-i-Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

Housing	Fieldbus	Art. No.	Characteristics	P.
	AS-i 3.0 EtherCAT-Gateway in Stainless Steel	BW2162	1 AS-i Master	31
		BW2163	2 AS-i Master	
		BW2164	2 AS-i Master	
			1 gateway + 1 AS-i power supply for 2 AS-i networks	
	AS-i 3.0 Ethernet/IP + Modbus TCP Gateway in Stainless Steel	BWU2379	1 Master	33
		BWU2380	2 AS-i Masters	
		BWU2381	2 AS-i Masters	
			1 gateway + 1 AS-i power supply for 2 AS-i networks	
	AS-i 3.0 PROFINET Gateway in Stainless Steel	BWU1912	1 Master	35
		BWU2238	2 AS-i Masters	
			1 gateway + 1 AS-i power supply for 2 AS-i networks	
		BWU2239	2 AS-i Masters	
	AS-i 3.0 Ethernet Gateway in Stainless Steel	BW1659	1 AS-i Master, Modbus TCP Slave, Class 1 Div 2	37
		BW1660	2 AS-i Masters, Modbus TCP Slave, Class 1 Div 2	
		BW1661	2 AS-i Masters, Modbus TCP Slave, Class 1 Div 2	
			1 gateway + 1 AS-i power supply for 2 AS-i networks	
	AS-i 3.0 EtherNet/IP Gateway in Stainless Steel	BW1834	1 AS-i Masters, Class 1 Div 2	39
		BW1835	2 AS-i Masters, Class 1 Div 2	
		BW1836	2 AS-i Masters, Class 1 Div 2	
			1 gateway + 1 AS-i power supply for 2 AS-i networks	
	AS-i 3.0 RS 232 Master in Stainless Steel	BWU1955	1 AS-i 3.0 Master with serial interface	41
	AS-i 3.0 Master for Allen-Bradley ControlLogix	BW1611	complete set: AS-i 3.0 Master/Scanner for Allen-Bradley ControlLogix BWU1488 plus accessories BW1563	42
		BWU1488	2 AS-i 3.0 Masters	
		BW1716	2 AS-i 3.0 Masters, Class 1 Div 2	
	AS-i 3.0 Master for Allen-Bradley CompactLogix/MicroLogix	BW1610	complete set: AS-i 3.0 Master/Scanner for Allen-Bradley CompactLogix and MicroLogix BWU1416 plus accessories BW1563	43
		BWU1416	1 AS-i 3.0 Master	
	AS-i/PROFIBUS Gateway	BW1253	1 AS-i Master, PROFIBUS slave, IP65	44

Housing	Fieldbus	Art. No.	Characteristics	P.
		BW1371	1 AS-i Master, PROFIBUS slave, IP65 with M12 connector	
	AS-i/CC-Link Gateway	BW1435	1 AS-i Master, AS-i 2.1	45
	AS-i/Modbus Plus Gateway	BWU1583	1 AS-i 2.1 Master, Modbus Plus node	46

AS-i 3.0 PROFIBUS Gateway in Stainless Steel



THE AS-INTERFACE MASTERS

AS-i 3.0 from ID no. 12003 (see lateral Label)

1 AS-i master
PROFIBUS slave

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated



Art. no.	BWU1567	
Art. no.	BW1653 Class 1 Div. 2 (Group A, B, C & D, T-Code 4)	BWU1773 AS-i 3.0 from ID no. 12470, without RS232 diagnostics interface, without recognition of duplicate AS-i addresses
Operating current	master power supply approx. 200 mA out of AS-i circuit	
Operating voltage	AS-i voltage 30 V DC	
PROFIBUS interface	according to DIN 19 245 Part 3	
Serial interface	RS 232	-
Baud rates	9,6 Kbaud up to 12000 Kbaud, automatic recognition	
DP functions	imaging of the AS-i slaves as I/O Data of the PROFIBUS complete diagnosis and configuration via the PROFIBUS DP	
AS-i cycle time	150 µs*(number of slaves + 2)	
Displays		
LCD	displaying slave addresses and error messages	
LED green (power)	power on	
LED green (PROFIBUS)	PROFIBUS master recognized	
LED red (config error)	configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i normal operation active	
LED green (prg enable)	automatic address programming enabled	
LED yellow (prj mode)	master is in configuration mode	
Buttons	4	
Voltage of insulation	≥ 500 V	
EMC directions	EN 61 000-6-2, EN 61 000-6-4	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	AS-i master housing in stainless steel	
Dimensions (L, W, H in mm)	120 / 75 / 83	
Protection category (DIN 40 050)	IP20	
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2	
Weight	460 g	

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i master in stainless steel (art. no. BW1602, see also page 56)
- Serial PROFIBUS master (art. no. BW1258, see also page 207)
- PROFIBUS DP master simulator (art. no. BW1257, see also page 206)

AS-i 3.0 PROFIBUS Gateway in Stainless Steel

AS-i 3.0 from ID no. 12003 (see lateral Label)

2 AS-i masters

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated

BWU1568: redundant power supply out of AS-i:
all fundamental functions of the device remain available even in case
of power failure in one of the two AS-i networks



Art. no.	BWU1568		
Art. no.		BW1654 Class 1 Div. 2 (Group A, B, C & D, T-Code 4)	 BWU1774 AS-i 3.0 from ID no. 12470, without RS232 diagnostics interface, without recognition of duplicate AS-i addresses
Operating current	master power supply, max. 200 mA out of AS-i circuit 1 (approx. 70 mA ... 200 mA), max. 200 mA out of AS-i circuit 2 (approx. 70 mA ... 200 mA); in sum max. 270 mA	approx. 200 mA out of AS-i circuit 1 approx. 70 mA out of AS-i circuit 2	
PROFIBUS interface	according to DIN 19 245 part 1-3		
Serial interface	RS 232		-
Baud rates	9,6 Kbaud up to 12 000 Kbaud, automatic recognition		
DP functions	imaging of the AS-i slaves as I/O data of the PROFIBUS complete diagnosis and configuration via the PROFIBUS DP		
AS-i cycle time	150 µs*(number of slaves + 2)		
Displays			
LCD	displaying slave addresses and error messages		
LED green (power)	power on		
LED green (PROFIBUS)	PROFIBUS master recognized		
LED red (config error)	configuration error		
LED green (U AS-i)	AS-i voltage OK		
LED green (AS-i active)	AS-i normal operation active		
LED green (prg enable)	automatic address programming enabled		
LED yellow (prj mode)	master is in configuration mode		
Buttons	4		
Voltage of insulation	≥ 500 V		
EMC directions	EN 61 000-6-2, EN 61 000-6-4		
Operating temperature	0°C ... +55°C		
Storage temperature	-25°C ... +85°C		
Housing	AS-i master housing in stainless steel		
Dimensions (L, W, H in mm)	120 / 75 / 83		
Protection category (DIN 40 050)	IP20		
Weight	460 g		

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i master in stainless steel (art. no. BW1602, see also page 56)
- Serial PROFIBUS master (art. no. BW1258, see also page 207)
- PROFIBUS DP master simulator (art. no. BW1257, see also page 206)
- Power supply 4A (art. no. BW1649)/8A (art. no. BW1593) for BW1569, see also page 182

AS-i 3.0 PROFIBUS Gateway in Stainless Steel

**Bihl
+ Wiedemann**

THE AS-INTERFACE MASTERS

**AS-i 3.0 from ID no. 12003 (see lateral Label)
2 AS-i masters**

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated

**BWU1569 and BW1655 in version
1 gateway, 1 power supply for 2 AS-i circuits:
Only 1 gateway + 1 AS-i power supply for 2 AS-i networks**



Art. no.	BWU1569
Art. no.	BW1655
	Class 1 Div. 2 (Group A, B, C & D, T-Code 4)
Operating current	version "1 gateway, 1 power supply for 2 AS-i circuits", approx. 250 mA (PELV voltage)
PROFIBUS interface	according to DIN 19 245 part 1-3
Serial interface	RS 232
Baud rates	9,6 Kbaud up to 12000 Kbaud, automatic recognition
DP functions	imaging of the AS-i slaves as I/O data of the PROFIBUS complete diagnosis and configuration via the PROFIBUS DP
AS-i cycle time	150 µs*(number of slaves+ 2)
Displays	
LCD	displaying slave addresses and error messages
LED green (power)	power on
LED green (PROFIBUS)	PROFIBUS master recognized
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	master is in configuration mode
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	EN 61 000-6-2, EN 61 000-6-4
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H in mm)	120 / 75 / 83
Protection category (DIN 40 050)	IP20
Weight	460 g

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i master in stainless steel (art. no. BW1602, see also page 56)
- Serial PROFIBUS master (art. no. BW1258, see also page 207)
- PROFIBUS DP master simulator (art. no. BW1257, see also page 206)
- Power supply 4A (art. no. BW1649)/8A (art. no. BW1593) for BW1569, see also page 182

AS-i 3.0 PROFIBUS Gateway in Stainless Steel

AS-i 3.0 PROFIBUS-DP-Gateway/Link in Stainless Steel Basic Master

1 AS-i 3.0 Master
PROFIBUS slave



Art. no.	BWU1746
Operating current	master power supply approx. 200 mA out of AS-i circuit (max. 300 mA)
Operating voltage	AS-i voltage 30 V DC
PROFIBUS interface	according to DIN 19 245 part 3
Baud rates	9,6 Kbaud up to 12 000 Kbaud, automatic recognition
DP functions	imaging of the AS-i slaves as I/O Data of the PROFIBUS complete diagnosis and configuration via the PROFIBUS DP
AS-i cycle time	150 µs*(number of slaves + 2)
Displays	
LED	displaying slave addresses and error messages
LED green (power)	power on
LED green (PROFIBUS)	PROFIBUS master recognized
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	master is in configuration mode
Buttons	2
Voltage of insulation	≥ 500 V
EMC directions	EN 61 000-6-2, EN 61 000-6-4
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H in mm)	120 / 45 / 40
Protection category (DIN 40 050)	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Weight	300 g

Accessories:

- Software "AS-i Control Tools" (art. no. BW1203, see also page 56)
- Serial PROFIBUS master (art. no. BW1258, see also page 207)
- PROFIBUS DP master simulator (art. no. BW1257, see also page 206)

AS-i 3.0 PROFIBUS Gateway Stainless Steel



THE AS-INTERFACE MASTERS

**PROFIBUS DP Gateway/Link
with decoupling coils**

**1 AS-i-Master
PROFIBUS-Slave**

Duplicate address' recognition

AS-i earth fault detector integrated

AS-i noise detector integrated



Graphical display	Art. no. BWU1891
Operating current	master power supply approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
PROFIBUS interface	according to DIN 19 245 Part 3
Serial interface	RS 232
Baud rates	9,6 Kbaud up to 12000 Kbaud, automatic recognition
DP functions	imaging of the AS-i slaves as I/O data of the PROFIBUS complete diagnosis and configuration via the PROFIBUS DP
AS-i cycle time	150 µs*(number of slaves + 2)
Displays	
LCD	displaying slave addresses and error messages
LED green (power)	power on
LED green (PROFIBUS)	PROFIBUS master recognized
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	master is in configuration mode
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	EN 50 295, EN 61 000-6-2, EN 61 000-6-4
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H)	120 mm, 75 mm, 83 mm
Protection category (DIN 40 050)	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Weight	460 g

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i master in stainless steel (art. no. BW1602)
- Serial PROFIBUS master (art. no. BW1258)
- PROFIBUS DP master simulator (art. no. BW1257)

Ethernet diagnostics interface

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector distinguishes AS-i cable and sensor cable

AS-i Noise Detector integrated

Optional programmable in C

GSD file integrated

AS-i Power24V capable¹



BWU2544 /
BWU2625



BWU2545



BWU2546



Article no.	BWU2544 / BWU2545 / BWU2546 / BWU2625
Interface	
PROFIBUS interface	according to DIN 19 245 part 1-3
Diagnostics interface	Ethernet
Baud rates	9,6 Kbaud up to 12 000 Kbaud, automatic recognition
DP functions	imaging of the AS-i slaves as I/O Data of the PROFIBUS complete diagnosis and configuration via the DP Master
AS-i	
AS-i cycle time	150µs * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
Display	
LCD	displaying slave addresses and error messages
LED power (green)	power ON
LED config error (red)	configuration error
LED U AS-i (green)	AS-i voltage o.k.
LED AS-i active (green)	AS-i normal operation active
LED prg enable (green)	automatic address programming enabled
LED prj mode (yellow)	master is in configuration mode
Environment	
Applied standards	according to EN 61 000-6-2 EN 61 000-6-4
Housing	AS-i master housing in Stainless Steel
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Protection category (DIN 40 050)	IP20
Maximum tolerable shock and vibration stress	according to EN 61 131-2
Voltage of insulation	≥ 500V
Dimensions (W / H / D in mm)	120 / 75 / 93
Weight	460 g

Article no.	BWU2544	BWU2625	BWU2545	BWU2546
AS-i Master	1		2	
Operating current	master power supply approx. 200mA out of AS-i circuit	approx. 250mA (PELV voltage)	master power supply, max. 200mA out of AS-i circuit 1 (approx. 70mA ... 200mA), max. 200mA out of AS-i circuit 2 (approx. 70mA ... 200mA); in sum max. 270mA	version "1 gateway, 1 power supply for 2 AS-i circuits", approx. 250mA (PELV voltage)

Article no.	Redundant power supply out of AS-i: all fundamental functions of the device remain available even in case of power failure in one of the two AS-i networks	Current measurement of the AS-i circuits	Self-resetting adjustable fuses	In version 1 gateway, 1 power supply for 2 AS-i circuits: Only 1 gateway + 1 AS-i power supply for 2 AS-i networks
BWU2544	—	—	—	—
BWU2545	●	—	—	—
BWU2546	—	●	●	●
BWU2625	—	●	●	—

AS-i Power24V¹

All gateways in this group are AS-i Power24V capable. That means, that all devices can be operated directly on a 24V (PELV) power supply.

The gateways BWU2546 and BWU2625 are optimized with integrated data coupling coils and adjustable self-resetting fuses for safe use also of powerful 24V power supplies.

The gateways BWU2544 and BWU2545 will add in Power24V-ran a BW1943 power supply decoupling unit.

Accessories:

- Software "AS-i Control Tools" (art. no. BW1203, see also page 56)
- PROFIBUS DP master simulator (art. no. BW1257, see also Seite 206) / (art. no. BW1258, see also page 207)
- Power supply 4A (art. no. BW1649)/8A (art. no. BW1593, see also page 182)
- AS-i Netzteilentkoppelmodul (Art.-Nr. BW1943, see also Seite 152)

AS-i 3.0 DeviceNet Gateway in Stainless Steel

DeviceNet to AS-i bridge

1 AS-i 3.0 master

AS-i Earth Fault Detector integrated

Recognition of duplicate AS-i addresses

AS-i Noise Detector integrated



Art. no.	BWU1818
Art. no.	BW1824 Class 1 Div 2 (Group A, B, C & D, T-Code 4)
Operating current	power supply A, approx. 200 mA out of AS-i
Operating voltage	AS-i voltage 30 V DC
Terminals	DeviceNet interface (5-pin plug) RS 232 diagnostic interface
AS-i Master profile	master profile M4 (AS-i specification 3.0)
AS-i cycle time	150 µs* (number of slaves + 2)
Displays	
LCD	displaying AS-i slave addresses and error messages
LED green (power)	voltage ON
LED green/red (ser active)	module/network-status (MNS)
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i in normal operation
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	configuration mode active
Push-buttons	4 (mode/set)
Voltage of insulation	≥ 500 V
EMC directions	EN 50 295, EN 61 000-6-2, EN 61 000-6-4
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H)	120 mm, 85 mm, 83 mm
Protection category DIN 40 050)	terminals IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Weight	520 g

Accessories:

- Software "AS-i Control Tools" with serial transmission cord for connection of the AS-i Master (art. no. BW1602, s. page 56)
- DeviceNet Master Simulator with USB interface (art. no. BW1420, s. page 208)
- Data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226)
- AS-i Power Supply 4 A (art. no. BW1649, s. page 178)

Pin assignment:

	Signal	Color
1	V+	red
2	CAN_H	white
3	Shield	n/a
4	CAN_L	blue
5	V-	black

AS-i 3.0 DeviceNet Gateway in Stainless Steel

DeviceNet to AS-i Bridge

2 AS-i 3.0 Masters

AS-i Earth Fault Detector integrated

Recognition of duplicate AS-i addresses

AS-i Noise Detector integrated

BWU1819: redundant power supply out of AS-i:
all fundamental functions of the device remain available even in
case of power failure in one of the two AS-i networks

BWU1820, BW1826 in version
"1 Power Supply, 1 Gateway for 2 AS-i Circuits":
only 1 Gateway + 1 AS-i Power Supply for 2 AS-i Networks!



Art. no.	BWU1819		Art. no. BWU1820
Art. no.		BW1825 Class 1 Div 2 (Group A, B, C & D, T-Code 4)	W1826 Class 1 Div 2 (Group A, B, C & D, T-Code 4)
Operating current	master power supply, max. 200 mA out of AS-i circuit 1 (approx. 70 mA ... 200 mA) max. 200 mA out of AS-i circuit 2 (approx. 70 mA ... 200 mA); in sum max. 270 mA	approx. 200 mA out of AS-i circuit 1 approx. 70 mA out of AS-i circuit 2	version "1 power supply, 1 gateway for 2 AS-i circuits", approx. 250 mA (PELV supply)
Terminals	DeviceNet interface (5-pin plug) RS 232 diagnostic interface		
AS-i master profile	master profile M4 (AS-i specification 3.0)		
AS-i cycle time	150 µs* (number of slaves + 2)		
Displays			
LCD	displaying AS-i slave addresses and error messages		
LED green (power)	voltage ON		
LED green/red (ser active)	module/network status (MNS)		
LED red (config error)	configuration error		
LED green (U AS-i)	AS-i voltage OK		
LED green (AS-i active)	AS-i in normal operation		
LED green (prg enable)	automatic address programming enabled		
LED yellow (prj mode)	configuration mode active		
Push-buttons	4 (mode/set)		
Voltage of insulation	≥ 500 V		
EMC directions	EN 50 295, EN 61 000-6-2, EN 61 000-6-4		
Ambient operating temperature	0°C ... +55°C		
Storage temperature	-25°C ... +85°C		
Housing	AS-i master housing in stainless steel		
Dimensions (L, W, H)	120 mm, 85 mm, 83 mm		
Protection category DIN 40 050)	terminals IP20		
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2		
Weight	520 g		590 g

Accessories:

- Software "AS-i Control Tools" with serial transmission cord for connection of the AS-i Master (art. no. BW1602, s. page 56)
- DeviceNet Master Simulator (art. no. BW1420, s. page 208)
- Data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226)
- AS-i Power Supply 4 A (art. no. BW1649, s. page 178)
- Power Supply 4 A (art. no. BW1597)/8 A (art. no. BW1598) for art. no. BW1826 and BWU1820 (s. page 182)

Signal	Color
V+	red
CAN_H	white
Shield	n/a
CAN_L	blue
V-	black

AS-i 3.0 CANopen Gateway in Stainless Steel

CANopen-Gateway to AS-i

1 AS-i 3.0 master

Recognition of Duplicate AS-i addresses

Advanced Diagnostic Function



Art. no.	BWU1821	BWU2225
Operating current	power supply A, approx. 200 mA out of AS-i	
Operating voltage	AS-i voltage 30 V DC	
Terminals	CANopen (5-pin plug), RS 232 diagnostic interface	
AS-i Master profile	Master profile M4 (AS-i Specification 3.0)	
Baud rate	10/1000 Kbaud	
AS-i cycle time	150 µs* (Number of slaves + 2)	
CANopen-Features	extended boot-up, minimum boot-up, life guarding COB ID Distribution: DBT, SDO, Default Node ID Distribution: SDO, Switch No of PDOs: up to 35 Rx, 35 Tx PDO Modes: async, cyclic, acyclic Device Specification: CiA DS-301	
Displays		
LCD	displaying AS-i slave addresses and error messages	
LED green (power)	voltage ON	
LED green/red (MNS)	module/network status (MNS)	
LED red (config error)	configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i in normal operation	
LED green (prg enable)	automatic address programming enabled	
LED yellow (prj mode)	configuration mode active	
Push-buttons	4 (mode/set)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 295, EN 61 000-6-2, EN 61 000-6-4	
Operating temperature	0 °C ... +55 °C	-25 °C ... +55 °C
Storage temperature	-25 °C ... +85 °C	
Housing	housing in stainless steel	
Dimensions (L, W, H)	120 mm, 85 mm, 83 mm	
Protection category DIN 40 050)	terminals IP20	
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2	
Weight	520 g	

Accessories:

- Software "AS-i-Control-Tools" with serial transmission cord for connection of the AS-i Master (art. no. BW1602, s. page 56)
- CANopen master simulator (art. no. BW1453, s. page 209)
- Data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226)
- AS-i power supply 4 A (art. no. BW1649, s. page 178)

Pin assignment:

	Signal	Color
1	V+	red
2	CAN_H	white
3	Shield	n/a
4	CAN_L	blue
5	V-	black

AS-i 3.0 CANopen Gateway in Stainless Steel

CANopen-Gateway to AS-i

2 AS-i 3.0 Masters

Recognition of Duplicate AS-i addresses

Advanced Diagnostic Function

BW1822: redundant power supply out of AS-i:
all fundamental functions of the device remain available
even in case of power failure in one of the two AS-i networks

BWU1823 version 1 power supply, 1 gateway for 2 AS-i circuits:
only 1 gateway + 1 AS-i power supply for 2 AS-i networks!



Art. no.	BWU1822	BWU1823
Operating current	master power supply, max. 200 mA out of AS-i circuit 1 (approx. 70 mA ... 200 mA) max. 200 mA out of AS-i circuit 2 (approx. 70 mA ... 200 mA); in sum max. 270 mA	version "1 Power Supply, 1 Gateway for 2 AS-i circuits", approx. 250 mA (PELV Supply)
Terminals	CANopen (5-pin plug) RS 232 diagnostic interface	
AS-i Master profile	Master profile M4 (AS-i Specification 3.0)	
Baud rate	10/1000 Kbaud	
AS-i cycle time	150 µs* (Number of slaves + 2)	
CANopen-Features	extended boot-up, minimum boot-up, life guarding COB ID Distribution: DBT, SDO, Default Node ID Distribution: SDO, Switch No of PDOs: up to 70 Rx, 70 Tx PDO Modes: async, cyclic, acyclic Device Specification: CiA DS-301	
Displays	displaying AS-i slave addresses and error messages	
LCD	voltage ON	
LED green (power)	module/network status (MNS)	
LED green/red (ser active)	configuration error	
LED red (config error)	AS-i voltage OK	
LED green (U AS-i)	AS-i in normal operation	
LED green (AS-i active)	automatic address programming enabled	
LED green (prg enable)	configuration mode active	
LED yellow (prj mode)	4 (mode/set)	
Push-buttons	≥ 500 V	
Voltage of insulation	EN 50 295, EN 61 000-6-2, EN 61 000-6-4	
EMC directions	0°C ... +55°C	
Operating temperature	-25°C ... +85°C	
Storage temperature	housing in stainless steel	
Housing	120 mm, 85 mm, 83 mm	
Dimensions (L, W, H)	terminals IP20	
Protection category DIN 40 050)	according to EN 61131-2	
Tolerable loading referring to impacts and vibrations	520 g	
Weight	590 g	

Accessories:

- Software "AS-i-Control-Tools" with serial transmission cord for connection of the AS-i Master (art. no. BW1602)
- CANopen master simulator (art. no. BW1453)
- Data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226)
- AS-i power supply 4 A (art. no. BW1649)
- Power supply 4 A (art. no. BW1597)/8 A (art. no. BW1598) for art. no. BWU1823

Signal	Color
1 V+	red
2 CAN_H	white
3 Shield	n/a
4 CAN_L	blue
5 V-	black

AS-i 3.0 Modbus Gateway in Stainless Steel

AS-i 3.0 from ID no. 11833 (see lateral Label)

1 AS-i master, modbus slave

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated



Art. no.	BWU1641
Art. no.	BW1656 Class 1 Div. 2 (Group A, B, C & D, T-Code 4)
Operating current	master power supply approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
Baud rates	1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115000 baud, adjustable parity; default settings are: 9600 Baud, no parity, address 1
AS-i Master profile	M1
Serial interface	RS 485 (Modbus/Modbus RTU)
AS-i cycle time	150 µs*(number of slaves + 2)
Displays	
LCD	displaying slave addresses and error messages
LED green (power)	power on
LED green (ser active)	Modbus interface
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	the master is in configuration mode
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	according EN 50082, EN 50081
Ambient operating temperature	0 °C ... +55 °C
Storage temperature	-25 °C ... +85 °C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H)	120 mm, 75 mm, 83 mm
Protection category (DIN 40 050)	IP20
Tolerable loading referring to impacts and vibrations	according EN 61 131-2
Weight	460 g

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i Master in Stainless Steel (art. no. BW1602)
- Interface converter RS 232C/RS 485 (art. no. BW1094, see also page 210)

AS-i 3.0 Modbus Gateway in Stainless Steel

AS-i 3.0 from ID no. 11833 (see lateral Label)

2 AS-i masters, modbus slave

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated

BWU1642: redundant power supply out of AS-i:
all fundamental functions of the device remain available
even in case of power failure in one of the two AS-i networks

**BWU1643 and BW1658 in version "1 gateway, 1 power supply
for 2 AS-i circuits":**
only 1 gateway + 1 AS-i power supply for 2 AS-i networks



Art. no.	BWU1642		BWU1643
Art. no.		BW1657 Class 1 Div. 2 (Group A, B, C & D, T-Code 4)	BW1658 Class 1 Div. 2 (Group A, B, C & D, T-Code 4)
Operating current	master power supply, max. 200 mA out of AS-i circuit 1 (approx. 70 mA ... 200 mA) max. 200 mA out of AS-i circuit 2 (approx. 70 mA ... 200 mA); in sum max. 270 mA	approx. 200 mA out of AS-i circuit 1 approx. 70 mA out of AS-i circuit 2	version "1 gateway, 1 power supply for 2 AS-i circuits", approx. 250 mA (PELV supply)
Baud rates	1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115000 baud, adjustable parity; default settings are: 9600 Baud, no parity, address 1		
AS-i Master profile	M1		
Serial Interface	RS 485 (Modbus/Modbus RTU)		
AS-i cycle time	150 µs*(number of slaves + 2)		
Displays			
LCD	displaying slave addresses and error messages		
LED green (power)	power on		
LED green (ser active)	Modbus interface		
LED red (config error)	configuration error		
LED green (U AS-i)	AS-i voltage OK		
LED green (AS-i active)	AS-i normal operation active		
LED green (prg enable)	automatic address programming enabled		
LED yellow (prj mode)	the master is in configuration mode		
Buttons	4		
Voltage of insulation	≥ 500 V		
EMC directions	according EN 50082, EN 50081		
Ambient operating temperature	0 °C ... +55 °C		
Storage temperature	-25 °C ... +85 °C		
Housing	AS-i master housing in stainless steel		
Dimensions (L, W, H)	120 mm, 75 mm, 83 mm		
Protection category (DIN 40 050)	IP20		
Weight	460 g		

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i Master in Stainless Steel (art. no. BW1602)
- Interface converter RS 232C/RS 485 (art. no. BW1094, see also page 210)
- Power Supply 4 A (art. no. BW1649)/8A (art. no. BW1593) for BWU1643 and BW1658, see also page 182

AS-i 3.0 EtherCAT Gateways in Stainless Steel

EtherCAT to AS-i

1 AS-i 3.0 master

Recognition of Duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated



Art. no.	BW2162
Operating current	master power supply approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
EtherCAT interface	according to IEEE 802.3 (RJ-45 connector)
Baud rates	10/100 Mbaud
AS-i cycle time	150 µs*(number of slaves+ 2)
Displays	
LCDs	displaying slave addresses and error messages
LED green (power)	Power on
LED green (ser active)	EtherCAT network active
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	the master is in configuration mode
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082, EN 50 081
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H)	120 mm, 85 mm, 83 mm
Protection category (DIN 40 050)	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Weight	500 g

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i master in stainless steel (art. no. BW1602, see also page 56)
- Cross-Link cable (art. no. BW1304, see also page 198)

AS-i 3.0 EtherCAT Gateways in Stainless Steel

EtherCAT to AS-i

2 AS-i 3.0 Masters

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated

BW2163: redundant power supply out of AS-i:
all fundamental functions of the device remain available
even in case of power failure in one of the two AS-i networks

BW2164 in version 1 gateway, 1 power supply for 2 AS-i circuits:
only 1 gateway + 1 AS-i power supply for 2 AS-i networks



Art. no.	BW2163	BW2164
Operating current	master power supply, max. 200 mA out of AS-i circuit 1 (approx. 70 mA ... 200 mA) max. 200 mA out of AS-i circuit 2 (approx. 70 mA ... 200 mA); in sum max. 270 mA	version "1 power supply, 1 gateway for 2 AS-i circuits", approx. 250 mA (PELV supply)
EtherCAT interface	according to IEEE 802.3 (RJ-45 connector)	
Baud rates	10/100 MBaud	
AS-i cycle time	150 µs*(number of slaves+ 2)	
Displays		
LCDs	displaying slave addresses and error messages	
LED green (power)	power on	
LED green (ser active)	EtherCAT network active	
LED red (config error)	configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i normal operation active	
LED green (prg enable)	automatic address programming enabled	
LED yellow (prj mode)	the master is in configuration mode	
Buttons	4	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 082, EN 50 081	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	AS-i master housing in stainless steel	
Dimensions (L, W, H)	120 mm, 85 mm, 83 mm	
Protection category (DIN 40 050)	IP20	
Weight	500 g	

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i master in stainless steel (art. no. BW1602, see also page 56)
- Cross-Link cable (art. no. BW1304, see also page 198)
- Power supply 4A (art. no. BW1649, see also page 178)/8A (art. no. BW1593, see also page 182) for art. no. BWU1652

AS-i 3.0 Ethernet/IP + Modbus TCP Gateway in Stainless Steel

EtherNet/IP + Modbus TCP in one device

Integrated switch

1 AS-i 3.0 Master

AS-i Earth Fault Detector integrated

Recognition of Duplicate AS-i Addresses

AS-i Noise Detector integrated



Graphical Display	Art. no. BWU2379
Operating current	Master power supply approx. 300 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
Interfaces	RJ-45: 10/100 MBaud Ethernet + Modbus TCP acc. to IEEE 802.3, integrated switch RS 232: diagnostic interface
Baud rates	10/100 MBaud
AS-i cycle time	150 µs * (number of slaves + 2)
Displays	
LCD	indication of slave addresses and error messages
LED green (power)	power on
LED green (ser active)	Ethernet network active
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	configuration mode active
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	EN 50 295 EN 61 000-6-2 EN 61 000-6-4
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L / W / H in mm)	120 / 85 / 83
Protection category DIN 40 050	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Weight	500 g

Accessories:

- Software „AS-i-Control-Tools“ with serial cable for AS-i Master in stainless steel (art. no. BW1602, s. page 56)
- Cross link cable (art. no. BW1304)
- AS-i Power Supply 4 A (art. no. BW1649 s. page 178)

AS-i 3.0 Ethernet/IP + Modbus TCP Gateway in Stainless Steel

Ethernet/IP + Modbus TCP in one device

Integrated switch

2 AS-i 3.0 Master

AS-i Earth Fault Detector integrated

Recognition of Duplicate AS-i Addresses

AS-i Noise Detector integrated

**BWU2381 in version 1 power supply for 2 AS-i circuits:
only 1 gateway + 1 AS-i power supply for 2 AS-i networks!**

**BWU2380 redundant power supply out of AS-i:
all fundamental functions of the device remain available
even in case of power failure in one of the two AS-i networks**



Graphical Display	Art. no. BWU2380	Art. no. BWU2381
Operating current	approx. 200 mA out of AS-i circuit 1 approx. 70 mA out of AS-i circuit 2	version „1 gateway, 1 power supply for 2 AS-i circuits“, approx. 250 mA (PELV supply)
Interfaces	RJ-45: 10/100 MBaud Ethernet + Modbus TCP acc. to IEEE 802.3, integrated switch RS 232: diagnostic interface	
Baud rates	10/100 MBaud	
AS-i cycle time	150 µs * (number of slaves + 2)	
Displays		
LCD	indication of slave addresses and error messages	
LED green (power)	voltage ON	
LED green (ser active)	Ethernet network active	
LED red (config error)	configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i normal operation active	
LED green (prg enable)	automatic addresses programming enabled	
LED yellow (prj mode)	configuration mode active	
Buttons	4	
Voltage of insulation	≥ 500 V	
EMC standards	EN 50 295 EN 61 000-6-2 EN 61000-6-4	
Ambient operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	AS-i master housing in stainless steel	
Dimensions (L / W / H in mm)	120 / 85 / 83	
Protection category DIN 40 050	IP20	
Tolerable loading referring to impacts and vibrations	according EN 61 131-2	
Weight	500 g	

Accessories:

- Software „AS-i-Control-Tools“ with serial cable for AS-i Master in stainless steel (art. no. BW1602, s. page 56)
- Cross link cable (art. no. BW1304)
- AS-i Power supply 4 A (art. no. BW1649, s. page 178)
- Power supply 4 A (art. no. BW1597)/8 A (art. no. BW1598) for BWU2381 (s. page 182)

AS-i 3.0 PROFINET Gateway in Stainless Steel

PROFINET IO, offers IRT-technology, 1 integrated Switch

**For BWU1912 from ID no. 12824
(see lateral label)**

1 AS-i 3.0 Master

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated



Article no.	BWU1912
Operating current	Master power supply approx. 300 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
PROFINET interface	RJ-45
Conformance class	B
Baud rates	10/100 MBaud
Serial interface	RS 232
Baud rate	19,2 KBaud
AS-i cycle time	150 µs*(number of slaves+ 2)
Displays	
LCDs	displaying slave addresses and error messages
LED green (power)	power on
LED green PROFINET	PROFINET IO network active
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	the master is in configuration mode
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	EN 50 295 EN 61 000-6-2 EN 61 000-6-4
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L / W / H in mm)	120 / 85 / 83
Protection category (DIN 40 050)	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Weight	500 g

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i Master in Stainless Steel (art. no. BW1602, page 56)
- Cross-Link cable (art. no. BW1304, page 198)
- AS-i Power Supply (art. no. BW1649, page 178)

AS-i 3.0 PROFINET Gateway in Stainless Steel

PROFINET IO, offers IRT-technology, 1 integrated switch

2 AS-i 3.0 master

Recognition of duplicate AS-i addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated

**BWU2239: redundant power supply out of AS-i:
all fundamental functions of the device remain available
even in case of power failure in one of the two AS-i networks**

**BWU2238 in version 1 gateway, 1 power supply for 2 AS-i circuits:
only 1 gateway + 1 AS-i power supply for 2 AS-i networks**



Article no.	BWU2238	BWU2239
Operating current	Version "1 Power Supply, 1 Gateway for 2 AS-i Circuits", approx. 250 mA (PELV Supply)	master power supply, max. 200 mA out of AS-i circuit 1 (approx. 70 mA ... 200 mA) max. 200 mA out of AS-i circuit 2 (approx. 70 mA ... 200 mA); in sum max. 270 mA
PROFINET interface	RJ-45	
Conformance class	B	
Baud rates	10/100 MBaud	
Serial interface	RS 232	
Baud rate	19,2 KBaud	
AS-i cycle time	150 µs*(number of slaves+ 2)	
Displays		
LCDs	displaying slave addresses and error messages	
LED green (power)	power on	
LED green PROFINET	PROFINET IO network active	
LED red (config error)	configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i normal operation active	
LED green (prg enable)	automatic address programming enabled	
LED yellow (prj mode)	the master is in configuration mode	
Buttons	4	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 295 EN 61 000-6-2 EN 61 000-6-4	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	AS-i master housing in stainless steel	
Dimensions (L / W / H in mm)	120 / 85 / 83	
Protection category (DIN 40 050)	IP20	
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2	
Weight	500 g	

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i Master in Stainless Steel (art. no. BW1602, page 56)
- Cross-Link cable (art. no. BW1304, page 198)
- AS-i Power Supply (art. no. BW1649, page 178)

AS-i 3.0 Ethernet Gateway in Stainless Steel

AS-i 3.0 from Ident. no. 11866 (see lateral Label)

1 AS-i Master, Modbus TCP Slave

Recognition of Duplicate AS-i Addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated



Art. no.	BWU1650
Operating current	Master power supply approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
Ethernet TCP/IP interface	according to IEEE 802.3, 10BaseT, (RJ-45 connector), Modbus TCP
Baud rates	10/100 MBaud
AS-i cycle time	150 µs*(number of slaves + 2)
Displays	
LCDs	displaying slave addresses and error messages
LED green (power)	Power on
LED green (ser active)	Ethernet network active
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	the master is in configuration mode
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082, EN 50 081
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H)	120 mm, 100 mm, 83 mm
Protection category (DIN 40 050)	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Weight	550 g

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i master in stainless steel (art. no. BW1602)
- Cross-Link cable (art. no. BW1304)

AS-i 3.0 Ethernet Gateway in Stainless Steel

AS-i 3.0 from Ident. no. 11866 (see lateral Label)

2 AS-i Masters, Modbus TCP Slave

Recognition of Duplicate AS-i Addresses

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated

**BWU1651: redundant power supply out of AS-i:
all fundamental functions of the device remain available even in case of
power failure in one of the two AS-i networks**

**BWU1652
in version 1 Power Supply for 2 AS-i circuits:
only 1 Gateway + 1 AS-i Power Supply for 2 AS-i Networks**



Art. no.	BWU1651	BWU1652
Operating current	Master power supply approx. 200 mA out of AS-i circuit 1 (approx. 70 mA ... 200 mA) approx. 200 mA out of AS-i circuit 2 (approx. 70 mA ... 200 mA); in sum max. 270 mA	version "1 Power Supply, 1 Gateway for 2 AS-i Circuits", approx. 250 mA (PELV Supply)
Ethernet TCP/IP interface	according to IEEE 802.3, 10BaseT, (RJ-45 connector), Modbus TCP	
Baud rates	10/100 MBaud	
AS-i cycle time	150 µs*(number of slaves + 2)	
Displays		
LCDs	displaying slave addresses and error messages	
LED green (power)	power on	
LED green (ser active)	Ethernet network active	
LED red (config error)	configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i normal operation active	
LED green (prg enable)	automatic address programming enabled	
LED yellow (prj mode)	the master is in configuration mode	
Buttons	4	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 082, EN 50 081	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	AS-i master housing in stainless steel	
Dimensions (L, W, H)	120 mm, 100 mm, 83 mm	
Protection category (DIN 40 050)	IP20	
Weight	550 g	

Accessories:

- Software "AS-i Control Tools" with serial cable for AS-i master in stainless steel (art. no. BW1602)
- Cross-Link cable (art. no. BW1304)
- Power supply 4A (art. no. BW1649)/8A (art. no. BW1593) for art. no. BWU1652

AS-i 3.0 EtherNet/IP Gateway in Stainless Steel

EtherNet/IP to AS-i

1 AS-i 3.0 master

AS-i Earth Fault Detector integrated

Recognition of duplicate AS-i addresses

AS-i Noise Detector integrated



Art. no.	BW1834 Class 1 Div 2 (Group A, B, C & D, T-Code 4)	ETL US
Operating current	power supply A, approx. 300 mA out of AS-i circuit	
Operating voltage	AS-i voltage 30 V DC	
Terminals	10/100 MBaud Ethernet, RJ-45 socket RS 232 diagnostic interface	
Baud rates	10/100 MBaud	
AS-i cycle time	150 µs*(Number of slaves + 2)	
Displays		
LCD	displaying AS-i slave addresses and error messages	
LED green (power)	voltage ON	
LED green (ser active)	Ethernet network active	
LED red (config error)	configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i in normal operation	
LED green (prg enable)	automatic address programming enabled	
LED yellow (prj mode)	configuration mode active	
Push-buttons	4 (mode/set)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 295, EN 61 000-6-2, EN 61 000-6-4	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	housing in stainless steel	
Dimensions (L, W, H)	120 mm, 100 mm, 83 mm	
Protection category (DIN 40 050)	terminals IP20	
Tolerable loading refering to impacts and vibrations	according to EN 61 131-2	
Weight	550 g	

Accessories:

- Software "AS-i Control Tools" with serial transmission cord for connection of the AS-i Master (art. no. BW1602, s. page 56)
- Cross-Link cable (art. no. BW1304)
- AS-i power supply 4 A (art. no. BW1649, s. page 178)

AS-i 3.0 EtherNet/IP Gateway in Stainless Steel

EtherNet/IP to AS-i

2 AS-i 3.0 Masters

AS-i Earth Fault Detector integrated

Recognition of Duplicate AS-i Addresses

AS-i Noise Detector integrated



Art. no.	BW1835 Class 1 Div 2 (Group A, B, C & D, T-Code 4)	BW1836 Class 1 Div 2 (Group A, B, C & D, T-Code 4)
Operating current	approx. 200 mA out of AS-i circuit 1 approx. 70 mA out of AS-i circuit 2	version "1 power supply, 1 gateway for 2 AS-i circuits", approx. 250 mA (PELV supply)
Terminals	10/100 Mbaud ethernet, RJ-45 socket RS 232 diagnostic interface	
Baud rates	10/100 Mbaud	
AS-i cycle time	150 µs*(Number of slaves + 2)	
Displays		
LCD	displaying AS-i slave addresses and error messages	
LED green (power)	voltage ON	
LED green (ser active)	Ethernet network active	
LED red (config error)	configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i in normal operation	
LED green (prg enable)	automatic address programming enabled	
LED yellow (prj mode)	configuration mode active	
Push-buttons	4 (mode/set)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 295, EN 61 000-6-2, EN 61 000-6-4	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	housing in stainless steel	
Dimensions (L, W, H)	120 mm, 100 mm, 83 mm	
Protection category (DIN 40 050)	terminals IP20	
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2	
Weight	550 g	620 g

Accessories:

- Software "AS-i Control Tools" with serial transmission cord for connection of the AS-i Master (art. no. BW1602, s. page 56)
- Cross-Link cable (art. no. BW1304)
- AS-i power supply 4 A (art. no. BW1649, s. page 178)
- Power supply 4 A (art. no. BW1597)

AS-i 3.0 RS 232 Master in Stainless Steel

AS-i 3.0 Master with serial interface

1 AS-i-Master

RS 232 interface

**B+W standard protocol
for communication with the host**

AS-i-Specification 3.0

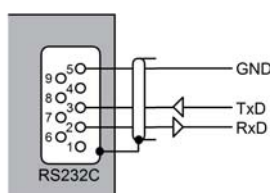


Graphical display	Art. no. BWU1955 AS-i 3.0 without RS 232 diagnostic interface, without duplicate address' recognition
Operating current	approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
Baud rates	1200, 2400, 4800, 9600, 19200, 38400, 57600 baud, automatic recognition
Serial interface	RS 232
AS-i cycle time	150 µs*(number of slaves + 2)
Displays	
LCD	displaying slave addresses and error messages
LED green (power)	power on
LED green (ser active)	serial interface active
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	configuration mode active
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	according EN 61 100-6-2, EN 61 000-6-4
Ambient operating temperature	0 °C ... +55 °C
Storage temperature	-25 °C ... +85 °C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H)	120 mm, 75 mm, 83 mm
Protection category (DIN 40 050)	IP20
Tolerable loading refering to impacts and vibrations	according EN 61 131-2
Weight	460 g

Accessories:

- Software "AS-i Control Tools" (art. no. BW1203, page 56)
- AS-i power supply 4 A (art. no. BW1649, page 178)
- 24 V to 30 V AS-i power supply 2 A (art. no. BW1760, page 181)
- D-sub-data cable 9-pin, 1,8 m (art. no. BW1058)

Pin assignment:



AS-i 3.0 Master/Scanner for Allen-Bradley ControlLogix

Bihl + Wiedemann

THE AS-INTERFACE MASTERS

AS-i Master for

Allen-Bradley ControlLogix

2 AS-i Master

AS-i 3.0 from ID no. 12704
(see lateral Label)



Art. no. BW1611 complete set: AS-i 3.0 Master BWU1488 plus accessories BW1563

Art. no. BWU1488 AS-i 3.0 Master for Allen-Bradley ControlLogix

**Art. no. BW1716 AS-i Master for Allen-Bradley ControlLogix
Class I Div. 2 (Group A, B, C & D, T-Code 4)**



Function

The Bihl+Wiedemann AS-i Master for ControlLogix of Allen-Bradley has 2 AS-i masters according to the new specification. A fast and easy commissioning can be accomplished with the use of two push-buttons and the display.

AS-i I/O data and status information is mapped into the PLC processor's I/O data.

AS-i Scope

Diagnostics, which go far beyond the standard diagnostics facilitate the simple detection of the occasionally occurring configuration

errors and further irritations towards the AS-i communication. So in case of an error the down time of machines can be minimized or you can initiate preventive maintenance.

Commissioning and monitoring

The AS-i Master can be commissioned respectively programmed with the help of the software "AS-i Control Tools". Commissioning, debugging and setting up the system without the software can only be accomplished with the use of two push-buttons, the display and the LEDs directly on the system.

Art. no.	BWU1488 / BW1716
Operating current	approx. 70 mA out of AS-i approx. 390 mA out of power supply 5,1 V DC approx. 150 mA out of power supply 24 V DC
Operating voltage	AS-i voltage 30 V DC
AS-i cycle time	150 µs*(Number of slaves + 2)
Displays	
LED display	displaying slave addresses and error messages
LED green (PWR)	power on
LED green (OK)	communication and control information
LED red (Fault)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i act)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	the master is in configuration mode
Push-buttons	2 (mode/set)
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082, EN 50 081
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L, W, H)	146 mm, 35 mm, 132 mm
Protection category (DIN 40 050)	housing IP20
Weight	420 g

Accessories:

- Software "AS-i Control Tools" with serial transmission cord for Allen-Bradley AS-i Master (Art. no. BW1563)

AS-i 3.0 Master/Scanner for Allen-Bradley CompactLogix/MicroLogix 1500



THE AS-INTERFACE MASTERS

AS-i-Master for

Allen-Bradley

CompactLogix

MicroLogix 1500

AS-i 3.0 from ID no. 12821
(see lateral Label)



Article No. BW1610 Complete set: AS-i 3.0 Master BWU1416 plus accessories BW1563

Article No. BWU1416 AS-i 3.0 Master for Allen-Bradley CompactLogix/MicroLogix 1500

Function

The Bihl+Wiedemann AS-i Master connects a CompactLogix processor or a MicroLogix 1500 to an AS-i network. Fast, easy set up into PLC backplane by the help of the new AS-i Master.

AS-i I/O data and status information is mapped into the PLC processor's I/O data.

AS-i-Scope

Diagnostics, which go far beyond the standard diagnostics facilitate the simple detection of the occasionally occurring configuration errors and further irritations towards the AS-i communication.

So in case of an error the down time of machines can be minimized or you can initiate preventive maintenance.

Commissioning and monitoring

The AS-i Master can be commissioned respectively parametrized with the help of the software "AS-i Control Tools".

Commissioning, debugging and setting up the system without the software can only be accomplished with the use of two push-buttons, the display and the LEDs directly on the system.

Art. no.	BWU1416
Operating current	approx. 100 mA out of AS-i approx. 450 mA out of power supply 5 V DC
Operating voltage	AS-i voltage 30 V DC
AS-i cycle time	150 µs*(number of slaves + 2)
Displays	
LED display	displaying slave addresses and error messages
LED green (power)	power on
LED green (diag)	communication and control information
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	the master is in configuration mode
Push-buttons	2 (mode/set)
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082, EN 50 081
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L, W, H)	102 mm, 35 mm, 132 mm
Protection category (DIN 40 050)	housing IP20
Weight	420 g

Accessories:

- Software "AS-i Control Tools" with serial transmission cord for Allen-Bradley AS-i Master (art. no. BW1563)

AS-i/PROFIBUS DP Gateway/Link in Protection Class IP65

AS-i Specification 2.1

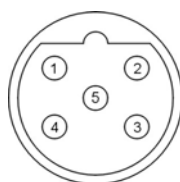
Entirely powered by AS-i

AS-i Scope function



Article no.	BW1253	BW1371
Connections	AS-i: electromechanical interface (penetration technique) PROFIBUS DP: heavy gauge terminals and cage clamp terminal blocks	AS-i: electromechanical interface (penetration technique) PROFIBUS DP: via M12 connector
Operating current	Master power supply A, approx. 200 mA out of AS-i circuit	
Operating voltage	AS-i voltage 30 V DC	
PROFIBUS Interface	according to DIN 19 245 part 3	
Baud rates	9,6 Kbaud up to 12 000 Kbaud, automatic recognition	
PROFIBUS DP Functions	imaging of the AS-i slaves as I/O data of the PROFIBUS. complete diagnosis and configuration via PROFIBUS	
AS-i cycle time	150 µs*(Number of slaves + 1)	
Displays		
LED display	AS-i slave addresses and error messages	
LED green (power)	Power on	
LED green (Bus active)	PROFIBUS Master recognized	
LED red (config error)	Configuration error	
LED green (U AS-i)	AS-i voltage OK	
LED green (AS-i active)	AS-i normal operation active	
LED green (prg enable)	automatic Address Programming enabled	
LED yellow (prj mode)	the Master is in configuration mode	
Push-buttons	2 (mode/set)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 082, EN 50 081	
Ambient operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing		
Dimensions (L, W, H)	90 mm, 80 mm, 70 mm	
Protection category (DIN 40 050)	housing IP65	
Weight	355 g	

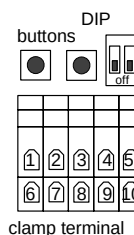
M12 Connector:



Bus Out (female)

Pin	Function
1	+5 V (only for termination resistor)
2	RxD/TxD-N (A)
3	DGND (only for termination resistor)
4	RxD/TxD-P (B)
5	Shield

Connection of PROFIBUS interface on cage clamp terminal block (IP65):



Pin	Function
1	RxD/TxD-N
2	RxD/TxD-P
3	RxD/TxD-N
4	RxD/TxD-P
5	0 V
6	Shield
7	FG function ground
8	FG function ground
9	Shield
10	+5 V

Accessories:

- Software "AS-i Control Tools" (art. no. BW1203, see page 56)
- Serial PROFIBUS Master (art. no. BW1258, see page 207)
- PROFIBUS DP Master Simulator DP V0 and DP V1 (art. no. BW1257, see page 206)
- Transmission cords (art. no. BW1097, see page 197)

AS-i/CC-Link Gateway in Protection Class IP65

Entirely powered by AS-i

Advanced AS-i diagnostics

AS-i Specification 2.1

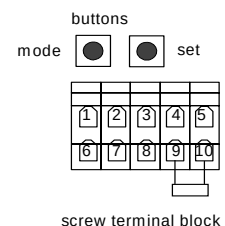


Article no.	BW1435
Connections	AS-i: electromechanical interface (penetration technique) CC-Link: heavy gauge terminals and screw terminal blocks
Operating current	master power supply A, approx. 200 mA out of the AS-i circuit
Operating voltage	AS-i voltage 30 V DC
CC-Link interface	according to CC-Link specification
Baud rates	156 Kbps up to 10 MBps
Type	remote device
Occupied stations	3
CC-Link functions	imaging of the AS-i slaves as RW data on CC-Link. complete diagnosis and configuration via CC-Link
AS-i cycle time	150 µs*(Number of slaves + 1)
Displays	
LCD	AS-i slave addresses and error messages. CC-Link baud rate and station number
LED green (PW)	Power on
LED green (L RUN)	CC-Link Run LED
LED red (L ERR)	CC-Link Error LED
LED green (SD)	CC-Link Send Data LED
LED green (RD)	CC-Link Receive Data LED
LED red (CONF ERR)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i ACTIVE)	AS-i normal operation active
LED green (PRG ENABLE)	AS-i automatic address programming enabled
LED yellow (PRG MODE)	AS-i Master is in configuration mode
Push-buttons	2 (mode/set)
Voltage of insulation	≥ 500 V
EMC directions	EN 50082, EN 50081
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	
Dimensions (L, W, H)	90 mm, 80 mm, 70 mm
Protection category (DIN 40 050)	housing IP65
Weight	355 g

Connection of CC-Link interface on screw terminal block and arrangement on circuit board

1	FG
2	SLD
3	DG
4	DA
5	DB
6	FG
7	SLD
8	DG
9	DA
10	DB

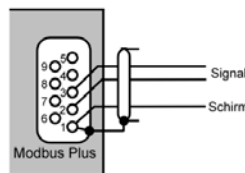
Termination resistor:
To be removed if module is
not at the end of the line



AS-i Gateway to Modbus Plus

**AS-i Master
Modbus Plus node**

Advanced AS-i diagnostics



Function

The AS-i/Modbus Plus Gateway serves to connect the Actuator-Sensor-Interface to a hierarchically higher Modbus Plus network. The Gateway acts as a complete Master for the AS-i and as a node for Modbus Plus. All AS-i functions can be called via the Modbus Plus network. As with all Masters of Bihl+Wiedemann, commissioning, debugging and setting up of the AS-i parameters

can be accomplished with the use of two push-buttons, the LCD display and the LEDs directly on the system, but it can also be handled via Modbus Plus. Advanced AS-i diagnostics allows to detect occasional occurring configuration errors and to judge the quality of the AS-i communication are implemented.

Specification 2.1	Art. no. BWU1583
Operating current	master power supply A approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
Serial interface	Modbus Plus
Baud rates	1 MBit/s
AS-i Master profile	M1
AS-i cycle time	150 µs*(Number of Slaves + 1)
Displays	
LCD	displaying slave addresses and error messages
LED green (power)	power on
LED green (Modbus Plus)	network indicator (diagnosis LED)
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	the master is in configuration mode
Push-buttons	2 (mode/set)
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082, EN 50 081
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L, W, H)	75 mm, 100 mm, 110 mm
Protection category (DIN 40 050)	housing IP40 terminals IP20

Overview AS-i Masters OEM Modules/PC Boards

Housing	Master/Module	Art. No.	Characteristics	P.
	AS-i 3.0 Master PCI Board	BW1922	with advanced diagnostics	49
		BW2087	without RS 232 interface, without duplicate address recognition	
		BW1911	AS-i 3.0 Master Compact PCI Board	
	AS-i PC2	BW1228	AS-i 2.1	50
	AS-i PC104	BW1229	AS-i 2.1	51
	AS-i Master M-Module	BW1230	AS-i 2.1	52
	AS-i Master OEM Module	BW1670	for use together with the Evaluation Kit BW1565	53
		BW1588	for AS-i 3.0 customer applications	
		BW2176 BW1554	with option for AS-i chip programming sample for different options	
	Evaluation kit for AS-i Master OEM Module	BW1565	easy configuration of the AS-i Master OEM Module	54

AS-i Masters for PC based Automation

The whole Technology around the PC systems (hardware and software) has been turning more powerful with falling prices. This is one reason why PC based systems have been used in growing figures, also in industrial automation. Many possibilities to use a PC in combination with soft PLCs, to write own application software in C, C++, Pascal, Delphi, Visual Basic etc., or to use visualization packages are indications that AS-i has been used in combination with PC based automation. Especially in that field Bihl+Wiedemann offers the all common hard- and software interfaces for PC based automation. For each problem the right AS-i master solution.

For the direct integration of AS-i Masters into PC systems Bihl+Wiedemann offers AS-i Masters with

- PCI-Bus interface with 2 AS-i Masters,
- **ISA-Bus interface** or as
- PC/104-Modul.

These cards have got the PLC functionality "AS-i Control" (Fast Logic) on board. While the AS-i Master controls the AS-i network the full resources of the computer can be used for visualization or other applications.

Further AS-i Masters to interface a PC are the AS-i Masters with serial interface and the Gateway between AS-i and Ethernet TCP/IP. The AS-i/Ethernet TCP/IP Gateway is an easy to use device to link the AS-i directly to the company network. While the Gateway is located near the application, the PC remains in the

room with the master display. As fieldbus application layer Modbus is used. Other protocols can be implemented on request.

Bihl+Wiedemann provides all common drivers for AS-i Masters: OPC server, NT driver, 16 bit and 32 bit dll drivers, etc. free of charge in the internet. In this way there is no need for a timeconsuming licensing procedure with key disks etc. The newest drivers can be downloaded on 24 hours a day, 365 days a year. It does not matter where problems occur with the use of the homepage users can ensure that they have got the right drivers.

Embedded AS-i Masters: AS-i Master OEM Module



The AS-i Master OEM module is ideal for integration in specific electronics. The AS-i Master OEM module fulfills the new AS-i specification 2.1 and supports all new AS-i functions. Additionally the new OEM module is supporting all AS-i master specialities of Bihl+Wiedemann as the special AS-i safety diagnostics, AS-i analyser functions etc.

AS-i 3.0 Master PCI Board / AS-i 3.0 Master Compact PCI Board

2 AS-i Master on 1 board

AS-i Master Board (BW1922, BW2087)
for AT-PCs with PCI slots

AS-i 3.0 Master Board (BW1911)
for AT-PCs with Compact PCI slots

Advanced AS-i diagnostics (BW1922):

- duplicate address' recognition
- AS-i earth fault detector integrated
- AS-i noise detector integrated
- RS 232 diagnostic interface



Art. No. BW1922: AS-i 3.0 Double Master with advanced diagnostics

Art. No. BW2087: AS-i 3.0 Double Master without RS 232 interface, without duplicate address' recognition

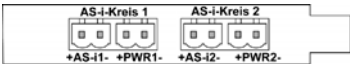
Art. No. BW1911: AS-i 3.0 Compact PCI Double Master

The AS-i Master PCI Board realizes the functionality of two complete AS-i Masters on a PCI Board. In addition to that an implemented AS-i control unit performs as a PLC to preprocess the AS-i data on the board (BW1922). Another additional function is the integrated watchdog function.

Advanced AS-i diagnostic function for the localization of occasionally occurring configuration errors as well as for the qualitative diagnosis of the AS-i communication are also implemented.

For normal operation there is no need for an PC interrupt, but the AS-i PCI Board is capable to generate interrupts cyclically with every AS-i cycle or leaded by configuration errors or changes in input data.

The DPRAM interface provides an easy integration of the AS-i PCI Board in any operating system (special drivers). The address of the AS-i PCI Board does not have to be adjusted. The AS-i PCI Board works with "Plug and Play". Up to 4 AS-i PCI Masters can be used simultaneously in one PC. The AS-i PCI Board serves the requirements of industrial use.

Article no.	BW1922	BW2087	BW1911
Type	PCI Board		Compact PCI Board
Duplicate address' recognition	yes	–	
AS-i earth fault detector integrated	yes		–
AS-i noise detector integrated	yes		–
RS 232 diagnostic interface	yes	–	
Interface	32 bit PCI Bus interface, 3,3 V/5 V galvanic isolation to AS-i AS-i circuit 1, AS-i circuit 2		
Serial interface	RS 232	–	
Program memory (EEPROM)	16 KB	–	
Operating voltage	3,3 V/5 V DC and AS-i voltage		
Operating current	approx. 300 mA out of 5 V power supply approx. 100 mA out of 3,3 V power supply approx. 70 mA out of AS-i per AS-i circuit		
Voltage of insulation	≥ 500 V		
EMC directions	EN 61 000-6-2, EN 61 000-6-4		
Ambient operating temperature	0°C ... +55°C		
Storage temperature	-25°C ... +70°C		
AS-i cycle time per AS-i circuit	150 μs*(number of slaves + 2)		
AS-i specification	3.0		
AS-i master profile	M4		
Requirements	IBM compatible PC 80 486, PCI		
Connections			

Accessories:

- AS-i Control Tools (Windows) (art. no. BW1602, v. page 56)
- AS-i power supply 4 A (art. no. BW1649, s. page 178)
- OPC Server
- AS-i power supply decoupling unit for 2 AS-i circuits (art. no. BWU1943, s. page 186)
- DLL drivers for Win 2000 and Win XP; Linux driver

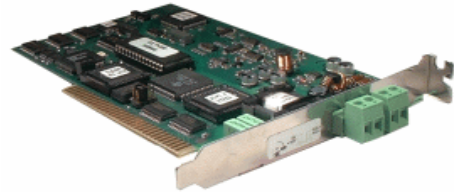
AS-i Master Board for AT-PCs

AS-i Control function

Watchdog

Advanced AS-i diagnostics

AS-i Specification 2.1



Article no. BW1228

AS-i PC2 realizes the functionality of a complete AS-i Master on a short PC-board. In addition to that an implemented AS-i Control unit performs as a PLC and an additional watchdog watches breakdowns on your PC system. If used without the AS-i Control the board will work as a pure AS-i Master. While the AS-i PC2 board controls the AS-i network, the full resources of the computer can be used for visualization or other applications. For normal operation there is no need for an interrupt, but the AS-i PC2 card is capable to generate interrupts leaded by events. Only 3 bytes of the I/O area are used. The watchdog can set the Master into the offline phase, if it is not triggered by a PC program. Advanced

AS-i diagnostics to detect occasional occurring configuration errors and to judge the quality of the AS-i communication are implemented.

AS-i PC2 uses a DPRAM interface for data exchange. This fact provides an easy embedding of AS-i PC2 in any PC operating system (special drivers). I/O-data is readable all time. Up to 8 AS-i PC2-Boards can be used simultaneously in one PC and can share one interrupt. The board serves the requirements of industrial use.

Article no.	BW1228
Type	short AT-board
Interface	8 bit ISA Bus interface, galvanic separation from AS-i
Operating voltage	5 V DC and AS-i voltage
Operating current	approx. 200 mA out of power supply approx. 70 mA from AS-i
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082 EN 50 081
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C
AS-i cycle time per AS-i circuit	150 µs*(number of slaves + 1)
AS-i specification	2.1

Requirements:

IBM compatible PC 80286 or higher

Accessories:

AS-i Control Tools (Windows) (art. no. BW1203, see also page 56)

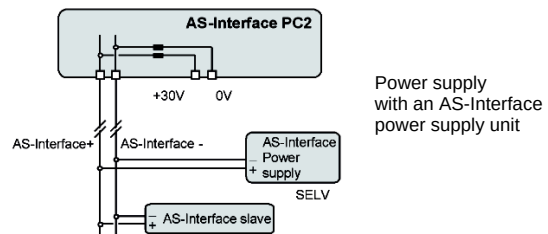
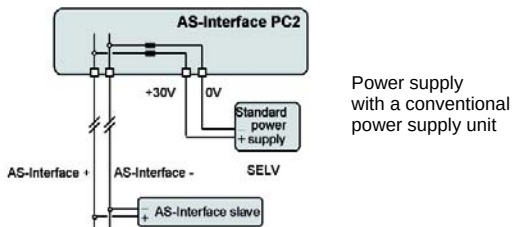
Examples in ANSI C and PASCAL, both with source code

Drivers for:
Microsoft C, Borland C

DLL drivers for:
Win 3.11, Win 95/98, Win NT 4.0, Win 2000

OPC Server

AS-i Connections:



AS-i Master Module in PC/104 format

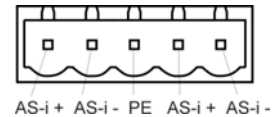
with AS-i Control function

Watchdog

Advanced AS-i diagnostics

Use as
embedded AS-i-Master

AS-i Specification 2.1



Article no. BW1229

The AS-i/PC104 Master module realizes the functionality of a complete AS-i Master on a PC/104 module (identical functions as AS-i PC2 with ISA-bus interface). In addition to that an implemented AS-i Control unit performs as a PLC and an additional watchdog watches breakdowns of the PC/104 system. While the AS-i/PC104 Master controls the AS-i network, the full resources of the computer can be used for visualization or other applications. Without using the AS-i Control feature the board works as a pure AS-i Master. The activated watchdog sets the Master to the offline phase, if it is not triggered by a PC program. Advanced AS-i diagnostics to detect occasional occurring configuration errors and judge the quality of the AS-i communication are implemented. Normally there is no need for a PC interrupt, but the

AS-i/PC104 module is capable to generate interrupts cyclically with every AS-i cycle or led by configuration errors or changes in input data. Several AS-i/PC104 Master modules can share one interrupt.

The AS-i/PC104 Master uses a DPRAM interface for data exchange which reserves only 3 bytes on the PC/104 Bus (ISA-Bus) and provides an easy integration of AS-i/PC104 Masters in any PC operating system (special drivers). The base address of data exchange can be determined via software. Up to 8 AS-i/PC104 modules can be used simultaneously in one PC/104 system. Beside the use in PC/104 systems this AS-i Master module can be implemented as embedded AS-i Master into specific controllers.

Article no.	BW1229
Type	PC/104 module
Interface	8 bit PC/104 interface, 16 bit connector; galvanic separation from AS-i
Operating voltage	5 V DC and AS-i voltage
Operating current	approx. 200 mA out of PC power supply approx. 70 mA from AS-i
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082 EN 50 081
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C
AS-i cycle time	150 µs*(number of slaves + 1)
AS-i specification	2.1
Dimensions (L / W / H in mm)	96 / 90 / 16

Requirements:

IBM compatible PC
PC/104 architecture 80 286 or higher

Accessories:

AS-i Control tools (Windows)
(Art. no. BW1203, see also page 56)

Examples

ANSI C and PASCAL both with source code

Drivers for:

Microsoft C, Borland C

DLL drivers for:

Win 3.11, Win 95/98, Win NT 4.0, Win 2000

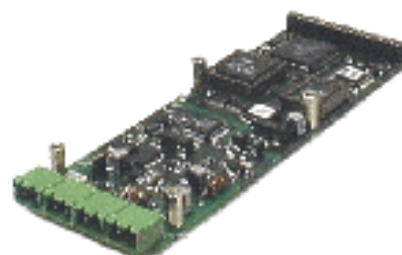
OPC Server

AS-i Master Module with M-Module Interface

Watchdog

Advanced AS-i diagnostics

AS-i Specification 2.1



Article no. BW1230

The AS-i Master M-Module realizes the functionality of a complete AS-i Master on a M-Module (similar functions as AS-i PC2 with ISA-bus interface).

The module is with the VITA standard "M-Module Mezzanine Specification".

The AS-i Master M-Module is supporting the following features:

- Single M-Module
- +5 V operating voltage
- no +/-12 V operating voltage
- 8 Bit data bus
- 8 Bit address bus
- Interrupt-capable, Typ A (software-end-of-interrupt)
- AS-i connection through COMBICON connectors on the front
- AS-i signal additional through Pin 23 and 24 of the Peripheral Connectors

The activated watchdog sets the Master to the offline phase, if it is not triggered by a host program. Advanced AS-i diagnostics to detect occasional occurring configuration errors and judge the quality of the AS-i communication are implemented. Normally there is no need for an interrupt, but the AS-i Master M-Module is capable to generate interrupts cyclically with every AS-i cycle or leaded by configuration errors or changes in input data.

The AS-i Master M-Module uses a DPRAM interface for data exchange. The DPRAM interface is consuming 128 words, but only the low bytes are used. The DPRAM interface is easy to use, especially with any operating systems and with different programming languages.

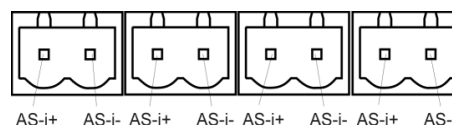
Beside the use in VMEbus or other systems through carrier boards (for example 3U or 6U carrier boards) this AS-i Master module can be implemented as embedded AS-i Master into specific controllers.

Article no.	BW1230
AS-i specification	2.1
Type	M-Module
Interface	8 bit M-Bus interface; galvanic separation from AS-i
Operating voltage	5 V DC and AS-i voltage
Operating current	approx. 200 mA out of PC power supply approx. 70 mA from AS-i
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082 EN 50 081
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C
AS-i cycle time	150 µs*(Number of slaves + 1)
Dimensions (L / W / H in mm)	150 / 53 / 14

Requirements:

Carrier boards for example 3U or 6U for VME-bus system, Compact PCI etc.

Connections:



Evaluation Kit for the AS-i Master OEM Module

Easy configuration of the AS-i Master OEM Module



Article no. BW1565

The Evaluation Kit for AS-i Master OEM Module serves for easy commissioning of the AS-i OEM Module. On the carrier board there is a 5 Voltage controller and a RS 232 converter, to commu-

nicate with the OEM Module via the AS-i Control Tools. Furthermore the AS-i line is pinned to a Combicon plug.

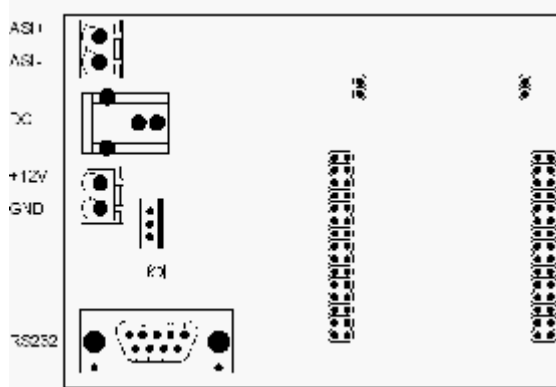
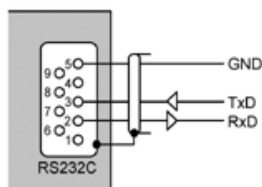
With the help of the evaluation kit for the AS-i Master OEM Module the development of an AS-i Master will be very easy.

Article no.	BW1565
Interfaces	- AS-i (Combicon plug) - RS 232 for connection to the PC
LED green	device is powered
Operating current	9 ... 15 V DC, pole-protected
Operating voltage	12 V DC out of external power supply and AS-i voltage

Specification:

- AS-i Control Tools BW1203
- Data cable BW1058
- 12 V power supply

Connections of the RS 232 interface and arrangement on circuit board



Overview Software

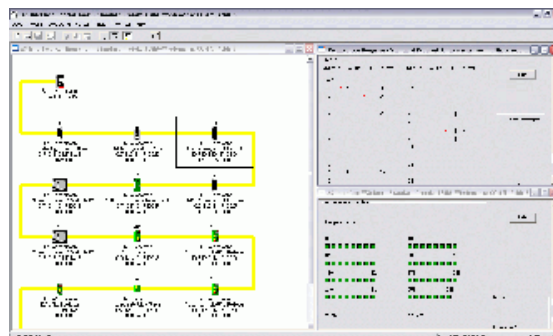
Software	Art. No.	Characteristics	P.
 AS-i Control Tools ASIMON and AS-i Control Tools	BW1602	with serial cable for AS-i Master in Stainless Steel	56
	BW1563	with serial cable for Allen-Bradley AS-i Master	
	BW1203	Software AS-i Control Tools	
	BW2071	with serial cable for AS-i Master/Monitor in Stainless Steel	
	BW2501	for Safety Monitors and AS-i Masters	
 Control III, Programming in C (Mini-PLC)	BW2582	Activation of the „control“-functions, chip card for easy device replacement, Ethernet programming- and diagnostic interface	57
OPC server for AS-i Masters	BW1222		57
Windows drivers for AS-i Masters	BW1099	16 Bit DLL	59
	BW1224	32 Bit DLL	
	BW1815	.NET and 32 Bit DLL	
Windows NT4 drivers (Kernel mode drivers)	BW1102	for AS-i PC2 board	59
	BW1223	for AS-i PCI board	
Linux drivers for AS-i PCI Board	BW1816	LINUX kernel 2.0 and 2.2	59
	BW1817	LINUX kernel 2.4	

Drivers and examples can be downloaded free of charge in the download area under <http://www.bihl-wiedemann.de>.

Software for Configuration and Programming and

for AS-i Diagnostics and AS-i Safety Diagnostics

of Bihl+Wiedemann
AS-i Masters and
AS-i Gateways



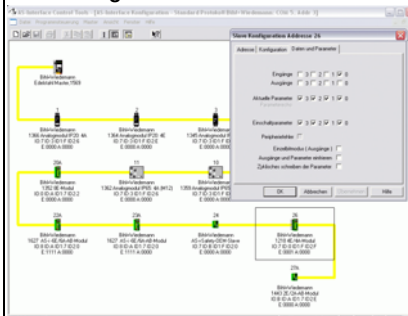
Article no. BW1602: Software AS-i Control Tools with serial cable for AS-i Master in Stainless Steel

Article no. BW1563: Software AS-i Control Tools with serial cable for Allen-Bradley AS-i Master

Article no. BW1203: Software AS-i Control Tools

Article no. BW2071: ASIMON and AS-i Control Tools with serial cable for AS-i Master/Monitor in Stainless Steel

Article no. BW2501: ASIMON and AS-i Control Tools for Safety Monitors and AS-i Masters

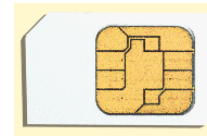
General information	- operating system: Win 98 SE, Win NT4, Win Me, Win 2000, Win XP, Vista 32-bit, Windows 7 (32 bit or 64 bit) - comprehensible operator guidance - simple installation - language: English/German - extensive help menu
AS-i configuration editor 	opening, saving, editing and managing of AS-i configurations tool for the commissioning of AS-i - graphical display of the AS-i network - alternative plain text display of the AS-i network -many devices icons out of an icon archive -simple embedding of own icons and devices - display of the actual configuration on the AS-i (slave-profiles in plain language) - comparison of actual configuration with the projected one - programming of slave addresses - projecting of the actual configuration - reading of inputs - writing of outputs - writing of parameters - projecting of individual slaves (Offline/Online) - slave can be given its own name
AS-i address assistant	automatic address of the AS-i slaves (no handheld necessary)
Advanced AS-i diagnostics 	- display of AS-i slaves which caused configuration errors - judgement of the quality of the AS-i communication by means of error counters for every AS-i slave - extended AS-i diagnostic functions AS-i Safety diagnostic without additional software for the AS-i monitor possible
AS-i Master identity	reading and writing of AS-i Master and AS-i Control flags
Further functions	- offline/online mode - opening and saving of AS-i configuration files - opening and saving of AWL-files
Can be used with the following AS-i Masters	- AS-i/PROFIBUS Gateways, AS-i/Modbus Gateways, AS-i/DeviceNet Gateways, AS-i/Ethernet TCP/IP Gateway - AS-i Control - AS-i Master with RS 232, RS 485, RS 422 - AS-i PC2, AS-i PC104, AS-i PCI Board - AS-i Master/Scanner for Allen-Bradley ControlLogix, CompactLogix/Micro-Logix 1500

Control III, Programming in C (mini-PLC)

Bihl+Wiedemann AS-i Masters and AS-i Gateways in Stainless Steel can be delivered with or without mini-PLC.¹

Chip card of the replacement of the devices

Ethernet interface allows remote administration



Chip card for easy device replacement



Ethernet programming and diagnostic interface



Control III is a PLC-functionality integrated into the B+W AS-i Masters. It forms a mini-PLC with up to 248 inputs and outputs per AS-i circuit together with commercial AS-i I/O modules, Double Master a total of up to 496 I / O's. The programming of the mini-PLC is fully in Standard C.

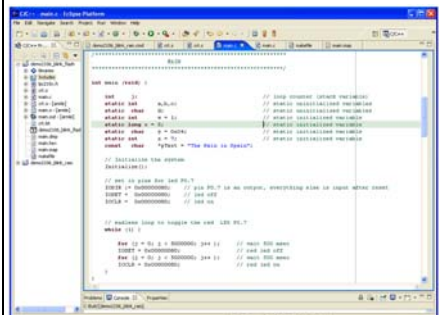
In combination with B+W AS-i Masters according to the new specification 3.0 Control III supports also the extension to 62 AS-i slaves per AS-i network, the evaluation of AS-i peripheral faults as well as the automatic data exchange with AS-i analog modules according to the standardized profile.

In that way up to 248 digital inputs and outputs or max. 248 analog values can be processed via AS-i.

Integrated in an AS-i Master with serial interface Control III is the ideal mini-PLC for stand alone solutions for smaller machines or plants.

Use of Control III offers in AS-i gateways the ability of the preprocessing of sensors and actuators. The master PLC is relieved by. Control III thus makes possible a decentralization of control task.

Typical applications are the fast execution of time critical operations directly within the Gateway.

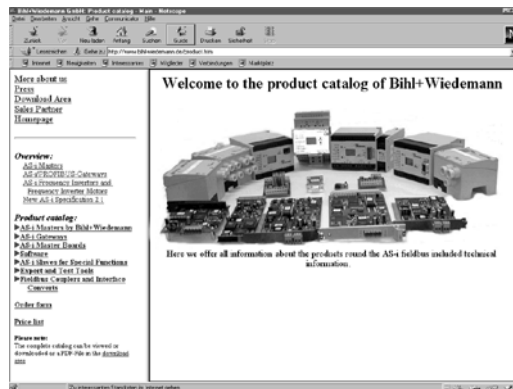
Article no.	BW2582
General	
	• Complete IDE with Eclipse and GCC. • Complete debugging of the control program with Eclipse and GDB.

Mini-PLC description	
Programm memory (EEPROM) / load memory	28 KByte max.
Data memory / main memory	16 KByte max.
Flag area / fieldbus	256 Byte
Remanent data memory (also via chip card)	1 KByte
Cycle time (1 KBit-/1000 word instructions)	1,0 ms up to 20 ms depending on device
Processing	
Instruction set	ARMv4T (ARM9)
API	based on ASiDRV
Timer	A configurable timer interrupt from which any number of timers and counters are derived
Programmable time values	1 ms up to 2 ³² ms
In -and outputs	up to 496 E/A's and 248 analog values via AS-i slaves

Activation of the "Control"-functions

Programming	
Compiler	GCC ARM C-Compiler
Debugger	GDB with Eclipse
Programming language	C (or Assembler)
Programming device	PC
Bus connections	PROFIBUS, PROFINET, Ethernet/IP, Modbus TCP
Extras	
Identification	unique 32 bit identifier in the device
Chip card	redundant memory for control programm and parameters

¹The option to activation is to recognize by the note in the Gateway data sheet : "Optional programmable in C ".



Bihl+Wiedemann provides all common drivers free of charge in the internet. In this way there is no need for a time-consuming licencing procedure with key disks etc. The newest drivers can be downloaded on 24 hours a day, 365 days a year. It does not matter where problems occur with the use of the homepage users can ensure that they have got the right drivers. The drivers can also be ordered on disc.

OPC server for AS-i Masters

Art. no. BW1222

The OPC server for the AS-i offers the possibility to exchange data between the respective AS-i Master and a SCADA software package via a standardized interface. In that way all Bihl+Wiedemann AS-i Masters can get connected to the leading visualisations systems e. g. WinCC, RS View, Fix, Bridge View, Lab View, in Touch, Client. The OPC server already fulfils the AS-i specification 2.1. First test of the OPC server can be made without any AS-i master hardware.

The "AS-i Control Tools" can be used as configurator to commission the AS-i.

Windows drivers for AS-i Masters

Art. no. BW1099: 16-bit DLL

Bihl+Wiedemann provides AS-i DLLs for free. There are 16 bit DLLs for Windows 3.1/3.11 and 32 bit DLLs for Windows 95/98 and Windows NT.

Art. no. BW1224: 32-bit DLL

The DLL interface is identically for all different AS-i Masters.

Art. no. BW1815: .NET and 32-bit DLL

Windows NT4 drivers (Kernel mode drivers)

Art. no. BW1102: AS-i PC2 Board

Fast device drivers to use the AS-i PC boards in combination with Windows NT can also be downloaded free of charge.

Art. no. BW1223: AS-i PCI Board

Linux drivers for AS-i PCI Board

Art. no. BW1816: LINUX kernel 2.0 and 2.2

Fast device drivers to use the AS-i PC boards in combination with LINUX can also be downloaded free of charge.

Art. no. BW1817: LINUX kernel 2.4

Drivers and exmaples can be downloaded free of charge in the download area under <http://www.bihl-wiedemann.de>.

AS-i Master/Gateways/ Links/Scanner	
AS-i Slaves	
AS-i Accessories/ Diagnostics/Development	
Other Fieldbuses/ Master Simulators	
AS-i Safety	
Price Lists	

Overview AS-i Digital Modules

Housing	Module	Art. No.	Characteristic	P.
 	AS-i Digital Modules, Stainless Steel in IP20	BW1808	AS-i 4I/3O Relay Module in Stainless Steel, AB Slave	62
		BW1926	AS-i 4I/4O Relay Module in Stainless Steel, Single Slave	
		BW2555	AS-i 4I/4O Relay Module in Stainless Steel, Single Slave, depth 90 mm	
		BW1907	AS-i 4I/4O Module in Stainless Steel, AB Slave	
		BW2565	AS-i 4I/4O Module in Stainless Steel, Single Slave	
		BW2077	AS-i 8I Module in Stainless Steel, AB Slave	
		BW2556	AS-i 8I Module in Stainless Steel, AB Slave, depth 90 mm	
		BW2078	AS-i 8O Module in Stainless Steel, AB Slave	
  	AS-i Digital Modules (M12) in IP67	BWU2552	4 digital inputs on M12 sockets, Y assignment, protection category IP67 (M12)	65
		BW2620	4 digital inputs on M12 sockets, protection category IP67 (M12)	
		BWU2487	4 digital in- and outputs on M12 sockets, Y assignment, protection category IP67 (M12)	
		BWU2626	4 digital in- and outputs on M12 sockets, Y assignment, protection category IP67 (M12)	
		BWU2617	4 digital in- and outputs on M12 sockets, protection category IP67 (M12)	
	AS-i Module, digital and analog (M12) in IP67	BW2313	2 inputs Pt100 and 4 digital inputs/ outputs in IP67 (M12)	69

AS-i-Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

AS-i 3.0 Modules in Stainless Steel

AS-i 3.0 Modules in Stainless Steel

LED display of the I/Os

Connection via cage clamp terminals

Stainless steel housing IP20



BW1808 / BW1907 /
BW1926 / BW2077 /
BW2078 / BW2565

BW2555 / BW2556

This digital Modules are meeting the requirements of the AS-i specification 3.0 and are robust housing solution for cabinet mounting. The status of the in- and outputs is displayed by LEDs.

Sensors and / or actuators can be quickly and easily connected to the cage clamp terminals. The addressing will also take place on addressing socket.

Artikel Nr.	BW1808	BW1907	BW1926	BW2077	BW2078	BW2555	BW2556	BW2565
Connection								
Length of connector cable	I: max. 1.5 m, O: unbegrenzt	I: max. 1.5 m, O: max. 1.5 m	I: max. 1.5 m, O: unbegrenzt	I: max. 1.5 m	O: max. 1.5 m	I: max. 1.5 m, O: unbegrenzt	I: max. 1.5 m	I: max. 1.5 m, O: max. 1.5 m
AS-i								
AS-i Profile	S-7.A.E, ID1= 7 (default)	S-7.A.7, ID1= 7 (fixed)	S-7.F.E, ID1= F (default)	2 x S-7.A.E, ID1= 7 (fixed)	S-7.A.7, ID1= 7 (fixed)	S-7.F.E, ID1= F (default)	2 x S-7.A.E, ID1= 7 (fixed)	7. F. E, ID1=7 (fixed)
Slave-Type	AB Slave (up to 62)		Single Slave (up to 31)	2 AB Slaves (up to 31)		Single Slave (up to 31)	2 AB Slaves (up to 31)	Single Slave (up to 31)
Operating voltage	26 ... 31,6V	18 ... 31,6V	26 ... 31,6V	18 ... 31,6V		26 ... 31,6V	18 ... 31,6V	
Required Master profile	≥M3	≥M4	≥M0	≥M3	≥M4	≥M0	≥M3	≥M0
Max. AS-i current consumption	200mA	60mA	200mA	100mA	80mA	200mA	100mA	60mA
Qiescent current	< 30mA (no sensors, outputs= 0)							
AUX								
AUX voltage	–	18 ... 30V	–	18 ... 30V		–	18 ... 30V	
Max. AUX current consumption	–	(AUX-I) 1,2A permanent operation; 4A max.	–	(AUX) 1,2A permanent operation; 4A max.	(AUX1) 2A permanent operation; 4A max.	–	(AUX) 1,2A permanent operation; 4A max.	(AUX-I) 1,2A permanent operation; 4A max.
		(AUX2) 2A permanent operation; 4A max.			(AUX-O) 1,2A permanent operation; 4A max.			
		(total) 8A max.			(total) 8A max.			
Input								
Number	4			8	–	4	8	4
Power supply	24V generated out of AS-i	supply out of external 24V	24V generated out of AS-i	supply out of external 24V	–	24V supply out of AS-i	supply out of external 24V	
Power supply of attached sensors	max. 100mA	max. 1,2A permanent operation	max. 100mA	max. 1,2A permanent operation	–	max. 100mA	max. 1,2A permanent operation	
Input level	inputs 24V DC < 0,8mA (low) > 5mA (high)				–	inputs 24V DC < 0,8mA (low) > 5mA (high)		
Output								
Number	3 relays, change over, 230V, 10A (AC1)	4, electronic	4 relays, change over, 230V, 10A (AC1)	–	8, electronic	4 relays, change over, 230V, 10A (AC1)	–	4, electronic
Power supply	supply out of AS-i	supply out of external 24V	supply out of AS-i	–	supply out of external 24V	supply out of AS-i	–	supply out of external 24V

AS-i 3.0 Modules in Stainless Steel

Artikel Nr.	BW1808	BW1907	BW1926	BW2077	BW2078	BW2555	BW2556	BW2565
Max. output current	–	0,5A permanent operation per output	–	–	0,5A permanent operation per output	–		0,5A permanent operation per output
Display								
LEDs I1 ... In (yellow)	state of inputs I1-I4			state of inputs I1-I8	–	state of inputs I1-I4	state of inputs I1-I8	state of inputs I1-I4
LEDs O1 ... On (yellow)	state of outputs O1-O3	state of outputs O1-O4		–	state of outputs O1 - O8	state of outputs O1-O4	–	state of outputs O1-O4
LED PWR (green)	AS-i voltage o.k.			flashing: address is 0 on: AS-i voltage o.k.		AS-i voltage o.k.	flashing: address is 0 on: AS-i voltage o.k.	AS-i voltage o.k.
LED AUX (green)	–	(AUX-I) AUX voltage for inputs on, (AUX-O) AUX voltage for outputs on	–	AUX voltage on	(AUX 1, AUX 2) AUX voltage on	–	AUX voltage on	(AUX-I) AUX voltage for inputs on, (AUX-O) AUX voltage for outputs on
LED FLT/FAULT (red)	communication error	flashing: AUX-I voltage missing or overload on: communication error	communication error	flashing: AUX voltage missing or overload on: communication error	communication error		flashing: AUX voltage missing or overload on: communication error	flashing: AUX I voltage missing or overload on: communication error
Environment								
Applied standards	EN 61 000-6-2 EN 61 000-6-3			EN 61 131-2 EN 61 000-6-2 EN 61 000-6-3	EN 61 000-6-2 EN 61 000-6-3		EN 61 131-2 EN 61 000-6-2 EN 61 000-6-3	EN 61 000-6-2 EN 61 000-6-3
Operating temperature	-25°C ... +70°C			0°C ... +60°C		-25°C ... +70°C	0°C ... +60°C	-25°C ... +70°C
Storage temperature	-40°C ... +70°C							
Protection category DIN EN 60 529	IP20 (build in)							
Dimensions (W / H / D in mm)	120 / 50 / 45					120 / 50 / 90		120 / 50 / 45

Programming:	Bit setting			
	D0	D1	D2	D3
	Input			
BW1808 / BW1907 / BW1926 / BW2555 / BW2565	I1	I2	I3	I4
BW2077 / BW2556	Slave 1: I1	Slave 1: I2	Slave 1: I3	Slave 1: I4
	Slave 2: I5	Slave 2: I6	Slave 2: I7	Slave 2: I8
	Output			
BW1808	O1	O2	O3	–
BW1907 / BW1926 / BW2555 / BW2565	O1	O2	O3	O4
BW2078	Slave 1: A1	Slave 1: A2	Slave 1: A3	Slave 1: A4
	Slave 2: A5	Slave 2: A6	Slave 2: A7	Slave 2: A8
	Parameter bit			
	P0	P1	P2	P3
BW1907 / BW2565	0= Off / 1= On (Watchdog)	0= ON / 1= Off (data input filter 128 µs)	0= On / 1= Off (synchronous I/O mode)	not used
BW1808 / BW1926 / BW2077 / BW2078 / BW2555 / BW2565	not used			

Programming notes:								
	BW1808	BW1907	BW1926	BW2077	BW2078	BW2555	BW2556	BW2565
IO Code	7	7	7	7	7	7	7	7
ID Code	A	A	F	A	A	F	A	F
ID2 Code	E	7	E	E	7	E	E	E

AS-i 3.0 Modules in Stainless Steel

Article no.	Digital inputs	Input voltage (voltage supply actuators)	Digital outputs	Output voltage	AS-i adress	Special version
BW1808	4	via AS-i	3x Relays (change over)	–	A/B address	–
BW1907		24V DC extern	4	24V DC extern	AS-i 3.0 A/B address	Galv. separation to AS-i
BW1926		via AS-i	4x Relays (change over)	–	Single address	–
BW2077	8	24V DC extern	–	24V DC extern	AS-i 3.0 A/B address	Inputs: Galv. separation to AS-i
BW2078	–	–	8			Outputs: Galv. separation to AS-i
BW2555	4	via AS-i	4x Relays (change over)	–	Single address	–
BW2556	8	24V DC extern	–		AS-i 3.0 A/B address	Inputs: Galv. separation to AS-i
BW2565	4		4			Galv. separation to AS-i

Connections:

BW1808 / BW1926 / BW2555

		ASI+, ASI-	AS-i connection
		+24V, 0V	Sensor supply, generated out of AS-i
		PE	Protective ground
		E1 ... E4	24V inputs
		K1CM ... K4CM	Relay common
		K1NO ... K4NO	Relay normally open
		K1NC ... K4NC	Relay normally closed

Hint:

In article no.: BW1808 the output O4 is not assigned; K4 is not used!

BW1907 / BW2565

		AS-i +, AS-i -	Connection to the AS-i bus
		+24V I ext.in, 0V I ext.in	Supply inputs for inputs
		+24V O ext.in, 0V O ext.in	Supply inputs for outputs
		+24V I, 0V I	Sensor supply
		0V O	Supply outputs GND for outputs
		I1, I2, I3, I4	Inputs
		O1, O2, O3, O4	Outputs

BW2077 / BW2556

		AS-i +, AS-i -	Connection to the AS-i bus
		+24V ext.in, 0V ext.in	Supply inputs for inputs
		+24V, 0V	Sensor supply
		I1 - I8	Inputs

BW2078

		AS-i +, AS-i -	Connection to the AS-i bus
		+24V1 ext.in, 0V1 ext.in	Supply inputs for outputs outputs A1 - A4
		+24V2 ext.in, 0V2 ext.in	Supply inputs for outputs outputs A5 - A8
		0V1	Reference potential for outputs A1 - A4
		0V2	Reference potential for outputs A5 - A8
		O1 - O8	Outputs

AS-i 3.0 Modules in IP67 (M12)

AS-i Digital Input / Output Modules

AS-i 3.0 Specification

A/B Slave (up to 62 slaves)

Protection Category IP67



BWU2487 BWU2552 / BW2620 BWU2617 / BWU2626

Article no.	BWU2552	BW2620	BWU2487	BWU2626	BWU2617
Connection					
AS-i connection	flat cable and piercing				
Periphery connection	M12, Y-assignment	M12	M12, Y-assignment		M12
AS-i					
AS-i Profile	S-0.A.E (ID1=7 default)		S-7.A.7 (ID1=7 fixed)		
Slave-Type	AB-Slave (up to 62)				
AS-i operating voltage	30V (18 ... 31.6V)				
Required Master profile	≥M3		≥M4		
Max. AS-i current consumption	200mA				
AUX					
AUX voltage	–		24V (18 ... 30V)		
Max. AUX current consumption	–		2A	3A	
Input					
Number	4				
Power supply	supply out of AS-i				
Power supply of attached sensors	max. 200mA (see also figure "Power supply of attached sensors")		120mA	max. 200mA (see also figure "Power supply of attached sensors")	
Input level	U<5V (low) U>15V (high)				
Output					
Number	–		4		
Power supply	–		supply out of AUX		
Max. output current	–		500mA per output	1A (Σ 3A max.)	
Display					
LED ASI (green)	on: AS-i voltage on, slave has no peripheral fault and slave address is not 0 flashing: AS-i voltage on, but slave has peripheral fault or address 0 off: no AS-i voltage				
LED FLT/FAULT (red)	on: slave address is 0 or slave is offline flashing: slave has peripheral fault off: slave is online and slave has no peripheral fault				
LED AUX (green)	–		on: 24V _{DC} AUX on off: no 24V _{DC} AUX		
2x LEDs I1 / I2 and I3 / I4 (yellow)	–		state of input I1 / I2 and I3 / I4: at least one input I1 / I2 (or I3 / I4) is on	–	
2x LEDs O1 / O2 and O3 / O4 (yellow)	–		state of outputs O1 / O2 and O3 / O4: at least one output O1 / O2 (or O3 / O4) is on	–	

AS-i 3.0 Modules in IP67 (M12)

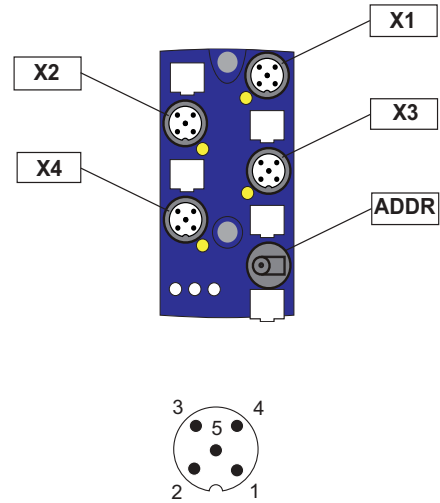
Article no.	BWU2552	BW2620	BWU2487	BWU2626	BWU2617
4x LEDs I1 ... I4 (yellow)	state of inputs I1 to I4		–	state of inputs I1 to I4	
4x LEDs O1 ... O4 (yellow)	–			state of outputs O1 to O4	
Environment					
Applied standards	EN 61 000-2 EN 61 000-3 EN 61 131-2				
Operating temperature	-30°C ... +70°C				
Storage temperature	-30°C ... +85°C				
Protection category (DIN EN 60 529)	IP67				
Maximum tolerable shock and vibration stress	≤15g, T≥11ms 10 ... 55Hz, 0,5mm amplitude				
Isolation voltage	≥500V				
Dimensions (W / H / D) in mm	45 / 80 / 42			60 / 151 / 31	
Weight	100g			200g	

Article no.	AS-i specification			Inputs		Outputs		Advanced addressing (AB slave)
	2.0	2.11	3.0	Binary	Power supply out of AS-i	Binary	Power supply out of AUX	
BWU2552	–	•	•	•	•	–	–	•
BWU2620	–	•	•	•	•	–	–	•
BWU2487	–	–	•	•	•	•	•	•
BWU2626	–	–	•	•	•	•	•	•
BWU2617	–	–	•	•	•	•	•	•

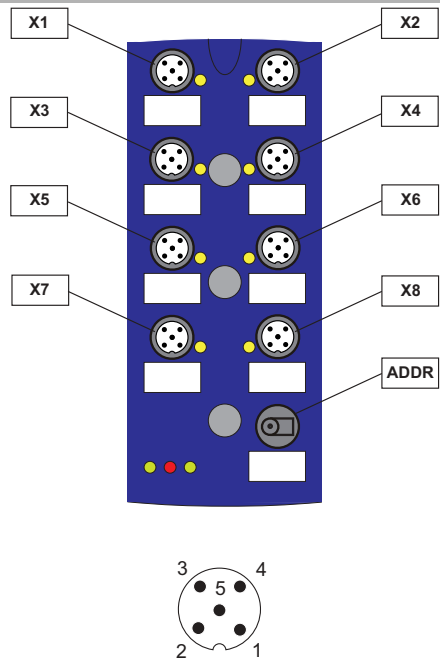
Programming	AS-i Bit assignment			
Bit	D0	D1	D2	D3
	Input			
BWU2487 / BWU2552 / BWU2617 / BWU2620 / BWU2626	I1	I2	I3	I4
	Output			
BWU2487 / BWU2617 / BWU2626	O1	O2	O3	O4
	Parameter bit			
	P0	P1	P2	P3
BWU2487 / BWU2617 / BWU2626	0= Off / 1= On (Watchdog)	0= On / 1= Off (data input filter 128µs)	0= On / 1= Off (synchronous I/O mode)	not used
BWU2552 / BWU2620	0= Off / 1= On (peripheral fault)			

AS-i 3.0 Modules in IP67 (M12)

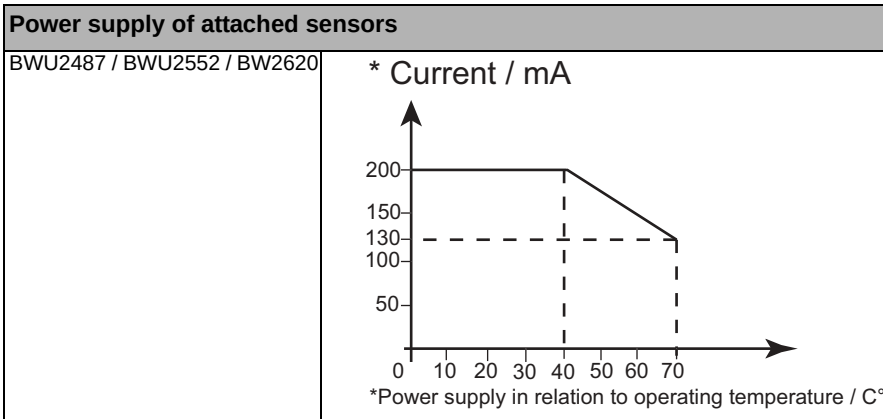
Connections							
Article no.	Connection M12	Marking	Pin1	Pin2	Pin3	Pin4	Pin5
BW2487	X1	I1/I2	24V _{out} of AS-i	I2	0V _{out} of AS-i	I1	nc
	X2	O1/O2	24V _{out} of AS-i	O2	0V _{ext.}	O1	nc
	X3	I3/I4	24V _{out} of AS-i	I4	0V _{out} of AS-i	I3	nc
	X4	O3/O4	24V _{out} of AS-i	O4	0V _{ext.}	O3	nc
BW2552	X1	I1	24V _{out} of AS-i	I2	0V _{out} of AS-i	I1	nc
	X2	I2	24V _{out} of AS-i	nc	0V _{out} of AS-i	I2	nc
	X3	I3	24V _{out} of AS-i	I4	0V _{out} of AS-i	I3	nc
	X4	I4	24V _{out} of AS-i	nc	0V _{out} of AS-i	I4	nc
BW2620	X1	I1	24V _{out} of AS-i	nc	0V _{out} of AS-i	I1	nc
	X2	I2	24V _{out} of AS-i	nc	0V _{out} of AS-i	I2	nc
	X3	I3	24V _{out} of AS-i	nc	0V _{out} of AS-i	I3	nc
	X4	I4	24V _{out} of AS-i	nc	0V _{out} of AS-i	I4	nc
	ADDR (dummy plug)	connection for AS-i addressing device					



Connections						
Article no.	Connection M12	Pin1	Pin2	Pin3	Pin4	Pin5
BWU2617	I1	24V _{out} of AS-i	nc	0V _{out} of AS-i	I1	nc
	I2	24V _{out} of AS-i	nc	0V _{out} of AS-i	I2	nc
	I3	24V _{out} of AS-i	nc	0V _{out} of AS-i	I3	nc
	I4	24V _{out} of AS-i	nc	0V _{out} of AS-i	I4	nc
	O1	0V _{ext out}	nc	0V _{ext out}	O1	nc
	O2	0V _{ext out}	nc	0V _{ext out}	O2	nc
	O3	0V _{ext out}	nc	0V _{ext out}	O3	nc
	O4	0V _{ext out}	nc	0V _{ext out}	O4	nc
	ADDR (dummy plug)	connection for AS-i addressing device				
	I1	24V _{out} of AS-i	I2	0V _{out} of AS-i	I1	nc
	I2	24V _{out} of AS-i	nc	0V _{out} of AS-i	I2	nc
	I3	24V _{out} of AS-i	I4	0V _{out} of AS-i	I3	nc
BWU2626	I1	24V _{out} of AS-i	I2	0V _{out} of AS-i	I1	nc
	I2	24V _{out} of AS-i	nc	0V _{out} of AS-i	I2	nc
	I3	24V _{out} of AS-i	I4	0V _{out} of AS-i	I3	nc
	I4	24V _{out} of AS-i	nc	0V _{out} of AS-i	I4	nc
	O1	0V _{ext out}	O2	0V _{ext out}	O1	nc
	O2	0V _{ext out}	nc	0V _{ext out}	O2	nc
	O3	0V _{ext out}	O4	0V _{ext out}	O3	nc
	O4	0V _{ext out}	nc	0V _{ext out}	O4	nc
	ADDR (dummy plug)	connection for AS-i addressing device				



Signal name	Explanation
Ix	digital input x
Ox	digital output x
24V _{ext out}	positive supply voltage out of external voltage (AUX, acuator supply)
0V _{ext out}	ground supply voltage out of external voltage (AUX, acuator supply)
24V _{out} of AS-i	positive supply voltage out of AS-i (sensor supply)
0V _{out} of AS-	ground supply voltage out of AS-i (sensor supply)



Accessories:

- AS-i substructure module for 4-channel module in 45 mm-housing (art. no. BW2349, see page 294)
- AS-i substructure module (CNOMO) 4-channel module in 45 mm-housing (art. no. BW2350, see page 294)
- AS-i substructure module (CNOMO) for 8-channel module in 60 mm-housing (article no. BW2351, see page 294)
- Protection caps for unused M12 sockets (article no. BW2368, see page 198)

AS-i Analog Module, 2 inputs Pt100 + 4 digital inputs/outputs in IP67 (M12)

AS-i Analog Module, 2 inputs Pt100 + 4 digital inputs/outputs in IP67 (M12)

2 slaves in one housing

- 1 slave with 2 analog inputs PT100
- 1 slave with
 - 4 binary inputs
 - 4 binary outputs

Protection category IP67



Article no. BW2313: AS-i Analog Module, 2 inputs Pt100 + 4 digital inputs/outputs in IP67 (M12)

The analog module has 2 analog inputs for Pt100 sensors. The conversion of the measured value and the data transmission via AS-i occurs according to AS-i Profile 7.A.9. The digital module has 4 binary inputs and 4 binary outputs. Inputs and outputs are completely galvanically isolated. The ground of the binary outputs is connected to 0 V ext.

The sensor-interfaces can be supplied by external voltage (according to PELV) via the black ribbon cable, 1 A max. The resolution of the analog data is 14 or 12 bit. The connection of the sensors and actuators is done via M12 connectors.

Addressing is done through the addressing socket. Both devices use extended addressing (AB address).

Article no.	BW2313
Connection	flat cable and M12
AS-i Profile	analog slave: S-7.A.9, ID1=7 (default) digital slave: S-7.A.7, ID1=7 (fixed)
AS-i voltage	30 V (22 V ... 31,6 V)
Max. AS-i current consumption	80 mA
AUX voltage	24 V (18 V ... 30 V)
Max. AUX current consumption	3 A
Number of analog inputs	2
Power supply of analog inputs	AUX voltage
Analog input level	Pt100, 15 ... 400 Ohm
Analog measuring range	-200°C ... +850°C in 0.1° resolution (-2000 ... +8500) or -120°C ... +130°C in 0.01° resolution (-12000 ... +13000)
Analog conversion speed	240 ms for both sides
Number of digital inputs	4
Power supply of digital inputs	AUX voltage
Digital input level	U < 5 V: low U > 15 V: high
Number of digital outputs	4
Power supply of digital outputs	AUX voltage
Max. digital output current	1 A, Σ 3 A max.
Power supply of attached sensors	1 A max.
Indicator	
LED yellow (AI1)	state of Pt100 sensor AI1
LED yellow (AI2)	state of Pt100 sensor AI2
LED yellow (DI1)	state of digital input DI1
LED yellow (DI2)	state of digital input DI2
LED yellow (DI3)	state of digital input DI3
LED yellow (DI4)	state of digital input DI4
LED yellow (DO1-2)	state of digital output DO1 and DO2
LED yellow (DO3-4)	state of digital output DO3 and DO4
LED green (ASI)	no slave has address 0 or peripheral fault
LED red (FLT)	state of slaves
LED green (AUX)	AUX voltage on
Applied standards	EN 61 131-2, EN 61 000-6-2, EN 61 000-6-3
Operating temperature	0°C ... +70°C
Storage temperature	-20°C ... +85°C
Protection class	IP67
Dimensions (L / W / H in mm)	151 / 60 / 31
Weight	-

Analog slave:

Analog input values:

CH0 Temperature AI1
CH1 Temperature AI2

Programming:

(Bit-settings of AS-i parameters)

Bit P0:

1: peripheral fault is indicated
0: peripheral fault is not indicated

Bit P1:

1: 2-wire mode
0: 4-wire mode

Bit P2:

1: -200 °C ... +850 °C / 0,1 °C
0: -120 °C ... +130 °C / 0,01 °C

Bit P3:

not used

Digital slave:

Digital input values:

DI0 Input DI1
DI1 Input DI2
DI2 Input DI3
DI3 Input DI4

Digital output values:

DO0 Output DO1
DO1 Output DO2
DO2 Output DO3
DO3 Output DO4

Programming:

(Bit-settings of AS-i parameters)

Bit P0:

1: watchdog enabled
0: watchdog disabled

Bit P1:

1: 128µs input filter
0: no input filter

Bit P2:

1: synchronous I/O mode disabled
0: synchronous I/O mode enabled

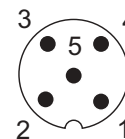
Bit P3:

not used

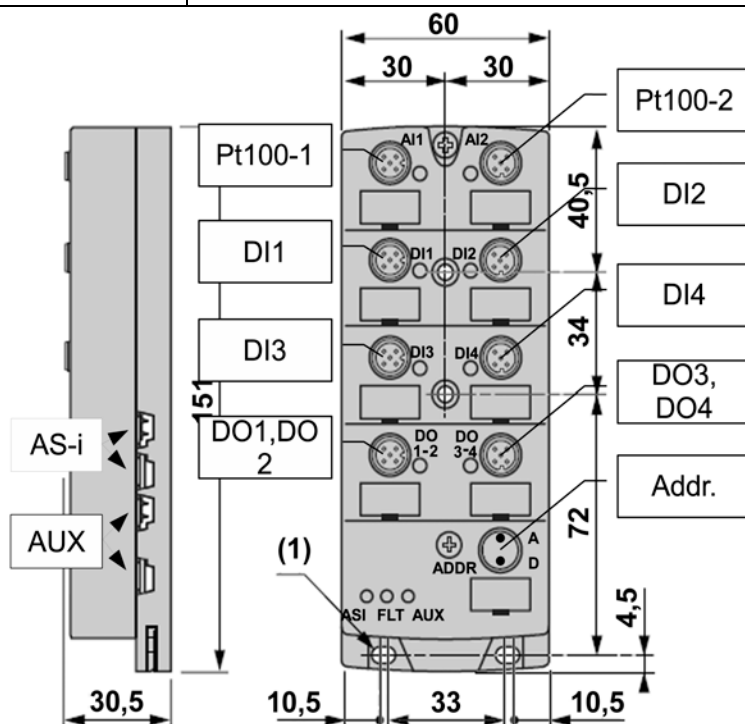
AS-i Analog Module, 2 inputs Pt100 + 4 digital inputs/outputs in IP67 (M12)

Connections

Connector / M12 Pin number	1	2	3	4	5
AI1	CH1+	CH1S+	CH1-	CH1S-	Shield
AI2	CH2+	CH2S+	CH2-	CH2S-	Shield
DI1	24 V ext out	DI2	0 V ext out	DI1	nc
DI2	24 V ext out	nc	0 V ext out	DI2	nc
DI3	24 V ext out	DI4	0 V ext out	DI3	nc
DI4	24 V ext out	nc	0 V ext out	DI4	nc
DO1-2	0 V ext out	DO2	0 V ext out	DO1	nc
DO3-4	0 V ext out	DO4	0 V ext out	DO3	nc
ADDR A, ADDR D	Dummy plug, double AS-i hand-held connector behind				



Signal Name	Explanation
CHx+	Positive terminal for 2-wire sensors and supply terminal for 4-wire sensors
CHxS+	Positive sense terminal for 4-wire sensors. Not used for 2-wire sensors
CHx-	Negative terminal for 2-wire sensors and supply terminal for 4-wire sensors
CHxS-	Negative sense terminal for 4-wire sensors. Not used for 2-wire sensors
Dlx	Digital input x
DOx	Digital output x
24 V ext out	Positive terminal for 2-wire sensors and supply terminal for 4-wire sensors
0 V ext out	Reference sense terminal for 4-wire sensors. Not used for 2-wire sensors



ID1 code definition for the analog slave

ID1	14 bit	12 bit
Channel 1 only	0; 2; 3	1
Channel 1+2	4; 5; 7 (default setting ID1=7)	6

AS-i Analog Module, 2 inputs Pt100 + 4 digital inputs/outputs in IP67 (M12)

LEDs	State	Signal / Description
AI1 (yellow)		Pt100 sensor connected and in range
		no Pt100 sensor connected or sensor out of range
AI2 (yellow)		Channel deactivated or module offline
		Pt100 sensor connected and in range
		no Pt100 sensor connected or sensor out of range
DI1, DI2, DI3, DI4 (yellow)		Input off
		Input on
DO1-2 (yellow)		DO1 and DO2 off
		DO1 or DO2 on
DO3-4 (yellow)		DO3 and DO4 off
		DO3 or DO4 on
ASI (green)		no slave has address 0 or peripheral fault
		at least one slave has address 0 or peripheral fault
FLT (red)		both slaves are online and no slave has peripheral fault
		at least one slave is offline
		at least one slave has peripheral fault
AUX (green)		no AUX voltage present
		AUX voltage presentt

 LED on  LED flashing  LED off

AS-i Master/Gateways/ Links/Scanner
AS-i Slaves
AS-i Accessories/ Diagnostics/Development
Other Fieldbuses/ Master Simulators
AS-i Safety
Price Lists

Overview AS-i Analog Modules

Housing	Module	Art. No.	Characteristic	P.
	AS-i Analog Input Module	BWU1897	2 analog inputs, 4 ... 20 mA and 0 ... 10 V	76
		BWU1345	2 analog inputs, 4 ... 20 mA and 0 ... 10 V	
		BWU1447	SIEMENS compatible scale	
		BWU1726	default power supply 24 V external	
	AS-i Analog Output Module	BWU1412	2 analog outputs, 0 ... 20 mA and 0 ... 10 V	76
		BWU1727	default power supply 24 V external	
		BWU2224	2 analog outputs for ± 10 V	
	AS-i Analog Input Module	BWU1364	4 analog inputs, 4 ... 20 mA	76
		BWU1365	4 analog inputs, 0 ... 10 V	
	AS-i Analog Output Module	BWU1366	4 analog outputs, 0 ... 20 mA	76
		BWU1367	4 analog outputs, 0 ... 10 V	
	AS-i Analog Input Module	BWU1368	4 Pt100 inputs	76
		BWU1933	4 thermocouple inputs type J	
		BWU2243	4 thermocouple inputs type K	
	AS-i Analog Input Module	BWU1232	2 analog inputs, 4 ... 20 mA, protection category IP65	83
		BWU1233	2 analog inputs, 0 ... 10 V, protection category IP65	
	AS-i Analog Output Module	BWU1234	2 analog outputs, 0 ... 20 mA, protection category IP65	84
		BWU1235	2 analog outputs, 0 ... 10 V, protection category IP65	
	AS-i Analog Module	BWU1254	4 Pt100 inputs, protection category IP65	85
		BWU1509	4 Pt1000 inputs, protection category IP65	
		BWU1552	2 Pt100 inputs + 2 relais outputs, protection category IP65	86
	AS-i Balance Controller	BWU2240	AS-i connection for a 6 lines balance cell, protection category IP65, calibration with AS-i Control Tools	87
	AS-i Analog Input Module	BWU1893	2 inputs 4 ... 20 mA on AS-i with M12 connectors, protection category IP65, AS-i 3.0 AB slave	88
		BWU1894	2 inputs 4 ... 20 mA on AS-i with M12 connectors, protection category IP65, AS-i 2.1 single slave	
		BWU1895	2 inputs Pt100 on AS-i with M12 connectors, protection category IP65, AS-i 3.0 AB slave	
		BWU2086	see BWU1895, second input via ID1 deactivated	
		BWU2050	2 inputs Pt100 on AS-i with M12 connectors, protection category IP65, AS-i 2.1 single slave	
	AS-i Analog Input Module	BWU1963	2 inputs 0 ... 10 V on AS-i with M12 connectors, protection category IP65, AS-i 3.0 AB slave	90
		BWU1964	2 inputs 0 ... 10 V on AS-i with M12 connectors, protection category IP65, AS-i 2.1 single slave	

AS-i Master/Gateways/ Links/Scanner
AS-i Slaves
AS-i Accessories/ Diagnostics/Development
Other Fieldbuses/ Master Simulators
AS-i Safety
Price Lists

Housing	Module	Art. No.	Characteristic	P.
	AS-i Analog Module	BWU1853	1 analog input/1 analog output, 4 ... 0 mA or 0 ... 10 V in one module, 24 V auxiliary on M12, protection category IP65	91
		BWU1917	1 analog input/1 analog output, 4 ... 0 mA or 0 ... 10 V in one module, supplied out of AS-i, protection category IP65	
	AS-i Analog Input Module	BWU1359	4 analog inputs on M12 socket, 4 ... 20 mA, protection category IP65	93
		BWU2049	4 analog inputs on M12 socket, 4 ... 20 mA, protection category IP65, Siemens format	
		BWU1360	4 analog inputs on M12 socket, 0 ... 10 V, protection category IP65	
		BWU1742	4 analog inputs on M12 socket, 0 ... 10 V, advanced temperature range, protection category IP65	
	AS-i Analog Output Module	BWU1361	4 analog outputs on M12 socket, 0 ... 20 mA, protection category IP65	95
		BWU1362	4 analog outputs on M12 socket, 0 ... 10 V, protection category IP65	
		BWU1722	4 analog outputs on M12 socket, 0 ... 20 mA, protection category IP65	
		BWU1736	4 analog outputs on M12 socket, 0 ... 10 V, advanced temperature range, protection category IP65	
	AS-i Analog Module	BWU1363	4 Pt100 inputs on M12 socket, protection category IP65, 4-wire mode	97
		BWU2532	4 Pt100 inputs on M12 socket, protection category IP65, 3-wire mode	

With the new AS-i specification it is possible to transmit analog values via AS-Interface as simple as binary signals. For these reasons the new AS-i slave profiles 7.3 and 7.4 for the transmission of analog values have been defined. According to the profile 7.3 the AS-i master puts the analog slaves into operation in the same way as the digital slaves and starts the data exchange automatically. The host system (PC, PLC, Fieldbus) can read the 16 bit-value directly out of the AS-i master. The analog value transmission between AS-i master and AS-i slave is done invisibly for the user.

The user's advantages are obvious. He does not have to pay attention to the handling of the data transmission. This means in the majority of applications that the transmission time of analog values via AS-i will be reduced because the transmission time depends on the AS-i cycle time and not as it was before on the cycle time of the PLC program.

Bihl+Wiedemann has developed AS-i analog modules for safe and direct connection of sensors and actuators according to the new standardized Profile 7.3.

Analog data such as pressure and room temperature is transmitted by the module in interference-free digital signal form. In factory applications the module is installed as with isolation amplifier or real power transformer. The protection class IP65 modules are simply clamped onto the AS-i cable via AS-i penetration technology and then directly supported by the AS-i master: **Simply Plug and Play!** There is no need to program a function block to transmit the AS-i analog value via AS-i. The range consists of different AS-i analog modules:

2/4 analog inputs 0 - 10 V, 2/4 analog inputs 4 - 20 mA, 4 analog inputs Pt100, 2/4 analog outputs 0 - 10 V, 2/4 analog outputs 0 - 20 mA. The modules with IP65 protection can be directly installed in the field.



AS-i Analog Module (M12) in IP65



AS-i Analog Module (PG) in IP65



AS-i Analog Module IP20, 2 channels



AS-i Analog Module IP20, 4 channels



AS-i Analog Module (M12) in IP65, 2 channels



AS-i Analog Module (M12) in IP65, 4 channels

AS-i Analog Modules IP20

AS-i Analog Modules IP20

AS-i 3.0 Specification

„Plug and Play“ – as simply as digital AS-i I/O

Protection category IP20



BWU1345 / BWU1412 / BWU1364 / BWU1365 /
BWU1447 / BWU1726 / BWU1366 / BWU1367 /
BWU1727 / BWU1897 / BWU1368 / BWU1933 /
BWU2224 BWU2243



Article Nr.	BWU1345 BWU1364 BWU1365 BWU1447 BWU1726	BWU1368	BWU1897	BWU1933 BWU2243	BWU1366 BWU1367	BWU1412	BWU1727	BWU2224
General Data								
Device type	input				output			
Connection								
Periphery connection	COMBICON clamp							
AS-i connection	COMBICON clamp							
AS-i								
AS-i Profile	S-7.3		S-7.A.9	S-7.3			S-7.3.5	
Slave-type	Single Slave (up to 31)		AB Slave (up to 62)	Single Slave (up to 31)				
Required Master profile	≥ M3		≥ M4	≥ M3				
Operating voltage	AS-i voltage 30V DC							
Max. AS-i current consumption	< 80mA			< 100mA	< 80mA			< 100mA
AUX								
AUX voltage	-							18 .. 30V
Max. AUX current consumption	-							100mA
Input								
Internal resistance	50Ω / 100kΩ	-	50Ω / 100kΩ	1MΩ	-			
Max. input voltage	25V	-	25V	-				
Max. input current	40mA	-	40mA	-				
Power supply of attached sensors	out of AS-i / 24V DC extern				-			
Output								
Resistance of the Actuators	-							≥ 1kΩ
Max. output current	-							10mA
Power supply	-				out of AS-i / 24V DC extern	default out of AS-i	default out of 24V DC extern	24V DC external (AUX)
Environment								
Applied standards	EN 61 000-6-2 EN 61 000-6-4							
Housing	housing for DIN-rail mounting							
Operating temperature	0°C ... +70°C							0°C ... +60°C
Storage temperature	-25°C ... +85°C							
Protection category DIN 40 050	IP20							
Voltage of insulation	≥ 500V							

Selection matrix			Standard signal						
Article Nr.	Inputs	Outputs	Current	Voltage	Others	AS-i address	Resolution	Range of value	from AS-i version
BWU1412, BWU1727	–	2	0 ... 20mA	0 ... 10V	–	Single address	16 Bit (1µA/1mV)	0 ... 20000 dez. / 0 ... 10000 dez.	2.1
BWU2224	–	2	–	±10V	–	Single address	16 Bit	-10000 ... +10000 dez.	2.1
BWU1366	–	4	0 ... 20mA	–	–	Single address	16 Bit (1µA)	0 ... 20000 dez.	2.1
BWU1367	–	4	–	0 ... 10V	–	Single address	16 Bit (1mV)	0 ... 10000 dez.	2.1
BWU1345, BWU1726	2	–	4 ... 20mA	0 ... 10V	–	Single address	16 Bit (1µA/1mV)	4000 ... 20000 dez. / 0 ... 10000 dez.	3.0
BWU1447	2	–	4 ... 20mA	0 ... 5V	–	Single address	16 Bit (1µA/1mV)	0 ... 27648 dez. / 0 ... 27648 dez.	3.0
BWU1897	2	–	4 ... 20mA	0 ... 10V	–	A/B address	14 Bit (1µA/1mV)	4000 ... 20000 dez. / 0 ... 10000 dez.	3.0
BWU1364	4	–	4 ... 20mA	–	–	Single address	16 Bit (1µA)	4000 ... 20000 dez.	2.1
BWU1365	4	–	–	0 ... 10V	–	Single address	16 Bit (1mV)	0 ... 10000 dez.	2.1
BWU1368	4	–	–	–	Pt100	Single address	16 Bit (0,1°C)	-200°C ... +850°C	2.1
BWU1933	4	–	–	–	thermocouple type J	Single address	16 Bit (0,1°C)	-200° .. +760°C	2.1
BWU2243	4	–	–	–	thermocouple type K	Single address	16 Bit (0,1°C)	-200° .. +760°C	2.1

Programming of input						
Bit setting	Article Numbers					
	BWU1345, BWU1726	BWU1364, BWU1365	BWU1368	BWU1447	BWU1897	BWU1933, BWU2243
P0:						
0: 60H filter in A/D converter active 1: 50H filter in A/D converter active	•	•	•	•	•	•
P1:						
0: normal operation 1: both channels in current mode and without broken wire recognition	–	–	–	–	•	–
0: channel 2 is not projected 1: channel 2 is projected	•	–	–	•	–	–
Analog modul is switched on-/off (bit combination P1 and P2)	–	•	–	–	–	–
A peripheral fault can be released through channel X (bit combination P1 and P2)	–	–	•	–	–	•
P2:						
0: peripheral fault is indicated 1: peripheral fault is not indicated	•	–	–	•	•	–
Analog modul is switched on-/off (bit combination P1 and P2)	–	•	–	–	–	–
A peripheral fault can be released through channel X (bit combination P1 and P2)	–	–	•	–	–	•
P3:						
0: normal operation 1: both channels in current mode and without broken wire recognition	•	–	–	–	–	–
0: peripheral fault is indicated 1: peripheral fault is not indicated	–	•	–	–	–	–
0: 4 wire-mode 1: 2 wire-mode	–	–	•	–	–	–
0: external cold-junction compensation 1: internal cold-junction compensation	–	–	–	–	–	•

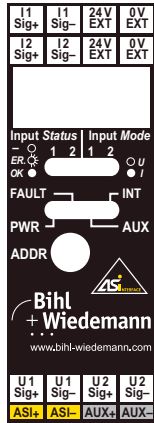
Combination of input bits P1 and P2																	
BWU1364, BWU1365						BWU1368						BWU1933, BWU2243					
analog module is						peripheral fault can be released through channel						channel c.X is					
P1	P2	1	2	3	4	P1	P2	1	2	3	4	P1	P2	c.1	c.2	c.3	c.4
0	0	on	off	off	off	0	0	yes	no	no	no	0	0	on	off	off	off
0	1	on	on	off	off	0	1	yes	yes	no	no	0	1	on	on	off	off
1	0	on	on	on	off	1	0	yes	yes	yes	no	1	0	on	on	on	off
1	1	on	on	on	on	1	1	yes	yes	yes	yes	1	1	on	on	on	on

Programming of output			
Bit setting		Article Numbers	
		BWU1366, BWU1367	BWU1412, BWU1727
P0:		BWU2224	
0: mode of channel 1 and 2 (bit combination P1 and P3) 1: automatic mode recognition		–	•
0: profile is not monitored 1: profile is monitored1:		•	–
P1:			
0: chanal 1 is voltage module 1: chanal 1 is current module		–	•
P2:			
0: peripheral fault is indicated 1: peripheral fault is not indicated		•	•
P3:			
0: chanal 2 is voltage module 1: chanal 2 is current module		–	•

Programming notes				
Article Nr.	ID Code	ID1 Code	ID2 Code	IO Code
BWU1345, BWU1447, BWU1726	3 _{hex}	–	D _{hex}	7 _{hex}
BWU1364, BWU1365, BWU1368, BWU1933, BWU2243	3 _{hex}	–	E _{hex}	7 _{hex}
BWU1366, BWU1367	3 _{hex}	–	6 _{hex}	7 _{hex}
BWU1412, BWU1727	9 _{hex}	–	5 _{hex}	7 _{hex}
BWU1897 ¹	A _{hex}	Code-Definition		9 _{hex}
		ID1	14 bit	
		channel 1	0; 2; 3	
		channel 1 and 2	4; 5; 7 (default)	
BWU2224	3 _{hex}	F _{hex} (default)		5 _{hex}

1. BWU1897 can transfer either 12 or 14 bit-values. Via ID1 the data capacity and the channel number can be defined.

Connections BWU1345, BWU1447, BWU1726

Dimensions (W / H / D) in mm		99 / 22,5 / 92
1	I1 Sig.+	
2	I1 Sig.-	
3	24V ext.	
4	0V ext.	
5	I2 Sig.+	
6	I2 Sig.-	
7	24V ext.	
8	0V ext.	
9	U1 Sig.+	
10	U1 Sig.-	
11	U2 Sig.+	
12	U2 Sig.-	
13	AS-i+	
14	AS-i-	
15	AUX+	
16	AUX-	

LEDs BWU1345, BWU1447, BWU1726

LED PWR (green)	AS-i voltage
LED FAULT (red)	AS-i communication error, peripheral fault
LED AUX (green)	voltage supply 24V for the analog part
LED INT (green)	voltage supply for the analog part out of AS-i
LED Analog 1 (green)	state of channel 1
LED Analog 2 (green)	state of channel 2
LED Analog 1 (green)	on: current measurement; off: voltage measurement
LED Analog 2 (green)	on: current measurement; off: voltage measurement

Current or voltage modules can be attached over different clamps. The current supply of the sensors can take place depending upon position of a slide switch from AS-i or from external voltage (after PELV). With the help of a 2. slide switch the 2. channel in favor of faster data communication can be switched off. The position of the slide switches is indicated over LEDs.

Supplying external loads:

- by supply out of AS-i: 50mA max.
- y external supply: 500mA max. (750mA fuse)

Attention: no PE connection at 24V aux. supply!

Connections BWU1364, BWU1365

Dimensions (W / H / D) in mm		105 / 22,5 / 114
1	24V ext.	
2	I1 Sig.+	
3	0V ext.	
4	I1 Sig.-	
5	24V ext.	
6	I2 Sig.+	
7	0V ext.	
8	I2 Sig.-	
9	24V ext.	
10	I3 Sig.+	
11	0V ext.	
12	I3 Sig.-	
13	24V ext.	
14	I4 Sig.+	
15	0V ext.	
16	I4 Sig.-	
17	AS-i+	
18	AS-i-	
19	AUX+	
20	AUX-	

LEDs BWU1364, BWU1365

LED PWR (green)	AS-i voltage
LED FAULT (red)	AS-i communication error, peripheral fault
LED AUX (green)	voltage supply 24V for the analog part
LED DIAG (green)	diagnosis
LED I1 ... I4 (green)	state of channel I1, I2, I3, I4

The current supply of the sensors can be made out of AS-i or an external voltage supply (according to PELV). The current supply switches automatically to the supply out of external voltage supply, as soon as an external voltage is connected. The analog sensors and AS-i are galvanically separated.

Connections BWU1366, BWU1367

Dimensions (W / H / D) in mm		105 / 22,5 / 114
1	24V ext.	
2	O1 Sig.+	
3	0V ext.	
4	O1 Sig.-	
5	24V ext.	
6	O2 Sig.+	
7	0V ext.	
8	O2 Sig.-	
9	24V ext.	
10	O3 Sig.+	
11	0V ext.	
12	O3 Sig.-	
13	24V ext.	
14	O4 Sig.+	
15	0V ext.	
16	O4 Sig.-	
17	AS-i+	
18	AS-i-	
19	AUX+	
20	AUX-	

The current supply of the actuators can be made out of AS-i or an external voltage supply (according to PELV). The current supply switches automatically to the supply out of external voltage supply, as soon as an external voltage is connected.
The actuators and AS-i are galvanically separated.

LEDs BWU1366, BWU1367

LED PWR (green)	AS-i voltage
LED FAULT (red)	AS-i communication error, peripheral fault
LED AUX (green)	voltage supply 24V for the analog part
LED DIAG (green)	diagnosis
LED O1 ... O4 (green)	state of channel O1, O2, O3, O4

Connections BWU1368

Dimensions (W / H / D) in mm		105 / 22,5 / 114
1	FE	
2	FE	
3	FE	
4	FE	
5	CH1 S+	
6	CH1+	
7	CH1-	
8	CH1 S-	
9	CH2 S+	
10	CH2+	
11	CH2-	
12	CH2 S-	
13	CH3 S+	
14	CH3+	
15	CH3-	
16	CH3 S-	
17	CH4 S+	
18	CH4+	
19	CH4-	
20	CH4 S-	
21	AS-i+	
22	AS-i-	

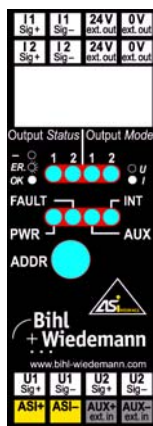
The measuring sensors and AS-i are galvanically separated.

LEDs BWU1368

LED PWR (green)	AS-i voltage
LED FAULT (red)	AS-i communication error, peripheral fault
LED I1 ... I4 (yellow)	state of channel I1, I2, I3, I4

Connections BWU1412, BWU1727, BWU1897

Dimensions (W / H / D) in mm	99 / 22,5 / 92
1	I1 Sig.+
2	I1 Sig.-
3	24 V ext.
4	0 V ext.
5	I2 Sig.+
6	I2 Sig.-
7	24 V ext.
8	0 V ext.
9	U1 Sig.+
10	U1 Sig.-
11	U2 Sig.+
12	U2 Sig.-
13	AS-i+
14	AS-i-
15	AUX+
16	AUX-



LEDS BWU1412, BWU1727, BWU1897

LED PWR (green)	AS-i voltage
LED FAULT (red)	AS-i communication error, peripheral fault
LED AUX (green)	voltage supply 24V for the analog part
LED INT (green)	voltage supply for the analog part out of AS-i
LED Analog 1 (green)	state of channel 1
LED Analog 2 (green)	state of channel 2
LED Analog 1 (green)	channel 1: on: current measurement; off: voltage measurement
LED Analog 2 (green)	channel 2: on: current measurement; off: voltage measurement

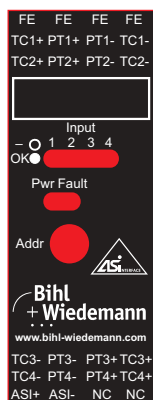
Current or voltage modules can be attached over different clamps. The current supply of the actuators can take place depending upon position of a slide switch from AS-i or from external voltage (after PELV). The position of the slide switch is indicated over LEDs.

BWU1897: With the help of a 2. slide switch the 2. channel in favor of faster data communication can be switched off.

Attention: no PE connection at 24V aux. supply!

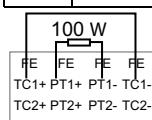
Connections BWU1933, BWU2243

Dimensions (W / H / D) in mm	105 / 22,5 / 114
1	FE
2	FE
3	FE
4	FE
5	TC1+
6	PT1+
7	PT1-
8	TC1-
9	TC2+
10	PT2+
11	PT2-
12	TC2-
13	TC3+
14	PT3+
15	PT3-
16	TC3-
17	TC4+
18	PT4+
19	PT4-
20	TC4-
21	AS-i+
22	AS-i-
23	nc
24	nc



Terminal connections BWU1933, BWU2243

FE	functional earth
TCx±	thermo element +/- (inputs 1 - 4)
PTx±	PT100 +/- (External cold junction compensation)
AS-i±	AS-Interface +/-
NC	not connected



The inputs ch. 2, ch. 3 and ch 4 are connected with a bridge and a resistor (in default state) to become a valid input value and to avoid peripheral faults.

This can also be obtained by setting the paramater P1 and P2.

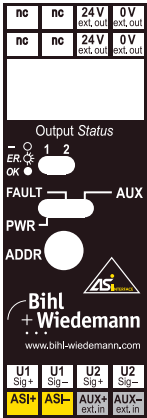
The temperature is measured using cold junction temperature compensation. The analog sensors are galvanical separated to AS-i. For internal compensation the peripheral fault can be caused by a broken wire of the thermocouple. For the external compensation (Pt100 in connectors 2 and 3) the peripheral fault can also be caused by a broken wire or a short circuit of the Pt100 element. A short circuit of the TC cannot be recognised as an error.

Note:

Precise cold junction compensation requires vertical mounting and natural air circulation. A clearance of at least 5cm each side is required!

LEDs BWU1933, BWU2243

LED PWR (green)	AS-i voltage
LED FAULT (red)	AS-i communication error, peripheral fault
LED In1 ... In4 (yellow)	state of channel I1, I2, I3, I4

Connections BWU2224		
Dimensions (W / H / D) in mm		105 / 22,5 / 114
1	nc	
2	nc	
3	24V _{ext.out}	
4	0V _{ext.out}	
5	nc	
6	nc	
7	24V _{ext.out}	
8	0V _{ext.out}	
9	U1 Sig.+	
10	U1 Sig.-	
11	U2 Sig.+	
12	U2 Sig.-	
13	AS-i+	
14	AS-i-	
15	AUX+ _{ext.in}	
16	AUX- _{ext.in}	

U1 Sig.- and U2 Sig.- connected.

The outputs are short circuit. The output channels have a common reference potential. The actuators are controlled from separate 24V and they are galvanically isolated from AS-i and AUX.

LEDs BWU2224	
LED PWR (green)	AS-i voltage
LED FAULT (red)	on: AS-i communication error; flashing: peripheral fault
LED AUX (green)	voltage supply 24V for the analog part
LED 1 (yellow)	state of channel 1
LED 2 (yellow)	state of channel 2

AS-i Analog Module: 2 analog Inputs

2 analog Inputs

4 ... 20 mA
0 ... 10 V

Profile 7.3 "Plug and Play"
As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1232 for 4 ... 20 mA

Article no. BWU1233 for 0 ... 10 V

The analog modules have 2 analog inputs. The conversion of the measured value and the data transmission via AS-i occurs asynchronously according to AS-i Profile 7.3. 2 analog sensors can be connected via cage clamp terminals. The sensors can be sup-

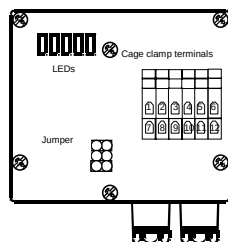
plied by AS-i or external voltage (according to PELV) via the black ribbon cable. The resolution of the analog data is 16 bit. The analog modules contain 50 Hz and 60 Hz filters. These filters can be optionally activated with the help of the AS-i parameters.

Article no.	BWU1232	BWU1233
Inputs	2 inputs 4 ... 20 mA	2 inputs 0 ... 10 V
Voltage supply, sensors	via AS-i/extern	via AS-i/extern
Internal resistance	50 Ω	100 kΩ
Max. input current	40 mA	—
Max. input voltage	—	25 V
Resolution	16 bit/1 µA	16 bit/1 mV
Range of value	4000 ... 20000 dec.	0 ... 10000 dec.
AS-i Profile	7.3	
ID Code	3 _{hex}	
ID2 Code	D _{hex}	
IO Code	7 _{hex}	
Displays		
LED green (analog 1)	analog signal1	
LED green (analog 2)	analog signal2	
LED green (AUX)	power on	
LED green (PWR)	AS-i voltage	
LED red (FAULT)	AS-i communication error, peripheral fault	
Operating current	< 80 mA	
Operating voltage	AS-i (30 V DC)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 081-2, EN 61 000-6-2	
Ambient operating temperature	0°C ... +70°C	
Storage temperature	-25°C ... +85°C	
Housing	housing for DIN-rail mounting	
Case connector	2*M16x1,5, 1*M12x1,5	
Dimensions (L, W, H)	90 mm, 80 mm, 70 mm	
Protection category (DIN 40 050)	housing IP65	

Connections:

1	24V ext.	7	24V ext.
2	Sig.+ Ch2	8	Sig.+ Ch1
3	0V ext.	9	0V ext.
4	Sig.- Ch2	10	Sig.- Ch1
5	Shield	11	FG
6	Shield	12	FG

FG: Function ground



Programming:

(Bit-setting of AS-i parameters)

Bit P0:

- 1: 50 Hz filter in A/D Converter active
- 0: 60 Hz filter in A/D Converter active

Bit P1:

- 1: Channel 2 is projected
- 0: Channel 2 is not projected

Bit P2:

- 1: Peripheral fault (e. g. broken wire to the sensor) is indicated
- 0: Peripheral fault (e. g. broken wire to the sensor) is not indicated

Bit P3:

not used

Accessories:

AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (Art. no. BW1181, see also page 195)

AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (Art. no. BW1183, see also page 195)

AS-i Analog Module: 2 analog Outputs

2 analog Outputs

0 ... 20 mA
0 ... 10 V

Profile 7.3 "Plug and Play"
As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1234 for 0 ... 20 mA

Article no. BWU1235 for 0 ... 10 V

The analog modules have 2 analog outputs. The digital-analog conversion and the data transmission via AS-i occurs asynchronously according to AS-i Profile 7.3. 2 analog actuators can be

connected via cage clamp terminals. The actuators can be supplied by AS-i or external voltage (according to PELV) via the black ribbon cable. The resolution of the analog data is 16 bit.

Article no.	BWU1234	BWU1235
Outputs	2 outputs 0 ... 20 mA	2 outputs 0 ... 10 V
Voltage supply	via AS-i/extern	via AS-i/extern
Output limit		
Resolution	16 bit/1 μ A	16 bit/1 mV
Range of value	0 ... 20000 dec.	0 ... 10000 dec.
AS-i Profile	7.3	
ID Code	3 _{hex}	
ID2 Code	5 _{hex}	
IO Code	7 _{hex}	
Displays		
LED green (Analog 1)	analog signal 1	
LED green (Analog 2)	analog signal 2	
LED green (AUX)	Power on	
LED green (PWR)	AS-i voltage	
LED red (FAULT)	AS-i communication error, peripheral fault	
Operating current	< 80 mA	
Operating voltage	AS-i (30 V DC)	
Voltage of insulation	$\geq$ 500 V	
EMC directions	EN 50 081-2, EN 61 000-6-2	
Ambient operating temperature	0°C ... +70°C	
Storage temperature	-25°C ... +85°C	
Housing	housing for DIN-rail mounting	
Case connector	2*M16x1,5, 1*M12x1,5	
Dimensions (L, W, H)	90 mm, 80 mm, 70 mm	
Protection category (DIN 40 050)	housing IP65	

Programming:

(Bit-setting of AS-i parameters)

Bit P0:
not used

Bit P1:
not used

Bit P2:
1: Peripheral fault (e. g. broken wire to the sensor) is indicated
0: Peripheral fault (e. g. broken wire to the sensor) is not indicated

Bit P3:
not used

Accessories:

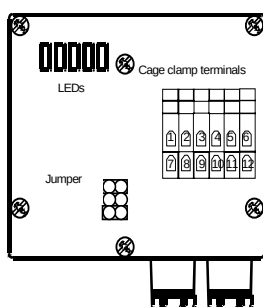
AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (Art. no. BW1181, see also page 195)

AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (Art. no. BW1183, see also page 195)

Connections:

1	24 V ext.	7	24 V ext.
2	Sig.+ Ch2	8	Sig.+ Ch1
3	0V ext.	9	0 V ext.
4	Sig.- Ch2	10	Sig.- Ch1
5	Shield	11	FG
6	Shield	12	FG

FG: Function ground



AS-i Analog Module: 4 Pt100/Pt1000 Inputs

4 inputs Pt100 and Pt1000 respectively

Profile 7.3 "Plug and Play"
As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1254: 4 Pt100 Inputs

Article no. BWU1509: 4 Pt1000 Inputs

The analog modules have 4 Pt100 inputs and 4 Pt1000 inputs respectively. The conversion of the measured value and the data transmission via AS-i occurs asynchronously according to AS-i Profile 7.3. 4 analog sensors can be connected via cage clamp

terminals. The sensors can be supplied by AS-i. The resolution of the analog data is 16 bit/0,1°C. The Pt100/Pt1000 module contains 50 Hz and 60 Hz filters. These filters can be optionally activated with the help of the AS-i parameters.

Article no.	BWU1254	BWU1509
Inputs	4 Pt100 inputs	4 Pt1000 inputs
Supply	via AS-i/extern	
Resolution/Bit	16 bit/0,1 °C	
Measuring range [°C]	-200°C ... +850°C	
AS-i Profile	7.3	
ID Code	3 _{hex}	
ID2 Code	E _{hex}	
IO Code	7 _{hex}	
Displays		
LED green (Analog 1)	analog signal 1	
LED green (Analog 2)	analog signal 2	
LED green (Analog 3)	analog signal 3	
LED green (PWR)	AS-i voltage	
LED red (FAULT)	AS-i communication error, peripheral fault	
LED green (Analog 4)	analog signal 4	
Operating current	< 80 mA	
Operating voltage	AS-i (30 V DC)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 081-2, EN 61 000-6-2	
Ambient operating temperature	0°C ... +70°C	
Storage temperature	-25°C ... +85°C	
Housing	housing for DIN-rail mounting	
Case connector	8*M12x1,5	
Dimensions (L, W, H)	90 mm, 80 mm, 70 mm	
Protection category (DIN 40 050)	housing IP65	

Programming:
(Bit-setting of AS-i parameters)

Bit P0:
1: 50 Hz filter in A/D Converter active
0: 60 Hz filter in A/D Converter active

Bit P1 and P2:
Peripheral fault can be caused by channel:

P1	P2	1	2	3	4
0	0	yes	no	no	no
0	1	yes	yes	no	no
1	0	yes	yes	yes	no
1	1	yes	yes	yes	yes

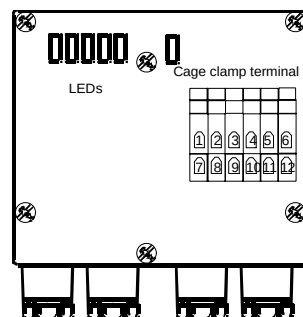
Bit P3:
1: 2-wire mode
0: 3-wire mode

Accessories:
AS-i substructure module to connect 2 AS-i flat cables (Art. no. BW1180, see also page 195)

AS-i substructure module to connect 2 AS-i round cables (Art. no. BW1182, see also page 195)

Connections:

1	channel 1+
2	channel 1 Sense-
3	channel 1 -
4	channel 2 +
5	channel 2 Sense-
6	channel 2 -
7	channel 3 +
8	channel 3 Sense-
9	channel 3 -
10	channel 4 +
11	channel 4 Sense-
12	channel 4 -



1, 4, 7, 10 are internally connected

AS-i Analog Module: 2 Pt100 Inputs + 2 Relais Outputs

**Bihl
+ Wiedemann**

THE AS-INTERFACE MASTERS

2 Pt100 Inputs + 2 Relais Outputs

Profile 7.3 "Plug and Play"
As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1552

The analog module has 2 Pt100 inputs and 2 relais outputs. The conversion of the measured value and the data transmission via AS-i occurs asynchronously according to AS-i Profile 7.3. 2 analog sensors can be connected via cage clamp terminals. The sensors can be supplied by AS-i. The resolution of the analog

data is 16 bit/0,1°C. The Pt100 module contains 50 Hz and 60 Hz filters. These filters can be optionally activated with the help of the AS-i parameters.

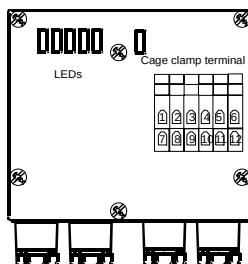
The relais outputs are galvanically isolated SPDT Reed-relais. They are switched with parameter bits P2 and P3.

Article no.	BWU1552
Inputs	2 Pt100 inputs
Outputs	2 relais outputs
Supply	via AS-i/extern
Resolution/Bit	16 bit/0,1 °C
Measuring range [°C]	-200°C ... +850°C
AS-i Profile	7.3
ID Code	3 _{hex}
ID2 Code	D _{hex}
IO Code	7 _{hex}
Displays	
LED green (Analog 1)	analog signal 1
LED green (Analog 2)	analog signal 2
LED yellow (Rel 1)	relais 1
LED green (PWR)	AS-i voltage
LED red (FAULT)	AS-i communication error, peripheral fault
LED yellow (Rel 2)	relais 2
Operating current	< 80 mA
Operating voltage	AS-i (30 V DC)
Voltage of insulation	≥ 500 V
Relais	SPDT, max 50 V, max. 0.5 A
EMC directions	EN 50 081-2, EN 61 000-6-2
Ambient operating temperature	0°C ... +70°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Case connector	8*M12x1,5
Dimensions (L, W, H)	90 mm, 80 mm, 70 mm
Protection category (DIN 40 050)	housing IP65

Connections:

1	channel 1+	7	relais 1 - NO
2	channel 1 Sense-	8	relais 1 - COM
3	channel 1 -	9	relais 1 - NC
4	channel 2 +	10	relais 2 - NO
5	channel 2 Sense-	11	relais 2 - COM
6	channel 2 -	12	relais 2 - NC

1 and 4 are internally connected



Programming:

(Bit-setting of AS-i parameters)

Bit P0:

- 1: 50 Hz filter in A/D Converter active
- 0: 60 Hz filter in A/D Converter active

Bit P1:

- 1: 2-wire mode
- 0: 3-wire mode

Bit P2:

- 0: Relais 1 on
- 1: Relais 1 off

Bit P3:

- 0: Relais 2 on
- 1: Relais 2 off

Accessories:

AS-i substructure module to connect 2 AS-i flat cables (Art. no. BW1180, see also page 195)

AS-i substructure module to connect 2 AS-i round cables (Art. no. BW1182, see also page 195)

AS-i Balance Controller

AS-i connection for a 6-wire load cell

Weights directly via AS-i

Tara via AS-i parameter



Article no. BWU2240: Calibration with AS-i Control Tools

The AS-i Balance Controller allows the connection of a load cell to AS-i. The weight will be transferred as 16 bits analog value. Via AS-i the weight is available to nearly all controls as 16 bits value. The setting and deleting of tara is made with the help of 2 AS-i parameters. The tara value is stored remanent.

The 6-wire load cells are connected directly via heavy gauge terminals onto a cage clamp block in the AS-i load cell controller. The AS-i load cell controller is located in a robust IP65 housing and can so be mounted near to the load cell. Longer wires

between cells and controller can be avoided. The calibration is executed with the help of AS-i Control Tools and any AS-i 3.0 Bihl+Wiedemann Master. With the calibration on 2 points of reference the average value of 50 measurements is formed. The output for a reference weight can be set likewise simply with the help of the Windows software. As long as the scales controller was not calibrated on a load cell, the expenditure of the measured values takes place in mV/V (1 mV/V corresponds to 5000 decimally).

Article no.	BWU2240
Inputs	1 load cell
Sensor supply	via AS-i
Resolution	16 bit
Range of values	adjustable
AS-i Profile	7.5.5
ID Code	3 _{hex}
ID2 Code	C _{hex}
IO Code	7 _{hex}
Displays	
LED yellow (CAL)	calibration
LED green (IN)	load cell connected
LED green (PWR)	AS-i voltage
LED red (FAULT)	AS-i communication error, peripheral fault
Operating current	< 80 mA
Operating voltage	AS-i (30 V DC)
Voltage of insulation	≥ 500 V
EMC	according to EN 50 081-2, EN 61 000-6-2
Ambient operating temperature	0°C ... +70°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Case connector	2*M16x1,5, 1*M12x1,5
Dimensions (L / W / H in mm)	90 / 80 / 70
Protection category (DIN 40 050)	housing

Accessories:

Windows software for calibration

Calibration Master (art. no. BWU1728)

AS-i substructure module to connect 2 AS-i flat cable (art. no. BW1180, page 195)

AS-i substructure module to connect 2 AS-i round cable (art. no. BW1182, page 195)

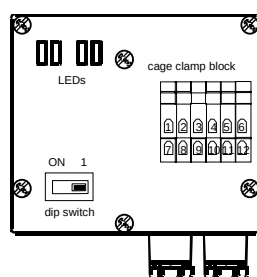
Software "AS-i Control-Tools" (art. no. BW1203, page 48)

Software "AS-i Control-Tools" with serial transmission cord for AS-i Master in Stainless Steel (art. no. BW1602, page 48)

AS-i Parameter	
0	Set tara
1	Delete tara
B	Filter 4 s
C	Filter 3 s
D	Filter 2 s
E	Filter 1 s
F	No filter

Connections

Pin	Connection
1, 7	Supply +
2, 8	Sensor line +
3, 9	Output +
4, 10	Output -
5, 11	Sensor line-
6, 12	Supply -



Switch 1: Normal operation

AS-i 3.0 Analog Module: 2 analog Inputs (M12)



THE AS-INTERFACE MASTERS

2 analog inputs, either 4 ... 20 mA or 2 Pt100 inputs

Infrared interface for slave addressing

Profile 7.3 "Plug and Play"

As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1893: 2 inputs 4 ... 20 mA on AS-i with M12 connectors in IP65, AS-i 3.0 AB Slave

Article no. BWU1894: 2 inputs 4 ... 20 mA on AS-i with M12 connectors in IP65, AS-i 2.1 Single Slave

Article no. BWU1895: 2 inputs Pt100 on AS-i with M12 connectors in IP65, AS-i 3.0 AB Slave

Article no. BWU2086: see BWU1895, second input via ID1 deactivated

Article no. BWU2050: 2 inputs Pt100 on AS-i with M12 connectors in IP65, AS-i 2.1 Single Slave

The analog module has 2 analog inputs, either 4 ... 20 mA or 2 Pt100 inputs.

M12 connectors connect sensors to the analog module. The current supply of the sensors is made out of AS-i.

Measured values are transferred sequentially to the host according to the respective AS-i profile. The resolution of the analog data is either 11 bit or 14 bit.

Article no.	BWU1893	BWU1894	BWU1895	BWU2086	BWU2050
Inputs	2 inputs 4 ... 20 mA		2 inputs Pt100		
				second input via ID1 deactivated	
AS-i Specification	AS-i 3.0 AB Slave	AS-i 2.1 Single Slave	AS-i 3.0 AB Slave		AS-i 2.1 Single Slave
Sensor supply	via AS-i				
Internal resistance	82 Ω		—		
Max. current per input	40 mA		—		
Resolution	regular: 14 bit; fast: 11 bit		14 bit		16 bit
Range of value	4000 ... 20000 dec. 0 ... 27648 dec.		-2000 ... 8500 dec. -12000 ... 13000 dec.		
Measuring value	4 ... 20 mA		-200 °C ... +850 °C/ 0,4 °C -120 °C ... +130 °C/ 0,04 °C		-200 °C ... +850 °C/ 0,1 °C -120 °C ... +130 °C/ 0,01 °C
Transformation speed	regular: 33 ms/14 bit; fast: 4,2 ms/11 bit		240 ms		
AS-i Profile	7.A.9	7.3.D	7.A.9		7.3.D
ID Code	A _{hex}	3 _{hex}	A _{hex}		3 _{hex}
ID1 Code	see code definition table	F _{hex}	see code definition table		F _{hex}
ID2 Code	9 _{hex}	D _{hex}	9 _{hex}		D _{hex}
IO Code	7 _{hex}				
Displays					
LED green (PWR)	LED on: voltage at the AS-i clamps				
LED red (FAULT)	LED on: AS-i communication error LED flashing: AS-i peripheral fault				
LED yellow (state: In 1, In 2)	LED off: no signal or channel 2 is switched off (BW1894 only) LED on: signal in the range of values LED flashing: signal out of the range of values				
Operating current	< 200 mA		< 80 mA		
Operating voltage	AS-i (30 V DC)				
Voltage of insulation	≥ 500 V				
EMC directions	EN 61 000-6-2, EN 61 000-6-4				
Ambient operating temperature	0°C ... +70°C				
Storage temperature	-20°C ... +85°C				
Housing	housing for DIN-rail mounting				
Dimensions (L / W / H in mm)	80 / 45 / 24,5				
Protection category DIN 40 050	housing IP65				

AS-i 3.0 Analog Module: 2 analog Inputs (M12)

Bit-setting of AS-i parameters	BWU1893	BWU1894	BWU1895	BWU2086	BWU2050
Bit P0	1: peripheral fault is indicated 0: peripheral fault is not indicated				
Bit P1	1: 4000 ... 20000 dec. 0: 0 ... 27648 dec. (Siemens format)		1: 2-wire mode 0: 4-wire mode		
Bit P2	1: regular 0: fast		1: -200 °C ... +850 °C 0: -120 °C ... +130 °C		
Bit P3	–		1: channel 2 on 0: channel 2 off		

Code definition table for article no. BWU1893 and BWU1895		
ID1	14 bit	12 bit
Channel 1	0; 2; 3	1
Channel 1+2	4; 5; 7 (default setting ID1=7)	6

BWU1893 + BWU1895 can transfer either 12 bit or 14 bit values.
Via ID1 the data capacity and the channel number can be defined.

Accessories:

AS-i substructure module to connect 2 AS-i flat cables (article no. BW1180, see also page 195)
AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (article no. BW1181, see also page 195)
AS-i substructure module to connect 2 AS-i round cable (article no. BW1182, see also page 195)
AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (article no. BW1183, see also page 195)
AS-i substructure module to connect 2 AS-i flat cables with addressing socket (article no. BW1438, see also page 195)

Pinning:

BWU1893, BWU1894

1	24 V
2	Sig+
3	0 V
4	0 V
5	Shield

BWU1895, BWU2086, BWU2050

1	CH+
2	CHS+
3	CH-
4	CHS-
5	Shield



AS-i 3.0 Analog Module: 2 analog Inputs (M12)



THE AS-INTERFACE MASTERS

2 analog inputs 0 ... 10 V

Infrared interface for slave addressing

Profile 7.A.9 "Plug and Play"
As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1963: 2 inputs 0 ... 10 V on AS-i with M12 connectors in IP65, AS-i 3.0 AB slave

Article no. BWU1964: 2 inputs 0 ... 10 V on AS-i with M12 connectors in IP65, AS-i 2.1 single slave

The analog module has 2 analog inputs 0 ... 10 V.

The connection of the sensors is made by M12 connectors. The current supply of the sensors is made out of AS-i.

Measured values are transferred sequentially to the host according to the respective AS-i profile. The resolution of the analog data is 11 resp. 14 bit.

Article no.	BWU1963	BWU1964
Inputs	2 inputs 0 ... 10 V	
AS-i specification	AS-i 3.0 AB slave	AS-i 2.1 single slave
Sensor supply	via AS-i	
Max. supply current for sensors (sum)	70 mA	
Resolution	11 resp. 14 bit	
Range of value	0 ... 10000 dec. 0 ... 27648 dec.	
Transformation speed	regular: 33 ms/14 bit, fast: 4,2 ms/11 bit	
AS-i Profile	7.A.9	7.3.D
ID Code	A _{hex}	3 _{hex}
ID2 Code	9 _{hex}	D _{hex}
IO Code	7 _{hex}	7 _{hex}
Displays		
LED green (PWR)	LED on: voltage at the AS-i clamps	
LED red (FAULT)	LED on: AS-i communication error LED flashing: AS-i peripheral fault	
LED yellow (state: In 1, In 2)	LED off: channel 2 is switched off	
	LED on: signal in the range of values	
	LED flashing: signal out of the range of values	
Operating current	< 200 mA	
Operating voltage	AS-i (30 V DC)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 61 000-6-2, EN 61 000-6-4	
Ambient operating temperature	0°C ... +70°C	
Storage temperature	-20°C ... +85°C	
Housing	housing for DIN-rail mounting	
Dimensions (L / W / H in mm)	80 / 45 / 24,5	
Protection category DIN 40 050	housing IP65	

Programming:

(Bit-setting of AS-i parameters)

Bit P0:

1: peripheral fault is indicated
0: peripheral fault is not indicated

Bit P1:

1: 0 ... 10000 dec.
0: 0 ... 27648 dec. (Siemens format)

Bit P2:

1: regular transformation speed
0: fast transformation speed

BWU1964

Bit P3:

1: channel 2 on
0: channel 2 off

BWU1963

ID1: **14 bit** **12 bit**

channel 1: 0; 2; 3 1

channel 1+2: 4; 5; 7 6

(Default ID1=7)

BWU1963 can transfer 12 resp. 14 bits of values. Via ID1 the data capacity and the channel number can be defined.

Pinning:

1	24 V	
2	Sig+	
3	0 V	
4	Sig-	
5	Shield	

Accessories:

AS-i substructure module to connect 2 AS-i flat cables (article no. BW1180, see also page 195)

AS-i substructure module to connect 2 AS-i round cable (article no. BW1182, see also page 195)

AS-i substructure module to connect 2 AS-i flat cables with addressing socket (article no. BW1438, see also page 195)

AS-i 3.0 Analog Module: Analog Input and Output Module (M12)

1 analog Input/1 analog Output
4 ... 20 mA or 0 ... 10 V in one Module

Automatic switching between current and voltage

8, 12 or 16 transmitted bits
via 2, 3 or 4 AS-i slave address

Profile S-6.0.x

High protection category IP65



Article no. BWU1853: 1I/1O, 4 .. 20 mA or 0 .. 10 V (24 V auxiliary on M12)

Article no. BWU1917: 1I/1O, 4 .. 20 mA or 0 .. 10 V (supplied out of AS-i)

The analog module has 1 analog input and 1 analog output. Current or voltage modules can be attached over M12 connectors. The module switches automatically over between current and voltage depending upon the occupied socket. The current supply is made out of an external voltage supply (according to PELV, by BWU1853) or out of AS-i (BWU1917).

The conversion of the measured value and the data transmission via AS-i occurs according to AS-i Profile S-6.0.x. The resolution of the analog data is 16 bit. The analog modules contains 50 Hz and 60 Hz filters. These filters can be optionally activated with the help of the AS-i parameters. Optical addressing is not possible.

Article no.	BWU1853	BWU1917
Supply	24 V auxiliary on M12 1 A out of aux. 24 V	24 V auxiliary on M12 100 mA (In U) / 40 mA (In I) out of AS-i
Outputs	0 .. 20 mA or 0 .. 10 V	
Inputs	4 .. 20 mA or 0 .. 10 V	
Internal resistance	analog input 4-20 mA: 50 Ω 0-10 V: 100 kΩ analog output 0-20 mA: 600 Ω 0-10 V: 3,3 kΩ	
Max. input current or max. input voltage	40 mA or 25 V	
Resolution	16 bit/1 µA or 16 bit/1 mV	
AS-i profile	S-6.0.x	
Number of transmitted bits	8, 12, 16	
Impedance	2 single slave loads	
ID Code	0	
ID2 Code	acc. to profile	
IO Code	6 _{hex}	
Displays		
LED green (PWR)	AS-i voltage	
LED red (FAULT)	AS-i communication error, peripheral fault	
LED green (AUX)	voltage supply 24 V for the analog part	
LED yellow (In U)	state of channel input U	
LED yellow (In I)	state of channel input I	
LED yellow (Out U)	state of channel output U	
LED yellow (Out I)	state of channel output I	
Operating current	< 80 mA	
Operating voltage	AS-i (30 V DC)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 61 000-6-2 EN 61 000-6-4	
Ambient operating temperature	0°C .. +70°C	
Storage temperature	-20°C .. +85°C	
Housing	housing for DIN-rail mounting	
Dimensions (L, W, H in mm)	80 / 90 / 45	
Protection category (DIN 40 050)	housing IP65	

Configuration notes

IO code 6
ID code 0
ID1 code:

- The ID 1 code can be written for all slaves, but only the slave with the lowest address defines the code for the remaining slaves.
- The ID1 code is equal for all slaves.
- The ID2 code for all slaves (for each different according to the profile) is specified by the ID1 code.

Number of associated AS-i slaves

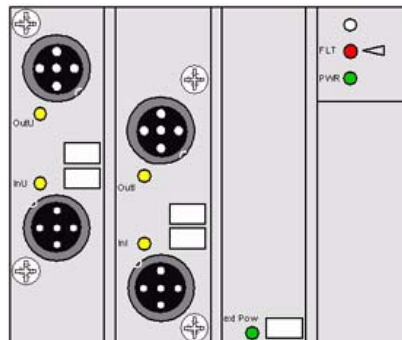
ID1 = A: 2 AS-i slaves according to 8 bits
ID1 = B: 3 AS-i slaves according to 12 bits
else: 4 AS-i slaves according to 16 bits

AS-i 3.0 Analog Module: Analog Input and Output Module (M12)

Programming

ID2 Codes				
	Adr n	Adr n+1	Adr n+2	Adr n+3
2 slaves = 8 bits	A	5	-	-
3 slaves = 12 bits	B	6	5	-
4 slaves = 16 bits	C	7	6	5
Parameter (first address)				
Parameter	Name	Description		
P0	Auto/Fix	1: automatic switching between current and voltage 0: current/voltage specified by P1		
P1	Out U/I	If P0 = 0: 1: OutI active 0: OutU active else not used		
P2	Peripheral fault	1: peripheral fault is indicated 0: peripheral fault is not indicated		
P3	In U/I	If P0 = 0: 1: InI active 0: InU active else not used		
Parameter (second address)				
Parameter	Name	Description		
P1, P0	Conversion rate InI, InU	11: fastest: 1 ms/8 bits 01: medium fast/precise: 5 ms/12 bits 10: highest precision: 20 ms/16 bits 00: not used		
P2	Format	1: 10 V = 10000, 20 mA = 20000 0: 10 V = 27648, 20 mA = 27648 (Siemens format)		
P3	Bridge	1: Pin 3 and pin 4 bridged 0: Pin 3 and pin 4 not bridged		

Socket allocation and pinning



No.	InI, InU	OutI, OutU
1	+24 V	Sig+
2	Sig+	+24 V
3	0 V	Sig-
4	Sig-	0 V
5	Shield	Shield

Accessories:

- AS-i substructure module to connect 2 AS-i flat cables (art. no. BW1180, see also page 195)
- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (art. no. BW1181, see also page 195)
- AS-i substructure module to connect 2 AS-i round cable (art. no. BW1182, see also page 195)
- AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (art. no. BW1183, see also page 195)
- AS-i substructure module to connect 2 AS-i flat cables with addressing socket (art. no. BW1438, see also page 195)

AS-i Analog Module: 4 analog Inputs (M12)

4 analog inputs on M12 socket

Galvanical isolation to AS-i

4 ... 20 mA

0 ... 10 V

Profile 7.3 "Plug and Play"

As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1359 for 4 ... 20 mA

Article no. BWU2049 for 4 ... 20 mA, Siemens format

Article no. BWU1360 for 0 ... 10 V

Article no. BWU1742 for 0 ... 10 V, advanced temperature range: -20°C ... +70°C

The analog module has 4 analog inputs.

M12 connectors connect sensors to the analog module. The sensors are powered out of AS-i or an external voltage supply (according to PELV). The current supply switches automatically to the supply out of an external voltage supply, as soon as an external voltage is connected.

The analog sensors are galvanically isolated to AS-i.

The conversion of the measured value and the data transmission out of AS-i occurs asynchronously according to the AS-i Profile 7.3. The resolution of the analog data is 16 bit.

With infrared interface for slave addressing.

Article no.	BWU1359	BWU2049	BWU1360	BWU1742
Inputs	4 inputs 4 ... 20 mA		4 inputs 0 ... 10 V	
Voltage supply, sensors	via AS-i/extern			
Internal resistance	50 Ω		100 kΩ	
Max. input current	40 mA		–	
Max. input voltage	–		25 V	
Resolution	16 bit/1 μA		16 bit/1 mV	
Range of value	4000 ... 20000 dec.	0 ... 27648 dec. (Siemens format)	0 ... 10000 dec.	
AS-i Profile	7.3			
ID Code	3 _{hex}			
ID2 Code	E _{hex}			
IO Code	7 _{hex}			
Displays				
LED green (PWR)	AS-i voltage			
LED red (FAULT)	AS-i communication error, peripheral fault			
LED green (AUX)	voltage supply 24 V for the analog part			
LED yellow (In 1)	state of channel 1			
LED yellow (In 2)	state of channel 2			
LED yellow (In 3)	state of channel 3			
LED yellow (In 4)	state of channel 4			
Operating current	< 200 mA			
Operating voltage	AS-i (30 V DC)			
Voltage of insulation	≥ 500 V			
EMC directions	EN 50 081-2, EN 61 000-6-2			
Ambient operating temperature	0°C ... +70°C		-20°C ... +70°C	
Storage temperature	-20°C ... +85°C		-20°C ... +85°C	
Housing	housing for DIN-rail mounting			
Dimensions (L, W, H)	80 mm, 90 mm, 43 mm			
Protection category (DIN 40 050)	housing IP65			

AS-i Analog Module: 4 analog Inputs (M12)

Programming:

(Bit-setting of AS-i parameters)

Bit P0 (BWU1359, BWU2049):

1: Bridge between Pin 3 and 4 active
0: Bridge between Pin 3 and 4 not active

Bit P0 (BWU1360, BWU1742):

Not used

Bit P1 and P2:

Analog input is

P1	P2	1	2	3	4
0	0	on	off	off	off
0	1	on	on	off	off
1	0	on	on	on	off
1	1	on	on	on	on

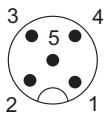
Bit P3:

1: Peripheral fault (e. g. broken wire to the sensor) is indicated
0: Peripheral fault (e. g. broken wire to the sensor) is not indicated

Accessories:

- AS-i substructure module to connect 2 AS-i flat cables (article no. BW1180, see page 195)
- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (article no. BW1181, see page 195)
- AS-i substructure module to connect 2 AS-i round cable (article no. BW1182, see page 195)
- AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (article no. BW1183, see page 195)
- AS-i substructure module to connect 2 AS-i flat cables with addressing socket (article no. BW1438, see page 195)

M12 connector:



1	24 V extern
2	Sig. +
3	0 V
4	Sig. -
5	Shield

AS-i Analog Module: 4 analog Outputs (M12)

4 analog Outputs on M12 socket

Galvanical isolation to AS-i

0 ... 20 mA

0 ... 10 V

Profile 7.3 "Plug and Play"

As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1361 for 0 ... 20 mA

Article no. BWU1362 for 0 ... 10 V

Article no. BWU1722 for 0 ... 20 mA, 24 V extern on M12

Article no. BWU1736 for 0 ... 10 V, advanced temperature range: -20°C ... +70°C

The analog module has 4 analog outputs.

The connection of the actuators is made by **M12 connectors**. The current supply of the analog part (BWU1361, BWU1362) can be made out of AS-i or an external voltage supply (according to PELV).

The current supply switches automatically to the supply out of external voltage supply, as soon as an external voltage is connected (BWU1361, BWU1362, BWU1736). At BWU1722 the external

24 V supply is distributed additionally on M12 connectors for supply of small actuators ($I_{max} < 1,1 \text{ A}$).

The actuators and AS-i are galvanically separated.

The conversion of the measured value and the data transmission via AS-i occurs asynchronously according to AS-i Profile 7.3. The resolution of the analog data is 16 bit.

With infrared interface for slave addressing.

Article no.	BWU1361	BWU1722	BWU1362	BWU1736
Outputs	4 outputs 0 ... 20 mA		4 outputs 0 ... 10 V	
Voltage supply, actuators	-	24 V extern 1,1 A	-	
Resolution	16 bit/1 µA		16 bit/1 mV	
Range of value	0 ... 20 000 dec.		0 ... 10 000 dec.	
AS-i Profile	7.3			
ID Code	3 _{hex}			
ID2 Code	6 _{hex}			
IO Code	7 _{hex}			
Displays				
LED green (PWR)	AS-i voltage			
LED red (FAULT)	AS-i communication error, peripheral fault			
LED green (AUX)	voltage supply 24 V for the analog part			
LED yellow (Out 1)	state of channel 1			
LED yellow (Out 2)	state of channel 2			
LED yellow (Out 3)	state of channel 3			
LED yellow (Out 4)	state of channel 4			
Operating current	< 200 mA	< 100 mA	< 200 mA	
Operating voltage	AS-i (30 V DC)			
Voltage of insulation	≥ 500 V			
EMC directions	EN 50 081-2, EN 61 000-6-2			
Ambient operating temperature	0°C ... +70°C			-20°C ... +70°C
Storage temperature	-20°C ... +85°C			-20°C ... +85°C
Housing	housing for DIN-rail mounting			
Dimensions (L, W, H)	80 mm, 90 mm, 43 mm			
Protection category (DIN 40 050)	housing IP65			

AS-i Analog Module: 4 analog Outputs (M12)

Programming:

(Bit-setting of AS-i parameters)

Bit P0:

- 1: Profile 7.3 is monitored
- 0: Profile 7.3 is not monitored

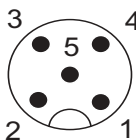
Bit P1, P3:

not used

Bit P2:

- 1: Peripheral fault (e. g. broken wire to the sensor) is indicated
- 0: Peripheral fault (e. g. broken wire to the sensor) is not indicated

M12 connector:



BWU1361,
BWU1362,
BWU1736:

1	Sig. +
2	n.c.
3	Sig. -
4	n.c.
5	Shield

BWU1722:

1	Sig. +
2	24 V ext.
3	Sig. -/0 V
4	n.c.
5	Shield

Accessories:

- AS-i substructure module to connect 2 AS-i flat cables (article no. BW1180, see page 195)
- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (article no. BW1181, see page 195)
- AS-i substructure module to connect 2 AS-i round cable (article no. BW1182, see page 195)
- AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (article no. BW1183, see page 195)
- AS-i substructure module to connect 2 AS-i flat cables with addressing socket (article no. BW1438, see page 195)

AS-i Analog Module: 4 Pt100 Inputs (M12)

4 Pt100 Inputs on M12 socket

Galvanical isolation to AS-i

Profile 7.3 "Plug and Play"
As simple as digital AS-i I/O

High protection category IP65



Article no. BWU2532 for 3 wire sensors

Article no. BWU1363 for 4 wire sensors

The analog module has 4 Pt100 inputs.

The connection of the sensors is made by **M12 connectors**. The **analog sensors and AS-i are galvanical separated**.

The conversion of the measured value and the data transmission via AS-i occurs asynchronously according to AS-i Profile 7.3.

The resolution of the analog data is 16 bit. The analog modules contains 50 Hz and 60 Hz filters. These filters can be optionally activated with the help of the AS-i parameters.

With infrared interface for slave addressing.

Article no.	BWU1363	BWU2532
Inputs	4 Pt100 inputs	
Voltage supply, sensors	via AS-i/extern	
Internal resistance	50 Ω	
Resolution	16 bit/0,1 °C	
Measuring value	-200°C ... +850°C	
AS-i Profile	7.3	
ID Code	3 _{hex}	
ID2 Code	E _{hex}	
IO Code	7 _{hex}	
Displays		
LED green (PWR)	AS-i voltage	
LED red (FAULT)	AS-i communication error, peripheral fault	
LED yellow (I1)	state of channel 1	
LED yellow (I2)	state of channel 2	
LED yellow (I3)	state of channel 3	
LED yellow (I4)	state of channel 4	
Operating current	< 80 mA	
Operating voltage	AS-i (30 V DC)	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 081-2 EN 61 000-6-2	
Ambient operating temperature	0°C ... +70°C	
Storage temperature	-20°C ... +85°C	
Housing	housing for DIN-rail mounting	
Dimensions (L / W / H in mm)	80 / 90 / 43	
Protection category (DIN 40 050)	housing IP65	

Programming:

(Bit-setting of AS-i parameters)

Bit P0:

1: 50 Hz filter in A/D Converter active
0: 60 Hz filter in A/D Converter active

Bit P1 and P2:

A peripheral fault can be released through channel:

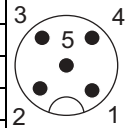
P1	P2	1	2	3	4
0	0	yes	no	no	no
0	1	yes	yes	no	no
1	0	yes	yes	yes	no

Bit P3

BWU1363	BWU2532
1:2-wire mode	1:2-wire mode
0:4-wire mode	0:3-wire mode

M12 connector:

BWU1363	BWU2532
1	CH+
2	CHS+
3	CH-
4	CHS-
5	Shield



*) Pin 4 internally connected with Pin 3

Accessories:

- AS-i substructure module to connect 2 AS-i flat cables (article no. BW1180, see page 195)
- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (article no. BW1181, see page 195)
- AS-i substructure module to connect 2 AS-i round cable (article no. BW1182, see page 195)
- AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (article no. BW1183, see page 195)
- AS-i substructure module to connect 2 AS-i flat cables with addressing socket (article no. BW1438, see page 195)

AS-i Master/Gateways/ Links/Scanner
AS-i Slaves
AS-i Accessories/ Diagnostics/Development
Other Fieldbuses/ Master Simulators
AS-i Safety
Price Lists

Overview OEM Modules / AS-i Special Slaves

Housing	Module	Art. No.	Characteristic	P.
	AS-i-OEM Module	BW2033	2 analog inputs, 4 ... 20 mA	103
		BW2035	2 analog inputs, 0 ... 10 V	
		BW2483	2 analog inputs, 0 ... 10 V, without wiring pins and screw terminals	
  	AS-i 2I/2O-AB Module	BW1421		104
		BW1490	with Fault LED output	
		BW1443	with screw terminals	
		BW1957	without galvanical separation, screw terminal only on AS-i pins	
   	AS-i 4I/3O-AB Module	BW1386	with wiring pins	106
		BW1387	with screw terminals	
		BW1408	without wiring pins, without screw terminals	
		BW2229	with plug-in connector	
  	AS-i 4I/4O Module	BW1218	with wiring pins	107
		BW1219	with screw terminals	
		BW1407	without wiring pins, without screw terminals	

Housing	Module	Art. No.	Characteristic	P.
 	AS-i 4I/4O OEM Module	BW1628	with screw terminals	108
		BW2054	with wiring pins	
 	AS-i 4I/4O Module	BW1388	galvanical separated, with wiring pins	109
		BW1389	galvanical separated, with screw terminals	
		BW1910	galvanical separated, without wiring pins, without screw terminals	
 	AS-i 4I/4O Module with LEDs	BW2571	LED display of the I/Os, with extended addressing	
		BW2597	LED display of the I/Os, Single Slave	
		BW1468	LED display of the I/Os	110
		BW1469	LED display of the I/Os, with wiring pins	
		BW1470	LED display of the I/Os, with screw terminals	
		BW1789	LED display of the I/Os, with screw terminals, lacquered	
	AS-i 6O-AB Module	BW1627	with screw terminals	112
		BW1679	with screw terminals, turned 180 degrees	
 	AS-i 8I Module	BW1351	with wiring pins	113
		BW1352	with screw terminals	
	AS-i 8I/8O Module	BW1898	AS-i 8I/8O OEM Module, 2 4I/4O Single Slaves	114
		BW1899	AS-i 3.0 8I/8O OEM Module, 2 4I/4O-AB Slaves	
	AS-i 16I/16O Module	BW1900	AS-i 16I/16O OEM Module, 4 4I/4O Single Slaves	114
		BW1901	AS-i 3.0 16I/16O OEM Module, 4 4I/4O-AB Slaves	

OEM Modules / AS-i Special Slaves

Housing	Module	Art. No.	Characteristic	P.
	AS-i OEM Slave with serial interface		developing platform for client specific electronics, specific serial protocols	116
	AS-i OEM Power Supply Module	BW1485	OEM power supply out of AS-i	117

Special AS-i Slaves Solutions

to
integrate in specific
electronics,

for building automation,

coupling of 2 AS-i networks,

to connect serial devices
to the AS-i

Bihl+Wiedemann does not offer standard AS-i I/O modules to connect standard sensors or actuators to the AS-i. The focus is more to use AS-i slaves to solve very special problems in different fields with AS-i. Further special solutions on request.

AS-i 4I/4O Module

The AS-i 4I/4O Module, which meets the requirements of the AS-i according to specification 2.1 is the board based solution for an AS-i Slave. The module can be used perfectly to integrate into client specific hardware, e. g. push button panels, signal lamps, actuating drives, etc.

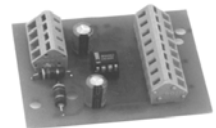


4I/4O Module to integrate in client specific electronics

AS-i Slaves for building automation

These AS-i Slaves are board bases solutions to fit in installation housings. They are perfect to be used for building automation like lighting systems, venetian blind applications, etc.

AS-i 4I Module for building automation



Coupling of 2 AS-i systems

The AS-i/AS-i Coupler provides the easiest solution to exchange data between two PLCs via AS-i. In big applications with more than one AS-i network there is often a need to exchange data between two AS-i networks e. g. to report status information. With the use of the AS-i/AS-i coupler to solve these problems the installations costs as well as the components costs can be reduced.



AS-i/AS-i Coupler

Cylindrical AS-i slaves

The cylindrical AS-i Slaves are AS-i I/O modules inside stainless steel sleeves. They can be mounted via reduction adapters in PG or metrical fittings. In that way devices with high protection can easily be interfaced to AS-i.

Cylindrical AS-i Actuator 1I/3O



Connection of serial devices to the AS-i

The AS-i Slaves with serial interface offer the possibility to connect complex devices, HMI terminals, serial printers, barcode scanners etc., to the AS-i.

For special applications a new firmware to connect a special device with serial interface can be implemented on the AS-i slave. In that way the serial device can be optimally adjusted to the AS-i.



AS-i Slave with serial interface in protection class IP20

AS-i OEM Modules: 2 analog Inputs

2 analog Inputs

4 ... 20 mA (BW2033) or 0 ... 10 V (BW2035, BW2483)
in one module

Profile 7.3 "Plug and Play"
As simple as digital AS-i I/O

AS-i Specification 2.1
Single Slave (up to 31 slaves)

2 additional holes for assembly angles



Article no. BW2033 for 4 ... 20 mA

Article no. BW2035 for 0 ... 10 V

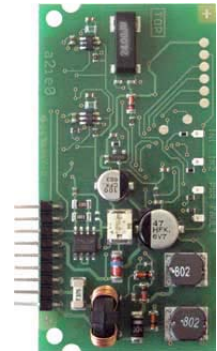
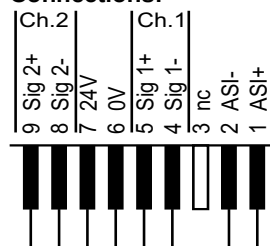
Article no. BW2483 for 0 ... 10 V

The AS-i OEM Module with 2 analog inputs, meets the requirements of the AS-i Specification 2.1. The module is a board based solution for an AS-i slave and it is completely powered by AS-i.

The 4 ... 20 mA (BW2033) or 0 ... 10 V (BW2035, BW2483) signal shall not have a connection to earth. The resolution of the analog data is either 11 or 14 bit. The module offers 2 additional holes for assembly angles.

Article no.	BW2033	BW2035	BW2483
Connection	wiring pins		–
Installation	circuit board installation		
Analog inputs	2		
	4 ... 20 mA	0 ... 10 V	
AS-i specification	AS-i 2.1 single slave		
Voltage supply sensors	via AS-i		
Internal resistance	82 Ω	100 kΩ	
Max. current per input	40 mA	–	
Max. supply current per input	40 mA	–	
Max. voltage per input	–	25 V	
Resolution	regular: 14-bit; fast: 11-bit		
Range of value	4000 ... 20000 dec.	0 ... 10000 dec.	
	0 ... 27648 dec.	0 ... 27648 dec.	
Measuring value	4 ... 20 mA	0 ... 10 V	
Transformation speed	regular: 33 ms/14-bit; fast: 4,2 ms/11-bit		
AS-i Profile	7.3		
ID Code	3 _{hex}		
ID2 Code	D		
IO Code	7 _{hex}		
Operating current	< 120 mA		
Operating voltage	AS-i (30 V DC)		
Voltage of insulation	≥ 500 V		
EMC directions	EN 61 000-6-2, EN 61 000-6-4		
Ambient operating temperature	0°C ... +70°C		
Storage temperature	-25°C ... +85°C		
Dimensions (L / W / H in mm)	73 / 37,6 / 10		

Connections:



Programming: (Bit-setting of AS-i parameters)

Bit P0

1: peripheral fault is indicated
0: peripheral fault is *not* indicated

Bit P1 (BW2033)

1: 4000 ... 20000 dec.
0: 0 ... 27648 dec. (Siemens format)

Bit P1 (BW2035)

1: 0 ... 10000 dec.
0: 0 ... 27648 dec. (Siemens format)

Bit P1 (BW2483)

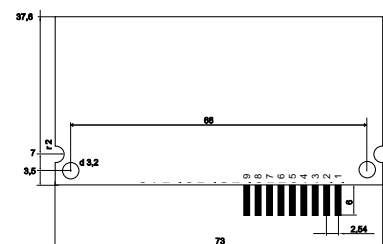
1: 0 ... 10000 dec.
0: 0 ... 27648 dec. (Siemens format)

Bit P2

1: regular
0: fast

Bit P3

1: channel 2 *on*
0: channel 2 *off*



AS-i 2I/2O AB Module

AS-i 2I/2O-AB Module

AS-i Specification 2.1
AB Slave (up to 62 slaves)

Additional 2 holes
for angles



BW1421 / BW1490 with screw terminals with wiring pins



Article no. BW1421

Article no. BW1443 with screw terminals

Article no. BW1957 without galvanical separation, screw terminal only on AS-i pins

Article no. BW1444 with wiring pins

Article no. BW1490 with Fault LED output

The AS-i 2I/2O-AB Module, which meets the requirements of the new AS-i Specification 2.1 is the board based solution for an AS-i slave. The board is completely powered by AS-i. The inputs and outputs are short circuit and overload protected. If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog. Using the inputs, you can interrogate up to 2 mechanical switching elements. Using the outputs, you can drive up to 2 indicator

lights, with the power being drawn from the AS-i system. Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well. The AS-i 2I/2O-AB Module offers additionally 2 holes for assembly angles. Advanced addressing (AB-technology, up to 62 slaves) is possible.

Article no.	BW1421	BW1443	BW1957	BW1444	BW1490
Connection	-	screw terminal	screw terminal only on AS-i pins	wiring pins	-
Connection	circuit board installation				
Quiescent current (Input = 0, Output = 0)	≤ 20 mA				
Switching threshold of inputs	≤ 0,8 mA (low) ≥ 5 mA (high)				
U	20 ... 30 V DC				
Outputs	2, electronic				
Loading capacity	80 mA per output (sum of all outputs < 80 mA) 24 V DC				
Length of connector cables	I/O: max. 1,5 m				
Operating voltage	via AS-i				
Operating current	≤ 200 mA				
EMC directions	EN 61 000-6-2 , EN 61 000-6-4				
Operating temperature	-25°C ... +70°C				
Storage temperature	-40°C ... +70°C				
Protection category (EN 60 529)	IP00 (soldering pins) IP20 (build in)				
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude				
Dimensions (L / W / H in mm)	29,7 / 36,5 / 10				27,7 / 36,5 / 10

Programming
(Bit-setting)

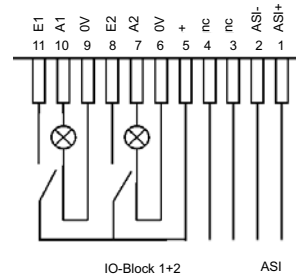
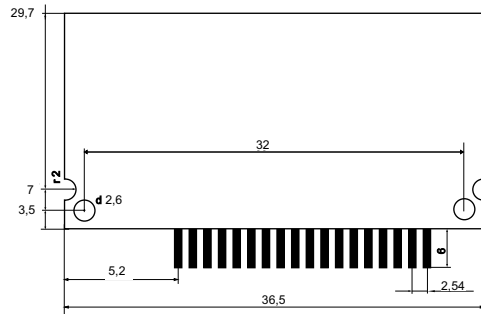
Data bit
(Input via AS-i)
Bit Function
D0 Output A1
D1 Output A2
D2 Input E1
D3 Input E2

Parameter bit
Bit Function
P0 not used
P1 not used
P2 not used
P3 not used

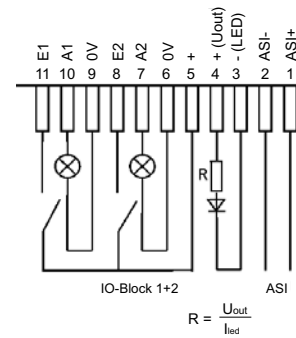
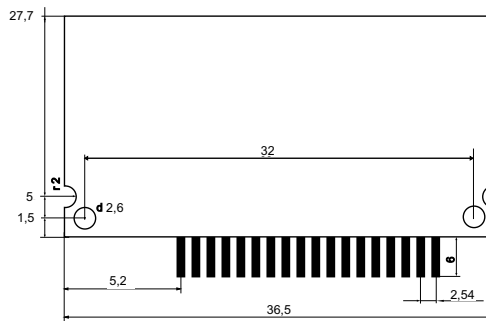
Programming:
Address preset 0
changeable via bus
master or programming
devices

IO Code B
ID Code A
ID2 Code E

Art. no.: 1421/1443/1957/1444



1490



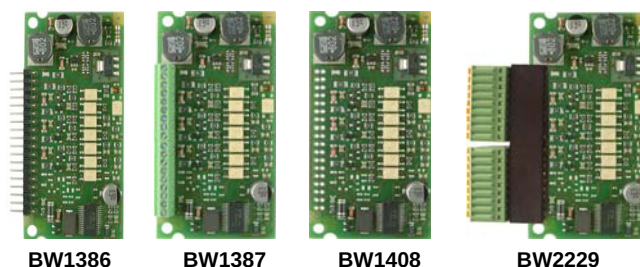
AS-i 4I/3O-AB Module

AS-i 4I/3O-AB Module

AS-i specification 2.1

AB slave (up to 62 slaves)

Additional 2 holes for
assembly angles



BW1386

BW1387

BW1408

BW2229



Article no. BW1386 with wiring pins

Article no. BW1387 with screw terminals

Article no. BW1408 without screw terminals, without wiring pins

Artikel no. BW2229 with plug-in connector

The AS-i 4I/3O AB Module, which meets the requirements of the AS-i according to specification 2.1 is the board based solution for an AS-i Slave. The board is completely powered by AS-i. The inputs and outputs are short circuit and overload protected.

If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog.

Using the inputs, you can interrogate up to 4 mechanical switching elements.

Using the outputs, you can drive up to 3 indicator lights, with the power being drawn from the AS-i system.

Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well.

Article no.	BW1386	BW1387	BW1408	BW2229
Connection	wiring pins	screw terminals	–	plug-in connector
Connection	circuit board installation			
Quiescent current (Input = 0, Output = 0)	≤ 20 mA			
Switching threshold of inputs	≤ 0,8 mA (low) ≥ 5 mA (high)			
U	20 ... 30 V DC			
Outputs	3, electronic			
Loading capacity	80 mA per output (Sum of all outputs < 80mA) 24 V DC			
Length of connector cables	I/O: max. 1,5 m			
Operating voltage	via AS-i			
Operating current	≤ 200 mA			
EMC directions	EN 50 081-2, EN 50 082-2			
Ambient operating temperature	-25°C ... +70°C			
Storage temperature	-40°C ... +70°C			
Protection category EN 60 529	IP00 (soldering pins) IP20 (build in)			
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude			
Dimensions (L / W / H in mm)	73 / 37,5 / 7	73 / 37,5 / 10	73 / 37,5 / 7	73 / 55,2 / 12

Programming (Bit-setting)

Data bit (input via AS-i)

Bit Function

D0	input I1 / output O1
D1	input I2 / output O2
D2	input I3 / output O3
D3	input I4 / output O4

Parameter bit

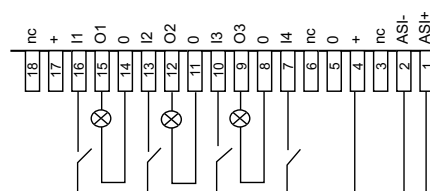
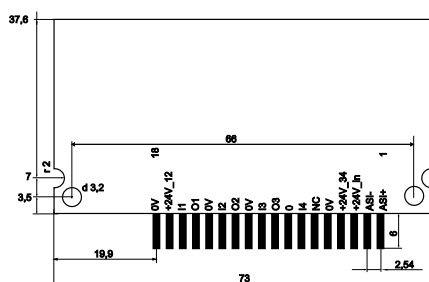
Bit Function

P0	not used
P1	not used
P2	not used
P3	not used

Programming:

Address preset 0,
changeable via bus master
or programming devices

IO-Code	7
ID-Code	A
ID2-Code	E

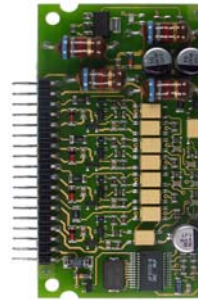


AS-i-4I/4O Module

AS-i Specification 2.1

Single Slave (up to 31 slaves)

**Additional 2 holes for
assembly angles**



BW1218



BW1219



BW1407



Article no. BW1218 with wiring pins

Article no. BW1219 with screw terminals

Article no. BW1407 without screw terminals, without wiring pins

The AS-i 4I/4O Module, which meets the requirements of the AS-i according to the specification 2.1 is the board based solution for an AS-i slave. The board is completely powered by AS-i. The inputs and outputs are short circuit and overload protected.

If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog. Using the inputs, you can interrogate up to 4 mechanical switch-

ing elements. Using the outputs, you can drive up to 4 indicator lights, with the power being drawn from the AS-i system.

Customer-specific special orders are possible on short notice.
The circuit board dimensions and the plug connections can be
changed as well.

The AS-i 4I/4O Module offers additionally 2 holes for assembly angles.

Article no.	BW1218	BW1219	BW1407
Connection	wiring pins	screw terminals	–
Connection	circuit board installation		
Quiescent current (Input = 0, Output = 0)	≤ 20 mA		
Switching threshold of inputs	≤ 0,8 mA (low) ≥ 5 mA (high)		
U	20 ... 30 V DC		
Outputs	4, electronic		
Loading capacity	100 mA per output (sum of all outputs < 180 mA) 24 V DC		
Length of connector cables	I/O: max. 1,5 m		
Operating voltage	via AS-i		
Operating current	≤ 200 mA		
EMC directions	EN 50 081-2, EN 50 082-2		
Ambient operating temperature	-25°C ... +70°C		
Storage temperature	-40°C ... +70°C		
Protection category EN 60 529	IP00 (soldering pins) IP20 (build in)		
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude		
Dimensions (L / W / H in mm)	73 / 37,5 / 7	73 / 37,5 / 10	73 / 37,5 / 7

Programming (Bit-setting)

Data bit
(Input via AS-i)
Bit function

```
D0 input I1/output O1
D1 input I2/output O2
D2 input I3/output O3
D3 input I4/output O4
```

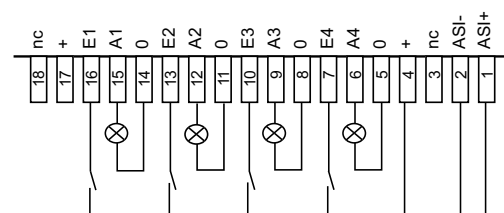
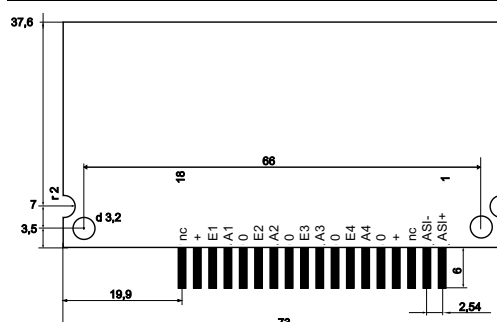
Parameter bit

Bit	function
P0	not used
P1	not used
P2	not used
P3	not used

Programming:

Address preset 0
changeable via bus master or
programming devices

IO code	7
ID code	0
ID2 code	F

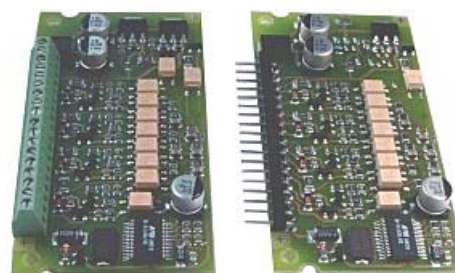


AS-i 4I/4O OEM Module

AS-i Specification 2.1
Single Slave (up to 31 slaves)

2 additional holes for assembly angles

Outputs galvanically isolated
Inputs supplied by AS-i



BW1628

BW2054

Article no. BW1628 with screw terminals

Article no. BW2054 with wiring pins

The AS-i 4I/4O OEM Module which meets the requirements of the AS-i Specification 2.1 is the board based solution for an AS-i slave. The inputs are powered out of AS-i and the outputs out of separated 24 V. The outputs are galvanically isolated. Besides the in- and outputs are short-circuit-protected, overload-proof and pole-protected. The state of the in- and outputs is indicated through 8 LEDs. Additionally the both AS-i LEDs (PWR green and FAULT red) display the state of the AS-i slaves as by AS-i slaves usually and U_{aux} is indicated with a green LED.

If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog. A short-circuit of the outputs is notified as peripheral fault. Customer-specific special solutions can be offered on demand. The circuit board dimensions and the plug connections can be modified also. The AS-i 4I/4O OEM Module offers additionally 2 holes for assembly angles.

Article no.	BW1628	BW2054
Connection	screw terminals	wiring pins
Connection	circuit board installation	
8 LEDs yellow	states of in-/output channel 1 - 4	
LED green (PWR)	AS-i voltage OK	
LED red (FAULT)	communication error	
LED green (U_{aux})	separated 24 V OK	
Quiescent current (Input = 0, Output = 0)	< 20 mA	
Switching threshold of inputs	< 0,8 mA (low), > 5 mA (high)	
U	20 ... 30 V DC (PELV)	
Outputs	4, electronic	
Loading capacity of inputs	sum of all inputs < 180mA, supplied out of AS-i	
Loading capacity of outputs	150 mA per output (sum of all outputs < 500mA), supplied by separated 24 V _{DC}	
Length of connector cables	I/O: max. 1,5 m	
Operating voltage	Via AS-i	
Operating current	< 20 mA	
EMC directions	EN 50 081-2, EN 50 082-2	
Ambient operating temperature	-25°C ... +70°C	
Storage temperature	-40°C ... +70°C	
Protection category EN 60 529	IP00 (soldering pins) IP20 (build in)	
Dimensions (L / W / H in mm)	73 / 37,5 / 10	73 / 37,5 / 7

Programming (Bit-setting)

Data bit

(input via AS-i)
Bit function
D0 input I1/output O1
D1 input I2/output O2
D2 input I3/output O3
D3 input I4/output O4

Parameter bit

Bit function
P0 not used
P1 not used
P2 not used
P3 not used

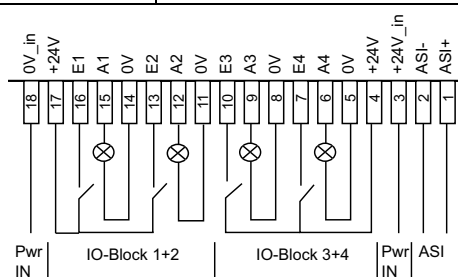
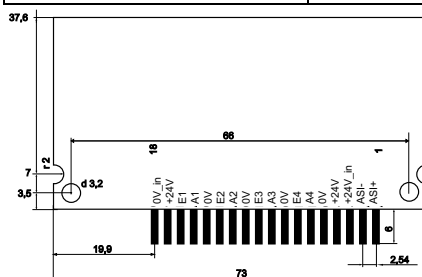
Programming:

Address preset 0
changeable via bus master or programming devices

IO code 7
ID code 0
ID2 code E

Hint:

The module can not be used with the OEM carrier board BW1484.
0 V is generated out of 0V_in, +24 V is generated out of ASI+.
Between +24 V and 0 V no consumers may be connected.



AS-i 4I/4O Module

AS-i Specification 2.1 Single Slave (up to 31 slaves)

Additional 2 holes for
assembly angles

Inputs/outputs galvanically separated



Article no. BW1388 with wiring pins

Article no. BW1389 with screw terminals

Article no. BW1910 without wiring pins, without screw terminals

The AS-i 4I/4O Module, which meets the requirements of the AS-i according to specification 2.1 is the board based solution for an AS-i slave. The inputs and outputs are powered out of separated 24 V and are galvanically separated to the AS-i. Besides they are short-circuit-protected, overload-proof and pole-protected.

If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog. Using the inputs, you can interrogate up to 4 mechanical switching elements.

Using the outputs, you can drive up to 4 indicator lights, with the power for the inputs and the outputs being drawn from separated 24 V.

Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well.

The AS-i 4I/4O Module offers additionally 2 holes for assembly angles.

Article no.	BW1388	BW1389	BW1910
Connection	wiring pins	screw terminals	—
Connection	circuit board installation		
Quiescent current (Input = 0, output = 0)	≤ 20 mA		
Switching threshold of inputs	≤ 0,8 mA (low) ≥ 5 mA (high)		
U	20 ... 30 V DC (PELV)		
Outputs	4, electronic		
Loading capacity	100 mA per output (sum of all outputs < 200 mA), 24 V DC		
Length of connector cables	I/O: max. 1,5 m		
Operating voltage	via AS-i		
Operating current	≤ 20 mA		
EMC directions	EN 50 081-2, EN 50 082-2		
Ambient operating temperature	-25°C ... +70°C		
Storage temperature	-40°C ... +70°C		
Protection category EN 60 529	IP00 (soldering pins) IP20 (build in)		
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude		
Dimensions (L / W / H in mm)	73 / 37,5 / 7	73 / 37,5 / 10	73 / 37,5 / 7

Programming (Bit-setting)

Data bit
(Input via AS-i)

Bit function

D0 input I1/output O1
D1 input I2/output O2
D2 input I3/output O3
D3 input I4/output O4

Parameter bit

Bit function

P0 not used
P1 not used
P2 not used
P3 not used

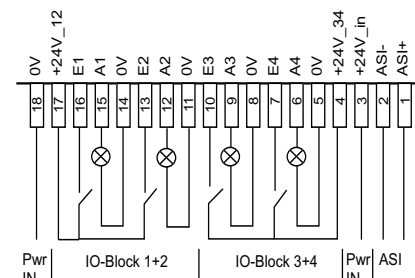
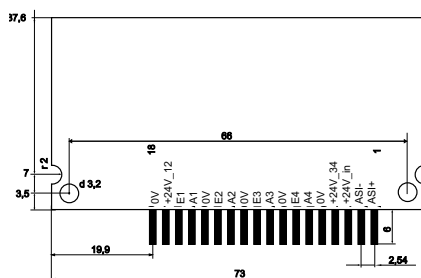
Programming:

Address preset 0
changeable via bus master
or programming devices

IO code 7

ID code 0

ID2 code F



AS-i 4I/4O OEM Module with LEDs

AS-i 4I/4O OEM Module with LEDs

LED display of the I/Os



Article no. BW1468

Article no. BW1469 with wiring pins

Article no. BW1470 with screw terminals

Article no. BW1789 with screw terminals, lacquered

Article no. BW2571 slave with extended addressing

Article no. BW2597 single slave

The AS-i 4I/4O Module, which meets the requirements of the AS-i according to specification 3.0 is the board based solution for an AS-i slave. The board is completely powered by AS-i. The inputs and outputs are short circuit and overload protected. The status of the in- and outputs is displayed by 8 LEDs. Additionally the both AS-i LEDs (AS-i Power green and AS-i Error red) show the status of the AS-i slave as by AS-i slaves usually.

If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog. Using the inputs, you can interrogate up to 4 mechanical switching elements. Using the outputs, you can drive up to 4 indicator lights, with the power being drawn from the AS-i system. Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well.

Article no.	BW1468 / BW1469 / BW1470 / BW1789 / BW2571 / BW2597
Connection	connecting wires
Connection	circuit board installation
Quiescent current (Input = 0, Output = 0)	≤ 20mA
Inputs	4
Switching threshold of inputs	≤ 0,8mA (low) ≥ 5mA (high)
U	20 ... 30V DC
Outputs	4, electronic
Length of connector cables	I/O: max. 1,5 m
Operating voltage	via AS-i
Operating current	≤ 200 mA
EMC directions	EN 50 081-2 EN 50 082-2
Ambient operating temperature	-25°C ... +70°C
Storage temperature	-40°C ... +70°C
Protection category EN 60 529	IP00 IP20 (build in)
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude
Dimensions (L / W / H in mm)	73 / 37,5 / 13

Programming (Bit-setting)

Data bit (Input via AS-i)

Bit Function

D0 input I1/output O1
D1 input I2/output O2
D2 input I3/output O3
D3 input I4/output O4

Parameter bit

Bit Function

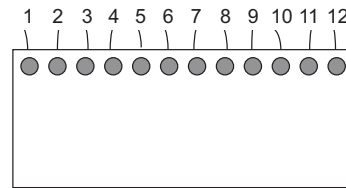
P0 not used
P1 not used
P2 not used
P3 not used

Programming:

Address preset 0
changeable via bus master
or programming devices

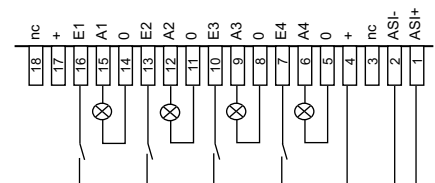
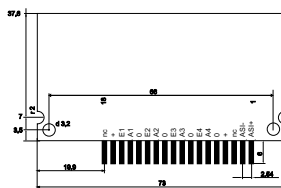
AS-i 4I/4O OEM Module with LEDs

BW2571 / BW2597		
Signal	Connection	
1	AS-i +	BN
2	AS-i -	BU
3	24V _{out}	RD
4	0V	BK
5	O4	YE
6	I4	WH
7	O3	YE
8	I3	WH
9	O2	YE
10	I2	WH
11	O1	YE
12	I1	WH



	AS-i Specification			Extended Addressing AB Slave	Outputs Loading capacity	AS-i Profile IO, ID, ID1, ID2
	2.0	2.11	3.0			
BW1468	•	•	•	—	100mA; Σ 180mA	7.O.-.F
BW1469	•	•	•	—	100mA; Σ 180mA	7.O.-.F
BW1470	•	•	•	—	100mA; Σ 180mA	7.O.-.F
BW1789	•	•	•	—	100mA; Σ 180mA	7.O.-.F
BW2571	—	—	•	•	80mA; Σ 180mA	7. A. 7. 7
BW2597	•	•	•	—	100mA; Σ 180mA	7.O.-.F

BW1468 / BW1469 / BW1470 / 1489



AS-i 6O-AB Module

AS-i Specification 2.1 AB-Slave (up to 62 slaves)

Additional 2 holes for
assembly angles



Article no. BW1627 with screw terminals

Article no. BW1679 with screw terminals, turned 180 degrees

The AS-i 6O-AB Module, which meets the requirements of the AS-i according to specification 2.1 is the board based solution for an AS-i slave. The board is completely powered by AS-i. The outputs are short circuit and overload protected.

The board consists out of 2 AS-i A/B Slaves.

If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog.

Using the outputs, you can drive up to 6 indicator lights, with the power being drawn from the AS-i system.

Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well.

The module offers additionally 2 holes for assembly angles.

AS-i addressing/startup: The second AS-i slave is disconnected until the first AS-i slave is in data exchange. Also with the help of a dip-switch the 2. AS-i slave could be separated from the AS-i line.

Article no.	BW1627	BW1679
Connection	screw terminals	screw terminals, turned 180 degrees
Connection	circuit board installation	
Quiescent current (Output = 0)	≤ 20 mA	
Outputs	6, electronic	
Loading capacity	100 mA per output (sum of all outputs < 180 mA) 24 V DC	
U	20 ... 30 V DC	
Supply current	max. 200 ma	
Length of connector cables	max. 1,5 m	
Operating voltage	via AS-i	
Operating current	≤ 200 mA	
EMC directions	EN 50 081-2, EN 50 082-2	
Ambient operating temperature	-25°C ... +70°C	
Storage temperature	-40°C ... +70°C	
Protection category EN 60 529	IP00 (soldering pins) IP20 (build in)	
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude	
Dimensions (L, W, H)	73 mm, 37,5 mm, 10 mm	

Programming (Bit-setting)

Data bit

(Input via AS-i)

Bit functions

D0 output O1, slave 1

D1 output O2, slave 1

D2 output O3, slave 1

D3 -

D4 output O4, slave 2

D5 output O5, slave 2

D6 output O6, slave 2

D7 -

Programming:

Address preset 0 + 1

changeable only via AS-i master in configuration mode.

IO code: 8

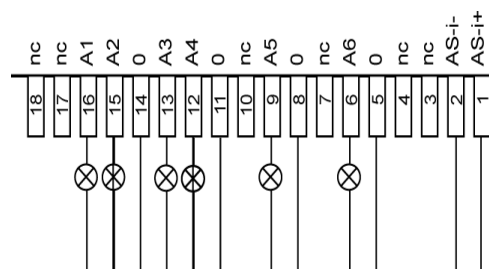
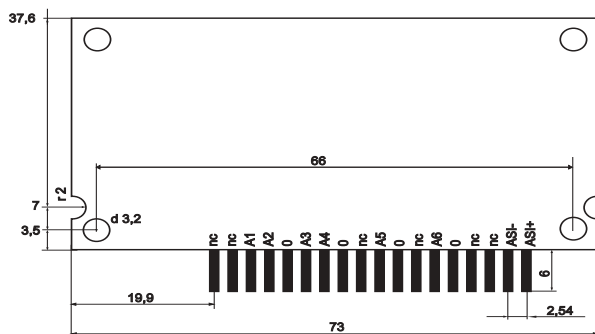
ID code: A

ID2 code: 0



1: 2. AS-i slave connected

1: 2. AS-i slave disconnected



AS-i 8I Module

AS-i Specification 2.1 AB Slave (up to 62 slaves)

Additional 2 holes
for angles



BW1351



BW1352



Article no. BW1351 with wiring pins

Article no. BW1352 with screw terminals

The AS-i 8I Module, which meets the requirements of the AS-i according to specification 2.1 is the board based solution for 2 AS-i slave. The board is completely powered by AS-i. The power supply is short circuit and overload protected.

The board exists of 2 AS-i A/B-Slaves.

With the inputs 8 mechanical switches can be interrogated.

Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well.

The AS-i 8I Module offers additionally 2 holes for assembly angles.

AS-i addressing: The second AS-i slave is disconnected until the first AS-i slave is in data exchange. Also with the help of a dip-switch the 2. AS-i slave could be separated from the AS-i line.

Article no.	BW1351	BW1352
Connection	wiring pins	screw terminals
Connection	circuit board installation	
Quiescent current (Input = 0)	≤ 20 mA	
Switching threshold of inputs	≤ 0,8 mA (low) ≥ 5 mA (high)	
U	20 ... 30 V DC	
Supply current	max. 200 mA	
Length of connector cables	max. 1,5 m	
Operating voltage	via AS-i	
Operating current	≤ 200 mA	
EMC directions	EN 50 081-2, EN 50 082-2	
Ambient operating temperature	-25°C ... +70°C	
Storage temperature	-40°C ... +70°C	
Protection category EN 60 529	IP00 (soldering pins) IP20 (build in)	
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude	
Dimensions (L / W / H in mm)	73 / 37,5 / 7	7 / 37,5 / 10

Programming (Bit-setting)

Data bit

(Input via AS-i)

Bit function

- D0 input I1, slave 1
- D1 input I2, slave 1
- D2 input I3, slave 1
- D3 input I4, slave 1
- D4 input I5, slave 2
- D5 input I6, slave 2
- D6 input I7, slave 2
- D7 input I8, slave 2

Programming:

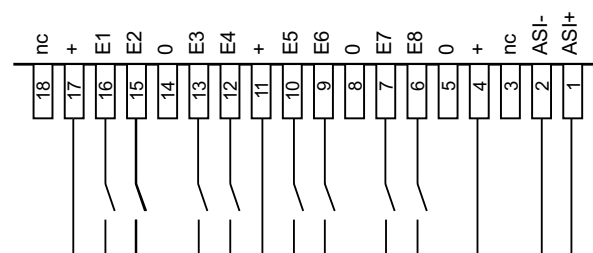
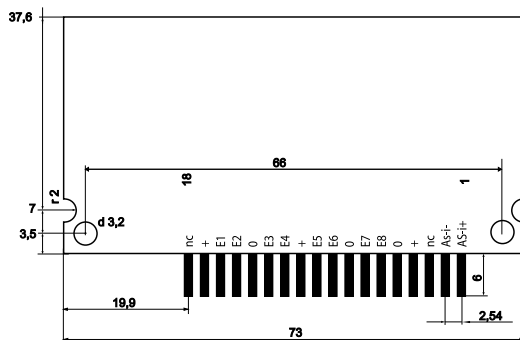
Address preset 0 + 0
changeable only via AS-i Master in
configuration mode.

IO code 0

ID code A

ID2 code 2

- 1: 2. AS-i slave connected
- 1: 2. AS-i slave disconnected

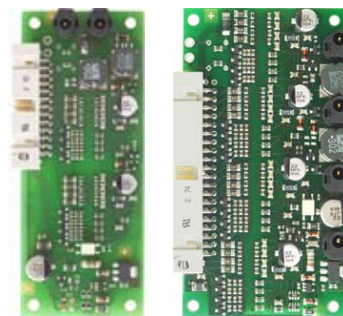


AS-i 8I/8O OEM Module
2 4I/4O Single Slaves

AS-i 3.0 8I/8O OEM Module
2 4I/4O-AB Slaves

AS-i 16I/16O OEM Module
4 4I/4O Single Slaves

AS-i 3.0 16I/16O OEM Module
4 4I/4O-AB Slaves



BW1898, BW1899 BW1900, BW1901



Article no. BW1898 AS-i 8I/8O OEM Module, 2 4I/4O Single Slaves

Article no. BW1899 AS-i 3.0 8I/8O OEM Module, 2 4I/4O-AB Slaves

Article no. BW1900 AS-i 16I/16O OEM Module, 4 4I/4O Single Slaves

Article no. BW1901 AS-i 3.0 16I/16O OEM Module, 4 4I/4O-AB Slaves

The AS-i Special Slave is realized by 2 resp. 4 AS-i slaves. The board is completely powered by AS-i.

A watchdog function is integrated. It powers the outputs off, if bus communication is interrupted (master failure).

The inputs/outputs can head for up to 8 resp. 16 LEDs. The energy is supplied by the AS-i system.

The addressing of 2 resp. 4 AS-i slaves is very easy with the help of 2 resp. 4 addressing sockets.

The extended addressing (AB-technique: up to 62 slaves, Single Slaves: up to 31 slaves) is possible.

Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well.

Article no.	BW1898	BW1899	BW1900	BW1901
AS-i Specification	AS-i 2.1	AS-i 3.0	AS-i 2.1	AS-i 3.0
Extended addressing	≤ 31 slaves	≤ 62 slaves	≤ 31 slaves	≤ 62 slaves
Addressing	2 slaves	2 slaves	4 slaves	4 slaves
Connection	wiring pins			
Connection	circuit board installation			
Quiescent current (input = 0, output = 0)	≤ 40 mA		≤ 50 mA	
Switching threshold of inputs	≤ 0,3 mA (low) ≥ 2 mA (high)			
U	20 .. 30 V DC			
Outputs	8		16	
Inputs	8		16	
Loading capacity	70 mA per output (sum of all outputs < 200 mA) 24 V DC, no inductive load, no short circuit			
Length of connector cables	I/O: max. 1,5 m			
Operating voltage	via AS-i			
Operating current	≤ 400 mA		≤ 500 mA	
EMC directions	EN 61000-6-2, EN 61000-6-4			
Ambient operating temperature	-25°C .. +70°C			
Storage temperature	-40°C .. +70°C			
Protection category EN 60 529	IP00			
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 .. 55 Hz, 0,5 mm amplitude			
Dimensions (L / W / H in mm)	104 / 41 / 16		93 / 51 / 16	

Programming (Bit-setting)

Data bit (Input via AS-i) Bit function

D0 input I1/output O1
D1 input I2/output O2
D2 input I3/output O3
D3 input I4/output O4

Parameter bit BW1898, BW1900

Bit function

P0 not used
P1 not used
P2 not used
P3 not used

Parameter bit BW1899, BW1901

Bit function

P0 0 = off/1 = on (watchdog)
P1 0 = on/1 = off (data input filter 128 µs)
P2 0 = on/1 = off (synchronous data I/O mode)
P3 not used

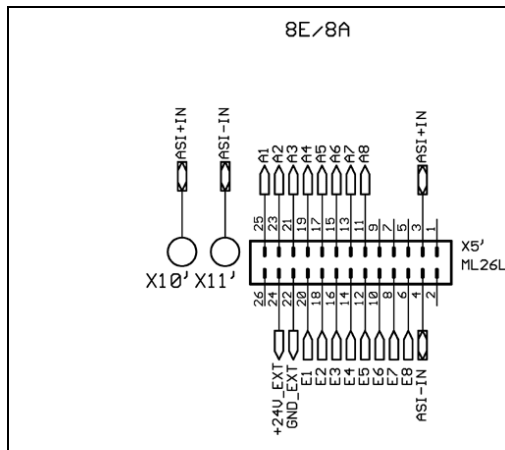
Programming:

Address preset 0
changeable via bus master or programming devices

AS-i Spec. 2.1 3.0

IO code 7 7
ID code F A
ID1 code (F) 7 (fixed)
ID2 code E 7

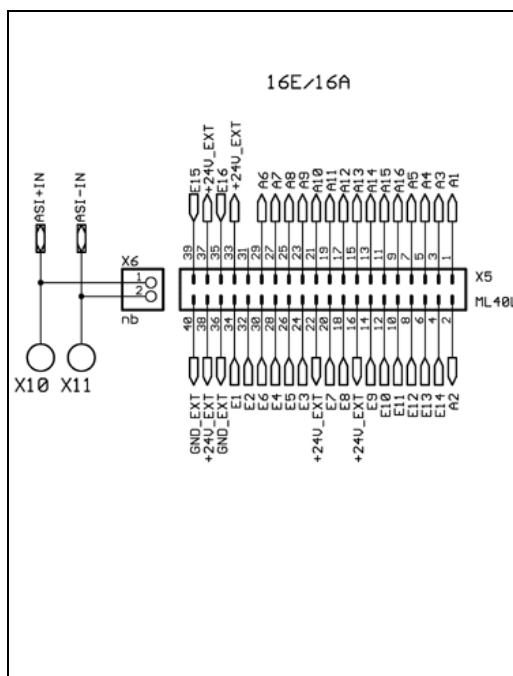
Connections 8I/8O Module



26 pin	Data bit	Signal name
1	-	-
2	-	-
3	ASI+	ASI +
4	ASI-	ASI-
5	-	-
6	ASI2.E3	E8
7	-	-
8	ASI2.E2	E7
9	-	-
10	ASI2.E1	E6
11	ASI2.A3	A8
12	ASI2.E0	E5
13	ASI2.A2	A7

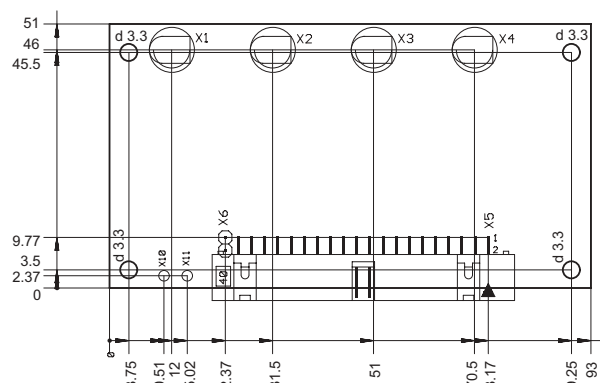
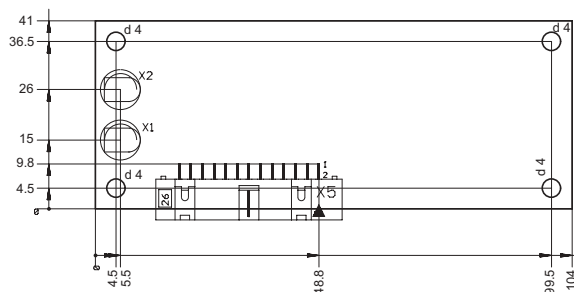
26 pin	Data bit	Signal name
14	ASI1.E3	E4
15	ASI2.A1	A6
16	ASI1.E2	E3
17	ASI2.A0	A5
18	ASI1.E1	E2
19	ASI1.A3	A4
20	ASI1.E0	E1
21	ASI1.A2	A3
22	GND_EXT	GND_EXT
23	ASI1.A1	A2
24	+24V_EXT	+24V_EXT
25	ASI1.A0	A1
26	-	-

Connections 16I/16O Module



40 pin	Data bit	Signal name
1	ASI1.A0	A1
2	ASI1.A1	A2
3	ASI1.A2	A3
4	ASI1.A3	A4
5	ASI1.A3	A4
6	ASI4.E1	E14
7	ASI2.A0	A5
8	ASI3.E3	E12
9	ASI4.A3	A16
10	ASI3.E2	E11
11	ASI4.A2	A15
12	ASI3.E1	E10
13	ASI4.A1	A14
14	ASI3.E0	E9
15	ASI4.A0	A13
16	+24V	+24V
17	ASI3.A3	A12
18	ASI2.E3	E8
19	ASI3.A2	A11
20	ASI2.E2	E7

40 pin	Data bit	Signal name
21	ASI3.A1	A10
22	+24V	+24V
23	ASI3.A0	A9
24	ASI1.E2	E3
25	ASI2.A3	A8
26	ASI2.E0	E5
27	ASI2.A2	A7
28	ASI1.E3	E4
29	ASI2.A1	A6
30	ASI2.E1	E6
31	-	-
32	ASI1.E1	E2
33	+24V	+24V
34	ASI1.E0	E1
35	ASI4.E3	E16
36	GND	GND
37	+24V	+24V
38	+24V	+24V
39	ASI4.E2	E15
40	GND	GND



AS-i OEM Slave with serial Interface

AS-i OEM Slave with serial Interface

Developing platform for
client specific electronics,
specific serial protocols

Single slave
(A/B slave possible with appropriate protocol)

Additional 2 holes for assembly angles



The AS-i OEM Slave with serial interface is a developing platform with its help client specific electronics can be connected to AS-i. With the help of the AS-i profile S-7.3 (other profiles on request) a greater data volume can be transferred via AS-i easily. The

data can be operated easily in the AS-i master via the command interface from a PLC.

Customer-specific special orders are possible on short notice.

Technical data	
Connection	screw terminals
Connection	circuit board installation
Customer interface	TTL, RS 232 or RS 485, galvanical separated to AS-i
Baud rates	Up to 19200 bit/s
Length of connector cable	I/O: max. 1,5 m
Operating voltage AS-i part	Via AS-i
Operating voltage customer interface	20 ... 30 V DC, 80 mA out of customer electronic, 5 V supply on request
Operating current AS-i part	≤ 100 mA
EMC directions	EN 61 000-6-2, EN 61 000-6-4
Ambient operating temperature	-25°C ... +70°C
Storage temperature	-40°C ... +70°C
Protection category (EN 60 529)	IP20 (build in)
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude
Dimensions (L, W, H)	73 mm, 37,5 mm, 10 mm

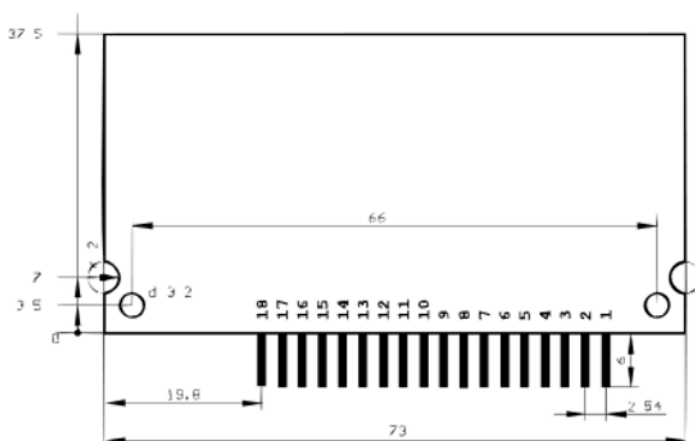
Programming
(Bit-setting)

Data range
Analog input data image, channel 1

Parameter bit
Bit function
P0 not used
P1 not used
P2 not used
P3 not used

Programming:
Address preset 0
changeable via bus master or programming devices

IO code 7
ID code 3
ID2 code 8



Pin	Connection
1	ASI+
2	ASI-
3	nc
4	nc
5	nc
6	nc
7	nc
8	nc
9	nc

Pin	Connection
10	RXD TTL
11	TXD TTL
12	TXD RS 232
13	RXD RS 232
14	GND supply input
15	RS 485 positive
16	RS 485 negative
17	24 V supply input
18	nc

AS-i OEM Power Supply Module

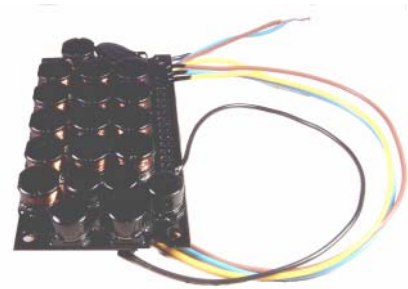
AS-i OEM Power Supply Module

OEM Power Supply out of AS-i

U_{aux} out of AS-i

1,5 A max. (by approx. 24 V)

Help energy out of AS-i

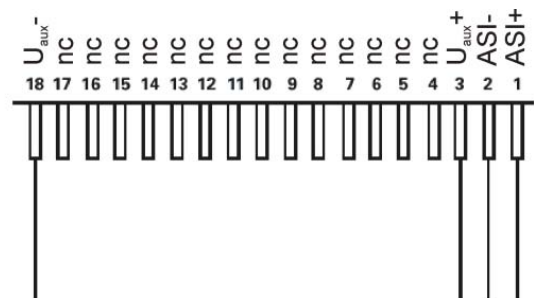
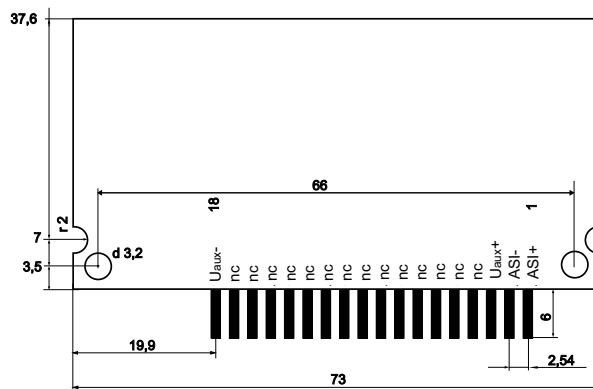


Article no. BW1485

With the help of the OEM Power Supply Module it is possible to take out up to 1,5 A current (by approx. 24 V) out of AS-i. The help energy can be used for supply of ventilis or other consumers. Every time if there is no additional help energy for supply available for example in moved parts, in robots or by far away locations in a plant, it is possible to take out the help energy out of AS-i with the help of the OEM Power Supply Module. With help of the OEM Power Supply Module it is possible to cut of conducting additional 24 V help energy to bad accessible places.

The OEM Power Supply Module occupies no slave addresses. But the module loads the AS-i circuit with the impedance of 7 AS-i slaves (single slaves). Therefore the maximum account of slaves is restricted. According AS-i specification it is allowed to operate only up to 24 single or 48 AB-slaves in connection with a OEM Power Supply Module at an AS-i rope. The OEM Power Supply Module is short circuit protected. For protection against dust and humidity the modul is varnished.

Article no.	BW1485
Connection	via fastened line
U_{aux}	20 ... 30 V DC
Loading capacity	1,5 A
EMC directions	EN 50 081-2, EN 50 082-2
Operating temperature	-25°C ... +70°C
Storage temperature	-25°C ... +70°C
Protection category EN 60 529	IP00
Allowable shock and vibration stress	≤ 15 g, $T \leq 11$ ms 10 ... 55 Hz, 0,5 mm amplitude
Dimensions (L, W, H)	73 mm, 37,5 mm, 7 mm



AS-i Master/Gateways/ Links/Scanner					
AS-i Slaves					
AS-i Accessories/ Diagnostics/Development					
Other Fieldbuses/ Master Simulators					
AS-i Safety					
Price Lists					

Overview AS-i Specialities

Housing	Module	Art. No.	Characteristic	P.
	AS-i 3.0 Universal Module in IP65	BWU1931	analog and digital inputs/outputs in one module	
	AS-i Counter Module	BWU2218	2-channel input	122
		BWU2219	2 x 2-channel input	
		BWU2189	4 x 2-channel input	
		BWU1723	1-channel input (analog)	124
		BWU1711	1-channel input (0 to 15)	125
	AS-i Analog Module: 2 inputs for Leuze ODSL 30 distance sensors	BW1908	0 ... 65 m	126
		BW1664	0 ... 30 m	
	AS-i Code Block	BW1527	with 2 code switches	128
 	AS-i/AS-i Coupler	BW1187	connection of 2 AS-i networks via 2 internal 4I/4O slaves	127
		BWU1280	connection of 2 AS-i networks via 2 internal 4I/4O slaves, 129 protection category IP65	

Analog and digital inputs/outputs in one module

Mixed input/output slave:

- 2 analog inputs 4 ... 20 mA
- 1 binary output
- 1 pulse input
- 1 status input

Protection category IP65



Article no. BWU1931: Analog and digital inputs/outputs in one module

The analog module has 2 analog inputs 4 ... 20 mA, 1 binary output, 1 pulse input and 1 status input.

The conversion of the measured value and the data transmission via AS-i occurs according to AS-i Profile 7.5.5. Inputs are completely galvanically isolated. The ground of the binary output is connected to 0 V

ext. Analog sensors can be connected via cage clamp terminals. The sensor-interfaces are supplied by external voltage (according to PELV) via the black ribbon cable, 1 A max. The external 24 V supply voltage must be connected. The resolution of the analog data is 16 bit.

Article no.	BWU1931
Analog inputs	2 inputs 4 ... 20 mA/ 50 W
Binary outputs	1 output 24 V/ 0,5 A
Digital inputs	1 pulse input 0 ... 1kHz, threshold value 13 V 1 status input 0 ... 10 Hz, threshold value 13 V
Resolution	16 bit
Max. current per analog input	40 mA
Range of value	40 mA
Transformation speed	120 ms for analog inputs
AS-i Profile	7.5.5
ID code	5
ID1 code	F
ID2 code	5
IO code	7
Displays	
LED green (analog 1)	analog signal 1
LED green (analog 2)	analog signal 2
LED green (binary output)	binary signal
LED green (pulse input)	pulse signal
LED green (status input)	status signal
LED green (Pwr)	AS-i voltage
LED red (Fault)	AS-i communication error, peripheral fault
LED green (Aux)	ext. power on (mandatory)
Operating current	< 80 mA
Operating voltage	AS-i (30 V DC)
Voltage of insulation	≥ 500 V
EMC directions	EN 61 000-6-2 EN 61 000-6-4
Ambient operating temperature	0°C ... +70°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L / W / H in mm)	90 / 80 / 70
Protection category (DIN 40 050)	housing IP65

Programming:

(Bit-settings of AS-i parameters)

Bit P0:

1: counter in operation
0: counter set to "0"

Bit P1:

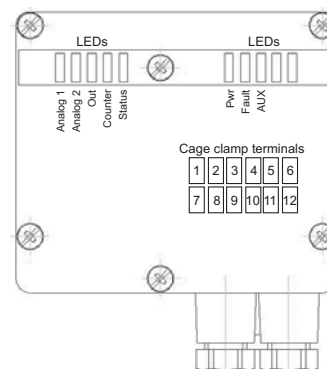
1: upward counting
0: downward counting

Bit P2:

1:Peripheral fault is indicated
0:Peripheral fault is *not* indicated

Bit P3:

1:scaling (analog values) 4000 ... 20000 dec.
0:scaling (analog values) 0 ... 27648 dec.
(Siemens format)



Bit Function

D0 input status / output 1
D1 input pulse / n.a.
D2 n.a. / n.a.
D3 n.a. / n.a.

Bit Function

A0 input 1
A1 input 2
A2 pulse count
A3 n.a.

Connections:

AS-i 3.0 Universal Module in IP65



THE AS-INTERFACE MASTERS

1	24 V ext.
2	Sig. + Ch 1
3	Sig. + Ch 2
4	Sig. + Pulse
5	Sig. + Status
6	Sig. + Out

7	0 V ext.
8	Sig. - Ch 1
9	Sig. - Ch 2
10	Sig. - Pulse
11	Sig. - Status
12	0 V Out

AS-i-Master/Gateways/

AS-i Slaves

AS-i Accessories/

Other Fieldbuses/

AS-i Safety

Price Lists

A/B inputs

**Profile 7.3 „Plug and Play“
as simple as digital AS-i I/O**

High protection category IP65



Article no. BWU2218: Counter Module 2-channel input

Article no. BWU2219: Counter Module 2 x 2-channel input

Article no. BWU2189: Counter Module 4 x 2-channel input

The AS-i Counter Module has inputs for standard sensors (24 V, pnp, push-pull). The module counts the impulses with the two channels (BWU2218), twice two channels (BWU2219) or 4 x two channels (BWU2189) up- and downwards and outputs the result as 16 bit value (-32768 ... 32767) via AS-i. The start value is -30768.

With the help of parameters the module can be set to zero as well as the counting direction can be defined. Es stehen verschiedene

Different pre-divisors are available, which can be select via AS-i parameters as well.

As long as the AS-i parameter for setting zero is set the counting is stopped. After the setting to zero of the counting value a pre-divisor or the AS-i parameter for no pre-divisor must be adjusted again.

The module reports a peripheral fault at counter overflow (under-flow).

Article no.	BWU2218	BWU2219	BWU2189
Inputs	1 M12 input (2 channels)	2 M12 inputs (2 x 2 channels)	4 M12 inputs (4 x 2 channels)
Voltage supply, sensors	via AS-i		
Range of value	-32 768 ... 32 767 dec. (start value: -30768)		
Counting rate	max. 20 kHz		
Power supply sensor	max: 150 mA		
AS-i profile	7.3		
ID code	3 _{hex}		
ID2 code	C _{hex}	D _{hex}	E
IO code	7 _{hex}		
Displays			
LEDs geen (In 1 - 4)	state of input 1	state of inputs 1 and 2	state of inputs 1, 2, 3 and 4
LED green (PWR)	AS-i voltage		
LED red (FAULT)	AS-i communication error, peripheral fault		
Operating current	< 200 mA		
Operating voltage	AS-i (30 V _{DC})		
Voltage of insulation	≥ 500 V		
EMV	EN 61 000-6-2 EN 61 000-6-4		
Ambient operating temperature	0°C ... +70°C		
Storage temperature	-25°C ... +85°C		
Housing	housing for DIN-rail mounting		
Dimensions (L / W / H in mm)	90 / 80 / 43		
Protection category DIN 40 050	housing IP65		

Programming (Bit-setting of AS-i parameters)

BWU2218

Bit P0	Parameter
1	count upwards In 1
0	count downwards In 1

Bit P1	Parameter
1	counter In 1
0	set zero In 1

Bit P3	Bit P2	Parameter
1	1	no pre-divisor
1	0	pre-divisor = 2
0	1	pre-divisor = 8
0	0	pre-divisor = 32

BWU2219

Bit P0	Parameter
1	count upwards In 1
0	count downwards In 1

Bit P1	Parameter
1	counter In 1
0	set zero In 1

Bit P2	Parameter
1	count upwards In 2
0	count downwards In 2

Bit P3	Parameter
1	counter In 2
0	set zero In 2

BWU2189

Bit P2	Bit P1	Bit P0	Parameter
0	0	0	set zero In 1
0	0	1	set zero In 3
0	1	0	pre-divisor = 32
0	1	1	set zero In 2
1	0	0	pre-divisor = 8
1	0	1	set zero In 4
1	1	0	pre-divisor = 2
1	1	1	no pre-divisor

Bit P3	Parameter
1	count upwards In 1 ... In 4
0	count downwards In 1 ... In 4

Start value:

At power-up, all the counter with 0x87D0 (-30768) are initialized to indicate that there is no zero-setting.

Accessories:

- AS-i substructure module to connect 2 AS-i flat cables (article no. BW1180, see page 195)
- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (article no. BW1181, see page 195)
- AS-i substructure module to connect 2 AS-i round cable (article no. BW1182, see page 195)
- AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (article no. BW1183, see page 195)
- AS-i substructure module to connect 2 AS-i flat cables with addressing socket (article no. BW1438, see page 195)

1-Channel Input

Profile 7.3 "Plug and Play"
As simple as digital AS-i I/O

High protection category IP65



Article no. BWU1723: AS-i Counter Module

The AS-i Counter Module has 1 input for standard sensors. The module counts the impulses or frequency up- and downwards with the 1 channel and outputs the result as a 16 bit value (-32 768 ... 32 767) via AS-i. The start value is -32 768. With the help of parameters the module can be set to start value as well as the counting direction can be defined.

With parameter P2 the user can choose between counting impulses or frequency measurement. As long as the AS-i parameter P0 is set the counting is stopped. The module reports a peripheral fault at counter overflow (under-flow) or when status input is going invalid (low).

Article no	BWU1723
Input	1 input
Voltage supply, sensors	via external voltage 24 V
Range of value	-32 768 ... 32 767 dec. (start value: -32 768)
Counting rate	max. 4 kHz
Power supply sensor (ext. 24V)	max. 700 mA
AS-i profile	7.3
ID code	3 _{hex}
ID2 code	C _{hex}
IO code	7 _{hex}
Displays	
LED yellow	state of channel 1
LED green (PWR)	AS-i voltage
LED red (FAULT)	AS-i communication error, peripheral fault
Operating current	< 200 mA
Operating voltage	AS-i (30 V DC)
Voltage of insulation	≥ 500 V
EMC	according EN 50 081-2, EN 61 000-6-2
Ambient operating temperature	0°C ... +70°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L, W, H)	90 mm, 80 mm, 43 mm
Protection category (DIN 40 050)	housing IP65

Programming:

(Bit-setting of AS-i parameters)

P0	Operation
0	set to start value (-32768)
1	normal operation

P1	Gate time
0	8 s gate time for frequency
1	1 s gate time for frequency

P2	Mode
0	impulse
1	frequency

P3	Counting direction
0	count downwards
1	count upwards

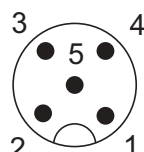
Accessories:

AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (art. no. BW1181, see also page 195)

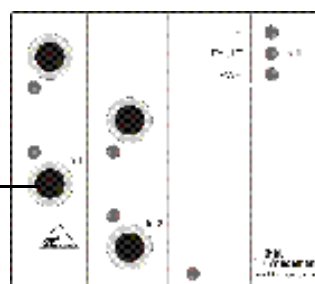
AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (art. no. BW1183, see also page 195)

Connections:

1	24 V extern
2	channel 1 +, pulse/freq. input
3	0 V extern
4	status input
5	n.c.



Connection counter



AS-i Counter Module (0-15)

1-Channel Input

As simple as digital AS-i I/O

High protection category IP65

AS-i connection via bottom module or M12



Article no. BWU1711: AS-i Counter Module (0 to 15)

The AS-i Counter Module has 1 input for standard sensors. The module counts the impulses from (0 ... 15) via AS-i. The start value is 0. When reaching the count 15 the module starts at 0 again. The counter module loads the current value and determines the number of pulses between two host calls from the difference between this value and the previous.

With the help of parameters the module can be set to zero as well as the counting direction can be defined.

As long as the AS-i parameter for setting zero is set the counting is stopped.

Article no	BWU1711
Inputs	1 input
Voltage supply, sensors	via AS-i
Range of value	0 ... 15 dec. (start value: -0)
Counting rate	max. 769 Hz
Power supply sensor	max. 150 mA
AS-i profile	S-0.F
ID code	F _{hex}
IO code	0 _{hex}
ID1 code	F _{hex}
ID2 code	E _{hex}
Displays	
LED yellow	state of channel 1
LED green (PWR)	AS-i voltage
LED red (FAULT)	AS-i communication error, peripheral fault
Operating current	< 200 mA
Operating voltage	AS-i (30 V DC)
Voltage of insulation	≥ 500 V
EMC	according EN 50 081-2, EN 61 000-6-2
Operating temperature	0°C ... +70°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L, W, H)	90 mm, 80 mm, 43 mm
Protection category (DIN 40 050)	housing IP65

Programming:

(Bit-setting of AS-i parameters)

P1	P0	not used
----	----	----------

P2	
1	normal mode
0	set zero

P3	
1	count upwards
0	count downwards

Accessories:

AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (art. no. BW1181, see also page 195)

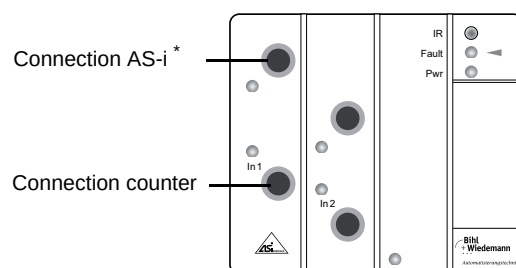
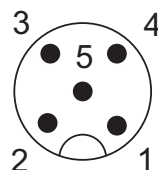
AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (art. no. BW1183, see also page 195)

Connection AS-i

1	AS-i +
2	n.c.
3	AS-i -
4	n.c.
5	n.c.

Connection counter:

1	24 V out of AS-i
2	input
3	0 V out of AS-i
4	n.c.
5	n.c.



* Remark: If you use this connection for AS-i, do not connect an AS-i cable to the substructure.

AS-i Analog Module: 2 Inputs for Leuze ODSL 30 Distance Sensors

2 ODSL Distance Sensors connectable

Connection of the ODSL 30
via M12 sockets

High protection category IP65



Article no. BW1908: 0 ... 65 m

Article no. BW1664: 0 ... 30 m

2 ODSL 30 can be connected to the module. The measured values are transferred asynchronously to the host according to AS-i profile 7.3. The distance sensors are connected via 4-pin M12 sockets. The communication between ODSL 30 and the AS-i module is made by RS 485.

The distance sensors are powered out of separated 24 V.

With the help of AS-i parameters the referencing can be started and the number of the connected ODSL 30 can be set. The peripheral fault is set, if an error occurs two times in succession at measuring or referencing.



Article no.	BW1664		BW1908
Inputs	max. 2 ODSL 30		
Voltage supply, sensors	via AS-i		
Resolution	1 mm 16 bit signed 0 ... 32766	1 mm 16 bit unsigned 0 ... 32766	
AS-i profile	7.3		
ID code	3 _{hex}		
ID2 code	D _{hex}	9 _{hex}	
IO code	7 _{hex}		
Displays			
LED green (Analog 1)	state of channel 1		
LED green (Analog 2)	state of channel 2		
LED green (PWR)	AS-i voltage		
LED red (FAULT)	AS-i communication error, peripheral fault		
Operating current	< 250 mA		
Operating voltage	AS-i (30 V DC)		
Voltage of insulation	≥ 500 V		
EMC directions	EN 61 000-6-3, EN 61 000-6-2		
Operating temperature	0°C ... +70°C		
Storage temperature	-25°C ... +85°C		
Housing	housing for DIN-rail mounting		
Dimensions (L, W, H)	90 mm/ 80 mm/ 70 mm		
Protection category (IEC 60 529)	housing IP65		

Programming:

(Bit-setting via AS-i parameters)

Bit P0:

1: It is measured on sensor 1
0: Sensor 1 is referencing

Bit P1:

(Bit P1 is not used, if bit P3 = 0)

1: It is measured on sensor 2
0: Sensor 2 is referencing

Bit P2:

1: Peripheral fault is allowed
0: Peripheral fault is not allowed

Bit P3:

1: Sensors 1 and 2 are used
0: Sensor 1 is used only

Settings at the ODSL 30:

Serial menu: Remote Control, Baudrate 19200, Node Address 0

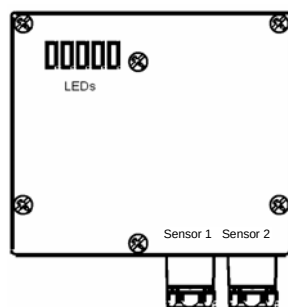
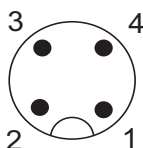
Accessories:

AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (art. no. BW1181, see also page 195)

AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (art. no. BW1183, see also page 195)

Connections (M12 socket, 4 pins):

1	+24V
2	RS485 TX+
3	0V
4	RS485 TX-



Connection of 2 AS-i Networks via 2 internal 4I/4O Slaves

Easy data exchange
between 2 AS-i Networks via
the internal 2 AS-i Slaves



Article no. BW1187

The AS-i/AS-i Coupler provides the easiest solution to exchange data between two PLCs via AS-i.

In big applications with more than one AS-i network there is often a need to exchange data between two AS-i networks, e. g. to report the process status. This problem was solved in the past with the help of 2 normal AS-i 4I/4O Modules, with the inputs of one slave connected to the outputs of the other slave. With the use of the AS-i/AS-i Coupler to solve this problem the installation costs as well as the components costs can be reduced.

The AS-i/AS-i Coupler consists of two 4I/4O Slaves in one housing. The outputs of one slave are connected to respective inputs

of the other slave and vice versa (AS-i output data bit 0 of the first slave with AS-i input data bit 0 of the second slave and vice versa, etc.).

There is a galvanic isolation between both AS-i networks.

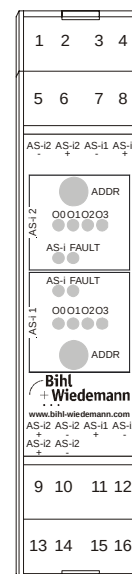
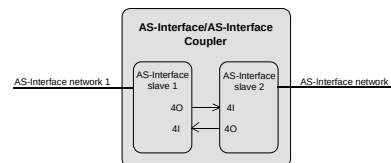
Each AS-i slave has got 6 LEDs, 4 LEDs for the 4 outputs, one power LED and 1 LED for AS-i faults. Furthermore each slave has got an address socket.

As long as one of both slaves does not exchange data the other slave reads on each input a 0 as default.

Technical data

Article no.	BW1187
Interfaces	AS-i circuit 1 and 2
IO-Code (slave 1 and 2)	7 _{hex}
ID-Code (slave 1 and 2)	F _{hex}
ID1-Code (slave 1 and 2)	F _{hex}
ID2-Code (slave 1 and 2)	E _{hex}
LEDs for slave 1 and 2	
LED green (power)	AS-i voltage ON
1x LED red (FAULT)	AS-i communication error, peripheral fault
4x LEDs yellow	output 1 up to output 4
2x address socket (ADDR)	for slave 1 and slave 2
Operating current	< 80 mA per slave
Operating voltage	AS-i (30 V DC)
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082, EN 50 081
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L, W, H)	99 mm, 22,5 mm, 92 mm
Protection category (DIN 40 050)	housing IP20

AS-i connections via 4-pin COMBICON plug:



1	AS-i2-
2	AS-i2+
3	AS-i1-
4	AS-i1+
5	n.c.
6	n.c.
7	n.c.
8	n.c.
9	AS-i2+
10	AS-i2-
11	AS-i1+
12	AS-i1-
13	AS-i2+
14	AS-i2-
15	n.c.
16	n.c.

AS-i Code Block

Codes from 0 to 255

Adjustment via
2 rotary switches

2 AB Slaves



Article no. BW1527 with 2 code switches

With the help of the 2 slaves for example tools (changing AS-i circuits) can be coded from 0 to 255.

The AS-i Code Block consists of 2 AS-i slaves and 2 rotary switches with which a value each from 0_{hex} to F_{hex} (0 to 15 decimal) can be adjusted. The adjusted values of the rotary switches are connected with the inputs of the AS-i slaves. The codes are

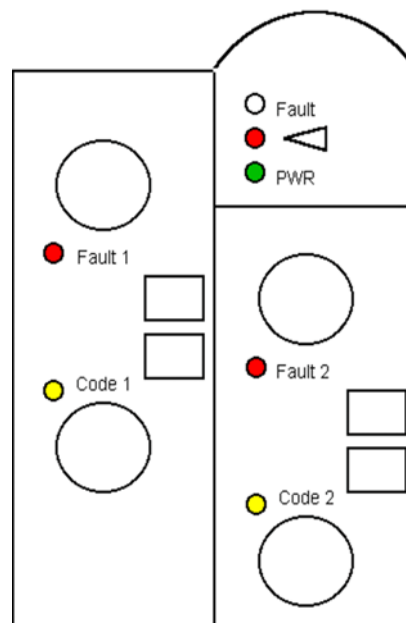
transmitted via AS-i and can be processed easy in the I/O area of the controller.

There is a common Fault LED (red) and a green AS-i Power LED. Additionally there are 2 LEDs for each slave: One for the code switch (yellow, on when code is not zero) and one for communication error (red).

The AS-i Code Block is equipped with two programming sockets.

Technical data

Article no.	BW1527
Interfaces	AS-i
IO code (slave 1 and 2)	0 _{hex}
ID code (slave 1 and 2)	A _{hex}
ID1 code	F _{hex}
ID2 code	E _{hex}
LED red (Fault)	communication error
LED green (PWR)	AS-i voltage OK
LEDs for slave 1 and 2:	
1x LED red (Fault 1/Fault 2)	slave 1/slave 2 offline
1x LED yellow (Code 1/Code 2)	code switch unequal zero
1x address sockets	for slave 1 and slave 2
Operating current	< 50 mA per slave
Operating voltage	AS-i (30 V DC)
Voltage of insulation	≥ 500 V
EMC directions	EN 61 000-6-2 EN 51 081-2
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L, W, H)	45 mm, 80 mm, 50 mm
Protection category (DIN 40 050)	housing IP65



Accessories:

- AS-i substructure module to connect 2 AS-i flat cable (Article no. BW1180, see also page 195)
- AS-i substructure module to connect 2 AS-i round cable (Article no. BW1182, see also page 195)

Connection of 2 AS-i networks via 2 internal 4I/4O slaves

Easy data exchange
between 2 AS-i networks via
the internal 2 AS-i slaves

High protection class IP65



Article no. BWU1280

The AS-i/AS-i Coupler provides the easiest solution to exchange data between two PLCs via AS-i.

In big applications with more than one AS-i network there is often a need to exchange data between two AS-i networks, e. g. to report the process status. This problem was solved in the past with the help of 2 normal AS-i 4I/4O Modules, with the inputs of one slave connected to the outputs of the other slave. With the use of the AS-i/AS-i Coupler to solve this problem the installation costs as well as the components costs can be reduced.

The AS-i/AS-i coupler consists of two 4I/4O Slaves in one housing. The outputs of one slave are connected to respective inputs

of the other slave and vice versa (AS-i output data bit 0 of the first slave with AS-i input data bit 0 of the second slave and vice versa, etc.).

There is a galvanic isolation between both AS-i networks.

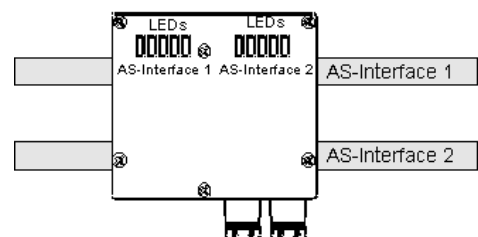
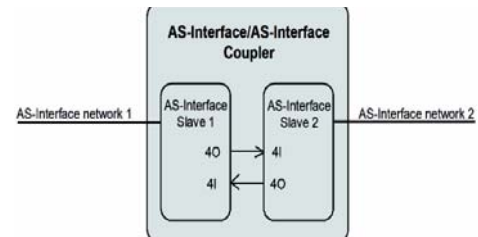
Each AS-i slave has got 5 LEDs, 4 LEDs for the 4 outputs and one power LED. Furthermore each slave has got an address socket.

As long as one of both slaves does not exchange data the other slave reads on each input a 0 as default.

Technical data

Article no.	BWU1280
Interfaces	AS-i circuit 1 and 2
IO-Code (slave 1 and 2)	7 _{hex}
ID-Code (slave 1 and 2)	F _{hex}
ID1-Code (slave 1 and 2)	F _{hex}
ID2-Code (slave 1 and 2)	E _{hex}
LEDs for slave 1 and 2	
2x 4 LEDs yellow	output 1 up to output 4
2 x LED green/red (PWR/FAULT)	AS-i voltage/Communication error
2x address sockets	for slave 1 and slave 2
Operating current	< 80 mA per slave
Operating voltage	AS-i (30 V DC)
Voltage of insulation	≥ 500 V
EMC directions	EN 50 082, EN 50 081
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L, W, H)	90 mm, 80 mm, 70 mm
Protection category (DIN 40 050)	housing IP65

AS-i connections via yellow AS-i cable



AS-i Master/Gateways/ Links/Scanner	
AS-i Slaves	
AS-i Accessories/ Diagnostics/Development	
Other Fieldbuses/ Master Simulators	
AS-i Safety	
Price Lists	

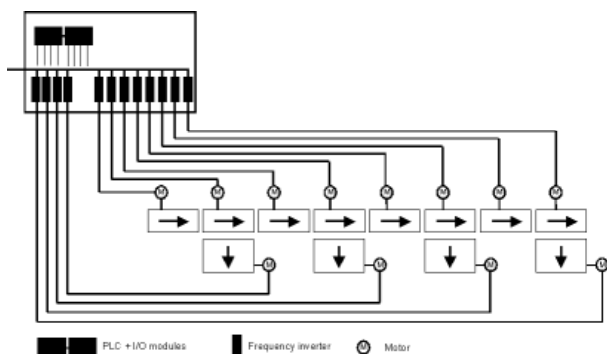
Overview AS-i Drive Solutions

Housing	Module	Art. No.	Characteristic	P.
	Cylindrical AS-i Actuator 1I/3O	BWU1647	AB slave (up to 62 slaves)	133
	AS-i Slave for SEW frequency inverters	BW2038	with M12 sockets, protection category IP65	134
	AS-i 3.0 Motor Modules	BW2437	AS-i 3.0 4I/4O Module for MOVI-SWITCH	135
		BWU2398	for 2 Roller Drives, speed setting of AS-i parameter, for each two Interroll motors EC200 or EC300	136
		BWU2575	for 2 Roller Drives, speed setting of AS-i parameter, for each two Interroll motors EC310	
		BWU2478	for 2 Roller Drives, speed setting of AS-i analog values or rotary switches	138

Connection of variabel speed drives and motors with integrated switching and protection

Application sample

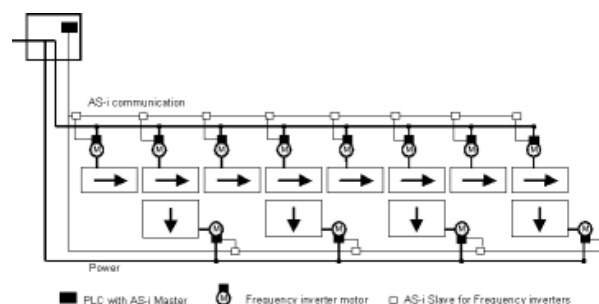
The AS-i - originally designed to network binary sensors and actuators - offers in combination with the AS-i slaves for frequency inverters and decentralizes frequency inverters frequency inverter motors a possibility to create new plant structures together with drives. The advantages of AS-i like small costs, high flexibility, easy handling can be combined with the functionality of frequency inverters and especially frequency inverter motors as well as with motors with integrated switching and protection function in an efficient way. That concept provides the user a real alternativ to create new solutions for machines and plants which were former realized with more powerful fieldbus systems.



Picture:1 Traditional concept with parallel wiring

Picture 1 shows a production line with 12 conveyer belts. Each conveyer belt is variable speed driven. The power cabeling between frequency inverter and the decentral located

motors is conventionally installed. The parallel wiring starts at the central cabinet and ends at the particular motors. This means a big cabinet with all PLC I/O slots as well as all frequency inverters.



Picture 2: Decentral frequency inverter motors communicating via AS-i

Picture 2 shows a cabeling alternative for the same production line, with frequency inverters or frequency inverter motors decentral located and communicating via AS-i. In opposite to the parallel power wiring only two cables go through the plant - the AS-i to transmit the control signals and the power bus.

As you can see from this example there are possibilities to minimize the cabinet card, the power cabeling, if AS-i is used in combination with decentral used drives. Further advantages are the possibility to design modular plant structures, to minimize the installation time and test time. This all leads to an earlier start of the production which means less "dead" money.



Cylindrical AS-i Actuator 1I/3O

AS-i I/O Module in Stainless Steel Sleeve

Simple networking of standard actuators with high protection class via AS-i

1I/3O

Mounting via reduction adapters into PG or metrical fittings

Additional 24 V



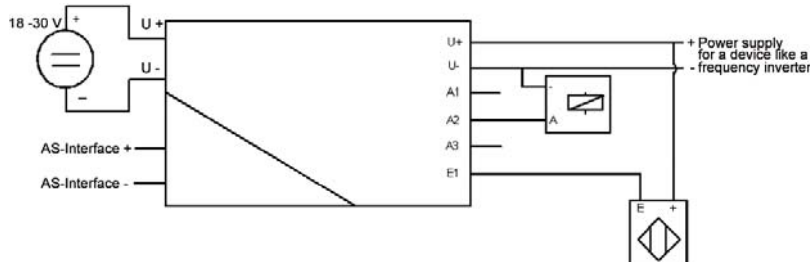
Article no. BWU1647: AB slave (up to 62 slaves)

The cylindrical AS-i Actuator enables a simple networking of standard actuators with high protection class via AS-i. The slave is a 1I/3O Module inside a M18 stainless steel sleeve. It can be mounted via reduction adapters in PG or metrical fit-

tings. This allows a rugged and quick mounting. It is connected to the AS-i line and the additional 24 V via M12 round connector. Two LEDs display power and AS-i communication errors. An AS-i peripheral fault is not indicated.

Article no.	BWU1647
Quiescent current (inputs = 1, outputs = 0)	≤ 20 mA
Switching threshold of inputs	≤ 0,5 mA (low) ≥ 0,8 mA (high)
External voltage supply U	18 ... 30 V DC (PELV)
Outputs	3 pnp outputs
Loading capacity	20 mA per output
Operating voltage	via AS-i
Operating current	< 30 mA
Voltage of insulation	≥ 500 V
EMC directions	EN 50 081-2, EN 50 082-2
Ambient operating temperature	0°C ... +70°C
Storage temperature	-25°C ... +70°C
Protection category EN 60 529	IP67 (mounted)
LED (green/red)	power/AS-i diagnostics
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude
Dimensions sleeve	M18x1, length 55 mm
Length of cable	approx. 20 cm
AS-i Connection	M12x1 round connector

Connection:



U+, U- not short circuit protected (max. 1 A)

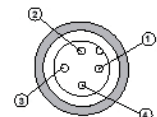
Accessories: Reduction sleeve M25/M18x1 (Art. no. BW1282)
Reduction sleeve PG16/M18x1 (Art. no. BW1241)

Cable:

- red: U+
- black: U-
- yellow: A1
- orange: A2
- brown: A3
- green: E1

M12 round connector:

- Pin 1: AS-i +
- Pin 2: U-
- Pin 3: AS-i -
- Pin 4: U+



Programming (Bit-setting)

AS-i Data bits

- | Bit | Function |
|-----|-----------|
| D0 | output A1 |
| D1 | output A2 |
| D2 | output A3 |
| D3 | input E1 |

Parameter bit

- | Bit | Function |
|-----|----------|
| P0 | not used |
| P1 | not used |
| P2 | not used |
| P3 | not used |

Programming:

Address preset 00
changeable via bus master or
programming device

BW1647

- | | |
|----------|---|
| IO Code | 9 |
| ID Code | A |
| ID2 Code | E |

AS-i Slave for Frequency Inverters (M12)

AS-i Slave for SEW Frequency Inverters

Infrared interface for slave addressing

Easy triggering
of fixed frequencies

M12 connectors

High protection class IP65



Article no. BW2038:

The AS-i Slave for SEW frequency inverters enables the data exchange and programming of frequency inverters with the help of an easy connection to AS-i. The AS-i Slave consists of an AS-i 2I Module as a bus interface and a serial interface to communicate with the frequency inverter. The MOVILINK protocol of MOVIMOT

is implemented in the AS-i Slave. The AS-i Slave for SEW frequency inverters is software-compatible to the previous AS-i Slaves for SEW frequency inverters.

With infrared interface for slave addressing.

Article no.	BW2038
Serial interface	RS 485
Initial wiring	PNP
Inputs	2
Voltage supply, sensors	via 24 V ext.
Voltage range	20 ... 30 V DC
Loading capacity of inputs	≤ 13 mA
Input current high/low	≥ 5 mA/≤ 1,0 mA
Baud rates	9600 bit/s
Display	
LED green (24 V/RS 485)	RS 485 communication active
LED yellow (In 1)	state of channel 1
LED yellow (In 2)	state of channel 2
IR	infrared interface
LED red (Fault)	error
LED green (Pwr)	AS-i voltage ON
LED green (Aux)	24 V power supply ON
Connections	
AS-i and 24 V	electromechanical interface (piercing technology)
RS 485, 24 V and 2 inputs	M12 sockets
Operating current	< 80 mA
Operating voltage	AS-i (30 V DC); 18 - 32 V
Voltage of insulation	≥ 500 V
EMC	EN 61 000-6-2, EN 61 000-6-4
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Dimensions (L / W / H in mm)	90 / 80 / 43
Protection category (DIN 40 050)	housing IP65

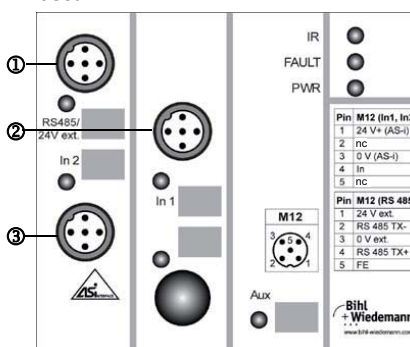
Reasons for peripheral fault (flashing Fault LED):

- error in the inverter
- communication error to the inverter
- short circuit in the sensor supply

Connections:

Pin assignment of the RS 485 interface, the inputs and the tap of 24 V via M12 sockets:

- The bus address must be set at the Movimot via the DIP switch "1".
- The tap of the external 24 V is protected via a resetting fuse



Pin	Connector (1)
1	24 V ext.
2	RS 485 TX -
3	0 V ext.
4	RS 485 TX +
5	FE

Pin	Connector (2+3)
1	24 V+ (AS-i)
2	not used
3	0 V (AS-i)
4	In
5	not used

Accessories:

- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (Art. no. BW1181)
- AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (Art. no. BW1183)

AS-i 3.0 Motor Module

AS-i 3.0 4I/4O Module for MOVI-SWITCH

Supply completely out of AS-i

Mixed input/output slave

Single Slave (up to 31 slaves)

Protection category IP67



Article no. BW2437: AS-i 3.0 4I/4O Module for MOVI-SWITCH

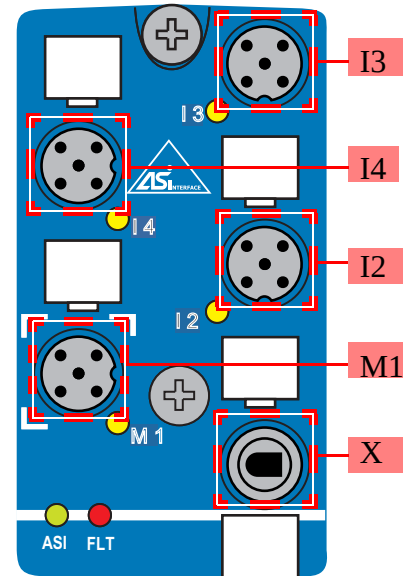
Article no.	BW2437
Connection	AS-i: flat cable and piercing, periphery: M12
AS-i profile	S-7.F.E, ID1=7 (default)
AS-i voltage	18 ... 31.6 V
Max. AS-i current consumption	400 mA
Number of inputs	4
Power supply of inputs	motor fault inputs: AS-i supply sensor inputs: AS-i supply
Input level	$U_{in} < 5\text{ V}$ low, $U_{in} > 10\text{ V}$ high
Number of outputs	3
Power supply of outputs	AS-i supply
Max. output current	O1, O3: 10 mA, O4: 350 mA
Supply of motor	out of AS-i, max. 350 mA
Power supply of attached sensors	max. 350 mA
Sum of supply current	sensors+motor: max. 350 mA
3x LEDs yellow (I2, I3, I4)	state of inputs I2, I3, I4
1x LEDs yellow (M1)	state of outputs O1
LED green (ASI)	AS-i voltage ON
LED red (FLT)	AS-i communication error, peripheral fault
Applied standards	EN 61 000-6-2 EN 61 000-6-4
Operating temperature	-30°C ... +45°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN-rail mounting
Protection category	housing IP67
Dimensions (L / W / H in mm)	80 / 45 / 42
Weight	appr. 103 g

Programming:
(Bit-setting)

Parameter bit

Bit Function

- P0 0 = off/1 = on (watchdog)
P1 0 = on/1 = off (data input filter 128 μ s)
P2 0 = on/1 = off (synchronous data I/O mode)
P3 not used



Connections M12	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
I 3 (input 3)	24 V _{out} of AS-i	I 3	0 V _{out} of AS-i	I 3	not used
I 4 (input 4)		I 4		I 4	
I 2 (input 2)		I 2		I 2	
M 1 (motor 1)	(O 4) 24 V _{out} of AS-i	O 1 (0: 0 V; 1: 24 V)		I 1 (0: 0 V; 1: 24 V)	O 3 (0: 0 V; 1: 24 V)
X (dummy plug)	connection AS-i hand-held				



Accessories:

- AS-i substructure module for 4-channel module in 45 mm-housing(art. no. BW2349)
- AS-i substructure module (CNOMO) 4-channel module in 45 mm-housing (art. no. BW2350)
- Protection caps for not used M12 sockets (art. no. BW2368)

AS-i 3.0 Motor Module

**AS-i 3.0 4I/4O module for each two Interroll motors
(EC200, EC300 or EC310) with 2 binary and 2 analog outputs**

Mixed input/output slave

Speed setting of AS-i parameter

Protection category IP67



The BWU2398 or BWU2575 is a control module for up to 2 roller drives. The module uses an AS-i AB slave for transmitting rotary information. the speed is defined using AS-i parameters. Up to 2

motors and 2 sensors can be connected to the module. The motors are powered by 24 V_{ext} and the sensors by AS-i. The module is 35 V (AUX) fixed and brake resistor compatible.

Article no.	BWU2398 / BWU2575
Connection	AS-i: flat cable and piercing, periphery: M12
AS-i	
AS-i profile	S-7.A.7, ID1 = 7 (fixed)
AS-i voltage	18 ... 31.6 V
Max. AS-i current consumption	200 mA
AUX	
AUX voltage	18 ... 30 V
Max. AUX current consumption	8 A continuously, 11 A peak
Inputs	
Number of inputs	4
Power supply of inputs	Motor fault inputs: external supply Sensor inputs: AS-i supply
Input level of sensors	U _{in} < 5 V low, U _{in} > 10 V high
Power supply of attached sensors	120 mA
Outputs	
Number of binary outputs	2
Power supply of outputs	24 V (AUX, galvanical separation)
Overvoltage tolerated by reaction	35 V-resistant brake resistor compatible
Number of analog outputs	2 (depending)
Max. output current	10 mA each
Supply of motors	out of AUX, 4 A continuously, 5.5 A max.
Indicator	
2x LED yellow (I 1, I 2)	state of input I 1, I 2
2x LED yellow (M 1, M 2)	state of output Out 1, Out 2
LED green (ASI)	AS-i voltage on
LED red (FLT)	LED on: AS-i communication error, slave does not participate in the normal exchange of data, e.g. slave address 0 LED flashing: peripheral fault
LED green (AUX)	24 V _{DC} AUX on
Environment	
Operating temperature	0°C ... +70°C
Storage temperature	-25°C ... +85°C
Protection class DIN EN 60 529	IP67
Weight	100 g
Dimensions (L / W / H in mm)	80 / 45 / 42
Applied standards	EN 61 000-6-2 EN 61 000-6-4

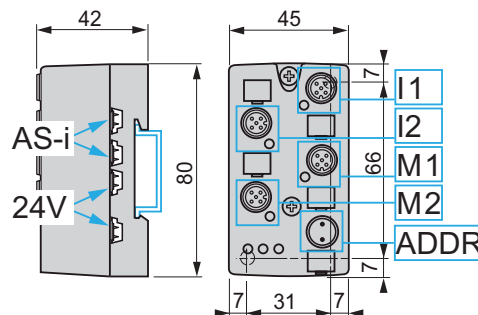
Article no.	intended use
BWU2398	module for each two Interroll motors EC200 or EC300
BWU2575	module for each two Interroll motors EC310

Configuration analog-value O1/O3

				BWU2398	BWU2575
P0	P1	P2	O1/O3	Pin 5	Pin 5
0	0	0	0	0 V	0 V
			1	2,42 V	2,3 V
1	0	0	0	0 V	0 V
			1	2,65 V	3,4 V
0	1	0	0	0 V	0 V
			1	2,90 V	4,5 V
1	1	0	0	0 V	0 V
			1	3,24 V	5,6 V
0	0	1	0	0 V	0 V
			1	3,70 V	6,7 V
1	0	1	0	0 V	0 V
			1	4,26 V	7,8 V
0	1	1	0	0 V	0 V
			1	4,98 V	8,9 V
1	1	1	0	0 V	0 V
			1	6 V	10 V

Bit assignment

Data bit	Function
DI0	I1 Input I1
DI1	I2 Input I2
DI2	I3 State (motor-error) motor 1
DI3	I4 State (motor-error) motor 2
DO0	O1 Start/Stop motor 1
DO1	O2 Direction of rotation motor 1
DO2	O3 Start/Stop motor 2
DO3	O4 Direction of rotation



Assignment M12	Pins				
Name / number	1	2	3	4	5
I 1 (input 1)	24 V _{out} of AS-i	I 1	0 V _{out} of AS-i	I 1	nc
I 2 (input 2)		I 2		I 2	
M 1 (motor 1)	24 V _{ext in}	O 2 (0: 0 V; 1: 24 V)	0 V _{ext in}	I 3 (0: 0 V; 1: 24 V)	analog-value O 1
M 2 (motor 2)		O 4 (0: 0 V; 1: 24 V)		I 4 (0: 0 V; 1: 24 V)	analog-value O 3
ADDR	addressing socket (with protection cap)				

Accessories:

- AS-i substructure module for 4-channel module in 45 mm-housing (article no. BW2349, see also page 294)
- AS-i substructure module (CNOMO) for 4-channel module in 45 mm-housing (article no. BW2350, see also page 294)
- Protection caps for not used M12 sockets (article no. BW2368, see also page 198)

2 slaves in one module

- 1 Single Slave with 2 analog outputs 0 ... 10V
 - 2 binary outputs
 - 2 binary inputs
- 1 AB Slave with
 - 4 binary inputs
 - 4 binary outputs

Mixed in- and output slave



The BWU2478 is a control module for up to 2 roller drives. The module uses an AS-i AB slave for transmitting rotary information. The speed is pre-assigned using a rotary switch or entered as an analog value over AS-i. Up to 2 motors and 4 sensors can be

connected to the module. The motors are powered by 24V_{ext} and the sensors by AS-i. The module is 35V-resistant and brake resistor compatible.

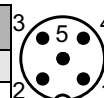
Article no.	BWU2478	
Connection		
Connection	AS-i: flat cable and piercing, peripheral: M12	
AS-i		
AS-i Profile	digital slave S-7.A.7, ID1=7	analog slave S-7.5.5, ID1=F
AS-i voltage	18 ... 31.6V	
Max. AS-i current consumption	200mA	
AUX		
Max. AUX current consumption	8 A continuously, 11A peak	
Overvoltage tolerated by reaction	35V brake resistor compatible	
Supply of the motors	out of AUX, 3A continuously, 6A max.	
Input		
Number of inputs, sensors	4	
Power supply of inputs	sensor inputs: AS-i power supply	
Input level	U _{in} < 5V low, U _{in} > 10V high, 3KΩ	
Power supply of attached sensors	< 100mA (sum)	
Output		
Number of outputsr Ausgänge	4 digital + 2 analog	
Power supply of outputs	24V (AUX, galvanically isolated)	
Max. output current	each 500mA (digital), each 10mA (analog)	
Display		
4x LEDs yellow (I1, I2, I3, I4)	state of inputsI1, I2, I3, I4	
2x LEDs yellow (M1, M2)	state of motors M1, M2	
LED green (ASI)	AS-i voltage ON	
LED red (FLT) / (FAULT)	AS-i communication error, peripheral fault	
LED bicolour: green (AUX) red (AUX)	AUX voltage on and OK AUX voltage on, < 18V	
Environment		
Applied standars	EN 61 000-6-2 EN 61 000-6-4	
Housing	housing for DIN-rail mounting	
Ambient operating temperature	0°C ... +55 °C	
Storage temperature	-25°C ... +85 °C	
Protection category	Gehäuse IP67	

Article no.	BWU2478
Voltage of insulation	≥ 500V
Dimensions (L / W / H in mm)	151 / 60 / 30,5

Programming:			
Analog slave			
Analog output 0 ... 10V: (0 ... 10 000 dez.):			
AO1: Analog value 1 motor 1 / motor 2*1	AO2: Analog value 2 motor 1 / motor 2*1		
Digital outputs:			
		D2: AO1 / AO2 motor 1 (O5)*1	D3: AO1 / AO2 motor 2 (O6)*1
Digital inputs:			
D0: M1 disturbance input (I5) *2	D1: M2 disturbance input (I6)*2		
Object ramp:			
adjustable up to 37,5 s from 0V to 10V			
Digital slave			
Digital input values:			
D0: input (I1)	D1: input (I2)	D2: input (I3)	D3: input (I4)
Digital output values:			
D0: M1 start output (O1)*2	D1: M1 rotating direction (O2)	D2: M2 start output (O3)*2	D3: M2 rotating direction (O4)
*1	with the help of the bits D2 and D3 of the analog slaves can be controlled, which analog value has an effect on which engine. This function depends on the rotary switch position.		
*2	pin 4 of the M1/M2 connections can be used as start output, or alternatively used as a disturbance input (depending on the rotary switch position). To use the input, the start output (digital slave, output D0/D2) must be set to be inactive.		

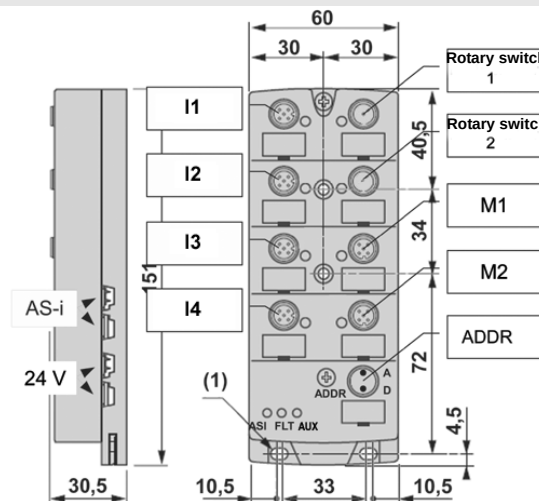
connections M12	Pins				
Name / Number	1	2	3	4	5
I1 (input I1)	24V _{out} of AS-i	–	GND	I1	–
I2 (input I2)				I2	
I3 (input I3)				I3	
I4 (input I4)				I4	
M1 (motor 1)	24V _{ext} out	Rotating direction	0V _{ext} out	Start output / disturbance input*2	
M21 (motor 2)					
ADDR	Connection for AS-i addressing device				





LEDs	State	Signal / Description
M1, M2	yellow	 Status M1/M2
I1, I2, I3, I4		Input off
		Input on
ASI	green	 No slave address is '0' or peripheral fault
		At least one slave address is '0' or peripheral fault
FLT	red	 Slave online and no peripheral fault
		At least one slave offline or address is '0'
		At least one slave has a peripheral fault (no +24 V)
AUX	red	 AUX voltage not present
	 	AUX voltage too low (< 18V)
	green	  AUX voltage OK, however at limit (18V ... 22V)
	 	AUX voltage OK

 LED on
  LED flashing
  LED off



Rotary switch 1 = motor 1
 Rotary switch 2 = motor 2

Rotary switch position 0 - 1:
 Values of analog slave for voltage and ramp

Rotary switch position 2 - F:
 Selection of preset voltages

Accessories:

- AS-i substructure module (CNOMO) for 8-channel module in 60 mm-housing (article no. BW2351, see page 294)
- Protection caps for unused M12 sockets (article no. BW2368, see page 198)

Overview - AS-i Building Automation

Housing	Module	Art. No.	Characteristic	P.
	AS-i EnOcean Slaves	BW2375	for connection of EnOcean wireless sensors, housing: white, AB Slave, AS-i Specification 3.0	142
		BW2473	for connection of EnOcean wireless sensors, housing: black, AB Slave, AS-i Specification 3.0	
		BW2580	for connection of EnOcean wireless sensors, Spelsberg housing with external fastening tabs and external antenna connection, AS-i Specification 3.0	
	AS-i Module for controlling damper actuators	BW2028	supplied by AS-i, AS-i Specifications 2.1/3.0	143
		BW2080	supplied by AS-i, meets requirements for Switzerland (JGBSK), AB Slave, AS-i Specifications 2.1/3.0	145
	AS-i Module for controlling 230 V blinds	BW2114	supplied by AS-i, 2 AB Slaves, AS-i Specifications 2.1/3.0	147
	AS-i 4I OEM Module for building services engineering	BW2388	4I AB Slave potted, for use in round flush-mounted boxes	149
	AS-i Modules for building services engineering	BW2137	4I/4O, AB Slave with spring-type terminal, AS-i Specification 3.0	150
		BW2138	4O, Single Slave with spring-type terminal, AS-i Specification 3.0	
		BW2139	4I/3O, AB Slave, with spring-type terminal, AS-i Specification 3.0	
		BW2175	4I/4O, Single Slave with spring-type terminal, AS-i Specification 3.0	
		BW2466	4I, Single Slave with spring-type terminal, AS-i Specification 3.0	
		BW2480	4I, AB Slave with external fastening tabs AS-i Specification 3.0	151
		BW2536	2 analog and 2 digital outputs, Single Slave with spring-type terminal, AS-i Specification 3.0	153
	AS-i OEM Module for building services engineering	BW2128	AB Slave (up to 62 Slaves), in- and outputs supplied by ext. 24V, AS-i Specification 3.0	155
	AS-i MP Bus Gateway	BW2406	for controlling up to 8 MP Bus participants (e.g. Belimo), MP Bus Master, integrated power supply with overtemperature protection, AS-i 3.0 Single Slave, protection category IP54	157

AS-i Module for connection of EnOcean wireless sensors

AS-i AB Slave + Single Slave

AS-i Specification 3.0

Up to 780 EnOcean Slaves per AS-i circuit

Special colors and various designs available



BW2375



BW2580



Article no. BW2375 Housing white

Article no. BW2473 Housing black

Article no. BW2580 Housing with external fastening tabs and external antenna connection

The AS-i Slave for connection of EnOcean wireless sensors and wireless actuators meets the requirements of AS-i Specification 3.0. Up to 20 AS-i EnOcean Slaves to an AS-i circuit can be connected, each of which max. 31 PTM switching modules and 8 EnOcean sensors or actuators may be assigned. The signals of the 31 switching modules are transmitted in real-time not exceeding than 5 ms in the control. There is no switching delay as in other systems. The AS-i conductor can be connected via spring clamp terminals. Function LEDs indicate

the respective operating condition. EnOcean switches can be assigned both locally and via the controller a certain AS-i Module.

The visually appealing housing is suitable for installation in the visual range also in intermediate ceilings or intermediate bottoms.

Upon request, all housing colours and ornaments, including root wood or stainless steel, are possible.

Article no.	BW2375	BW2473	BW2580
Connections			
AS-i	spring clamp terminals		
Properties			
Operating voltage	26,5 ... 31,6V _{DC}		
Quiescent current consumption (inputs = 0, outputs = 0)	≤ 30mA		
Max. current consumption	54mA		
Switch power supply	by AS-i		
Voltage range	18 ... 30V _{DC}		
Connection ext. antenna	-	-	SNA-socket
Displays			
LED green (AS-i)	LED on: voltage at the AS-i clamps is on LED flashing: voltage at the AS-i clamps, but slave is on addr. 0 (delivery status)		
LED red (Fault)	LED on: slave is not in cyclic data exchange (communication error)		
LED yellow (TRAFFIC)	an EnOcean telegram is received		
Conformity to standards			
EMC	EN 61 000-6-2 EN 61 000-6-4		
AS-i Profile	S-7.38 + S-7.A.5		
Housing			
Ambient operating temperature	0°C ... +55°C		
Operating temperature	-25°C ... +70°C		
Protection category	IP 40		
Housing	plastic		
Colour	white	black	light grey
Dimensions (L / W / H in mm)	110 / 110 / 38		80 / 80 / 52

Accessories:

- External antenna (Art. no. BW2581)
- AS-i address programming device (Art. no. BW1191)
- Connecting cable (module/programming device) (Art. no. BW1802)

Programming (Bit setting)

Parameter bit

Bit P1, P2, P3:
not used

Programming:

Adress preset 0
changeable via bus master-programming device

AS-i Module for controlling damper actuators and for detection the damper position

Runtime monitoring of the damper motor in master possible

Connection by external flat cable terminal via insulation penetration technology

AS-i Specifications 2.1/3.0



Article no. BW2028: Supplied by AS-i

The AS-i module to control damper actuators meets the requirements of the AS-i Specifications 2.1/3.0. It is used to control the damper actuator and detect the damper position **damper open** and **damper close** as well as the intermediate position „**damper opens**“ or „**damper closes**“. In addition external contact can be requested, e.g. of an smoke detector or an temperature switch.

The connections are short-circuit -and overload protected. A watchdog function, which switches the outputs to their currentless switching state if there is no communication on the AS-i circuit, is integrated. The transfer function is permanent monitored in the integrated AS-i Slave and in the AS-i Master.

This module can be connected via cage clamp terminals or ready to plug via Belimo-compatible connector.

Article no.	BW2028
Connections	
Damper actuator	cage clamp terminals or Belimo-compatible connectors
AS-i	cage clamp terminals
Properties	
Achievement	4 inputs / 2 outputs
Output function	transistor PNP
Operating voltage	26,5 ... 31,6 V _{DC}
Quiescent current (Inputs = 0, Outputs = 0)	≤ 20 mA
Max. current consumption incl. motor	≤ 420 mA
Short-circuit proof	yes
Protective circuit of inputs	DC PNP
Sensor supply	by AS-i
Voltage range	18 ... 30 V _{DC}
Switching threshold of inputs U	≤ 0,8 mA (low); ≥ 5 mA (high) 18 ... 30 V _{DC}
Loading capacity	400 mA per output (sum of all outputs ≤ 400 mA) out of AS-i
I/O configuration	7
ID code	D
Displays	
Operating	LED green
Function	LED yellow
Inputs 1 - 4	4 x LEDs yellow
Outputs 1 - 2	2 x LEDs yellow
Standard conformity	
EMC	EN 61 000-6-2, EN 61 000-6-3, EN 61 000-6-4
AS-i profile	S 7. D
Housing	
Operating temperature	-25°C ... +60°C
Storage temperature	-40°C ... +70°C
Protection category	IP 54
Housing	synthetic material
Dimensions (L / W / H in mm)	160 / 90 / 55

Programming (Bit-setting)

Data bit (input via AS-i)

Bit Function

D0	Input I1	(damper closed)
D1	Input I2	(damper open)
D2	Input I3	(external contact)
D3	Input I4	(reserved)
D0	Output O1	(damper open up)
D1	Output O2	(reserved)

Parameter bit

Bit Function

Bit P3:

- 1: Peripheral fault is indicated
- 0: Peripheral fault is *not* indicated

Bit P1, P2 :
not used

Programming:

preset: address 0

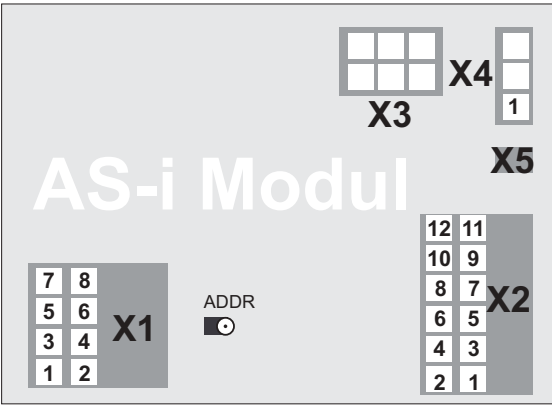
changeable via busmaster-programming devices

Accessories:

- Connecting cable 40 cm with M12 plug (art. no. BW2065)
- AS-i passive distributor, AS-i flat cable on M12 (art. no. BW1239, see also page 194)
- AS-i passive distributor, AS-i/24 V on M12 (art. no. BW1976, see also page 194)

AS-i Module to control damper actuators

AS-i Master/Gateways/ Links/Scanner
AS-i Slaves
AS-i Accessories/ Diagnostics/Development
Other Fieldbuses/ Master Simulators
AS-i Safety
Price Lists



Terminal connections:			
	X1	X2	X5
1	AS-i +	In 3	In 4
2	AS-i -	+24 V	+24 V
3		In 2	S6
4		+24 V	S4
5		In 1	S2
6		+24 V	S1
7		In 4	
8		+24 V	
9		Out 1	2
10		0 V	1
11		Out 2	
12		0 V	

AS-i Module for controlling damper actuators and for detection the damper position

Meets requirements for Switzerland (JGBSK)

AB Slave (up to 62 slaves)

Runtime monitoring of the damper motor in master possible

Connection by external flat cable terminal via insulation penetration technology

AS-i Specifications 2.1/3.0



Article no. BW2080: Supplied by AS-i

The AS-i module to control damper actuators meets the requirements of the AS-i Specifications 2.1/3.0. It is used to control the damper actuator and detect the damper position **damper open** and **damper close** as well as the intermediate position „**damper opens**“ or „**damper closes**“. In addition external contact can be requested, e.g. of an smoke detector or an temperature switch. O1 to the output can be connected in series with a smoke detector and an external fusible link. If they are not connected, the contacts have to be each bridged.

The connections are short-circuit -and overload protected. A watchdog function, which switches the outputs to their currentless

switching state if there is no communication on the AS-i circuit, is integrated. An integrated AB slave allows to control up to 62 slaves.

The transfer function is permanent monitored in the integrated AS-i Slave and in the AS-i Master. This module can be connected via cage clamp terminals or ready to plug via Belimo-compatible connector.

The module is equipped with advanced diagnostic capabilities and is able, by an short circuit at the outputs, to trigger a peripheral error message in the master.

Article no.	BW2080
Connections	
Damper actuator	cage clamp terminals or Belimo-compatible connectors
AS-i	cage clamp terminals
Properties	
Achievement	3 inputs / 2 outputs
Output function	transistor PNP
Operating voltage	26,5 ... 31,6 V _{DC}
Quiescent current (Inputs = 0, Outputs = 0)	≤ 20 mA
Max. current consumption incl. motor	≤ 420 mA
Short-circuit proof	yes
Protective circuit of inputs	DC PNP
Sensor supply	by AS-i
Voltage range	18 ... 30 V _{DC}
Switching threshold of inputs U	≤ 0,8 mA (low); ≥ 5 mA (high)
Loading capacity	400 mA per output (sum of all outputs ≤ 400 mA) out of AS-i
I/O configuration	7
ID-Code	A
Displays	
Operating	LED green
Function	LED yellow
Inputs 1 - 3	3 x LEDs yellow
Outputs 1 - 2	2 x LEDs yellow
Standard conformity	
EMC	EN 61 000-6-2, EN 61 000-6-3, EN 61 000-6-4
AS-i profile	S 7.A
Housing	
Operating temperature	-25°C ... +60°C
Storage temperature	-40°C ... +70°C
Protection category	IP 54
Housing	synthetic material
Dimensions (L / W / H in mm)	160 / 90 / 55

Programming (Bit-setting)

Data bit (Input via AS-i)

Bit Function

D0	Input I1	(damper closed)
D1	Input I2	(damper open)
D2	Input I3	(external smoke detector- contact closed)
D0	Output O1	(damper open up)
D1	Output O2	(reserved)

Parameter bit

Bit Function

Bit P3:

- 1: Peripheral fault is indicated
- 0: Peripheral fault is *not* indicated

Bit P1, P2:
not used

Programming:

preset: address 0
changeable via busmaster-programming devices.

Accessories:

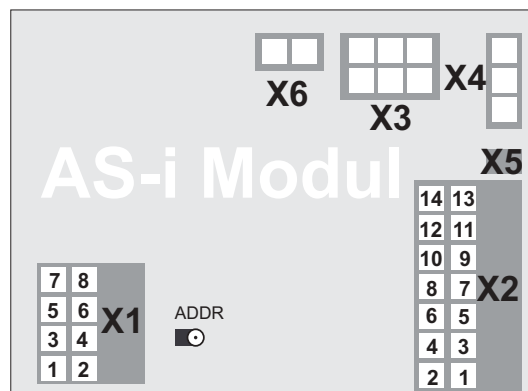
- Connecting cable 40 cm with M12 plug (art. no. BW2065)
- AS-i passive distributor, AS-i flat cable on M12 (art. no. BW1239, s. page 194)
- AS-i passive distributor, AS-i/24 V on M12 (art. no. BW1976, s. page 194)

AS-i Module to control damper actuators

Terminal assignment:

	X1	X2	X3	X4	X5	X6
1	AS-i +	SD A	+24 V	Out 0	In 3	FL A
2	AS-i +	0 V	+24 V	0 V	+24 V	FL B
3	AS-i -	SD B / In 2	nc	Out 1		
4	AS-i -	+24 V	nc			
5		In 1	In 0			
6		+24 V	In 1			
7		In 0				
8		+24 V				
9		In 3				
10		+24 V				
11		Out 0				
12		0 V				
13		Out 1				
14		0 V				

SD = smoke detector, FL = fusible link

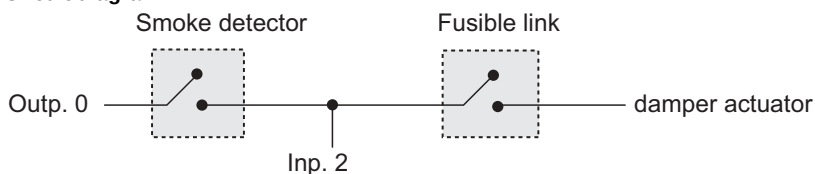


Variants with bridges:

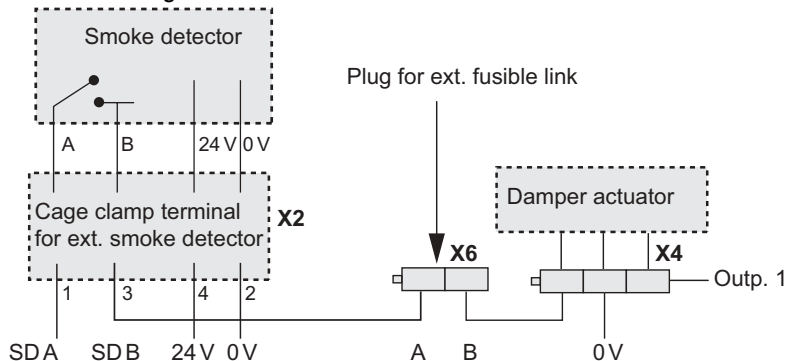
- 1-11: no smoke detector connected
no fusible link X6 connected
- 1- 3: no smoke detector connected

Attention: The controller can not recognize that by law bridges smoke detectors or fusible link are missing.

Circuit diagram:



Connection diagram:



AS-i Module for controlling 230V blinds

AS-i Module for controlling 230V blinds

2 AS-i AB Slaves

AS-i Specifications 2.1/3.0



Article no. BW2114: Supplied by AS-i

The AS-i module to control blinds meets the requirements of the AS-i Specifications 2.1/3.0. It is used to control 230V blinds with 4-conductor- or 5-conductor connections. The two inputs can be used to provide the switch position to the controller. Motors that turn off automatically when reaching the end-position have to be used.

A watchdog function, which switches the outputs to their current-less switching state if there is no communication on the AS-i circuit, is integrated. On the board there are two 2 AS-i slaves, so that two blinds can be controlled. Both slaves also have an addressing socket.

Article no.	BW2114
Connections	
Blinds and 230V supply	cage clamp terminals
AS-i / switch	cage clamp terminals
Properties	
Specification	2 x 4 inputs / 2 x 2 outputs
Inputs	each with 2 inputs for connecting external switches (up/down), 2 inputs are used internally
Outputs	each with 2 relay outputs for connecting the blind motors with 4- or 5-conductors
Output function	Relay
Operating voltage	26,5 ... 31,6V _{DC}
Quiescent current (inputs = 0, outputs = 0)	≤ 30 mA
Max. current consumption	I _{max} ca. 130 mA
Wiring of the inputs	switch contacts
Switch current supply	by AS-i
Voltage range	18 ... 30V _{DC}
Switching current of inputs	4 mA
Load capacity	230V _{AC} , 4 A each output
Displays	
LED green (Pwr)	LED on: voltage at the AS-i clamps LED flashing: voltage at the AS-i clamps, but slave on addr. 0 (default settings)
LED red (Fault)	LED on: slave is not in the cyclic data exchange (communication error)
2 x LEDs green (state: In 1, In 2)	LED on: switch closed
Standard conformity	
EMV	EN 61 000-6-2 EN 61 000-6-4
AS-i profile	S-7.A.E
Housing	
Operating temperature	-25°C ... +60°C
Storage temperature	-40°C ... +70°C
Protection category	IP 54
Housing	synthetic material
Dimensions (L / W / H in mm)	160 / 90 / 55

Programming (Bit setting)

Data bit (Input via AS-i)

Bit Function

D0	Input I3	(trip recognition)
D1	Input I4	(end position from 1 detection)
D2	Input I1	(switch up)
D3	Input I2	(switch down)

D0	Output O1	(motor down)
D1	Output O2	(motor up)

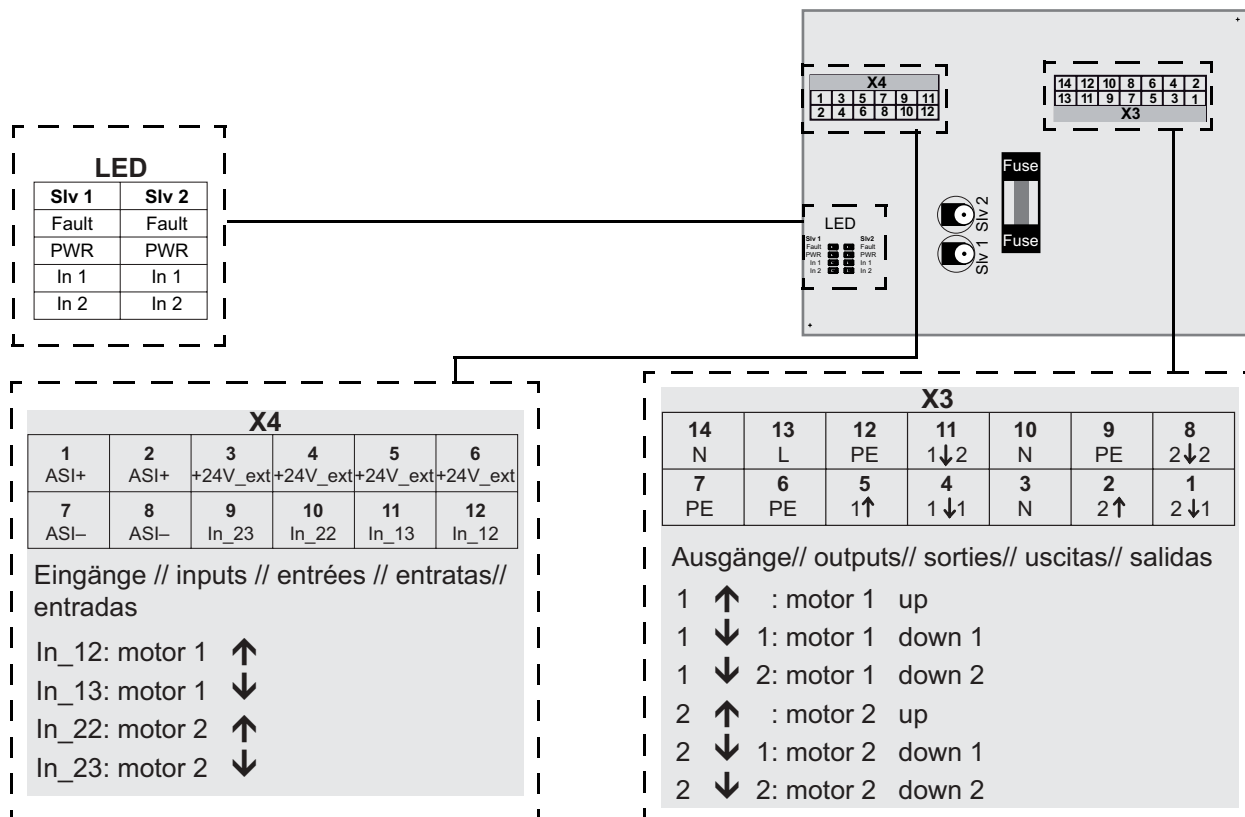
Parameter bit

Bit P1, P2, P3:
not used

Programming:
preset: address 0
changeable via
busmaster-programming devices

AS-i Module for controlling 230V blinds

Connections:



Motor limit switch as AS-i signals: (Motor 1= Slave 1, Motor 2= Slave 2)

Position	Trip to the top (output 1)		Trip to the bottom (output 0)	
	Input In 0	Input In 1	Input In 0	Input In 1
Top	0	0	0	1
Centre	1	1	1	1
Bottom 1	1	0	1	0
Bottom 2	0	0	0	0

AS-i 4I OEM Module for building services engineering

AS-i 4I OEM Module for building services engineering

For use in round flush-mounted boxes

Potted

AB Slave (up to 62 slaves)



Article no. BW2388: AS-i 4I OEM Module for building services engineering

This 4I Module is mainly used in building automation. It is an AS-i Slave with four inputs, the switches, buttons or two-wire sensors can be connected directly. The round module is potted and suitable to install in standard flush-mounted or junction boxes.

Switches or buttons can be directly clamped to the connection. The module can be connected to location AS-i PELV voltage and as well as to AS-i Power24-PELV voltage .

Article number	BW2388
Connection	via connecting wire
AS-i profile	S-7.A.7
AS-i voltage	22 ... 31,6 V
Number of inputs	4
IO Code	7
ID Code	A
ID1 Code	7
ID2 Code	7
Current supply of sensors	out of AS-i
Operating current I _B	< 50 mA
Operating voltage	out of AS-i (30 V) PELV, out of AS-i Power24V PELV
4 x LEDs yellow	state of inputs
LED red (FAULT)	LED on: AS-i communication error LED off: no AS-i communication error
LED green (PWR)	LED on: voltage at the AS-i clamps LED flushing: error, e. g. slave on adress 0 (state of delivery)
Length of connector line	ca. 25 cm
EMC	EN 61 000-6-2 EN 61 000-6-3 EN 61 000-6-4
Operating temperature	-25°C ... +70°C
Storage temperature	-40°C ... +70°C
Protection category	IP00
Dimensions (D / H in mm)	50 / /
Length of cable	max. 1,5 m
Weight	

Programming: (Bit-setting)

Data bit
BitFunction
D0 Input 1
D1 Input 2
D2 Input 3
D3 Input 4

Addressing
Adresse preset 0

AS-i Module for building services engineering

AS-i I/O Modules

AS-i Specification 3.0

Single Slave (up to 31 slaves) or
AB Slave (up to 62 slaves)

Housing with external fastening tabs



Article no. BW2137: 4 inputs/4 outputs, AS-i AB Slave

Article no. BW2138: 4 outputs, AS-i Single Slave

Article no. BW2139: 4 inputs/3 outputs, AS-i AB Slave

Article no. BW2175: 4 inputs/4 outputs, AS-i Single Slave

Article no. BW2466: 4 inputs, AS-i Single Slave

The AS-i 4I/4O Module, which meets the requirements of the new AS-i Specification 3.0 is the board based solution for an AS-i slave with 4 inputs and 4 outputs.

The inputs and outputs are powered out of separated 24V. They are short circuit and overload protected and can each be loaded

with up to 500mA (outputs). If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog. Connection by spring-type terminals. Installation by external fastening tabs.

Article no.	BW2137	BW2138	BW2139	BW2175	BW2466
Connection	cage clamp terminals				
Quiescent current (Input = 0, Output = 0)	≤ 20mA				
U	20 ... 30V DC				
Outputs (elektronic)	4		3	4	-
Inputs (elektronic)	4	-	4		
Capacity	500mA per output from 24V supply				
Length of connector cables	I/O: max. 15 m				
AS-i Profil	S-7.A.7	S-8.F.E	S-7.A.E	S-7.DF.E	S-7.A.7
IO-Code	7	8	7		
ID-Code	A	F	A	F	
ID1-Code	7 (fixed)	F (default)	7 (default)	F (default)	
ID2-Code	7	E			
Operating voltage	via AS-i				
Operating current	≤ 70mA				
Displays					
LED green (AS-i)	LED on: voltage at the AS-i clamp LED flashing: error, e.g. slave on adress 0 (default setting) or peripheral fault				
LED red (Fault)	LED on:AS-i communication error LED flashing: AS-i peripheral fault, e.g. no 24V or short circuit at an output, fuse				
LED green (AUX)	LED on: 24V available LED off: absence 24V				
EMC directions	EN 61 000-6-2 EN 61 000-6-4				
Operating temperature	-25°C ... +70°C				
Storage temperature	-40°C ... +70°C				
Protection category EN 60 529	IP54				
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude				
Housing material	polycarbonate / polystyrene				
Dimensions (L / B / H in mm)	93 / 93 / 55				

Programming (Bit setting)

Data bit (Input via AS-i)

Bit Function

D0 Input I1/Output O1
D1 Input I2/Output O2
D2 Input I3/Output O3
D3 Input I4/Output O4

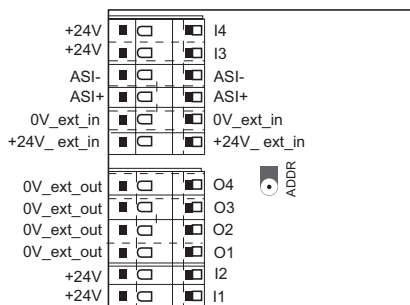
Parameter bit

Bit Function

P0 0 = Off/1 = On (watchdog)
P1 0 = On/1 = Off (data input filter 128 µs)
P2 0 = On/1 = Off (synchronous I/O mode)
P3 not used

Programming:

adress preset0
changeable via bus master or programming devices



AS-i Module for building services engineering

AS-i 4I Module

AS-i Specification 3.0

AB Slave (up to 62 slaves)

Supply of inputs by AS-i

Housing with external fastening tabs



The AS-i 4I Module, which meets the requirements of the new AS-i Specification 3.0 is the board based solution for an AS-i slave with 4 inputs as an AB slave.

The inputs are supplied out of AS-i. They are short circuit and overload protected.

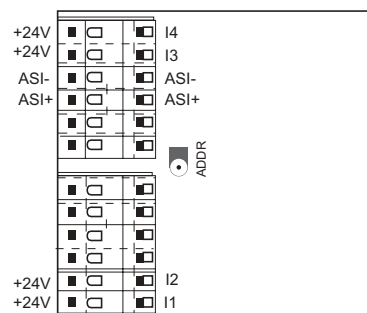
Article no.	BW2480
Connection	
Connection	cage clamp terminals
Length of connector cables	max. 15 m
AS-i	
AS-i Profile	S-O.A.O
AS-i voltage	20 ... 30V DC
Operating voltage	via AS-i
Operating current	≤ 70mA
Quiescent current	≤20mA
Input	
Number	4 (electronic)
Capacity	100mA in total supplied by AS-i
Display	
LED PWR (green)	LED on: voltage at the AS-i clamp LED flashing: error, e.g. slave on adress 0 (default setting) or peripheral fault
LED FLT/FAULT (red)	LED on:AS-i communication error LED flashing: AS-i peripheral fault, e.g. no 24V
Environment	
Applied standards	EN 61 000-6-2 EN 61 000-6-4
Housing	polycarbonate / polystyrene
Operating temperature	-25°C ... +70°C
Storage temperature	-40°C ... +70°C
Protection category DIN EN 60 529	IP54
Maximum tolerable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude
Dimensions (W / H / D in mm)	93 / 93 / 55

AS-i Module for building services engineering

Programming	Bit setting			
	D0	D1	D2	D3
	Input			
	I1	I2	I3	I4
	Parameter bit			
	P0	P1	P2	P3
	not used	0 = On/1 = Off (data input filter 128 µs)	not used	not used

Programming hints:

IO-Code	0
ID-Code	A
ID1-Code	7
ID2-Code	0



Accessories:

- Connecting cable 40 cm with M12 plug (art. no. BW2065)
- AS-i passive distributor, AS-i flat cable on M12 (art. no. BW1239)

AS-i Module for building services engineering

AS-i Module for building services engineering

2 analog outputs 0 ... 10V
2 digital outputs

The outputs are powered out of AS-i or out of 24V AC/DC (switchable)

Used e. g. for electric blankets/cooling ceilings

Housing with external fastening tabs



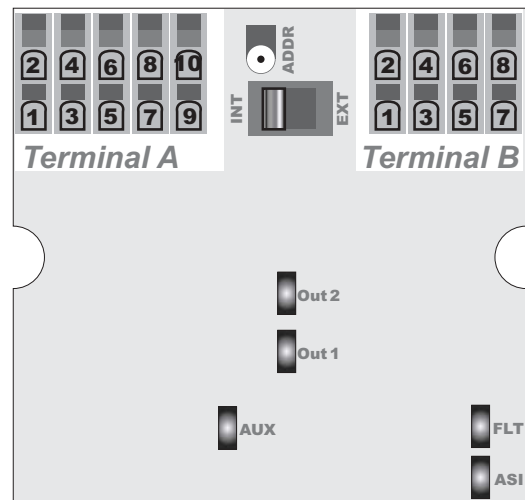
The AS-i analog slave BW2536 is a 2A-module with two additional binary switching outputs and meets the requirements of the new AS-i Specification 3.0.

The connection of actuators via cage clamp terminals. The power supply of the outputs can take place depending on the position of the slide switch from AS-i or an external voltage (PELV) 24V AC or DC. The resolution of the analog data is 16 bit. Addressing is done either via a programming terminal or bus master.



Article no.	BW2536
Connection	
Connection	cage clamp terminals
AS-i	
AS-i Profil	S-7.A.5
ID-Code	A _{hex}
ID2-Code	5 _{hex}
IO-Code	7 _{hex}
AS-i voltage	AS-i (30V DC)
AS-i current input EXT max.	< 40mA
AS-i current input INT max.	< 140mA
AUX	
AUX voltage max.	24V AC/DC
Output	
Analog outputs	2
Range value analog outputs	0 ... 10V DC
Digital outputs	2, AC/DC (see table)
Actuator power	via AS-i/external
Current at switch position EXT	≤ 10mA per analog-OUT (0°C ... 55°C) ≤ 200mA per digital-OUT (0°C ... 55°C) in total: (digital+analog+supply) ≤ 1,6 A
Current at switch position INT	≤ 10mA per analog-OUT (0°C ... 55°C) ≤ 200mA per digital-OUT (0°C ... 55°C) in total: (digital+analog+supply) ≤ 100mA (≤ 45°C) ≤ 90mA (45°C ... 55°C)
Resolution	16 Bit/1mV
Range of value	0 ... ±10.000 dec. (see table)
Display	
LED green (ASI)	voltage at the AS-i clamps
LED red (FLT) / (FAULT)	AS-i communication error, peripheral fault
LED green (AUX)	voltage supply 24V for thr analoge part
LED yellow (O 1, O 2)	state of the the digital outputs (Out 1 / Out 2)

Connections:



Terminal A

1,2,9,10	0V_ext_out
3	Digital_Out_Ch 1
4	Digital_Out_Ch 2
5	Analog_Out_Ch 1, 0...10V
6	Analog_Out_Ch 2, 0...10V
7,8	24V AC/DC_out

Terminal B

7,8	ASI-
5,6	ASI+
3,4	0V_ext_in
1,2	24V AC/DC_ext_in

Switch position

INT:	Voltage supply out of AS-i
EXT:	External voltage supply 24V AC/DC

AS-i Module for building services engineering

AS-i Master/Gateways/
Links/Scanner

Environment	
Applied standards	according EN 50 081-2 EN 61 000-6-2
Housing	polycarbonate / polystyrene
Operating temperatur	0°C ... +55°C
Storage temperature	-25°C ... +55°C
Protection category (EN 60 529)	housing IP54
Voltage of insulation	≥ 500V
Dimensions (L / W / H in mm)	80 / 80 / 52

AS-i Slaves

Analog value* 1 / 2	Analog_Out_Ch 1 / 2	Digital_Out_Ch 1 / 2
10.000	10V	on
9.000	9V	
...	...	
1.000	1V	
0	0V	
-1.000	1V	off
...	...	
-9.000	9V	
-10.000	10V	

* set are all integer values between +10.000 and -10.000

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

AS-i OEM-Module for building services engineering

AS-i OEM-Module

AS-i Specification 3.0

AB Slave (up to 62 slaves)

In- and outputs supplied by ext. 24V



The AS-i 4I/4O Module, which meets the requirements of the new AS-i Specification 3.0 is the board based solution for an AS-i slave with 4 inputs and 4 outputs.

The inputs and outputs are powered out of separated 24V. They are short circuit and overload protected and can each be loaded

with up to 500mA (outputs). If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog. Connection by spring-type terminals.



Article no.	BW2128
Connection	
Connection	cage clamp terminals
Length of connector cable	I/O: max. 15 m
AS-i	
AS-i Profile	S-7.A.E
AS-i voltage	20 ... 30V DC
Operating voltage	via AS-i
Operating current	≤ 70mA
Quiescent current (Input = 0, Output = 0)	≤ 20mA
Input	
Number	4 (electronic)
Output	
Number	3 (electronic)
Capacity	500mA per output from 24V supply
Display	
LED AS-i (green)	LED on: voltage at the AS-i clamp LED flashing: error, e.g. slave on adress 0 (default setting) or peripheral fault
LED FLT/FAULT (red)	LED on: AS-i communication error LED flashing: AS-i peripheral fault, e.g. no 24V or short circuit at an output, fuse
LED AUX (green)	LED on: 24V available LED off: absence 24V
Environment	
Applied standards	EN 61 000-6-2 EN 61 000-6-4
Operating temperature	-25°C ... +70°C
Storage temperature	-40°C ... +70°C
Protection category DIN EN 60 529	IP00
Maximum tolerable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude
Dimensions (W / H / D in mm)	68 / 70 / 32
Weight	40 g

AS-i OEM-Module for building services engineering

AS-i Master/Gateways/
Links/Scanner

Programming	Bit setting			
	D0	D1	D2	D3
	Input			
	I1	I2	I3	I4
	Output			
	O1	O2	O3	–
	Parameter bit			
	P0	P1	P2	P3
	0 = Off/1 = On (watchdog)	0 = On/1 = Off (data input filter 128 µs)	0 = On/1 = Off (synchronous I/O mode)	not used

AS-i Slaves

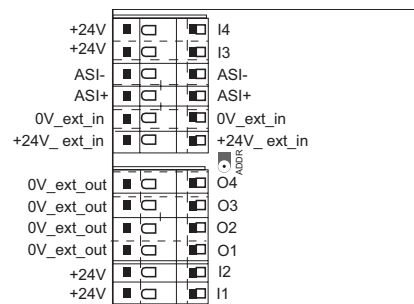
Programming notes:	
IO-Code	7
ID-Code	A
ID1-Code	7 (default)
ID2-Code	E

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists



AS-i 3.0 Single Slave, MP Bus Master

For controlling up to 8 MP Bus participants
(e.g. Belimo)

Integrated power supply with overtemperature protection

Address socket

4 indicator LEDs

Protection category IP54



Article no. BW2406: for controlling up to 8 MP Bus participants

The AS-i Bus MP Gateway is used to control MP Bus slaves via AS-i. The gateway represents for AS-i a slave, for the MP Bus a Master.

It can be connected 4 MP bus segments, a total of up to 8 participants controlled.

Through the gateway can max. 8 bytes of input data and max. 8 bytes of output data via the AS-i bus resp. the overlaying control processed.

The integrated, secure power supply ensures for the MP 24 VAC of the bus participants (alternatively: connection 24 V DC or AC possible).

About 4 rotatable external fastening tabs (or the 4 standard casing bores), the housing can be mounted at also hard to reach areas. The electrical connection is made via spring terminals. Function LEDs indicate the operating state. An RJ-11 interface allows the connection of an MP Bus terminal for addressing.

Article no.	BW2406
Connections	
Power supply and drives	spring terminals
AS-i	spring terminals
MP Bus Terminal	RJ-11
Properties	
Baudrate	1,2 kBaud
Power supply primary side	230 V AC
Power supply secondary side	24 V AC / 50 VA
Input current max. (fuse)	0,5A
Output current max. (fuse)	2A
Overtemperature protection	130°C
Displays	
LED green (AS-i)	voltage at the AS-i clamps
LED green (MP-Bus)	MP Bus connected
LED green (UAUX)	supply voltage 24 V (DC/AC) on
LED red (FAULT)	LED on: AS-i communication error LED flashing: peripheral fault
Standards	
EMC	EN 61 000-6-2 EN 61 000-6-4
AS-i profil	S-7.4.0
Housing	
Operating temperature	-10°C ... +50°C
Storage temperature	-15°C ... +80°C
Protection category	IP54
Housing	plastic
Dimensions (L / B / H in mm)	180 / 130 / 75

Programming:

(Bit setting)
Data bit (Input via AS-i)

Bit Function

- D0 Input: valid telegram
- D1 Input: Timeout or another error message
- D2 Input: AUX voltage o.k.
- D3 Address programming device connected

Programming:

address preset0
changeable via bus master or
programming devices

AS-i Master/Gateways/ Links/Scanner
AS-i Slaves
AS-i Accessories/ Diagnostics/Development
Other Fieldbuses/ Master Simulators
AS-i Safety
Price Lists

Overview Diagnostics/Commissioning

Housing	Device	Art. no.	Characteristic	P.
	AS-i Analyser InnovationStep 2	BWU1415	complementation of local AS-i Master diagnostic	160
	AS-i Address Programming Device	BW1191	with plug-in recharger 230 V	161
		BW1646	with plug-in recharger 115 V (Version North America)	
	Accessories for AS-i Address Programming Device	BW1935	AS-i addressing cable - infrared addressing adapter	
		BW1802	connecting cable (Module/programming device)	

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

AS-i Analyser Innovation Step 2

AS-i Analyser Innovation Step 2

Complementation of local AS-i Master diagnostics

Diagnose and analysis tool for AS-i

For service or release of AS-i networks

Printing test protocols of AS-i networks



Article no. BWU1415

The AS-i Analyser is a perfect complement to the local AS-i Master diagnostic of Bihl+Wiedemann.

Its functions:

- Statistics mode: statistical analysis of all telegrams transferred in the network: it instantly gives the "traffic lights presentation" of each slave's ability to communicate and provides a protocol of the actual state of the network.
- Data mode: topical digital and analogue I/O-values and the state of safety slaves.
- Trace mode: registers the complete telegram traffic and examines it on a notebook.

Its benefits:

- You can use the analyser in four different situations:
- when searching for errors,
- to provide a protocol which contains the network and its quality,
- to diagnose a network in detail, e. g. for preventive maintenance,
- to analyse your application e. g. of a Safety at Work network

The AS-i Analyzer is shipped in a fitted service case together with a D-Sub data cable, an RS 232-USB adapter and the appropriate screwdriver.

Article no.	BWU1415
Type	passive AS-i member
Interface	- AS-i - RS 232 for connection to a PC - Trigger input (24 V) - Trigger output (TTL)
Voltage of insulation	≥ 500 V
LED display	
LED green (Power)	power on
LED yellow (ser active)	RS 232 interface in operation
LED green/red (Test)	test mode
Telegram memory	256.000 AS-i telegrams
Operating current	approx. 70 mA out of AS-i
Operating Voltage	≥ 20 V
EMC directions	according EN 50 081-2, EN 61 000-6-2
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C
AS-i specification	2.1

Requirements:

IBM compatible PC, 80486 or higher

Operating system:

Windows 98, Windows NT4, Windows Me, Windows 2000, Windows XP, Windows Vista, Windows 7 (32 bit or 64 bit)

Scope of delivery:

- Software:
AS-i Analyser
- Hardware:
AS-i Analyser
D-sub-transmission cord
RS232-USB adapter
Screwdriver
Service case with foam insert

Accessories (optional):

AS-i Tuner (Article no. BWU1648, see page 166)
AS-i Bus Termination (Article no. BWU1644, see page 166)

More information can be found online at www.bihl-wiedemann.com *Innovation Step 2 of the AS-Interface Analyser: New functions and new possibilities*

AS-i Address Programming Device

- Addressing/programming max. 62 slaves
- Display of all the slaves in the bus
- Reading and writing slave data
- Addressing of AS-i modules with an optical data interface

Accessories for AS-i Address Programming Device:

- AS-i addressing cable
for addressing of active AS-i modules
with infrared addressing interface (BW1935)
- Connecting cable
module/programming device (BW1802)



Article no. BW1191: AS-i address programming device with plug-in recharger 230 V

Article no. BW1646: AS-i address programming device with plug-in recharger 115 V (North America)

Article no. BW1935: AS-i addressing cable - infrared addressing adapter

Article no. BW1802: Connecting cable (Module/programming device)

The **AS-i address programming device** is a compact device for addressing AS-i slaves such as sensors, actuators and coupling modules. The AS-i address programming device uses a universal adapter to connect to other devices. The AS-i address programming device can be used for AS-i slaves according to the AS-i specification 2.0, 2.1 and 3.0.

The **AS-i addressing cable** (BW1935) is the necessary accessory for the signal transmission between the AS-i address pro-

gramming device and an AS-i module. In this case the TTL-signals of the addressing-device are converted into optical signals and vice versa for the AS-i module. The AS-i addressing cable is connected via the M12 plug connector at the AS-i address programming device and via the infrared-head at the AS-i module.

The **connecting cable (module/programming device)** (BW1802) is used for the addressing of AS-i slaves.

Article no.	BW1191	BW1646	BW1935	BW1802
Application	Commissioning and diagnosis		Addressing of AS-i modules	Addressing of AS-i modules
Indication	LCD, character size is 13 mm		-	-
Buttons	keypad, 5 keys		-	-
Interface/connection	AS-i, short circuit and overload protected		infrared head/M12 connector	round connector 2-pin/ M12 connector
Cable length	-	-	1 m	1,6 m
Supply	battery (built-in)		-	-
Recharger	plug-in recharger (supplied)		-	-
	230 V AC	115 V AC	-	-
Charging time	ca. 12 h		-	-
Operating time	8 h ≥ 250 read/write operations with a fully charged battery		-	-
Protection category (EN 60 529)	IP20			
Operating temperature	0 °C ... +50 °C			
Storage temperature	-20 °C ... +55 °C			
Weight	approx. 550 g		-	-

Addressing references (Infrared addressing adapter BW1935):

- The power supply must be on during addressing.
- Plug the M12 connector of the IR interface adapter to the relevant connection of the AS-i address programming device.
- Plug the the infrared head of the IR interface adapter onto the AS-i module. Ensure that it is fixed properly to the coding element.
- Perform addressing as outlined in the description for the AS-i address programming device.

Caution:

- Only the supplied battery recharger may be used for the reloading of the batteries of the AS-i address programming device. Please pay attention to the land version!

AS-i Master/Gateways/ Links/Scanner	
AS-i Slaves	
AS-i Accessories/ Diagnostics/Development	
Other Fieldbuses/ Master Simulators	
AS-i Safety	
Price Lists	

Overview AS-i Repeater/Tuner/Bus Termination

Housing	Device	Art. No.	Characteristic	P.
	AS-i Diagnostic Tuner	BWU1843	with AS-i slave address trebling of AS-i cable length	166
	AS-i Tuner	BWU1648	without AS-i slave address trebling of AS-i cable length	
	AS-i Bus Termination	BWU1644	default value of the AS-i Tuner doubling of AS-i cable length	
	Advanced Repeater with Bus Termination	BWU2192	circuit extension by more than 200 m, passive bus termination connectable	168
	Advanced Repeater	BWU1855	circuit extension by more than 100 m	169
		BWU1273	extends network an additional 100 m, protection category IP65	170
	AS-i High Power Repeater	BW2384	Higher transmission and reception levels to High Power Segment A, protection category IP20	171

AS-i-Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

Tuning of AS-i Networks

Please note: There is no decrease in data security when using the AS-i tuner. The high level measures of data security and error detection are NOT affected. Thus the tuner may also be used in Safety at Work networks.

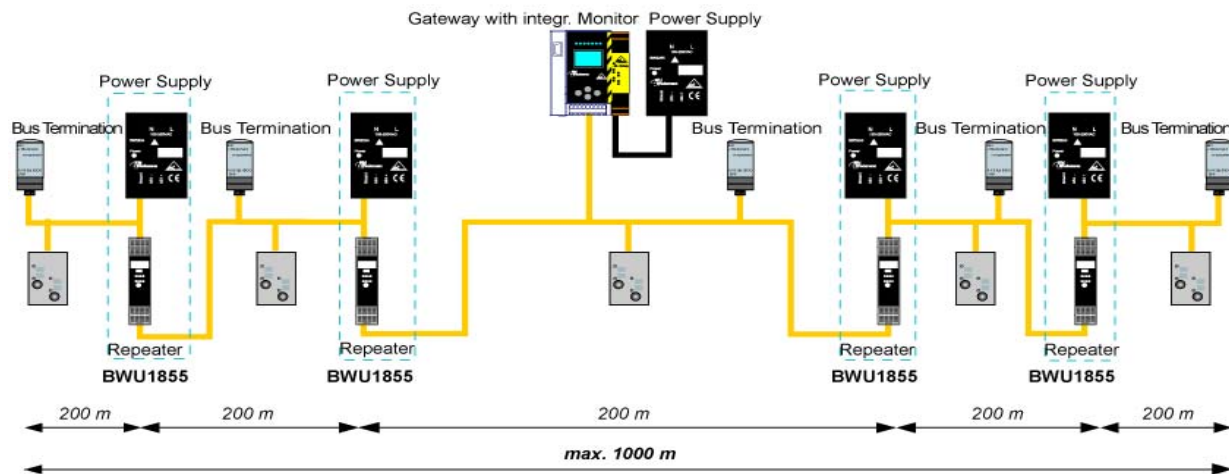
Apart from extension the tuner can even be used to correct an unstable network if the instability is caused by a faulty impedance. Thus networks can be run properly and with a high degree of availability even if their components misfit the specifications to some extent. This effect is due to the active adjustment and the continuous monitoring by the tuner. Especially if a network has to be extremely reliable (e.g. in plant automation or with AS-i Safety

at Work), optimising the impedance of the individual network may be advantageous.

New possibilities with the Advanced Repeater

Bihl+Wiedemann GmbH expands into new dimensions with innovations: AS-i networks with 1 to 1,5 km line length can be created with the help of the new Advanced AS-i, the Bus Termination (or the AS-i Tuner). Two new Advanced AS-i-Repeater can be also operated in a row in combination with the Bus Termination (or the AS-i Tuner).

The optional AS-i 3.0 Slave inside the Diagnostic Tuner supervises the AS-i voltage as a 16 bit value and monitors the quality of the AS-i communication permanently. In case of problems the Diagnostic Tuner informs the AS-i Master.



Config. D4: 1000 m AS-i line with mit Advanced Repeaters and Bus Terminations in a row.

AS-i Tuner, AS-i Bus Termination

Bihl + Wiedemann

THE AS-INTERFACE MASTERS

AS-i Tuner:

Triplication of the AS-i cable length

Strengthen of the robustness of AS-i

Supervise the quality of the installation

Tool for the service



AS-i-Bus Termination
(Default value of the AS-i Tuner)



AS-i Tuner

AS-i Bus Termination:

Doubling of the AS-i cable length
(Default value of the AS-i Tuner)



Article no.: BWU1843: AS-i Diagnostic Tuner (with AS-i Slave address)

Article no.: BWU1648: AS-i Tuner (without AS-i Slave address)

Article no.: BWU1644: AS-i Bus Termination (Default value of the AS-i Tuner)

The primary task of the AS-i Tuner consists in the length adjustment in AS-i circuits without repeater.

The AS-i Diagnostic Tuner is suitable for the employment as diagnose unit, which announces the bus function of the control on-line. Unlike to the AS-i Tuner the AS-i Diagnostic Tuner is able to read in the traffic light announcements for each individual slave and to refer to the superordinate control system.

The result can be intergrated into an application program. It signals whether an optimization succeeded. Gradual changing of the quality of the AS-i circuit can be recognized and repaired so on time.

The AS-i Diagnostic Tuner can be switched off over a switch completely or set on a default value.

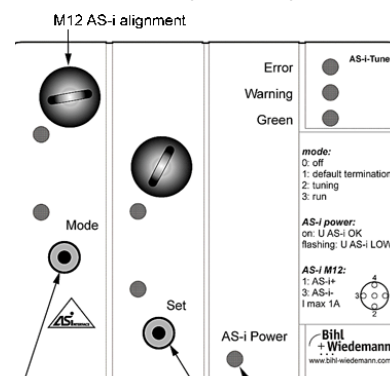
Article No.	BWU1648/BWU1843	BWU1644
Connection	AS-i flat cable/AS-i round cable	
Operating value	AS-i (30 V DC)	
Operating current	60 mA	10 mA
LEDs	5	2
LED green	LED (AS-i Power) on: U AS-i > 26 V LED (AS-i Power) flashing: 18,5 V < U AS-i < 26 V	U AS-i > 26 V
LED red	Error (AS-i Analyser)	-
LED yellow	Warning (AS-i Analyser)	U AS-i > 18,5 V
LED green	Communication o.k. (AS-i Analyser)	-
Ambient operating temperature	0 ... +55 °C	
Storage temperature	-25 ... +75 °C	
Protection category according to EN 60 529	IP65	
Electromagnetic sust.	according to slave spezifikation	
EMC	EN 61 000-6-2, EN 61 000-6-3	
Dimensions (L / B / H in mm)	90 / 80 / 43	46 / 19

Slave Profile (BWU1843)

I/O Code: 0x7
ID Code: 0xA
ID1 Code: 0x0
ID2 Code: 0x5
VENDOR ID: 0x0002
PRODUCT ID: 0x0002
AB-Slave (up to 62 Slaves)

Bit Allocation

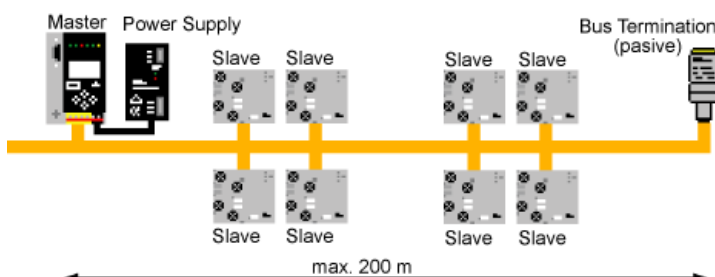
In 0, In 1 binary bits, freely usable
In 2, In 3 serial communication
Out 0, Out 1 serial communication
Out 2 binary bits, freely usable



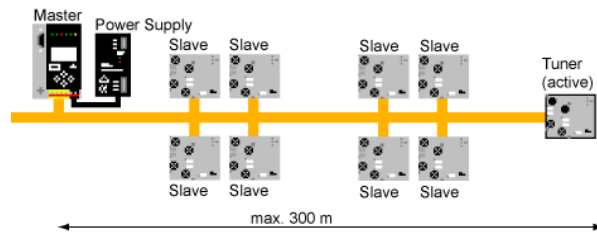
Rotary switch:
BWU1843, BWU1648, BWU1715
(without slave function)
0: off
1: default termination
2: tuning
3: run
only BWU1843
(slave function)
4: off
5: default termination
6: tuning
7: run

Button LED status display:
on: U AS-i OK
flashing: U AS-i LOW

The passive bus termination permits a circuit extension up to approximately 200 m



The Bihl+Wiedemann tuner permit a stable communication with net lengths to approximately 300 m *without* the employment of a Repeater and without a second power supply unit.



Combi Slave Profile

The AS-i Diagnostic Tuner operates after the new "combi slave profile" S-7.A.5, in which digital and serial data will be parallel transferred.

2I/1O data for the basic function of the tuner are transmitted thereby as usual, and are usable with each master. The serial data – here the analog values of the tension and the traffic light values of the individual slaves – are transmitted by the piece with the remaining bits, built up in the master again and sent from here than simple complete telegram to the control. The user finds the up-to-date measured AS-i tension and the minimum AS-i tension as 16 bit analog value in the field of the input data (similar to the analog value transmission).

So that data transmission rates of approx. 50 Baud are attainable in the AS-i A/B operation. Because of the ID code "A" is the Diagnostic Tuner a slave with an extended address range and takes in the A/B operation one of 62 addresses, in the standard mode as A-slave one of 31.

AS-i 3.0 Specification

Since the Diagnostic Tuner uses the extended functions as slave, he must be used together with a master after the AS i 3.0 specification. The primary tuner functions is available however also with a AS-i Master according to the specification 2.0 or 2.1.

Accessories:

- AS-i Analyser (art. no. BW1415, see also page 160)
- AS-i passive distributor H (art. no. BW1239, see also page 194)

Description of the Bit Allocation

In0, In1

The LEDs indicate the result of the optimization:

Bit	LED	Description
11	red	serious disturbances
10	yellow	more frequent replications, which should be clarified depending upon application
01	green	almost repetition-free communication
00	---	none result available („Tuning-Phase“, or the push-button even pressed)

Out2

A change of 0 to 1 has the same effect as a depressing the key. However no training procedure is released. It can be released only by means of parameters.

Parameter

The parameter bits release (independently of the position of the rotary switch) a training procedure. Only the parameter 5, then the parameter 2 within 5 seconds causes the start of a training procedure.

Analog Channel 0

Tension	as 16 bit value of 0 ... 32 767 in mV
Resolution	10 bit

Analog Channel 1

Tension	as 16 bit value of 0 ... 32 767 in mV
Resolution	10 bit

Vendor Specific Object 1

This object contains a pair of bits, which shows the condition of the slaves in this address for all 62 possible slaves:

Bit	LED
11	red
10	yellow
01	green
00	no slave

Byte	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
1	3/3A	3/3A	2/2A	2/2A	1/1A	1/1A	---	---
2	7/7A	7/7A	6/6A	6/6A	5/5A	5/5A	4/4A	4/4A
...	...							
16	31B	31B	30B	30B	29B	29B	28B	28B

AS-i Repeater IP20

Circuit extension up to 200 m

On-Board diagnostics AS-i Fault and AS-i Power

Passive bus termination connectable for segment A

AS-i voltage metering segment A

Galvanic isolation

Requires no programming

Passive on the AS-i network
(no slave address required)



Article no. BWU2192 Advanced Repeater with bus termination in IP20

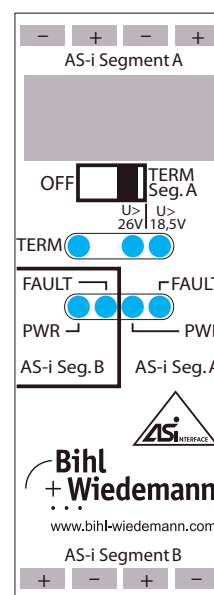
Beside the power supply, the AS-i Repeater with On-Board-Diagnostics displays separately AS-i communication errors. The red AS-i Fault LED flashes as long as there is no AS-i communication. The communication error LED will help the customer to find basic installation problems really fast. The new AS-i Repeaters

in IP 20 are compatible with all existing AS-i Repeaters and can easily be mounted into the switchboard in combination with an AS-i power supply. The passive bus termination allows a circuit extension up to 200 m.

Article no.	BWU2192
Connections	COMBICON clamps
AS-i voltage	26,5 ... 31,6 V via AS-i
Max. AS-i current consumption	60 mA (network segment), 120 mA (total)
Quantity of required AS-i power supplies	1 additionally (as any AS-i-Repeater)
Voltage of insulation	≥ 500 V
Display	
PWR AS-i Seg.B (green)	AS-i power network B
FAULT AS-i Seg.B (red)	AS-i communication error network B
PWR AS-i Seg.A (green)	AS-i power network A
FAULT AS-i Seg.A (red)	AS-i communication error network A
TERM (yellow)	Bus termination network A enabled
U > 26 V (green)	U AS-i segment A > 26 V
U > 18,5 V (yellow)	U AS-i segment A > 18,5 V
Applied standards	EN 61 000-6-2, EN 61 000-6-3
Operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Protection category EN 60529	IP20
Electromagnetic sustainability	according to slave specification
Dimensions (L / W / H in mm)	114 / 22,5 / 99

Connections:

1	AS-i A-
2	AS-i A+
3	AS-i A-
4	AS-i A+
5	n.c.
...	...
12	n.c.
13	AS-i B+
14	AS-i B-
15	AS-i B+
16	AS-i B-



Note:

- The AS-i Repeater does not occupy any slave address. The total amount of the slaves (31 resp. 62) per AS-i network remains constant. No programming required.

Accessories:

- AS-i Power Supply (art. no. BW1649, see also page 178)
- AS-i Bus Termination (art. no. BW1644, see also page 166)
- AS-i Tuner (art. no. BW1648, see also page 166)
- AS-i Repeater in IP65 (art. no. BW1273, see also page 170)
- AS-i Analyser (art. no. BW1415, see also page 160)

AS-i Repeater IP20

Circuit Extension by more than 100 m

On-Board Diagnostics AS-i Fault

Galvanic isolation

No programming required

**Passive on the AS-i network
(no slave address required)**

Simple mounting next to the AS-i power supply



Article no. BWU1855 Advanced Repeater (Circuit extension by more than 100 m)

The AS-i Repeater with On-Board Diagnostics has got a LED for power supply and AS-i communication errors. The red AS-i Fault LED flashes as long as there is no AS-i communication. The communication error LED will help the customer to find basic installation problems really fast.

The new AS-i Repeaters are compatible with all existing AS-i Repeaters.

Especially the AS-i Repeaters in IP20 can be easily mounted into the switchboard in combination with an AS-i power supply.

Together with the AS-i Tuner and the AS-i Bus Termination, the AS-i Repeater from Bihl+Wiedemann is a perfect package for every AS-i network.

Artikel no.	BWU1855
Connections	Combicon claps
Operating voltage	via AS-i
Operation current	60 mA (per network segment), 120 mA (total)
Quantity of required AS-i power supplies	1 additionally (as any AS-i Repeater)
4 LEDs	
PWR1	AS-i power network 1
FAULT1	AS-i communication error network 1
PWR2	AS-i power network 2
FAULT2	AS-i communication error network 2
Ambient operating temperatur	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Protection category according to EN 60 529	IP20
Electromagnetic sustainability	according to slave specification
Voltage of insulation	≥ 500 V
EMC	according to EN 61 000-6-3, EN 61 000-6-2
Dimensions (L / B / H in mm)	105 / 22,5 /114

Connections: BWU1855

1	AS-i-2
2	AS-i+2
3	AS-i-2
4	AS-i+2
5	n.c.
...	...
20	n.c.
21	AS-i+1
22	AS-i-1
23	AS-i+1
24	AS-i-1



Accessoires:

- AS-i power supply (art. no. BW1649, see also page 178)
- AS-i bus termination (art. no. BW1644, see also page 166)
- AS-i Tuner (art. no. BW1648, see also page 166)
- AS-i Repeater in IP65 (art. no. BW1273, see also page 170)
- AS-i Analyser (art. no. BW1415, see also page 160)

Note:

The AS-i Repeater does not occupy any slave address. The total amount of the slaves (31 respectively 62) per AS-i network remains constant. No programming required.

Repeater IP65

Advanced Repeater from Ident. no. 12243

Extends networks an additional 100 m and allows networks of more than 1 km in combination with the AS-i Tuner or AS-i Bus Termination

Several advanced AS-i Repeaters can be operated in parallel

On-Board Diagnostics: displays power supply and AS-i communication errors separately

Requires no programming

Passive on the AS-i network
(no slave address required)



Article no. BWU1273: AS-i Advanced Repeater IP65

Beside the power supply, the AS-i Repeater with On-Board-Diagnostics displays separately AS-i communication errors.

With the help of the advanced AS-i Repeaters (from Ident. no. 12243) two repeaters can be operated in combination with the AS-i Tuner or AS-i Bus Termination in a row. Thus, circuit exten-

sion up to 1 km is possible. Furthermore it is permitted to use several parallel operating Advanced Repeaters.

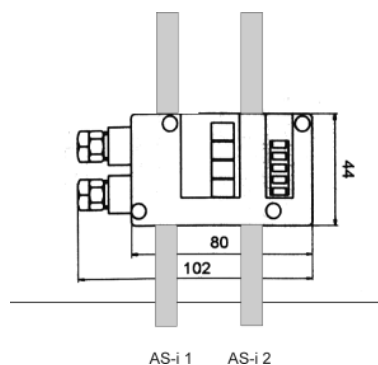
The AS-i Repeaters are compatible with all existing AS-i Repeaters.

Article no	BWU1273
Connections	AS-i flat cable / AS-i round cable
Operating voltage	via AS-i
Operating current	60 mA (per network segment), 120 mA (total)
Quantity of needed power supplies	2
4 LEDs	
U AS-i1	AS-i power network 1
FLT1	AS-i communication error network 1
FLT2	AS-i communication error network 2
U AS-i2	AS-i power network 2
Ambient operating temperature	-10 ... +55 °C
Storage temperature	-25 ... +75 °C
Protection category according to EN 60 529	IP 65
Electromagnetic Sustainability	according to slave specification
Voltage of insulation	≥ 500 V
EMC	according to EN 61 000-6-3, EN 61 000-6-2

Note: The AS-i Repeater needs no slave address. The total amount of the slaves (31 respectively 62) per AS-i network remains the same. No programming required.

LEDs

1	U AS-i1
2	FLT1
3	free
4	FLT2
5	U AS-i2



Accessories: AS-i substructure module to connect 1 AS-i round cable, 1 round cable or additional supply (Art. no. BW1183, see page 195) by using of AS-i round cables

AS-i High Power Repeater in IP20

AS-i High Power Repeater for sliding contacts

Higher transmission and reception levels to High Power Segment A

To interference insensitive point-to-point connections

On-Board Diagnostics AS-i Fault and AS-i Power

Galvanic isolation

Passive on the AS-i network (no slave address required)



Article No. BW2384 AS-i High Power Repeater for sliding contacts in IP20

The AS-i High Power Repeater for sliding contacts works with 3 x higher transmission and reception levels. The AS-i communication for sliding contacts gets considerably less sensitive to disturbances. AS-i is basically very inured to disturbances. The

interference resistance, for example, to parallel supply lines of converters is highly improved due to higher transmission and reception levels.

Article No.	BW2384
Connections	COMBICON clamps
AS-i voltage	26,5 ... 31,6 V via AS-i
Max. AS-i current consumption	60 mA in Segment B, 180 mA in Segment A, 240 mA (total)
Quantity of required AS-i power supplies	1 additionally (as any AS-i Repeater)
Voltage of insulation	≥ 500 V
Display	
PWR AS-i Seg.B (green)	Power AS-i Segmnt B
FAULT AS-i Seg.B (red)	Communication error Segment B
PWR High Power Seg.A (green)	Power High Power Segment A
FAULT High Power Seg.A (red)	Communication error High Power Segment A
TERM (yellow)	Bus termination High Power Segment A enabled
U > 26 V (green)	U High Power Segment A > 26 V
U > 18,5 V (yellow)	U High Power Segment A > 18,5 V
Applied standards	EN 61 000-6-2 EN 61 000-6-3
Ambient operating temperature	0 ... +55 °C
Storage temperature	-25 ... +75 °C
Protection category acc. EN 60 529	IP20
Electromagnetic sustainability	according to slave specification
Dimensions (L / W / H in mm)	114 / 22,5 / 99

Note:

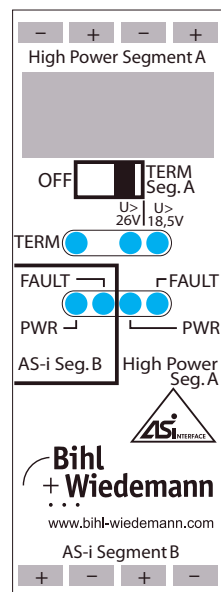
The AS-i High Power Repeater does not occupy any slave address. The total amount of the slaves (31 respectively 62) per AS-i network remains constant. No programming required.

Accessories:

- AS-i Power supply (art. no. BW1649, see also page 178)
- AS-i Bus termination (art. no. BWU1644, see also page 166)
- AS-i Tuner (art. no. BWU1648, see also page 166)
- AS-i Repeater in IP65 (art. no. BWU1273, see also page 170)
- AS-i Analyser (art. no. BW1415, see also page 160)
- AS-i Module for Power Decoupling (art. no BW2387, see also page 188)

Connections:

1	High Power A-
2	High Power A+
3	High Power A-
4	High Power A+
5	n.c.
...	...
12	n.c.
13	AS-i B+
14	AS-i B-
15	AS-i B+
16	AS-i B-



Hint:

Air circulation in the power supply may not be disturbed: therefore when mounting see that is at least 50 mm free space down/above and 30 mm free space left/right!

AS-i Master/Gateways/ Links/Scanner	
AS-i Slaves	
AS-i Accessories/ Diagnostics/Development	
Other Fieldbuses/ Master Simulators	
AS-i Safety	
Price Lists	

Overview Power Supplies

Housing	Module	Art. No.	UL	Characteristics	P.
	AS-i Power Supply 1,8 A	BW2255		AS-i Installation Power supply from 115 V _{AC} up to 250 V _{AC}	176
	AS-i Power Supply, 4 A/8 A	BW1649		90 V AC up to 265 V AC, wide range supply, 4 A	178
		BW1997		115 V AC/230 V AC, with range switch, 8 A	
	AS-i Wide Range Power Supply 8 A	BW2276		8 A AS-i power supply with integrated filter for input voltage from 195 V _{ac} up to 500 V _{ac}	179
	24 V to 30 V AS-i Power Supply in Stainless Steel, 2 A	BW1760		24 V DC to 30 V AS-i output voltage	181
	Power Supply for AS-i Master in Stainless Steel, 4 A/8 A	BW1593		Power Supply, 8 A	182
		BW1598		Power Supply, 8 A, Class 1 Div 2	
		BW1597		Power Supply, 4 A, Class 1 Div 2	
	Power Supply, 4 A/8 A, with 3 phases for AS-i Master in Stainless Steel	BW1927		Power Supply, 4 A, for 2 AS-i circuits	184
		BW1676		Power Supply, 8 A, for 2 AS-i circuits	185

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

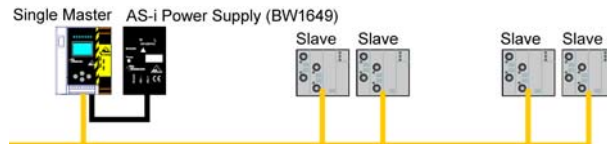
AS-i Safety

Price Lists

Housing	Module	Art. No.	UL	Characteristics	P.
	AS-i Power Supply Decoupling Unit: supply of 2 AS-i networks out of 1 power supply	BWU1943		applicable with double masters without integrated data decoupling	186
	AS-i Power Extender	BWU1197		extends the distance between AS-i power supply and AS-i network, 2,8 A	187
		BW1713		extends the distance between AS-i power supply and AS-i network, 2,8 A, Class 1 Div 2	
		BWU1477		extends the distance between AS-i power supply and AS-i network, 4,0 A	
		BW1714		extends the distance between AS-i power supply and AS-i network, 4,0 A, Class 1 Div 2	
	AS-i Module for Power Decoupling	BWU2387		in combination with an AS-i Repeater: decouples 1,2 A from AS-i Segment B and supplies Segment A with 1,2 A	188

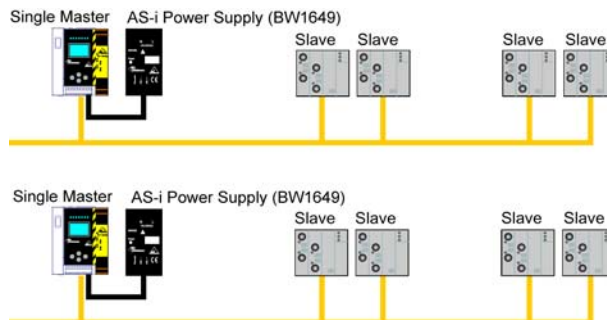
AS-i Power Supplies

Nowadays, AS-i networks are the standard technology for applications with up to 62 participants and a length of up to 100 m (configuration A1). Their benefits are low costs, simple installation and a reliable operation. For the single network configuration, Bihl+Wiedemann offers different masters, gateways and links in IP20 und IP65 including some useful application functions, as well as a power supply (4 A) and a diversity of analogue slaves.



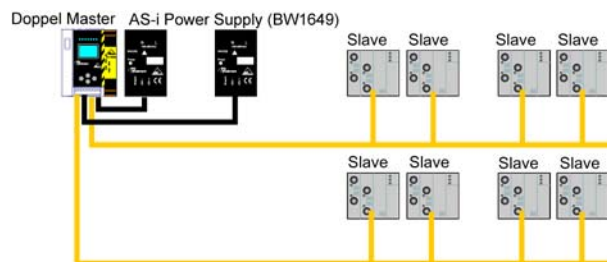
Config. A1: The standard: single network, often with coupling to a higher level network, e.g. to PROFIBUS.

If more than 62 slaves, cables longer than 100 m, more flexibility, or more flexibility in the network are needed, formally the answer to these cases was "duplicate all". The standard AS-i single network with up to 62 slaves and 100 m in length used to be the biggest unit (configuration A2). The rest was a matter of multiplying.



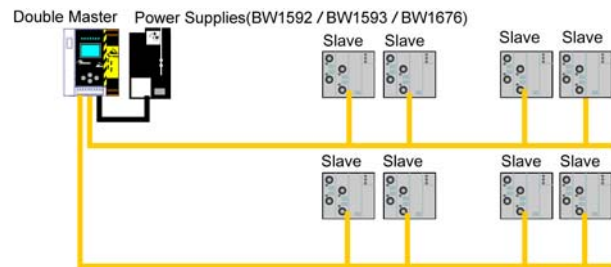
Config. A2: Multiple networks simply duplicating the standard single network.

Today there are several alternatives. A first step to more intelligent solutions is to install a double master, which is more cost effective than two single masters and saves one connection with a higher system (configuration A3). Thus the (cost) threshold to use multiple networks is lowered. Not only the number of slaves can require a second network, but also the higher rate of flexibility in designing a plant may make them appear desirable.



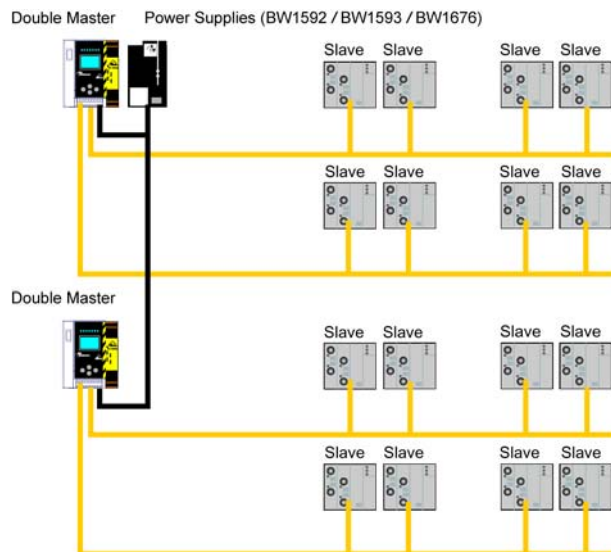
Config. A3: Two networks are served by one double master.

As the second step Bihl+Wiedemann offers now also a double master, which gets by only one power supply unit (configuration A4); the data decoupling is integrated inside the master (up to 4 A for each AS-i circuit), the power supply (30 V / 4 A or 8 A).



Config. A4: The second step: Using a double master in the version "1 power supply, 1 gateway for 2 AS-i networks".

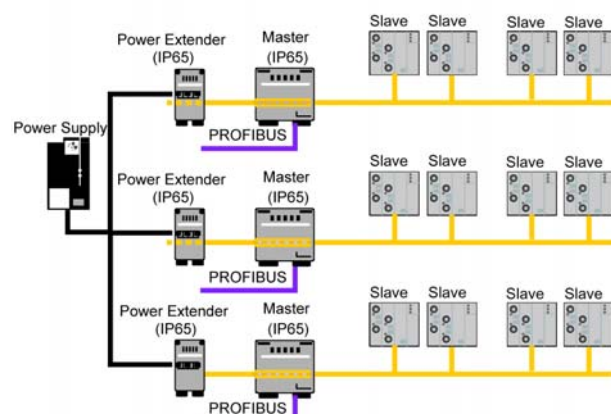
Several double masters can even be supplied from only one power supply.



Config. A5: Using 1 power supply for several double masters.

The identical power supplies can be used together with external data decoupling units of an "AS-i Power Extender" to feed several separate networks. As the leads between the power supplies and the data decoupling do not count in the 100 m-limit, these networks may be placed separately from each other (configuration A6).

If IP65-masters are used no service cabinets are required. The power supply may be placed in a central switch box (but mind the voltage drop!). This configuration is of special interest in large and spacious applications.



Config. A6: External data decoupling (AS-i power extenders) can be used to feed several masters from 1 power supply (BW1592/BW1593/BW1676).

AS-i Power Supply 1,8 A

AS-i Power Supply 1,8 A

AS-i Installation Power supply from 115 V_{AC} up to 250 V_{AC}

Primary switched-mode regulator 31,2 V/1,8 A

LED operation indicator



Article no. BW2255 AS-i Power Supply 1,8 A

The power supply is continuous idle running protected and thus delivers a variable direct current of 0 - 1,8 A as output current. Temperature indication and curve is based on the ambient temperatures from -5°C up to 40°C specified by the AS-i norm. However, the power supply is operating until an ambient temperature

of approx. 60°C with nominal load. With higher temperatures the output voltage, that is the total power is adjusted and so the power supply is protected from destruction.

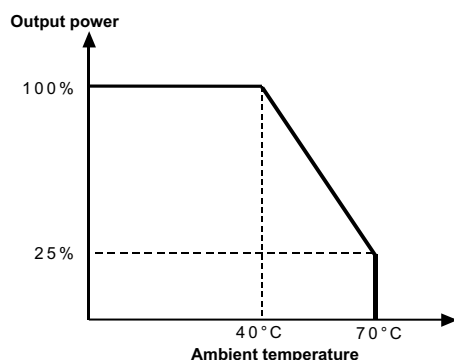
When temperature falls below 60°C, the power supply will again work in normal operation mode.

Article no	BW2255
Input	
Nominal input voltage	100 - 240 V _{AC} , 47 - 63 Hz
Input voltage	94 - 265 V _{AC}
Nominal input current	0,65 A at 230 V _{AC} ; 1,0 A bei 115 V _{AC}
Peak inrush current	I _{pt} < 1,5 A ² s
Power factor cos φ	0,4 capacitive at 230 V _{AC} ; 0,55 capacitive at 115 V _{AC}
Applicable wire size of input clamps	0,5 ... 2,5 mm ² (AWG20 ... AWG13)
Tightening torque of the input clamps	0,6 - 0,8 Nm
Insulation stripping length	10 mm
Output	
Output voltage U _{out}	31,2V ± 3%
Output current I _{out}	0 - 1,8 A
Ripple	< 50 mV _{pp} (0 ... 10 kHz); < 10 mV _{pp} (35 ... 500 kHz)
Current limitation typ.	2,3 A
Efficiency typ.	88%
Applicable wire size of output clamps	0,5 ... 2,5 mm ² (AWG20 ... AWG13)
Tightening torque of the output clamps	0,6 - 0,8 Nm
Insulation stripping length	10 mm
Regulation	
Line regulation	< 0,2% at U _{in} = 230 V _{AC} ± 15%
Load regulation	< 0,5% at 0 A → 1,8 A
Dynamics	< 2 ms at 10 ↔ 90% (I _{out max}), peaks < 2%
Protection and monitoring	
Internal fuse	T2,5 A / 250 V TR5 IEC 60 127-3/IV
Current limitation	Protected against continuous short circuit (see diagram)
Overload protection	yes
Idle running protection	yes
Hold-up time	> 65 ms bei U _{in} = 230 V _{AC} ; > 10 ms bei U _{in} = 115 V _{AC}
Safety	
Output	Safety extra low voltage SELV
Protective system (EN 60 529)	Class II
Protection category	IP20
Leakage current	< 0,25 mA (47 - 63 Hz line frequency)

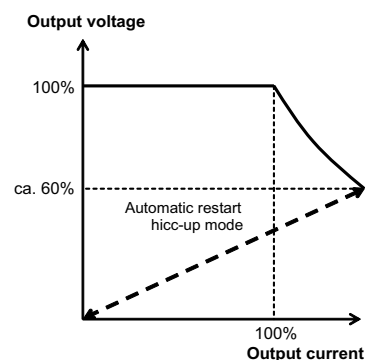
AS-i Power Supply 1,8 A

EMV CE-certified	EN 55 011, EN 50 082-1, EN 61 000-6-2
RFI suppression	EN 55 022, EN 55 011 class B
Static discharge ESD ref. (IEC 61 000-4-2)	8 kV contact discharge, 15 kV free air discharge (EN 61 000-4-2)
Electromagnetic fields ref. (IEC 61 000-4-3)	10 V/m (EN 61 000-4-3)
Burst ref. (IEC 61 000-4-4)	4 kV input, 2kV output/capacitive coupling clamp (EN 61 000-4-4)
Surge ref. (IEC 61 000-4-5)	4 kV unsymmetrical (EN 61 000-4-5)
Conducted disturbances ref. (IEC 61 000-4-6)	10V, 150 kHz ... 80 MHz (EN 61 000-4-6)
AS-i Certification	
AS-i Certification	Pending
Operational data	
Temperature range	-10°C ... +40°C, by free convection (start from -25°C)
Power derating	2,5% / K from +40°C (see diagram)
Storage temperature	-25°C ... +85°C
Displays	
LED green	The green LED indicates normal operation (0 A ... 1,8 A)
Mounting	
Mounting position	vertical as shown in figure
Input terminals	upper side
Output terminals	lower side
Assembly	
Plastic slider for fastening to mounting rails DIN EN 50 022-35	
Mechanics	
Dimensions max. (W / H / D):	45 / 72 / 105
Weight	approx. 0,2 kg

Derating



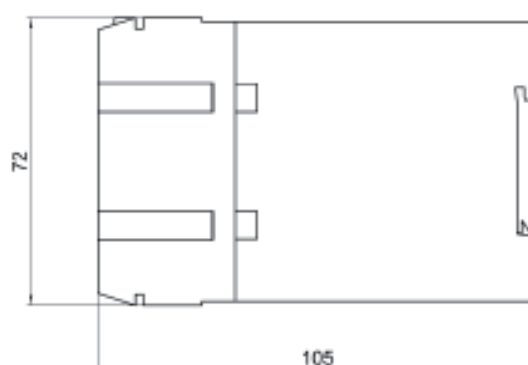
Current limitation curve



Connections



Dimensions (size in mm)



AS-i Power Supply 4 A/8 A



THE AS-INTERFACE MASTERS

AS-i Power Supply 4 A

90 V AC up to 265 V AC wide range power supply (BW1649)

AS-i Power Supply 8 A

115 V AC/230 V AC power supply with range switch (BW1997)

SELV

LED operation indicator

AS-i data decoupling

Power factor correction



BW1649



BW1997



Article no. BW1649 AS-i Power Supply 4 A, wide range power supply

Article no. BW1997 AS-i Power Supply 8 A, power supply with range switch

The primary clocked power supply is supposed for fieldbus applications, which transport energy and data via a 2-wire line at the same time.

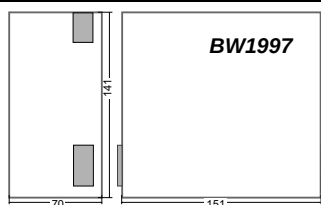
The AS-i Supply powers a fully loaded AS-i system with a maximum output current of 4.0 A or 8.0 A. The sinusoidal current consumption of the power supply prevents harmonic waves. The current is approximately in phase with the voltage by means of the passive power fac-

tor correction and leads to only a little reactive power. This guarantees a power factor $\cos\phi \geq 0,6$.

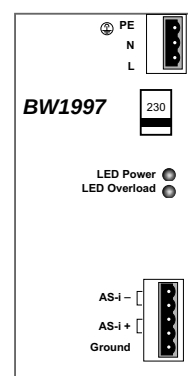
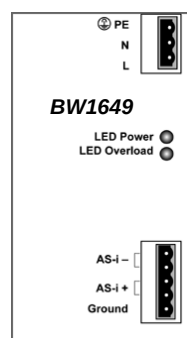
Besides the energy supply the power supply takes over also the function of data decoupling to the power source and the balancing of the two AS-i output lines in relation to the machine ground (shield).

Due to the accurate and transformic coupling the use of unscreened load lines is possible.

Article no.	BW1649		BW1997	
Input				
Power factor	approx. 0,6 (according to input voltage)			
Input frequency	47 ... 63Hz			
Voltage range U _e	90 ... 265V AC		115/230V AC	
Efficiency	approx. 90%			
Input current I _e	without idle current at 230V AC			
	approx. 0,6A		approx. 1,2A	
Input fuse	internal fuse electronic fuse against external short circuits			
Turn on surge current	<30V			
Output				
Output voltage	29,5 ... 31,6V DC			
Remaining ripple	according to AS-i Specifaction			
Output current	4A		8A	
Current limitation	approx. 4,5A		approx. 8,5A	
Displays				
LED green (PWR)	power on (at frontside)			
LED red (Overload)	overload error (at frontside)			
Standard conformity				
Protection category (EN 60 529)	IP20			
Standards	EN 60 950			
	UL 60 950		UL 60 950 intended, AS-i certificate intended	
Ambient operating temperature	-10°C ... +55°C			
Storage temperature	-40°C ... +85°C			
Dimensions (L / W / H in mm)	129 / 70 / 126		151 / 70 / 141	



Connections:



Hints:

- Clamp GND must be connected with machine ground.
- Air circulation in the power supply may not be disturbed: therefore when mounting see that is at least 3 cm free space down and sufficiently free space above!

AS-i Wide Range Power Supply 8 A

AS-i Wide Range Power Supply 8 A

8 A AS-i power supply with integrated filter for input voltage from 195 Vac up to 500 Vac

Primary switched-mode regulator 31,2 V/8 A

LED overload indicator

LED operation indicator



Article no. BW2276 AS-i Wide Range Power Supply 8 A

The power supply is continuous idle running protected and thus delivers a variable direct current of 0 - 8 A as output current.

Temperature indication and curve is based on the ambient temperatures from -5°C up to 40°C specified by the AS-i norm. However, the power supply is operating until an ambient temperature

of approx. 60°C with nominal load. With higher temperatures the output voltage, that is the total power is adjusted and so the power supply is protected from destruction.

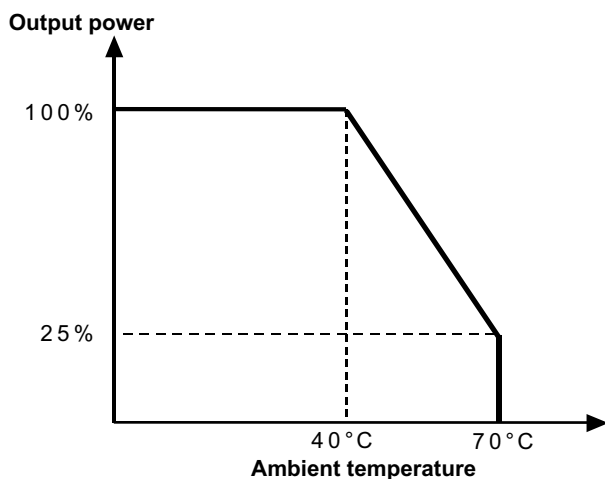
When temperature falls below 60°C, the power supply will again work in normal operation mode.

Article no.	BW2276
Input	
Nominal input voltage	230/400 V _{AC} 47-63 Hz
Input voltage	195 - 500 V _{AC}
Nominal input current	1 A bei 400 V _{AC}
Peak inrush current	< 50 A
Power factor cos φ	0,7 capacitive at 400 V _{AC}
PFC norm (harmonics)	EN 61 000-3-2 class A
Output	
Output voltage	31,2V ± 1%
DC output current	0 - 8 A
Ripple	< 60mV _{pp} (10 ... 500 kHz)
Current limitation typical	8,5 A
Efficiency typical	88%
Regulation	
Line regulation	< 0,2% at U _{on} = 400 V _{AC} ± 15%
Load regulation	< 1% at 0 A → 8 A
Dynamics	< 2 ms at 10 ↔ 90% (I _{out max}), peaks < 2%
Protection and monitoring	
Internal fuse	T3,15 A / 500 V 6,3 x 32 mm
Current limitation	protected against continuous short circuit (see diagramm) and idle running
Overload prot.	yes
Idle running prot.	yes
Hold-up time	> 15 ms at U _{in} = 230 V _{AC}
Safety	
Output	safety extra low voltage SELV
Protective system (EN 60 529)	class I
Protection category	IP20
Leakage current	< 3,5 mA (47-63 Hz mains frequency)
EMV CE-certified	
Harmonics	EN 55011, EN 50082-1, EN 61000-6-1, EN 61000-6-2
RFI suppression	EN 55022, EN 55011 class B
Static discharge	ESD 8kV contact discharge, 15kV free air discharge
ref. IEC 61000-4-2	EN 61000-4-2
Electromagnetic fields	10 V/m
ref. IEC 61000-4-3	EN 61000-4-3
Burst	4 kV input, 2kV output/capacitive coupling clamp
ref. IEC 61000-4-4	EN 61000-4-4
Surge	4 kV unsymmetrical, 4 kV symmetrical
ref. IEC 61000-4-5	EN 61000-4-5
Conducted disturbances	10V, 150 kHz ... 80 MHz

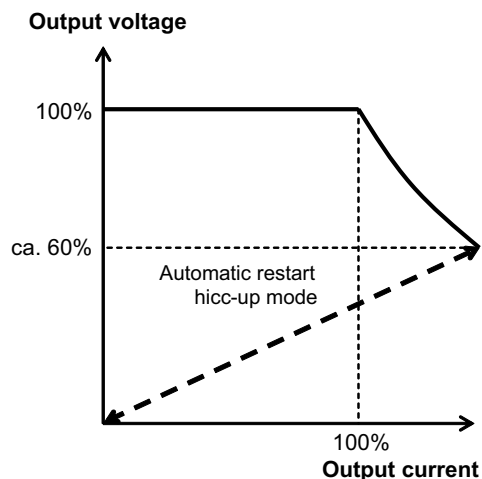
AS-i Wide Range Power Supply 8 A

ref. IEC 61000-4-6	EN 61000-4-6
Operational data	
Temperature range	-10°C ... +40°C, by free convection
Power derating	2,5% / K from +40°C to max.70°C (see diagram)
Storage temperature	-25°C ... max. +85°C
Displays	
LED green	LED on: normal operation (0 A ... 8 A)
LED red	LED on: overload
	LED flashing: hicc-up mode
Mounting	
Mounting position	vertical as shown in figure
Input terminals	upper side
Output terminals	lower side
Assembly	plastic slider
Mechanics	
Dimensions max. (L / W / H in mm)	70 / 141 / 151
Weight	approx. 1,2 kg

Derating

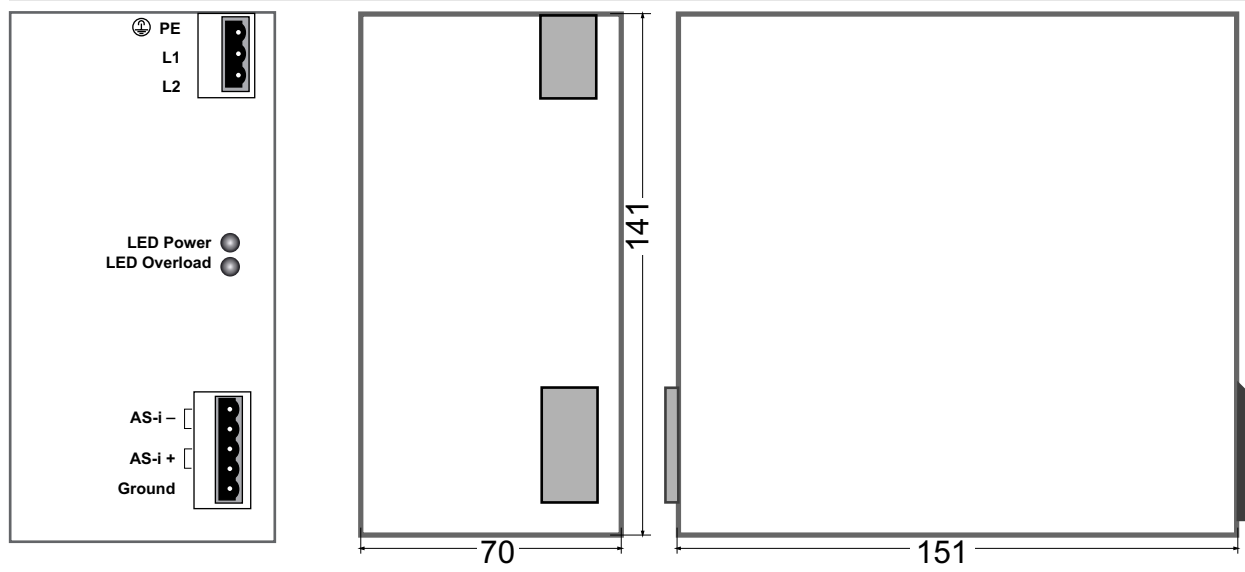


Current limitation curve



Connections

Diagram



24 V to 30 V AS-i Power Supply in Stainless Steel 2 A

24 V DC to 30 V AS-i Output Voltage

PELV

LED operation indicator

AS-i data decoupling

62 Watt

Insertable Combicon connectors



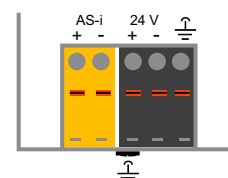
Article No. BW1760

The AS-i Power Supply in Stainless Steel supplies the AS-i system voltage for the supply of masters, sensors, actuators and modules.

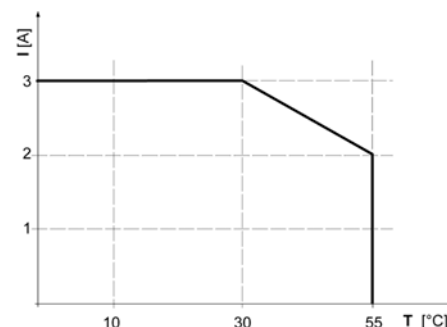
The power supply provides an output current of 2 A.

Article no.	BW1760
Input	
Operating voltage U_e	24 V DC
Input voltage range U_e	20 .. 32 V DC
Fuse	T 6,3 A built-in
Short circuit protected	yes
Overload protected	yes
Output	
Output voltage (AS-i)	29,5 V .. 31,6 V DC according PELV
Output current	2 A (3 A up to 30°C)
Remaining ripple	< 50 mV
Efficiency	88%
Hold-up-time	> 10 ms
Pre-fuse	> 10 A
Displays	
LED green	power on (at frontside)
LED red	overload error
Housing	
Ambient operating temperature	0°C .. +55°C
Storage temperature	-25°C .. +85°C
Connection	insertable Combicon connectors up to 2,5 mm ²
Housing	stainless steel
Protection category (EN 60 529)	IP20
Dimensions (L, W, H)	120 mm, 55 mm, 83 mm
Standard conformity	
Standards	EN 50295, EN 61000-6-2, EN 61000-6-4
Mounting position	vertical

Connections:



Temperatur performance, derating 3 A:



Note: Air circulation in the power supply may not be disturbed:
therefore when mounting see that is at least 3 cm free space
down and sufficiently free space above!

4A/8A Power Supply for AS-i Master in Stainless Steel



THE AS-INTERFACE MASTERS

4 A/8 A Power Supply for AS-i Master in Stainless Steel for 2 AS-i Circuits

LED operation indicator

At present for

BWU1569, BWU1643, BWU1652, BW1197, BW1477, BWU1820, BWU1823, BWU1833



BW1593/1598



BW1597



Article no. BW1593 8 A

Article no. BW1598 8 A Class1 Div2 (Group A, B, C & D, T-Code 4)

Article no. BW1597 4 A Class1 Div2 (Group A, B, C & D, T-Code 4)

This supply for AS-i powers one respectively two fully loaded AS-i systems with a maximum output current of 4 A respectively 8 A.

The power supplies are continuous idle running protected and can deliver therefore a variable direct current of 0 - 4 A (BW1597) resp. 0 - 8 A (BW1593/BW1598) as output current.

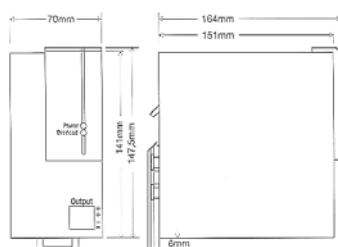
These power supplies are qualified only for the gateways in stainless steel in the version "1 power supply for 2 AS-i circuits".

Article no.	BW1593	BW1598	BW1597
		Class1 Div2 (Group A, B, C & D, T-Code 4) 	Class1 Div2 (Group A, B, C & D, T-Code 4) 
	30 V 8 A	30 V 8 A	30 V 4 A
Input			
Operating voltage	115/230 V AC, 47 - 63 Hz		
Voltage range	93 - 132 V AC/187 - 265 V AC, 47 - 63 Hz		
Input current	1,8 A at 230 V AC/4,2 A at 115 V AC		0,9 A at 230V AC/2,2 A at 115 V AC
Turn on impulse	< 30 A		
Fuse	T 6,3 A/250 V internal		T 3,15 A/250 V internal
Power factor cos φ	0,5 capacitively at 230 V AC/0,58 capacitively at 115 V AC		
PFC standard (harmonic waves)	EN 61 000-3-2		
Output			
Output voltage	30 V _{DC} ± 1%		
Output current	8 A		4 A
Ripple	< 50 mV _{pp}		
Current limitation (typ.)	12 A		6 A
Parallel use	yes		
Efficiency (typ.)	90 %		89 %
Hold-up-time	> 35 ms/230 V AC; > 30 ms/115 V AC		> 20 ms/230 V AC; > 15 ms/115 V AC
Displays			
LED green	power on (at frontside)		
LED red	overload error (at frontside)		
Ambient operating temperature	0°C ... +60°C		
Storage temperature	-25°C ... +85°C		
Protection (IEC)	IP20		
Electromagnetic compatibility			
Signal error	radio-screened according EN 55022 class B		
Interference resistance	EN 50 082-1/EN 50 082-2, continous short circuit and idle running protected		

4A/8A Power Supply for AS-i Master in Stainless Steel

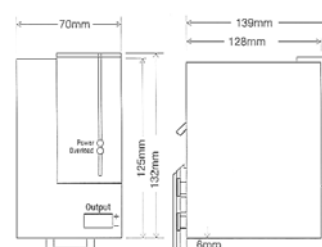


THE AS-INTERFACE MASTERS



BW1593
BW1598

BW1597



AS-i-Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

4 A Power Supply with 3 Phases for AS-i Master in Stainless Steel



THE AS-INTERFACE MASTERS

4 A Power Supply with 3 phases for AS-i Master in Stainless Steel for 2 AS-i circuits

LED operation indicator

At present for

BWU1569, BWU1643, BWU1652, BW1197, BW1477, BWU1820, BWU1823, BWU1833



Article no. BW1927

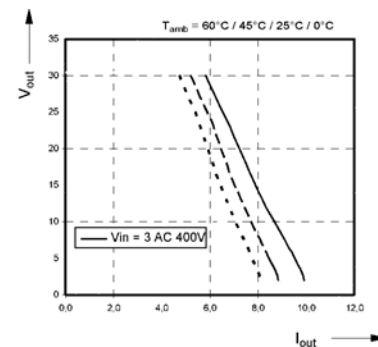
The power supply with 3 phases for AS-i powers one respectively two fully loaded AS-i systems with a maximum output current of 4 A. The power supply is continuous idle running protected and can deliver therefore a variable direct current of 0 - 4 A as output current.

These power supplies are qualified only for the gateways in stainless steel in the version "1 power supply for 2 AS-i circuits"

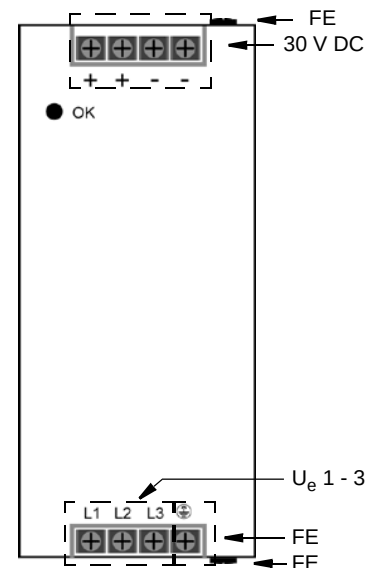
Article no.	BW1927
Input	
Operating voltage	3 x 400 - 500 V _{AC} , 47 - 63 Hz
Voltage range	3 x 340 - 576 V _{AC} , 47 - 63 Hz
Input current	3 x 0,5 A at 400 V _{AC}
Turn on impulse	< 25 A (at cold start, 575 V _{AC})
Prescribed external fusing	circuit breaker with B-characteristic 3 x 10 A or slower action, or alternatively 3 x 10 A HBC fuse
Internal fusing	-
Output	
Output voltage	30,5 V _{DC} ± 3%
Accuracy of regulation	2%
Output current	0 - 4 A
Ripple	< 25 mV _{pp}
Current limitation at 60°C	typ. 4.2 - 7,4 A
Derating (T _U = 60°C - 70°C)	typ. 6 W/K
Parallel operation	yes; no equal load sharing
Short-circuit protected	yes
Overload protected	yes
Efficiency (typical)	89%
Display	
LED	power on (at frontside)
Housing	
Ambient operating temperature	-10°C ... +70°C
Storage temperature	-25°C ... +85°C
Protection category EN 60529	IP20
Dimensions (L, W, H)	117 mm, 73 mm, 124 mm
Standards	
EMC: EN 61000-6-3, EN 61000-6-4, EN 61000-6-2, EN 61000-6-1, VDE 0160/W2 Safety: EN 60950-1, EN 60204-1, EN 50178, IEC 60950, UL 60950, UL 508, CAN/CSA-C22.2 No. 60950 (CUR), CAN/CSA-C22.2 No. 14 (CUL) Power factor (PFC): EN 61000-3-2	

Temperatur performance:

Fig. 1: V_{out} vs. I_{out} (typ., V_{in}=3 AC 400 V)



Connections:



Note:

Air circulation in the power supply may not be disturbed: therefore when mounting see that is at least 50 mm free space below/ above and 15 mm free space left/right!

8 A Power Supply with 3 Phases for AS-i Master in Stainless Steel

**8 A Power Supply with 3 phases for
for AS-i Master in Stainless Steel
for 2 AS-i circuits**

LED operation indicator

At present for

**BWU1569, BWU1643, BWU1652, BW1197,
BW1477, BWU1820, BWU1823, BWU1833**

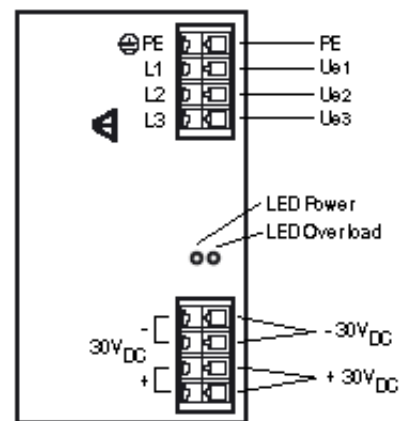


Article no. BW1676

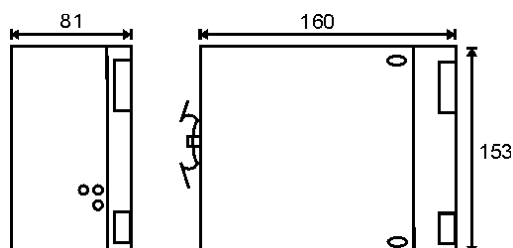
The Power Supply with 3 phases for AS-i powers one respectively two fully loaded AS-i systems with a maximum output current of 8 A. The Power Supply is continuous idle running protected and can deliver therefore a variable direct current of 0 - 8 A as output current.

These Power Supplies are qualified only for the gateways in stainless steel in the version "1 power supply for 2 AS-i circuits".

Article no.	BW1676
Input	
Operating voltage	3 x 380 - 500 V AC, 47 - 63 Hz
Voltage range	3 x 340 - 550 V AC, 47 - 63 Hz
Input current	3 x 0,7 A at 400 V AC
Turn on impulse	< 50 A
Fuse	-
Power factor cos φ	0,55 capacitively at 230 V AC
PFC standard (harmonic waves)	EN 61 000-3-2 class A
Output	
Output voltage	30 V _{DC} ± 1%
Output current	0 - 8 A
Ripple	< 50 mV _{pp}
Current limitation (typ.)	12,5 A
Parallel use	yes
Efficiency (typ.)	90%
Hold-up-time	> 5 ms/400 V AC
Displays	
LED green	power on (at frontside)
LED red	overload error (at frontside)
Housing	
Ambient operating temperature	-10° C ...+70° C, by free convection
Storage temperature	-25° C...+85° C
Elektromagnetic Compatibility	
Signal error per:	radio-screened according EN 55 011 class B
Interference resistance per:	EN 50 082-1/EN 50 082-2, continuous short circuit and idle running protected



Attention: Max: output power 240 W at setting to 30 V DC max. 8 A



AS-i Power Supply Decoupling Unit: Supply of 2 AS-i Networks via 1 Power Supply

AS-i Power Supply Decoupling Unit for 2 AS-i Networks

AS-i Power Extender for 2 AS-i networks

Applicable with double masters
without integrated data decoupling

Supply of 2 AS-i networks out of 1 power supply

Protection category IP20



Article no. BWU1943: Supply 2 AS-i networks out of 1 power supply

The AS-i Power Supply Decoupling Unit was developed for the use with double masters without integrated data decoupling in the master. It is used to decouple the power supply in order to power up 2 AS-i networks with only 1 AS-i Power Supply.

The AS-i Power Supply Decoupling indicates the AS-i voltage at the inputs with two LEDs in two steps:

1. AS-i voltage > 28 V
2. AS-i voltage > 26 V

The data decoupling unit built inside the AS-i Power Supply Decoupling Unit is limited to 4,0 A at 30 V for each network.

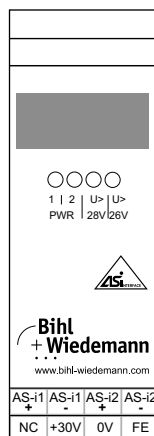
AS-i Power Supply Decoupling Unit is short circuit protected (self-recovering fuse, 6 A).

The AS-i Power Supply Decoupling Unit can also be used in combination with a repeater. It has an IP20 housing.

Several AS-i Power Supply Decoupling Units can be supplied out of 1 power supply.

The DC line from the power supply must not be grounded!

Article no.	BWU1943
Connections	30 V input voltage AS-i output voltage Function earth
Display	
LED green (PWR)	AS-i voltage (circuit 1) ON
LED green (PWR)	AS-i voltage (circuit 2) ON
LED green (U AS-i)	AS-i voltage > 28 V
LED green (U AS-i)	AS-i voltage > 26 V
Operating current	< 4,0 A at 30 V (per output)
Operating voltage	30 V DC (PELV)
Voltage of insulation	≥ 500 V
EMC directions	EN 61000-6-2, EN 61000-6-4
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	housing for DIN rail mounting
Dimensions (L, W, H)	99 mm, 22,5 mm, 92 mm
Protection category (DIN 40 050)	IP20
Weight	120 g



Accessories:

- AS-i Power Supply 4 A (article no. BW1649, see also page 178)
- 8 A Power Supply for AS-i Master in Stainless Steel for 2 AS-i circuits (article no. BW1593, see also page 182)
- 8 A Power Supply with 3 Phases for AS-i Master in Stainless Steel for 2 AS-i circuits (article no. BW1676, see also page 185)
- AS-i Advanced Repeater (article no. BW1855, see also page 169)
- 24 V to 30 V AS-i Power Supply in Stainless Steel 2 A (article no. BW1760, see also page 181)

Extends the distance between AS-i Power Supply and AS-i Network

Can be used in combination with Repeater/Extender

AS-i Power Extender and AS-i Gateway in IP65 Power Supply remains in IP20

Various AS-i networks can be powered by one power supply



Accessory: Art. no. BW1181

Accessory: Art. no. BW1183



Article no. BWU1197: AS-i Power Extender 2,8 A

Article no. BW1713: AS-i Power Extender 2,8 A, Class I Div. 2 (Group A, B, C & D, T-Code 4)

Article no. BWU1477: AS-i Power Extender 4,0 A

Article no. BW1714: AS-i Power Extender 4,0 A, Class I Div. 2 (Group A, B, C & D, T-Code 4)

The AS-i Power Extender is used to extend the distance between the power supply and the actual AS-i network.

Either an AS-i Power Supply or a standard power supply with 30 V according to AS-i specification can be used to power the remote AS-i network.

The AS-i Power Extender has to be connected in between of the Power Supply on one side and the AS-i Master and slaves on the other side.

In dependence on cable resistor and current there is a voltage drop between the power supply and the AS-i Power Extender. The AS-i voltage at the AS-i Power Extender's output is displayed with the help of two LEDs.

1. AS-i voltage at the AS-i Power Extender > 28 V

2. AS-i voltage at the AS-i Power Extender > 26 V

As with normal AS-i networks the user has to make sure that actuators have to be powered with 24 V +10%/-15%.

As rule of thumb für die AS-i cable length in dependence of the AS-i voltage compared with conventional AS-i network (cable cross-section: 1,5 mm², for example with AS-i flat cable):

1. AS-i voltage > 28 V: approx. 80 m cable length

2. AS-i voltage > 26 V: approx. 60 m cable length

Inside the AS-i Power Extender you can find a data decoupling for max. 2,8 A/4,0 A current with 30 V AS-i voltage. The AS-i Power Extender is short circuit protected (self-recovering fuse, idle, 3 A/6 A).

The AS-i Power Extender was developed for the use in combination with repeater/extender. The AS-i Power Extender is located in an IP65 housing with a substructure module.

In combination with gateways in IP65 you can easily build up small decentral islands.

Article no.	BWU1197	BW1713		BWU1477	BW1714	
Connections: 30 V input voltage AS-i output voltage Function earth	standard AS-i substructure module for the connection of the AS-i cable and the external power supply cage clamp					
Short circuit protection (self-recovering fuse)	3 A			6 A		
Display: LED green LED green	AS-i voltage > 28 V AS-i voltage > 26 V					
Operating current	< 2,8 A at 30 V			< 4,0 A at 30 V		
Operating voltage	30 V DC (PELV)					
Voltage of insulation	≥ 500 V					
EMC directions	EN 50082, EN 50081					
Ambient operating temperature	0°C ... +70°C					
Storage temperature	-25°C ... +85°C					
Housing	housing for DIN rail mounting					
Dimensions (L, W, H)	45 mm, 80 mm, 70 mm					
Protection category (DIN 40 050)	IP65					
Weight	120 g					

Accessories:

AS-i substructure module for the connection to the AS-i flat cable and the flat cable for 24 V DC (article no. BW1181, see also page 195).

AS-i substructure module for the connection to the AS-i round cable and the round cable for 24 V DC (article no. BW1183, see also page 195)

AS-i Module for Power Decoupling

24 V DC (U_{AUX}) power supply out of AS-i
(1,2 A max. by 24 V)

in combination with an AS-i Repeater:
decouples 1,2 A from AS-i Segment B
and supplies Segment A with 1,2 A



Article no. BWU2387 AS-i Module for Power Decoupling

With the help of the AS-i Modules for Power Decoupling it is possible to take out up to 1,2 A current (approx. 24 V) out of AS-i. The help energy can be used for supply of ventilis or other consumers. With the help of the AS-i Module for Power Decoupling it may be waived of conducting additional 24 V help energy to bad accessible places.

In combination with an repeater it decouples 1,2 A from AS-i Segment B and supplies Segment A with 1,2 A.

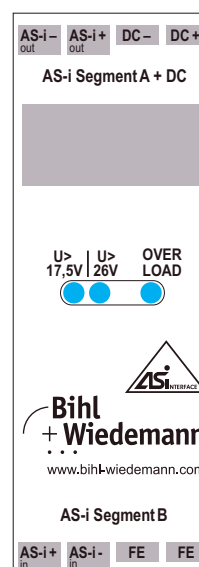
The impedance load of the module corresponds with that of 5 AS-i slaves. This reduces the maximum possible number of slaves for AS-i Segment B to 26 (Single) or 52 (AB).

The AS-i Module for Power Decoupling is short circuit proofed.

Article no.	BWU2387
Connections	COMBICON clamps
AS-i voltage	26,5 ... 31,6 V via AS-i
Max. AS-i current consumption	1,5 A
DC- / DC+	20 ... 30 V DC
Loading capacity	1,2 A
AS-i impedance	5 single slave load
OVERLOAD (red)	overload cut-off active
U > 26 V (green)	U AS-i Segment A > 26 V
U > 17,5 V (yellow)	U AS-i Segment A > 17,5 V
Applied standards	EN 61 000-6-2 EN 61 000-6-3
Operating temperature	-25 ... +55 °C
Storage temperature	-25 ... +70 °C
Protection category EN 60 529	IP20
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude
Dimensions (L / W / H in mm)	114 / 22,5 / 99
Weight	-

Connections:

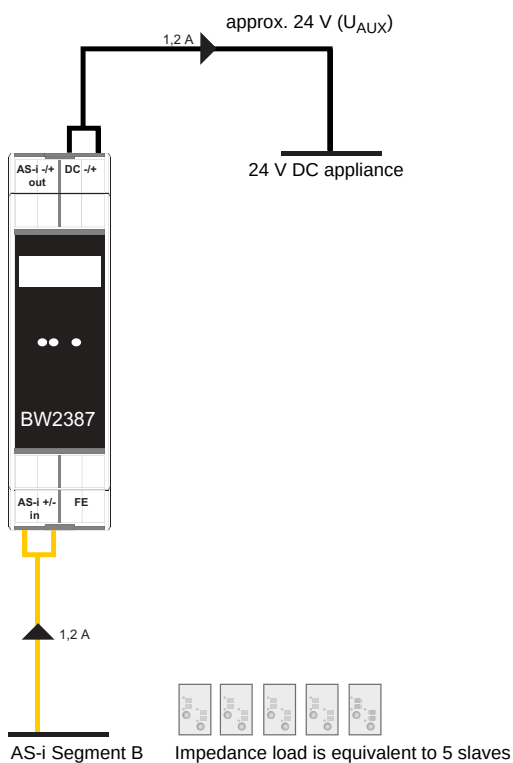
1	AS-i A _{out}
2	AS-i A _{out}
3	DC-
4	DC+
5	n.c.
...	...
12	n.c.
13	AS-i B _{in}
14	AS-i B _{in}
15	FE
16	FE



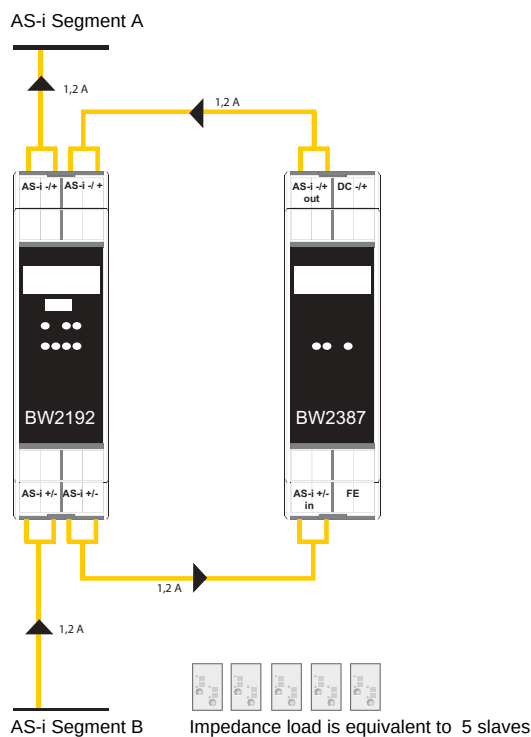
Terminals	Description
AS-i+, AS-i-	Connection to the AS-i bus
DC+, DC-	Voltage input, Voltage output
FE	Function earth

Connection examples:

1) 24 V DC (U_{AUX}) power supply out of AS-i(1,2 A max. at 24 V)



2) in combination with an AS-i repeater:
decouples 1,2 A from AS-i Segment B and supplies Segment A with 1,2 A



AS-i Profile Cables/Passive Distributors/ Substructure Modules/Accessories

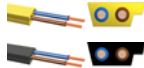


THE AS-INTERFACE MASTERS

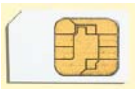
AS-i Master/Gateways/ Links/Scanner
AS-i Slaves
AS-i Accessories/ Diagnostics/Development
Other Fieldbuses/ Master Simulators
AS-i Safety
Price Lists

AS-i Profile Cables/Passive Distributors/ Substructure Modules/Accessories

Overview AS-i profil cables/passive distributors/substructure modules/accessories

Housing	Component	Art. No.	Characteristics	P.
	AS-i Profil Cable	BW1979	with a yellow jacket for data and power transmission	193
		BW1980	with a black jacket for additional auxiliary energy	
	AS-i Passive Distributors	BW1239	passive distributor AS-i on M12	194
		BW1976	passive distributor AS-i/24 V on M12	
		BW1977	passive distributor AS-i on M12, 2 m line	
		BW1974	passive distributor AS-i/24 V on M12, 2 m line	
		BW1975	passive distributor AS-i flat cable branch	
	AS-i Substructure Modules	BW1180	to connect 2 AS-i flat cables	195
		BW1438	to connect 2 AS-i flat cables with addressing socket	
		BW1439	to connect 1 AS-i flat cable, 1 flat cable for additional supply with addressing jack	
		BW1181	to connect 1 AS-i flat cable, 1 flat cable for additional supply	
		BW1182	to connect 2 AS-i round cables	
		BW1183	to connect 1 AS-i round cable, round cable for additional supply	
		BW1946	lid for standard AS-i substructure modules	
		BW1945	AS-i ribbon cable seal for PG11 fittings	

AS-i Profile Cables/Passive Distributors/ Substructure Modules/Accessories

Housing	Component	Art. No.	Characteristics	P.
	AS-i Cable-Stripper	BW1920	for AS-i cable with rubberized insulation	196
	AS-i Micro-Wire-Stripper	BW1921	for AS-i cable with an external insulation made of TPE or PUR	
	D-sub-data transmission cord for AS-i Master in IP65	BW1097		197
	D-sub-data transmission cord 9-pin	BW1058		
	D-sub-data transmission cord for AS-i Gateways with CAN interface	BW1226		
	AS-i addressing cable	BW2324	with COMBICON connector	
		BW1935	with infrared addressing adapter	
	Connecting cable	BW1802	Module/programming device	
	Protection cap	BW2368	for not used M12 sockets	
	Reduction sleeve	BW1241	PG16/M18x1	
		BW1282	M25/M18x1	
	Cross-Link-cable for AS-i/Ethernet Gateway	BW1304		
	AS-i probe	BW1745	AS-i probe	
	Chip card	BW2079	memory capacity 32 kByte	
		BW2222	memory capacity 128 kByte	

AS-i Profile Cable

Versions:

- with a yellow jacket
for data and power transmission (BW1979)
- with a black jacket
for additional auxiliary energy (BW1980)

High-flex life expectation

Oil-resistance

Fire protection

UL and CSA certificated



Article no. BW1979: AS-i Profile Cable yellow, 100 m

Article no. BW1980: AS-i Profile Cable black, 100 m

AS-i cables are specially designed for use in these low levels of plant automation and allow data and power transmission at the same time. The cable can be installed in equipment such as push buttons and sensors. Due to its profiled design it is resistant to polarity reversal and can be easily connected to the slave interfaces at any place.

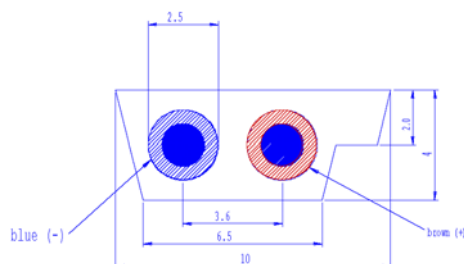
The cable is available in two versions: with a yellow jacket (BW1979) for data and power transfer, and a black jacket (BW1980) variant for additional auxiliary energy.

The cable jacket is made of TPE.

An important value for the industrial application field is the high-flex life expectation for all AS-i profile cables: ten million cycles of repeated bending are possible without any signs of degradation.

Mechanically, this makes them absolutely comparable with rubber-jacketed cable variants – but it's the magic of TPE that guarantees important properties such as oil-resistance and the right level of fire protection along with high-flex performance.

Art. no.	BW1979	BW1980
Application	TPE made cable for the use in plant automation	
Signal transmission	AS-i	U _{AUX}
Conductor	stranded tinned copper wire 84 x 0.15, Ø 1.5 mm	
Insulation	insulation of TPE, Ø 2,5 mm	
Insulation color	BN, BU	
Jacket	thermoplastic elastomer compound (TPE) yellow	thermoplastic elastomer compound (TPE) black
Thickness of insulation	ca. 0,5 mm	
Conductor resistance	13,7 Ohm/km	
Insulation resistance	1 MOhm/km	
Operating voltage (peak)	300 V	
Standards	flame retardant acc. to IEC 60332-1-2 and UL 758, page 95 oil and cut oil resistant acc. to UL 758, sec. 15 cold bending resistant acc. to IEC 60811-1-4 UL-Style 2103, CSA-File LL55255-42	
Delivery length	100 m (ring)	
Cross section		



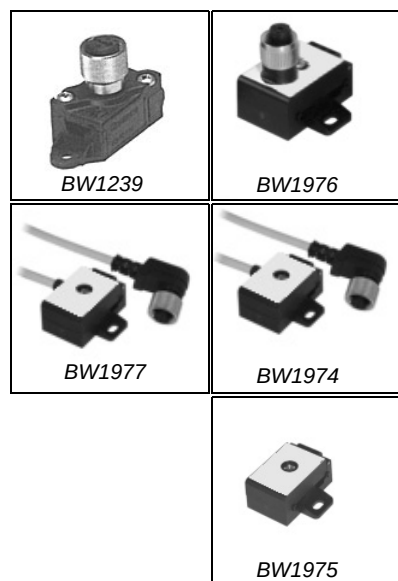
AS-i Passive Distributor

- compact design
- simple and fast mounting

BW1974, BW1976, BW1977, BW1975:

- immunity to vibration
- fixing component with captive screw
- gold plated contacts
- housing made of fibre optics-reinforces plastic
- reverse polarity protected and yellow marking for AS-i flat cable

Oil and abrasion resistant PUR line (BW1974, BW1977)
appropriate for conveyor chains



Article no. BW1239: Passive Distributor AS-i on M12

Article no. BW1976: Passive Distributor AS-i/24 V on M12

Article no. BW1977: Passive Distributor AS-i on M12, 2 m line

Article no. BW1974: Passive Distributor AS-i/24 V on M12, 2 m line

Article no. BW1975: Passive Distributor AS-i flat cable branch

AS-i Passive Distributors are characterised by a compact design. They offer a cost-effective, space-saving, fast and variable pos-

sibility to install many initiators or actuators on narrowest room in the type of protection IP67.

Technical data	BW1239	BW1976	BW1977	BW1974	BW1975
Plug-and-socket connection	socket M12 x 1 (V1)		plug M12 x 1 (V1), angled		–
Flat cable terminals	1 x AS-i	1 x AS-i/1 x U _{AUX}	1 AS-i	1 x AS-i/1 x U _{AUX}	2 x AS-i
	insulation penetration technology				
Rated operational voltage	≤ 35 V PELV (AS-i, U _{AUX})				
Rated operational current	≤ 2 A	≤ 4 A			≤ 8 A
Ambient operating temperature	-25 ... 75 °C				
Storage temperature	-25 ... 85 °C				
Protection degree	IP67				
Connector	–		PUR, black		–
Cable	–		PUR, halogen-free		–
Sheath diameter	–		Ø 4,8 mm		–
Colour	–		grey		–
Cores	–		2 x 0,34 mm ²	4 x 0,34 mm ²	–
Length	–		2 m		–
Dimensions (L / W / H in mm)	50 / 20 / 30	40 / 36 / 40	40 / 36 / 19		
Tightening torque, fixing screws	0,8 Nm				
Diagram					

AS-i Substructure Module

Mounting on DIN rail and rear panel

for connection of AS-i flat cables:

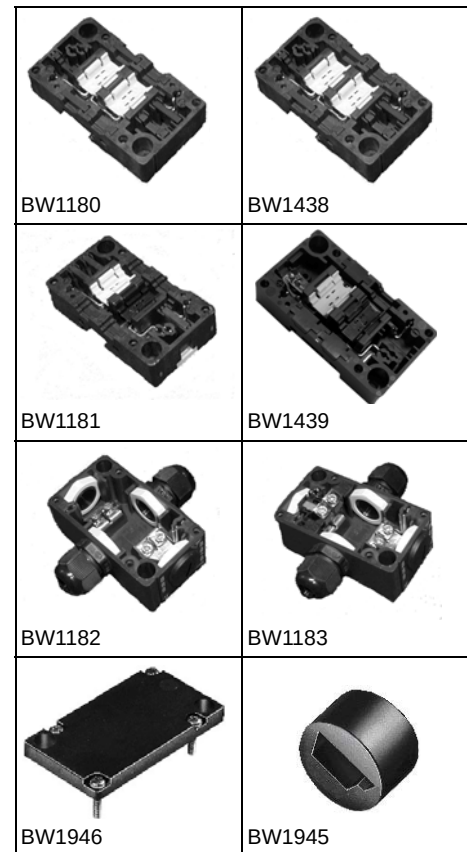
- quick mounting technology for AS-i flat cable
- 2 AS-i flat cables (BW1180)
- 2 AS-i flat cables with addressing jack (BW1438)
- 1 AS-i flat cable,
1 flat cable for external power supply (BW1181)
- 1 AS-i flat cable,
1 flat cable for external power supply with addressing jack (BW1439)

for connection of AS-i round cables:

- screw terminal
- 2 AS-i round cables (BW1182)
- 1 AS-i round cable,
1 round cable for external power supply (BW1183)

Lid for standard AS-i substructure modules (BW1946)

AS-i ribbon cable seal for PG11 fittings (BW1945)



Article no. BW1180 for connection of 2 AS-i flat cables

Article no. BW1438 for connection of 2 AS-i flat cables with addressing socket

Article no. BW1439 for connection of 1 AS-i flat cable, 1 flat cable for external auxiliary power with addressing jack

Article no. BW1181 for connection of 1 AS-i flat cable, 1 flat cable for external power supply

Article no. BW1182 for connection of 2 AS-i round cables

Article no. BW1183 for connection of 1 AS-i round cable, 1 round cable for external power supply

Article no. BW1946 lid for standard AS-i substructure modules

Article no. BW1945 ribbon seal for PG11 fittings

AS-i substructure modules are some necessary accessories for AS-i modules of the product family IP65 M12- and IP65 PG-modules. They are available in versions for connection of AS-i flat and round cables.

With the use of the lid for standard AS-i modules further passive branches can be built up.

AS-i ribbon cable seal is used for packing of PG11 fittings for AS-i flat cable.

Article no.	BW1180	BW1438	BW1181	BW1439	BW1182	BW1183	BW1946	BW1945
Cable	2 AS-i flat cables		1 AS-i flat cable		2 AS-i round cables		–	
Gauge	–		–		< 2,5 mm ²		–	
Connection	contact pins in the unit				terminals up to 2,5 mm ²		–	
Contact rating	< 2 A				< 4 A		–	
Operating voltage	AS-i		AS-i/U AUX		AS-i		AS-i/U AUX	
Ambient operating temperature					-25 ... 75 °C			
Storage temperature					-25 ... 85 °C			
Protection category					IP65			
Dimensions (L / W / H in mm)	80 / 45 / 20				80 / 45 / 34		80 / 45 / 13	–

AS-i Cable-Stripper:

for AS-i cables with rubberized insulation

AS-i Micro-Wire-Stripper:

for AS-i cables with an external insulation made out of TPE or PUR



AS-i Cable-Stripper (BW1920)

AS-i Micro-Wire-Stripper (BW1921)

Article no. BW1920: AS-i Cable-Stripper

Article no. BW1921: AS-i Micro-Wire-Stripper

The **AS-i Cable-Stripper** is the latest development for removing rubber made outer sheathing of AS-i cable.

The blades have got the same shape as the AS-i cable and allow an accurate stripping without any problems. For removing the insulation put in the cable, close and press the tool. The special blades do not cause any damage to the inner conductors. Those can be stripped with the additional blades at the side of the tool.

The **AS-i Micro-Wire-Stripper** is the latest development for removing the outer sheath of AS-i cable, which is made of TPE or PUR.

The tool strips AS-i cables without any problems, because the blades follow the special shape of the cable.

The pliers' body is made out of fibreglass-reinforced polyamide in an ergonomic and automatic design. Adjustment onto the cable is not necessary since the special hardened blades adjust themselves.

Article no.	BW1920	BW1921
Main using	for AS-i cable with rubberized insulation	for AS-i cable with an external insulation made of TPE or PUR
Length	125 mm	160 mm
Weigth	50 g	120 g

D-sub-data transmission cord for AS-i Master in IP65, 1,5 m



AS-i Master in IP65 (Specification 2.0)

Clamps	PIN	Function	Colour
1		PE	
2		SHIELD	
3	3	BUS P	green
4	8	BUS N	yellow
5	5	GRND	blue
6		PE	
7		SHIELD	
8		BUS P	
9		BUS N	
10	6	+5 V	red

Article no. BW1097	
Connection	RS 485 prefabricated cable
Storage temperature	-40°C ... +85°C
Operating temperature	-25°C ... +60°C
Protection category (IEC) EN 60 529	connector IP65, plug IP20
Dimensions (L, W, H)	ca. 50 mm, 20 mm, 30 mm
Length	1,5 m

D-sub-data transmission cord 9-pin, 1,8 m



Article no. BW1058	
Connection	D-Sub plug D-Sub socket
Length	1,8m
PIN 1 connected with PIN 1	

D-sub-data transmission cord for AS-i Gateways with CAN interface

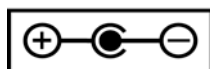


AS-i/CAN Gateway

Clamps	PIN	Function	Colour
1		n.c.	
2	7	CAN_H	white
3		SHIELD	
4	2	CAN_L	brown
5		n.c.	

Article no. BW1226	
Connection	D-subsocket, 5-pin COMBICON plug
Operating temperature	-40°C ... +85°C
Storage temperature	-25°C ... +60°C
Protection category (IEC) EN 60 529	IP20
Dimensions (L, W, H)	ca. 50 mm, 20 mm, 30 mm
Length	1,5 m

AS-i addressing cable (with COMBICON connector) for direct addressing with AS-i master



Article no. BW2324	
Connection	round connector 2-pin COMBICON-connector
Length	1,5 m
Connector (Master)	+ AS-i -

AS-i addressing cable - infrared addressing adapter



Article no. BW1935	
Connection	infrared head/M12 connector
Length	1 m

Connecting cable (Module/programming device)



Article no. BW1802	
Connection	round connector 2-pin/ M12 connector
Length	1,6 m

Protection cap for not used M12 sockets



Article no. BW2368	
Colour	blue
Packing unit	50 pieces

Reduction sleeve PG16/M18x1

Article no. BW1241	
Material	Stainless steel

Reduction sleeve M25/M18x1

Article no. BW1282	
Material	Brass

Cross-Link-cable for AS-i/Ethernet Gateway

Article no. BW1304	
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AS-i Probe



Article no. BW1745	
--------------------	--

Chip card for Bihl+Wiedemann AS-i products



Article no.	BW2079	BW2222
Memory capacity	32 kByte (256 bit)	128 kByte (1024 bit)
Labeling on the chip card	C 256	C 1024
Weight	approx. 1 g	
Dimensions (L / W / H in mm)	25 / 15 / 1	
Accessories: BW2079 for all Standard and all Safety products with chip card by Bihl + Wiedemann. BW2222 for Safety Monitors and Gateways in Stainless Steel Safety Version 4.X (for maximum 4 Safety configurations on a chip card).		

Development/Manufacturing of AS-i Components

Overview Development/Manufacturing of AS-i Components

Housing	Component	Art. No.	Characteristics	P.
	AS-i 3.0 Function and EMC-Test Master	BW1728	with master RS 232 suitable for SAP4, SAP5, A2SI and ASI4U	200
	AS-i 3.0 SAP4, SAP5, A2SI and ASI4U Programming and Test Tool	BW1783	Compact PCI Board	201
		BW2061	PCI Board with RS 232	
	AS-i Slave Evaluation Board	BW1423	on basis ASI-SW+	202
		BW1190	on basis A2SI	203

AS-i-Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

AS-i-Master

Suitable for SAP4, SAP5, A²SI and ASI4U

For programming, developing and tests of AS-i Slaves

AS-i specification 3.0



Article no. BWU1728 with Master RS 232

The AS-i Function and EMC-Test Master with RS 232 interface can be operated in 3 different modes:

1. As a standard AS-i Master according to specification 3.0.
2. As a tool for programming of the AS-i Slave ICs SAP4, SAP5, A²SI and ASI4U. This can be done with the help of Windows programs.
3. As a means to perform function and EMC tests which are necessary for every development of an AS-i slave (EMC test mode).

The AS-i Function and EMC-Test Master is used among others for the AS-i certification in Leipzig for release and test of AS-i Slaves.

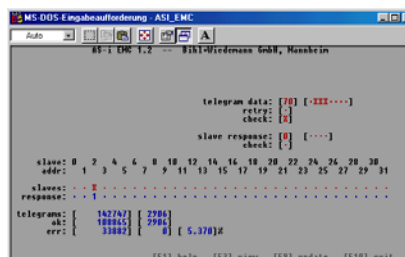
Graphical display	Art. no. BWU1728
Operating current	Master power supply approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
Baud rates	19200 Baud
Serial interface	RS 232
AS-i cycle time	150 µs*(number of slaves + 2)
Displays	
LCD	displaying slave addresses, error messages
LED green (power)	power on
LED green (ser active)	serial interface active
LED red (config error)	configuration error
LED green (U AS-i)	AS-i voltage OK
LED green (AS-i active)	AS-i normal operation active
LED green (prg enable)	automatic address programming enabled
LED yellow (prj mode)	the master in configuration mode
Buttons	4
Voltage of insulation	≥ 500 V
EMC directions	EN 61000-6-2, EN 61000-6-4
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	AS-i master housing in stainless steel
Dimensions (L, W, H)	120 mm, 75 mm, 83 mm
Protection category (DIN 40050)	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Weight	460 g

The EMC-Test Mode

It is possible to put the Master into a state that is not AS-i compliant. This option can be useful for specific tests on AS-i under laboratory conditions (e. g. tests with bursts on the lines or tests with very long wires).

By putting the AS-i Master into the EMC Test Mode it becomes an AS-i test set-up for experts. In the test mode, the list of addressed slaves and the telegrams for contacting these slaves are given by the host. Also, it is possible to decide from within the host whether faulty answered telegrams from the AS-i Master may be repeated or not (Note: in regular AS-i operation, data telegrams can be repeated one time). As above, there are two error counters. However, in this mode the first one counts all telegrams while the second counts all faulty telegrams.

The **AS-i EMC.EXE** program is designed for the operation of the AS-i Master in the EMC test mode. This program is also delivered as program for Windows.



Individual software:

It is, of course, possible to operate the AS-i Master from other hosts with individual software. The necessary telegrams are described in the manual.

Scope of delivery:

- The AS-i Function and EMC-Test Master with RS 232, power supply A
- Windows program **AS-i EMC.EXE** for EMV test mode
- Windows programs for programming of SAP4, SAP5, A²SI and ASI4U
- Software AS-i Control Tools with serial cable for AS-i master in stainless steel (art. no. BW1602, s. page 56)

A DLL-driver for the programming of the A²SI- and SAP4-ASIC can be ordered separately on request (art. no. BW1356)

AS-i 3.0 SAP4/5, A²SI, ASI4U Programming and Test Tool

AS-i 3.0 SAP4, SAP5, A²SI and ASI4U Programming and Test Tool

For programming,
developing and
testing of AS-i Slaves
AS-i Specification 3.0



Article no. BW1783: Compact PCI Board

Article no. BW2061: PCI Board with RS 232

The AS-i 3.0 Programming and Test Tool can be operated in 3 different modes:

- As a standard AS-i Master according to specification 3.0.
- As a tool for programming of the AS-i Slave ICs SAP4, SAP5, A²SI and ASI4U. This can be done with the help of Windows programs.
- As a means to perform function and EMC tests which are necessary for every development of an AS-i slave (EMC test mode).

The EMC-Test Mode

It is possible to put the Master into a state that is not AS-i compliant. This option can be useful for specific tests on AS-i under laboratory conditions (e. g. tests with bursts on the lines or tests with very long wires).

By putting the AS-i Master into the EMC Test Mode it becomes an AS-i test set-up for experts.

In the test mode, the list of addressed slaves and the telegrams for contacting these slaves are given by the host. Also, it is possible to decide from within the host whether faulty answered telegrams from the AS-i Master may be repeated or not (Note: in regular AS-i operation, data telegrams can be repeated one time). As above, there are



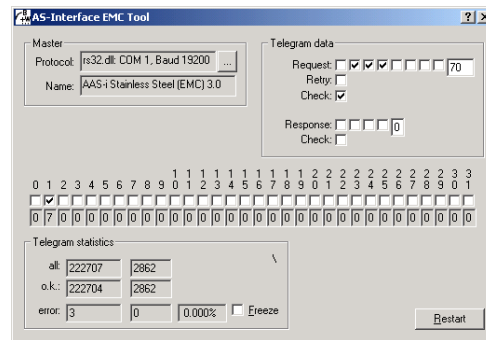
BW1783



BW2061

two error counters. However, in this mode the first one counts all telegrams while the second counts all faulty telegrams.

The **AS-i EMC.EXE** program is designed for the operation of the AS-i Master in the EMC test mode. This program is also delivered as program for Windows.



Individual software

It is, of course, possible to operate the AS-i Master from other hosts with individual software. The necessary telegrams are described in the manual.

Technical data	BW1783	BW2061
Type	Compact PCI Board	PCI Board
Interfaces	32-bit PCI bus interface, 3,3 V/5 V galvanic isolation to AS-i AS-i circuit 1 AS-i circuit 2	
Program memory (EEPROM)	–	RS 232
Operating voltage	3,3 V/5 V DC and AS-i voltage	
Operating current	ca. 300 mA out of 5 V power supply ca. 100 mA out of 3,3 V power supply ca. 70 mA out of AS-i per AS-i circuit	
Voltage of insulation	≥ 500 V	
EMC	according EN 61 000-6-2, EN 61 000-6-4	
Ambient operating temperature	0°C .. +55°C	
Storage temperature	-25°C .. +70°C	
AS-i cycle time per AS-i circuit	150 µs*(Number of slaves + 2)	
AS-i Specification	3.0	

Requirements:

Compact PCI System
Compact PCI Board

Accessories:

AS-i Control Tools
DLL drivers for: Win NT 4.0, Win 2000, Win XP
OPC Server

AS-i Slave Evaluation Board

Article no. BW1423
on basis ASI-SW+



Article no. BW1423

The AS-i Slave Evaluation Board on basis of the ASI-SW+ chip by ZMD can be connected to the AS-i circuit directly and without any additional hardware. It is a complete AS-i slave. Voltage supply is provided by the AS-i line.

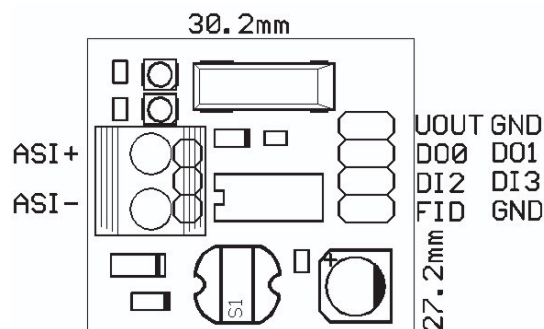
The AS-i Slave Evaluation Board is suitable for **experiments** and **test setups** and fully able to function without additional hardware. Linked to an AS-i network, it enables the AS-i Master to set parameter outputs (PWM function) and data outputs as well as to read data inputs.

Connections:

ASI+, ASI-	AS-i connection
Uout	DC output voltage max. 20 mA
DI2 to DI3	Data inputs
DO0 to DO1	Data outputs
FID	Periphery fault (0: no fault)
GND	Ground

The slave board can be simply stuck upon a bigger prototyping board (piggy back), or via screwed terminals be attached directly to the AS-i cable.

The ID codes and the IO code can be programmed with the help of the A²SI/SAP4 Programming and Test Tool (Article-no. BW1355) and the AS-i 2.1 Function and EMC-Test Masters (Article no. BW1259, BW1260)



Technical data

Operating current	Aprox. 20 mA (with external user application)
Operating voltage	AS-i voltage 30 V DC
Function display	Power-on LED: green Error: red
Dimensions (L, W, H)	28 mm, 31 mm, 8 mm

Programming:

Default setting

IO Code B
ID Code A
ID2 Code E

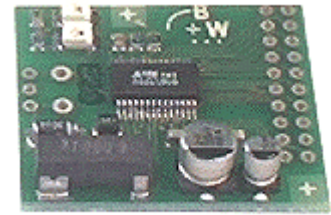
The ID codes and the IO code can be programmed with the help of the A²SI/SAP4 Programming and Test Tool (Article no. BW1355, see page 79) and the AS-i 2.1 Function and EMC-Test Masters (Article no. BW1259, BW1260).

The ID codes and IO codes for the different types of slaves have to be asked for at the AS-International Association.

The data sheet of the ASI-SW+ chip:
http://www.zmd.de/as_interface.html

AS-i Slave Evaluation Board

Article no. BW1190
on basis A²SI



Article no. BW1190

The AS-i Slave Evaluation Board on basis of the A²SI chip by ZMD can be connected to the AS-i circuit directly and without any additional hardware. It is a complete AS-i slave. Voltage supply is provided by the AS-i line.

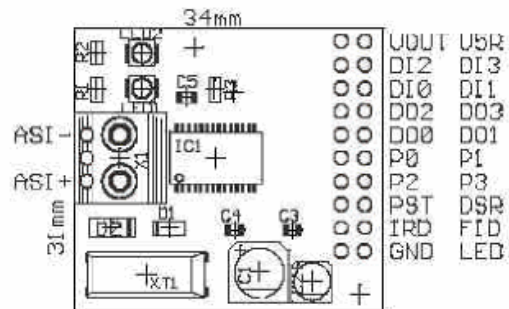
The AS-i Slave Board is suitable for **experiments** and **test set-ups** and fully able to function without additional hardware. Linked to an AS-i network, it enables the AS-i Master to set parameter outputs and data outputs as well as to read data inputs.

The slave board can be simply stuck upon a bigger prototyping board (piggy back), or via screwed terminals be attached directly to the AS-i cable.

The ID codes and the IO code can be programmed with the help of the A²SI/SAP4 Programming and Test Tool (Article no. BW1355).

Connections:

ASI+, ASI-	AS-i connection
Uout	DC output voltage max. 30 mA
U5R	5 V output voltage max. 4 mA
DI0 to DI3	Data inputs
DO0 to DO3	Data outputs
P0 to P3	Parameter in-/outputs
PST	Parameter strobe
DSR	Data strobe / reset
IRD	IR input
FID	Periphery fault (0: no fault)
GND	Ground
LED	Diagnosis LED



Technical data

Operating current	Aprox. 20 mA (with external user application)
Operating voltage	AS-i voltage 30 V DC
Function display	Power-on LED: green Error: red
Dimensions (L, W, H)	34 mm, 31 mm, 8 mm

Programming:

Default setting

IO Code 7
ID Code F
ID2 Code 2

The ID codes and the IO code can be programmed with the help of the A²SI/SAP4 Programming and Test Tool (Article no. BW1355).

The ID codes and IO codes for the different types of slaves have to be asked for at the AS-International Association.

The data sheet of the A²SI chip:
<http://www.amis.com/datasheets/a2si.html>

AS-i Master/Gateways/ Links/Scanner	AS-i Slaves	AS-i Accessories/ Diagnostics/Development	Other Fieldbuses/ Master Simulators	AS-i Safety	Price Lists
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Overview Master Simulators

Housing	Master Simulator	Art. No.	Characteristics	P.
	PROFIBUS Master Simulator	BW1131	monitoring software for PROFIBUS DP slaves, PROFIBUS-UART, DP V0	206
		BW1257	monitoring software for PROFIBUS DP slaves, PROFIBUS-UART, DP V0 and DP V1	
	Serial PROFIBUS DP Master	BW1258	PROFIBUS Master with RS 232 interface	207
	DeviceNet Master Simulator	BW1420	with USB interface	208
		BW1625	as PCI board	
	CANopen Master Simulator	BW1453	with USB interface	209
	Interface Converter	BW1094	interface converter RS 232C/RS 485 for Bihl+Wiedemann's AS-i master	210
	Interface Converter	BW2274	USB - RS 232 interface converter	211

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

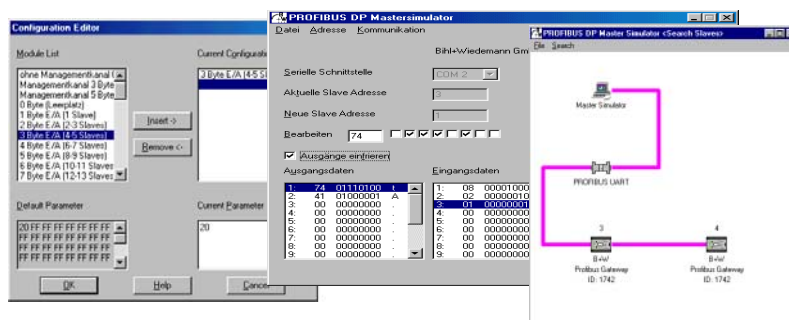
Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

Monitoring Software for PROFIBUS DP Slaves

PROFIBUS UART



Article no. BW1131 DP V0

Article no. BW1257 DP V0 and DP V1 supports Log function, supports PROFIsafe

The PROFIBUS DP Master Simulator is an easy to use software for data exchange with PROFIBUS slaves of many suppliers via PROFIBUS DP. The PROFIBUS DP Master Simulator can exchange data with many PROFIBUS slaves even without GSD-file or type-file. The PROFIBUS slaves can be put into operation with the default I/O window. Input data can be read and output data can be written. Furthermore the PROFIBUS DP Master Simulator also processes GSD-files. User parameters can be edited and the configuration can be modified and stored. The PROFIBUS station address can be changed as well with the PROFIBUS DP Master Simulator, this is useful for PROFIBUS I/O modules in protection class IP67 without addressing switches.

The PROFIBUS DP Master Simulator offers the possibility to scan a PROFIBUS network for connected slaves and display them in a graphical way. In this case the PROFIBUS UART has to be connected directly to a PROFIBUS slave. The I/O data and the PROFIBUS user diagnosis can be displayed binary, hexadecimal and now also as ASCII code. The PROFIBUS output data can be transmitted consistently to the PROFIBUS slave. In type

mode it is possible to set an output as long as the mouse button is pressed.

In addition, BW1257 supports a Log function as well as PROFIBUS DP V1. PROFIBUS slaves can be operated in the acyclic mode DP V1. This is helpful especially for the commissioning of complex field devices like drives, modular I/O systems etc.

The PROFIBUS Master Simulator consists of the software and the **PROFIBUS UART** which is the ideal interface converter between the RS 232 interface of a PC and the PROFIBUS slave. The **UART** does not need any additional external power supply. Therefore it is also suitable for mobile use with a laptop or a notebook. The **PROFIBUS UART** is simply inserted between the PROFIBUS slave and RS 232 connector cable.

Beside the software "PROFIBUS DP Mastersimulator" now **DLL drivers** for Windows 95/98, Windows NT as well as examples written in C are available for download on the homepage. This offers the possibility to **use the PROFIBUS UART in an application in combination with an own software**. However the PROFIBUS UART is a monitoring and commissioning tool for PROFIBUS slaves, it is not designed to control automation processes.

Technical data of PROFIBUS UART	
Type	PROFIBUS UART
Dimensions (L / W / H in mm)	63 / 34 / 17
Interfaces	Standard PC RS 232-interface with 9-pin D-sub-plug (female) RS 485-interface with 9-pin D-sub-plug (male)
Power supply	Powered from the RS 485 interface of the PROFIBUS slave (5 V)
Operating current	< 60 mA
Cable length	RS 232 and RS 485: max. 2 m
Transfer rate	19 200 Baud
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C

Requirements:

IBM compatible PC
80386 or higher

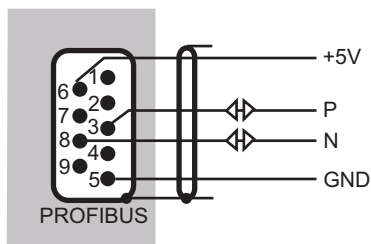
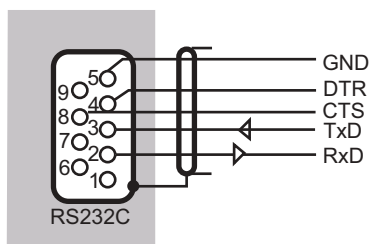
Operating system:

Windows 98
Windows NT4
Windows Me
Windows 2000
Windows XP
Windows 7 (32 bit or 64 bit)

Specification:

- Software: PROFIBUS DP Master Simulator
- PROFIBUS UART
- D-sub-data cable

32 Bit DLL an examples (in C as source code) are available for download on the homepage and are not delivered with.



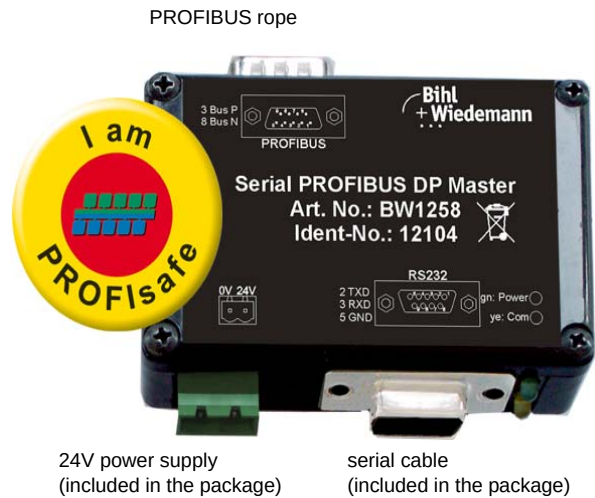
PROFIBUS Master with RS 232 Interface

PROFIBUS Master Class 1 and 2

Monitoring software for PROFIBUS DP Slaves and PROFIsafe Slaves

Cyclic data exchange via PROFIBUS DP V0

Acyclic data exchange via PROFIBUS DP V1



Article no. BW1258

The serial PROFIBUS DP Master is an easy to use software for data exchange with PROFIBUS -and PROFIsafe slaves of many suppliers via PROFIBUS DP. It can be processed in two modes:

1. Commissioning and test tool for PROFIBUS DP Slaves via PROFIBUS DP V0

In this operation mode I/O data can be exchanged cyclically with PROFIBUS slaves via PROFIBUS DP V0. Input data can be read and output data can be written. Furthermore the serial PROFIBUS DP Master also processes GSD-files. User parameters can be edited and the configuration can be modified and stored. The PROFIBUS station address can be changed as well with the serial PROFIBUS DP Master. This is useful for PROFIBUS I/O modules in protection class IP67 without addressing switches.

The serial PROFIBUS DP Master offers the possibility to scan a PROFIBUS network for connected slaves and display them in a graphical way. In this case the serial PROFIBUS UART has to be connected directly to a PROFIBUS slave. The I/O data and the PROFIBUS user diagnosis can be displayed binary, hexadecimal

and now also as ASCII code. The PROFIBUS output data can be transmitted consistently to the PROFIBUS slave. In single bit mode it is possible to set an output as long as the mouse button is pressed.

Beside the monitoring and putting into operation software **DLL drivers** as well as examples written in C are available for download on the homepage. This offers the possibility to **use the PROFIBUS UART in an application in combination with an own software.**

2. PROFIBUS Master class 2 with PROFIBUS DP V1 functionality

In this mode the serial PROFIBUS Master works as a class 2 Master in combination with the class 1 Master in a PROFIBUS network

Complex devices e.g. drives, modular I/O systems even PROFIBUS PA devices can be commissioned online via PROFIBUS DP V1. PROFIBUS PA devices need an additional segment coupler.

Technical data of the serial PROFIBUS Master	
Type	serial PROFIBUS Master
Dimensions (L, W, H)	72,0 mm, 68,5 mm, 19,5 mm
Interfaces	standard PC RS 232-interface with 9-pin D-Sub-plug (female) PROFIBUS interface with 9 pin D-Sub-plug (male)
Power supply	24 V DC
Operating current	< 60 mA
LED green (power)	power on
LED yellow (com)	serial interface/PROFIBUS in operation
Length of connector cables	RS 232 max. 2 m
Transfer rate RS 232	19 200 Baud
Transfer rate PROFIBUS	9,6 Kbaud up to 1500 Kbaud
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C

Requirements:

IBM compatible PC
80386 or higher

Operating system:

Windows 98
Windows NT4
Windows Me
Windows 2000
Windows XP
Windows 7 (32 bit or 64 bit)

Specification:

- Software: PROFIBUS DP Master simulator
- serial PROFIBUS Master
- D-sub-transmission cord
- power supply 24 V DC

32 Bit DLL an examples (in C as sourcecode) are available for download on the homepage and are not delivered with. CommDTM on request:

Monitoring Software for DeviceNet Slaves

DeviceNet Dongle with USB Interface (Art. no. BW1420)



DeviceNet Master Simulator as PCI Board (Art. no. BW1625)



Article no. BW1420 with USB Interface

Article no. BW1625 as PCI Board

The DeviceNet Master Simulator is an easy to use software for data exchange with DeviceNet slaves of many suppliers. The DeviceNet Master Simulator can exchange data with the slaves even without EDS-file. Input data can be read, output data can be written and the DeviceNet diagnosis can be displayed. Furthermore it is possible to read and write any object independent of the state of communication.

The DeviceNet Master Simulator offers the possibility to scan a DeviceNet network and find all connected slaves. The I/O data is displayed binary and hexadecimal.

In single bit mode it is possible to set an output as long as the mouse button is pressed.

The device identification is read out of the DeviceNet slave and displayed together with the I/O data.

The DeviceNet Master Simulator consists of the software and a DeviceNet dongle. The DeviceNet dongle is the ideal interface converter between an USB port (the parallel interface of a PC) and DeviceNet. The converter needs no extra power supply. Therefore it is also suitable for mobile use with a laptop or a notebook.

Article no.	BW1420	BW1625
Type		PCI Board
Interfaces	USB interface CAN interface with 9 pin D-sub-plug (male)	16 Bit PCI bus interface, CAN interface with 9 pin D-sub-plug (male)
Power supply	powered by the USB port of the PC	powered by the PCI port of the PC
Length of connector cables	max. 2 m	
Transfer rates	125, 250 or 500 Kbaud	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +70°C	

Requirements:

- IBM compatible PC 80486 or higher
- Plug and Play Bios

Operating system:

Windows 98, Windows NT, Windows 2000, Windows Me, Windows XP

Specification:

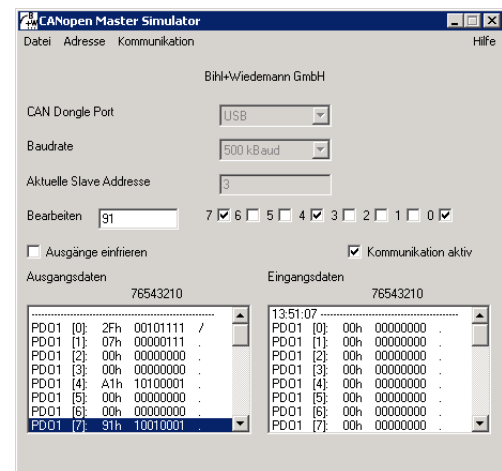
- Software:
- DeviceNet Master Simulator
 - DeviceNet-Dongle/PCI board

Note:

- At the end of the DeviceNet line a bus termination (120 Ohm) has to be used.
- 32-bit DLL drivers and program examples are available for download on the homepage and are not included in delivery.

Monitoring Software for CANopen Slaves

CAN Dongle



Article no. BW1453 with USB Interface

The CANopen Master Simulator is an easy to use software for data exchange with CANopen slaves of many suppliers. The CANopen Master Simulator can exchange data with the slaves even without EDS-file. Input data can be read, output data can be written. Furthermore it is possible to read and write any object independent of the state of communication.

The CANopen Master Simulator offers the possibility to scan a DeviceNet network and find all connected slaves. The digital I/O

data can be displayed binary, hexadecimal and also as ASCII code.

Analog I/O data are displayed decimal. The CANopen output data can be transmitted consistently to the CANopen slave.

The CANopen Master Simulator consists of the software and a CAN dongle. The CAN dongle is the ideal interface converter between the USB interface of a PC and CANopen. The converter needs for power supply only the USB interface. Therefore it is also suitable for mobile use with a laptop or a notebook.

Technical data of the CAN dongle	
Type	CAN dongle
Interfaces	USB interface CAN interface with 9-pin D-sub-plug (male)
Power supply	powered by the USB interface of the PC
Length of connector cables	max. 2 m
Transfer rates	5, 10, 20, 50, 100, 125, 250, 500 oder 1000 KBAud
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C

Requirements:

IBM compatible PC 80486 or higher

Operating system:

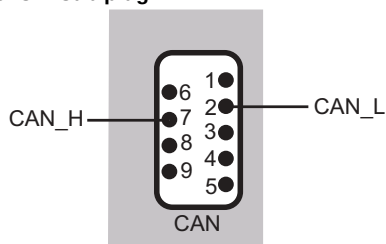
Windows 98, Windows NT,
Windows 2000, Windows Me,
Windows XP

Specification:

Software:

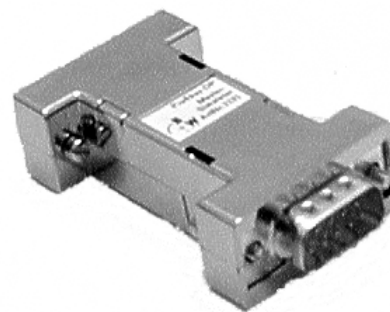
- CANopen Master Simulator
- CANopen dongle

Connections D-sub plug:



Accessories: D-Sub-data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226, see page 197)

Interface converter RS 232C/RS 485 for Bihl+Wiedemann AS-i Master



Article no. BW1094

Function

The interface converter is the ideal interface between the RS 232 interface of the PC and the RS 485 interface of the AS-i Gateways. The converter is very compact and does not need any additional external power supply. Therefore it is also suitable in mobile use with a laptop or a notebook. The converter is simply inserted between AS-i Gateway with RS 232 connector cable and PC.

Only one device with RS 485 interface can be connected to the converter.

The RS 232C/RS 485 converter can be used under different operating systems. Using the AS-i Control Tools for Windows an AS-i Master with RS 485 interface can be handled now just as an AS-i Master with RS 232 interface. The RS 232C/RS 485 converter works up to transfer rates of 57600 Baud.

Technical data	
Type	RS 232C/RS 485 converter
Dimensions (L, W, H)	63 mm, 54 mm, 17 mm
Interfaces	standard PC RS 232 interface with 9-pin sub-D plug (female) RS 485 interface with 9-pin sub-D plug (male)
Power supply	gets its power from the RS 232 interface of the PC, therefore external power supply is not necessary. Pin 4 (DTR) has to be high.
Length of connector cables	RS 232: max. 2 m, RS 485: 2 m
Transfer rate	up to 57600 KBAud
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C

USB - RS 232 Interface Converter

USB - RS 232 Interface Converter

for Bihl+Wiedemann



Artikel no. BW2274

Function

The USB - RS 232 interface converter is the ideal connection between the RS 232 interface of a device and the USB interface of modern PCs and notebooks. It corresponds to USB 2.0

(USB 1.1) standard and can be connected directly or by using the provided 0,80 m USB extension cord to a free USB port of the computer. The connection to the particular device takes place via the 9-pin Sub-D connector at the RS 232 interface

Technical data	
Interfaces	9-pin, sub-D (RS 232) USB 2.0 (USB 1.1) standard
Device type	serial adapter
Data Link Protocol	RS 232
Type of interface (Bus type)	USB
Maximum transfer rate	> 1 Mbps
System requirements	USB port Windows 98/ME/2000/XP/Vista Apple Mac OS 8.6
Extension (included in delivery)	USB extension cord (USB - USB type A, 4-pole) Length: 0,80 m

AS-i Master/Gateways/ Links/Scanner	AS-i Slaves	AS-i Accessories/ Diagnostics/Development	Other Fieldbuses/ Master Simulators	AS-i Safety	Price Lists
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Overview other Fieldbuses/Couplers

Housing	Coupler	Art. No.	Characteristic	P.
	PROFIBUS Option Board	BW1261	straight	214
		BW1271	crooked	
	CAN/PROFIBUS Coupler	BW1184		215
	CANrho/PROFIBUS Coupler	BWU1246		
	CAN/InterBus Coupler	BW1323	InterBus baud rate 500 KBAud / 2 MBAud, 10 words	216
		BW2504	InterBus baud rate 500 KBAud / 2 MBAud, 1-12 words	

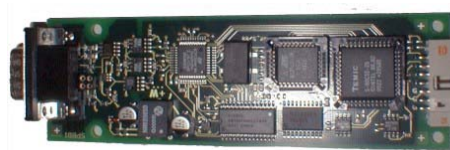
PROFIBUS Option Board

How to interface your device to a PROFIBUS network?

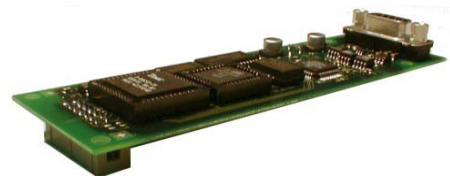
**The simplest way:
PROFIBUS Option Board**

Rugged and quick mounting

Coupling via serial interface (TTL-level)



straight



crooked



Article no. BW1261: PROFIBUS Option Board (straight)

Article no. BW1271: PROFIBUS Option Board (crooked)

How to interface your device to a PROFIBUS network? With the PROFIBUS Option Board.

The PROFIBUS Option Board is an embedded PROFIBUS slave interface for manufacturers of industrial automation products. It features an inexpensive PROFIBUS module with a serial interface to the host product.

The board is designed for rugged and quick mounting. The D-Sub connector for PROFIBUS can be delivered crooked or straight according to requirements of installation.

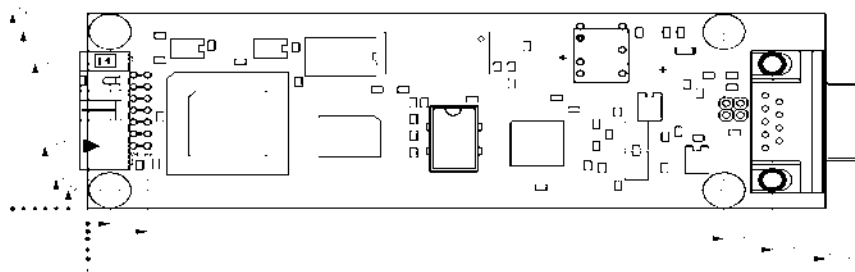
The serial connection to the host device is made flexibly via a 14 pin connector.

With the help of the PROFIBUS Option Board any devices can be offered with PROFIBUS interface without high development expenses.

The PROFIBUS Option Board is mounted in combination with the host hardware inside the housing of the host product.

The PROFIBUS Option Board provides the PROFIBUS DP slave interface between a host product with a serial interface and the PROFIBUS network.

For the use there is no need of any knowledge about PROFIBUS. The PROFIBUS Option board is served by the host product via the serial interface with a very simple serial telegram.



Pining of 14-pin connector	
2	CTS
3	TXD
4	RXD
9	+5V supply
10, 11	GND
others	NC.

Article Nr.	BW1261	BW1271
Connection	PROFIBUS: optional D-Sub 9-pin 180° or 90° serial interface: pinhead	
PROFIBUS interface	according to DIN 19 245 part 1-3	
PROFIBUS baud rates	9,6 KBAud to 12000 KBAud, automatic recognition	
DP funkctions	Imaging of the serial data as I/O data of the PROFIBUS Complete diagnosis and configuration via DP-Master	
Connection to the host	14 pin connector, 2 row type, 2,54 mm pitch, optional 180° or 90°	
Serial baud rates	19,2 KBAud/57,6 KBAud	
Transfer format	8N1	
Signal level of the serial interface	0 V, +5 V (not ±12 V)	
Operating current	max. 400 mA incl. PROFIBUS bus terminal	
Operating voltage	+5 V, ±5%	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 082,, EN 50 081	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Dimensions (L /W /H)	133,4 /41,9 / 8	
Connections	PROFIBUS: optional D-Sub 9-pin 180° or 90° serial interface: pinhead	

**Connection of a CAN network
and a PROFIBUS network
via integrated interfaces**

**Easy data exchange
between CAN and PROFIBUS
via the internal coupling**



Article no. BW1184: CANrho/PROFIBUS Coupler

Article no. BWU1246: CAN/PROFIBUS Coupler

The CAN/PROFIBUS Coupler is the easiest solution to exchange data between CAN and PROFIBUS.

In big applications is often a need to exchange data between a control of a CAN network and another PLC, e. g. to report the process status. This problem was solved in the past with the help of normal I/O modules, with the inputs of the control of the CAN network connected to the outputs of the other PLC and vice versa. With the use of the CAN/PROFIBUS Coupler to solve this problem the installation costs as well as the components costs can be reduced.

The CAN/PROFIBUS Coupler consists of a CAN slave with n bytes (8, 16 or 24 bytes) input data and n bytes output data and

a PROFIBUS slave with n bytes input data and 8 bytes output data in one housing. The outputs of one slave are connected to respective inputs of the other slave and vice versa (output data byte 1 of the CAN slave with input data byte 1 of the PROFIBUS slave and vice versa, etc.).

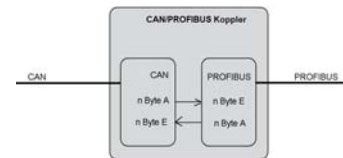
There is a galvanic isolation between CAN and PROFIBUS.

A seven digit display can be used for commissioning and diagnosis.

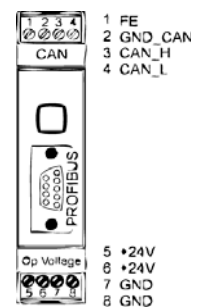
As long as one of both slaves does not exchange data the other slave reads on each input a 0 as default.

Article no.	BW1184	BWU1246
Connections	PROFIBUS: D-Sub 9-pin CAN: 4-pin COMBICON plug	
PROFIBUS interface	according to DIN 19 245 part 1-3	
Baud rates	9,6 Kbaud to 12000 Kbaud, automatic recognition	
DP functions	Imaging of the CAN Data as I/O data of the PROFIBUS Complete diagnosis and configuration via DP master	
CAN baud rates	125 Kbaud, 250 Kbaud, 500 Kbaud, 1 Mbaud	
Display	seven digit	
Operating current	< 120 mA at 24 V	
Operating voltage	24 V DC	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 082, EN 50 081	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	Housing for DIN-rail mounting	
Protection category (DIN 40 050)	Housing IP20	
Dimensions (L /W /H)	100 /25 /120	
Weight	120 g	

CAN/PROFIBUS connections

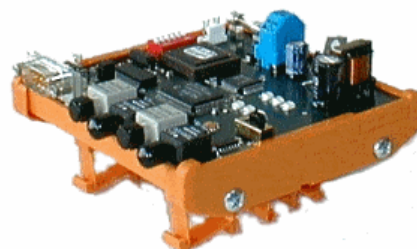


Terminal assignment:



Connection of a CAN network and a InterBus network via integrated interfaces

Easy data exchange
between CAN and InterBus
via the internal coupling



Article no. BW1323: InterBus baud rate 500 Kbaud / 2 Mbaud, 10 words

Article no. BW2504: InterBus baud rate 500 Kbaud / 2 Mbaud, 1-12 words

The CAN/InterBus Coupler is the easiest solution to exchange data between CAN and InterBus.

In big applications is often a need to exchange data between the robot control and another PLC, e. g. to report the process status. This problem was solved in the past with the help of normal I/O modules, with the inputs of the robot control connected to the outputs of the other PLC and vice versa. With the use of the CAN/InterBus coupler to solve this problem the installation costs as well as the components costs can be reduced.

The CAN/InterBus coupler consists of a CAN slave with input and output data and an InterBus slave with input and output data in one housing (data width see table). The outputs of one slave are connected to respective inputs of the other slave and vice versa. There is a galvanic isolation between CAN and InterBus.

The device has got 6 LEDs for commissioning and diagnosis.

As long as one of both slaves does not exchange data the other slave reads on each input a 0 as default.

Article no.	BW1323	BW2504
Connections	CAN: D-Sub 9-pin InterBus: Fiber optic interface	
InterBus interface	on basis SUP1 3 OPC	
Baud rates	500 Kbaud / 2 Mbaud	
Functions	imaging of the CAN Data as I/O data of the InterBus	
CAN baud rates	20 kbaud, 125 kbaud, 250 kbaud, 500 kbaud	
Data width	3 words	1-12 words
Display	6 LEDs	
Operating current	< 100 mA at 24 V	
Operating voltage	24 V DC	
Voltage of insulation	≥ 500 V	
EMC directions	EN 50 082, EN 50 081	
Operating temperature	0°C ... +55°C	
Storage temperature	-25°C ... +85°C	
Housing	housing for DIN-rail mounting	
Protection category (DIN 40 050)	housing IP00	
Dimensions (L /W /H in mm)	110 /105 /60	
Weight	200 g	

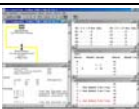
Overview AS-i Safety

Housing	Module	Art. No.	Characteristics	P.
	AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing	BWU2001	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	227
		BWU2002	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
	AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing	BWU2202	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface	227
		BWU2602	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface, safe cross communication	
	AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing	BWU2003	1 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	227
		BWU2004	1 AS-i-Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2204	1 AS-i-Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface	
		BWU2187	1 AS-i Master, 16 release circuits, 2 independent output switching elements, RS 232 diagnostics interface	
	AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing	BWU2188	1 AS-i Master, 16 release circuits, power supply decoupling unit, 2 independent output switching elements, RS 232 diagnostics interface	227
		BWU2206	1 AS-i Master, 16 release circuits, power supply decoupling unit, 2 independent output switching elements, Ethernet diagnostics interface	
	AS-i 3.0 PROFINET Gateway with integrated Safety Monitor in one housing	BWU2330	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	233
		BWU2237	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2307	1 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	

Housing	Module	Art. No.	Characteristics	P.
	AS-i 3.0 EtherNet/IP+Modbus TCP Gateway with integrated Safety Monitor in one housing	BWU2317	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	237
		BWU2267	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2273	1 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	
	AS-i 3.0 EtherCAT Gateway with integrated Safety Monitor in one housing	BWU2281	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	241
		BWU2338	1 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
	AS-i 3.0 Gateway PROFIsafe via PROFIBUS	BWU2479	1 AS-i Master, PROFIsafe for 1 AS-i network, RS 232 diagnostics interface	244
		BWU2214	2 AS-i Master, PROFIsafe for 2 AS-i networks, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2215	2 AS-i Master, PROFIsafe for 2 AS-i networks, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2598	1 AS-i Master, PROFIsafe for 1 AS-i network, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface, Control 3, programming in C	
		BWU2615	2 AS-i Master, PROFIsafe for 2 AS-i networks, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface, Control 3, programming in C	
	AS-i 3.0 Gateway PROFIsafe via PROFINET	BWU2421	2 AS-i Master, PROFIsafe for 2 AS-i networks, 4 independent output switching elements, RS 232 diagnostics interface	244
		BWU2383	2 AS-i Master, PROFIsafe for 2 AS-i networks, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2647	2 AS-i Master, PROFIsafe for 2 AS-i networks, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
	AS-i Safety Monitor in stainless steel, generation II	BWU2205	AS-i Safety Monitor in Stainless Steel, Generation II, 16 release circuits, 2 independent output switching elements, Ethernet diagnostics interface	251

Housing	Module	Art. No.	Characteristics	P.
	AS-i Safety Monitor in stainless steel, generation II	BWU2000	16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	251
		BWU2186	16 release circuits, 2 independent output switching elements, RS 232 diagnostics interface	
	Safety Basic Monitor	BWU2441	AS-i Master disengageable, 8 release circuits, 8 / 4 safe inputs and 2 (4) electronical safe outputs, USB interface	254
		BWU2567	successor for AS-i consortial Safety Monitor, compatible replacement	
		BWU2569	enhanced	
	Safety Basis Monitor Starter Kit	BWU2512		256
	Safe contact expander	BWU2539	2 independent channels	257
		BWU2548	1 independent channel	
	AS-i Safety Monitor	BW1764	advanced monitor, 1 release circuit, 40 ms	260
		BW1765	advanced monitor, 2 release circuits, 40 ms	
	AS-i Speed Monitor	BWU2427	2 independent axis, chip card	266
	Speed Monitor head unit and Speed Monitor for 2 axis	BW2538	prewired complet set, parameterization of the speed via USB, monitoring up to 40 axis with expansion modules possible	267
	Connecting cable for Speed Monitor	BW2476	connector-ferrule	268
		BW2477	connector-ferrule	
		BW2494	plug-plug	

Housing	Module	Art. No.	Characteristics	P.
	Adapter for Speed Monitor	BW2497	AMP Mini-I/O connector for e.g. Elau MC-4	269
		BW2499	AMP Mini-I/O connector for e.g. B+R Acopos Sin Cos Interface	
 	AS-i Safety In-/Output Module	BWU2314	AS-i Safety 4I/2O Module, 8 / 4 safety inputs and 2 (4) electronical safety outputs	270
		BWU2236	AS-i Safety Relay In-/Output Modul, with diagnostic slave, 1 EDM- and 2 / 1 safety inputs	272
	AS-i Safety Output Module	BWU2045	relay output module with diagnostic slave and 1 EDM input	276
		BWU2173	output module with diagnostic slave, 1 EDM input, 3I and 2O	280
 	AS-i Safety Input Module (M12)	BWU2270	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP67, AS-i connection via profile cable	284
		BWU2284	2 / 1 safety inputs (2 channels) for floating contacts, protection category IP67, AS-i connection via profile cable	
		BWU2369	2 / 1 safety inputs (2 channels) for floating contacts, protection category IP67, AS-i connection via M12	
		BWU2370	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP67, AS-i connection via M12	
	AS-i Safety Input Module	BWU1939	2 / 1 safety inputs (2 channels) for floating contacts, protection category IP20	286
		BWU2577	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP20	

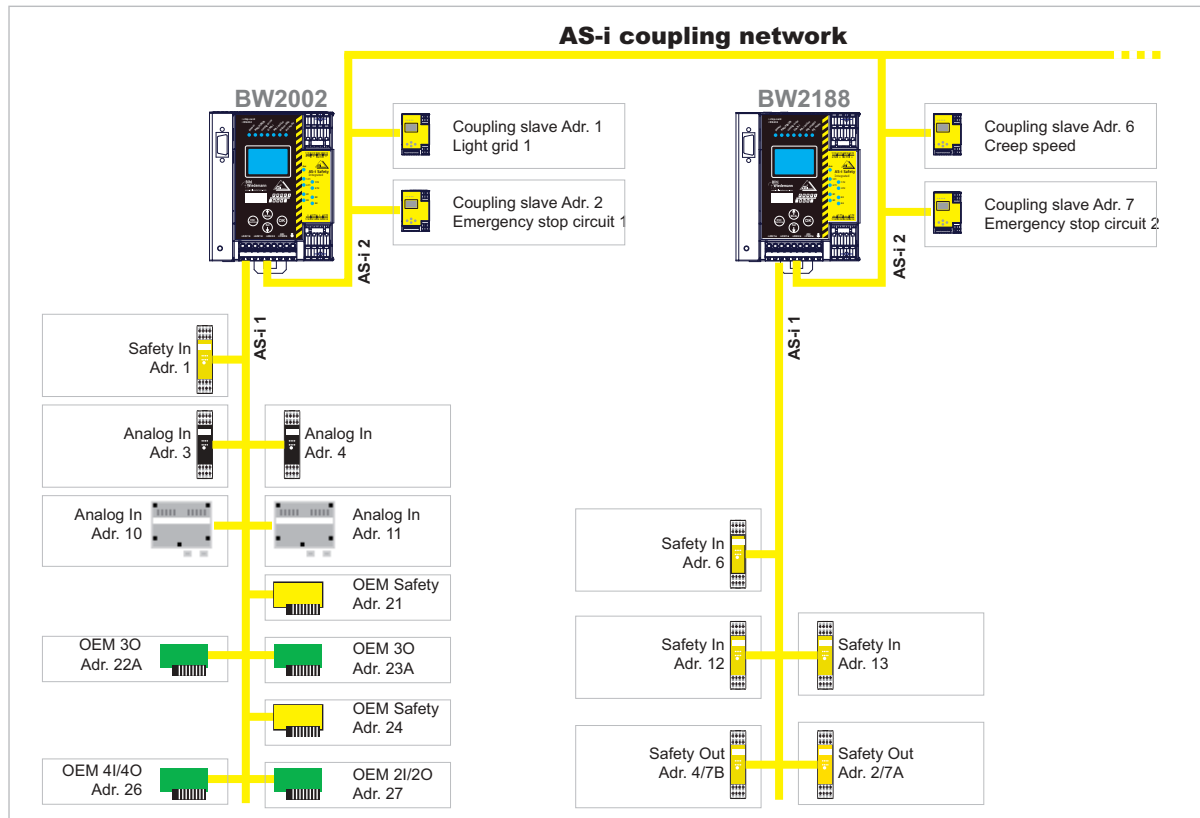
Housing	Module	Art. No.	Characteristics	P.
	Emergency stop- and push button modules	BW2529	AS-i Safety stop button module, lighted (red/green), 288 IP65, M12	
		BW2527	Emergency stop button with plug-in-shoe connection	
		BW2528	AS-i light button module, 2 buttons each 2-colored lighted (red/green), IP65, M12	
	AS-i Safety OEM Slave	BW2426	with 2 safe inputs and 2 standard outputs, supply out of AS-i, LED display, potted, with connection line	290
		BW2521	with 2 safe inputs and 2 standard outputs, supply out of AS-i, LED display, potted, with pin connection	
		BW1896	with screw terminals	292
		BW1751	with plug-in screw terminals	
		BW1801	with wiring pins	
		BW1934	no connection	
	AS-i OEM Slave	BW2522	with 2 standard inputs and 2 standard outputs, supply out of AS-i, LED display, potted, with pin connection	290
		BW2574	with 2 standard inputs and 2 standard outputs, supply out of AS-i, LED display, potted, with connection line	
	AS-i Substructure Module in IP67	BW2349	for 4-channel module in 45 mm-housing	294
		BW2350	for 4-channel module in 45 mm-housing, centerline spacing CNOMO	
		BW2351	for 8-channel module in 60 mm-housing, centerline spacing CNOMO	
	Programming software ASIMON 3 G2 and AS-i Control Tools	BW2071	with serial cable for AS-i Master/Monitor in stainless steel	298
		BW2501	for Safety Monitors and AS-i Masters	
		BW2145	with serial cable for AS-i Master/Monitor in stainless steel	
		BW1770	with cable BW1771 and BW1772 only for use with the Safety Monitors BW1764 and BW1765	
	AS-i Chipcard	BW2222	memory capacity 128 kbyte	299
		BW2079	memory capacity 32 kbyte	

AS-i Master/Gateways/ Links/Scanner
AS-i Slaves
AS-i Accessories/ Diagnostics/Development
Other Fieldbuses/ Master Simulators
AS-i Safety
Price Lists

Housing	Module	Art. No.	Characteristics	P.
	Serial cable	BW1575	for AS-i Masters and AS-i Monitors in stainless steel	298
	USB connector cable	BW2530	for Safety Basic Monitor	298
	Interface cable	BW1771	for connection of the Safety Monitor to a PC	298
	Interface cable	BW1772	for connection of 2 Safety Monitors	298

AS-i Safety at Work: AS-i safety monitors, AS-i gateways with integrated safety monitor and AS-i safety slaves for monitoring Safety at Work networks

In addition to the AS-i safety monitors, Bihl+Wiedemann offers Gateways with integrated safety monitor and AS-i Safety Slaves. This provides the user with the full range of products for monitoring AS-i Safety at Work networks as well.



Safety monitors

Using the newest generation Safety Monitors allows 2 Safety at Work networks and up to 16 release circuits to be monitored. The user is provided with comprehensive detailed diagnostics and system status information in plain text on the Monitor's display. In addition to the high SIL 3/Cat. 4 safety level, the monitors offer additional features beyond the standard:

1. 1 program for 2 Safety at Work networks
2. Up to 31 Safety at Work networks can be easily linked together
3. 16 release circuits enable fast, reliable and highly simplified and differentiated system response
4. Expanded programming allows up to 256 functions without increasing the response time
5. Linked networks can be started together
6. Safe Safety at Work outputs allow switching – even at great distances from the Monitor – without additional wiring
7. The use of memory cards greatly simplifies both program changing when units are replaced and programming of the Monitor using ASIMON software
8. The expanded AS-i diagnostics of the Bihl+Wiedemann AS-i Master, including duplicate address detection, ground fault monitor, EMC monitor, error counter etc. are of course fully integrated

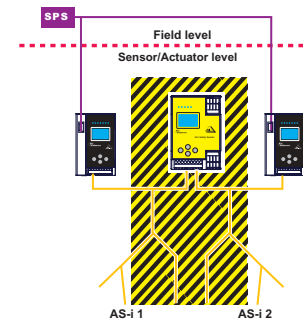
Configuration example: Safe networking of up to 21 Safety at Work networks

One Bihl+Wiedemann Safety Monitor monitors two networks simultaneously and can emulate multiple slaves at the same time. This enables two different configurations:

Standard case: 2 Safety at Work networks

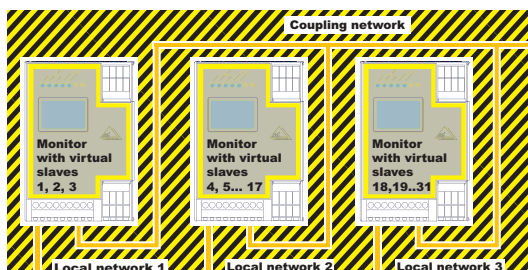
Two equal-priority Safety at Work networks are monitored by just one Multimonitor:

- Just 1 instead of 2 monitor programs
- Fast response
- No additional hardware
- Combination unit with double master saves costs, space and installation expense



The large network: 3 Safety at Work networks

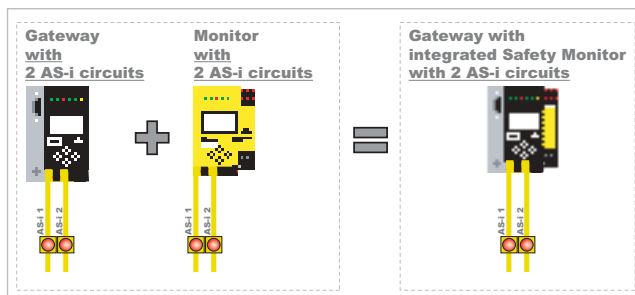
Multiple local Safety at Work networks are each monitored by 1 Multimonitor which is at the same time a node in a higher-level coupling network. There it is on one hand a Monitor, while on the other hand it internally emulates virtual slaves, through which it exchanges its own release circuits with those of the other monitors (see figure below):



- Up to 31 local networks are networked in a safety configuration
- Up to 16 virtual slaves per monitor
- Up to 31 virtual slaves in the coupled network
- Fast, bi-directional coupling of all local network with each other
- Very large networks with differentiated responses are possible without a safety controller or master

AS-i Gateways with integrated AS-i Safety Monitor

AS-i Gateways with integrated Safety Monitors combine an AS-i Gateway (e.g. PROFIBUS) with the new Safety Monitors in one unit to couple the Monitor and Gateway to the Safety at Work network, enabling a broad range of safety applications quickly and easily.



1. The advantages of the Safety Monitor (see above) and all the properties of an AS-i 3.0 Gateway including expanded local diagnostics, graphic display etc. are combined in one unit.
2. Available with and without power supply decoupling.
3. Ideally matched to all Bihl+Wiedemann power supplies.
4. Save costs, installation effort and control cabinet space: e.g. replaces the combination "Double Master with power supply decoupling + Multimonitor" together with a standard power supply (i.e. 2 devices) for a total of 6 individual units (2 Masters, 2 Monitors, 2 AS-i power supplies).
5. Coupling of Gateway and Safety Monitor to the Safety at Work network.
6. No AS-i address is occupied for the Safety Monitor diagnostics.

The product series of AS-i Gateways with integrated Safety Monitors is being continually expanded with additional field buses.

AS-i Safety Slaves

In addition to Safety Monitors AS-i gateways with integrated Safety Monitor, Bihl+Wiedemann also offers a wide range of AS-i Safety Slaves. For example, AS-i safety relay modules and various AS-i Safety OEM Slaves are available. These are also SIL 3/Cat. 4 approved.



The AS-i Safety Relay Output Module with conventional 4 inputs combines one AS-i Safety Relay Output with 4 inputs (1 EDM + 3 conventional (AB slave)) in one unit.

The AS-i Safety OEM Slaves currently offer the possibility of driving 2 safe switching contacts, e.g. signal lamps, over the AS-i safety network.



Overview AS-i Safety with integrated Safety Monitor

Housing	Module	Art. No.	Characteristics	P.
	AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing	BWU2001	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	227
		BWU2002	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
	AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing	BWU2202	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface	227
		BWU2602	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface, safe cross communication	
	AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing	BWU2003	1 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	227
		BWU2004	1 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2204	1 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface	
		BWU2187	1 AS-i Master, 16 release circuits, 2 independent output switching elements, RS 232 diagnostics interface	
	AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing	BWU2188	1 AS-i Master, 16 release circuits, power supply decoupling unit, 2 independent output switching elements, RS 232 diagnostics interface	227
		BWU2206	1 AS-i Master, 16 release circuits, power supply decoupling unit, 2 independent output switching elements, Ethernet diagnostics interface	
	AS-i 3.0 PROFINET Gateway with integrated Safety Monitor in one housing	BWU2330	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	233
		BWU2237	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2307	1 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

Housing	Module	Art. No.	Characteristics	P.
	AS-i 3.0 EtherNet/IP+Modbus TCP Gateway with integrated Safety Monitor in one housing	BWU2317	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	237
		BWU2267	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2273	1 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	
	AS-i 3.0 EtherCAT Gateway with integrated Safety Monitor in one housing	BWU2281	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	241
		BWU2338	1 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
	AS-i 3.0 Gateway PROFIsafe via PROFIBUS	BWU2479	1 AS-i Master, PROFIsafe for 1 AS-i network, RS 232 diagnostics interface	244
		BWU2214	2 AS-i Master, PROFIsafe for 2 AS-i networks, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2215	2 AS-i Master, PROFIsafe for 2 AS-i networks, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2598	1 AS-i Master, PROFIsafe for 1 AS-i network, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface, Control 3, programming in C	
		BWU2615	2 AS-i Master, PROFIsafe for 2 AS-i networks, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface, Control 3, programming in C	
	AS-i 3.0 Gateway PROFIsafe via PROFINET	BWU2421	2 AS-i Master, PROFIsafe for 2 AS-i networks, 4 independent output switching elements, RS 232 diagnostics interface	244
		BWU2383	2 AS-i Master, PROFIsafe for 2 AS-i networks, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
		BWU2647	2 AS-i Master, PROFIsafe for 2 AS-i networks, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	

AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

AS-i 3.0 Gateways with integrated Safety Monitor

2 / 1 Master, PROFIBUS Slave

1 AS-i Safety Monitor for 2 AS-i networks

- Operation using a single Monitor configuration!
Monitor processes safety slaves on two AS-i networks
Coupling between the two networks superfluous

16 release circuits

- 4 / 2 CAT4, SIL 3 safe output circuits on the Monitor
two sets of safe relays, two sets of fast electronic safe outputs resp.,
two sets of safe relays

Safe AS-i outputs are supported

- 16 independent AS-i outputs
Multiple safe AS-i outputs possible via a single AS-i address

Monitor configuration can be, arbitrarily" large

- configuration blocks (previously 48)
Identical reaction time due to artificial limitation to 256 configuration
block

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data



BWU2202 / BWU2204 /
BWU2206 / BWU2602



BWU2001 / BWU2002 /
BWU2003 / BWU2004 /
BWU2187 / BWU2188



Article no.	BWU2001 / BWU2002 / BWU2003 / BWU2004 / BWU2187 / BWU2188 / BWU2202 / BWU2204 / BWU2206 / BWU2602
Interface	
PROFIBUS interface	IE 61 158 / IEC 61 784-1
Baud rates	9,6 Kbaud up to 12 000 Kbaud, automatic recognition
DP functions	imaging of the AS-i slaves as I/O data of the PROFIBUS complete diagnosis and configuration via the PROFIBUS DP
AS-i	
AS-i cycle time	150 µs * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
Safety monitor	
Inputs	EDM inputs of external monitoring circuits or start inputs selectable, a total of 4 switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 µs)
Release circuits	16
Start delay	< 10 ms
Max. turn-off time	< 40 ms
Card slot	chip card for storage of configuration data
Display	
LCD	menu, indication of slave addresses and error messages in plaintext
LED power	power ON
LED PROFIBUS	PROFIBUS master recognized
LED config error	configuration error
LED U AS-i	AS-i voltage o.k.
LED AS-i active	AS-i normal operation active
LED prg enable	automatic addresses programming enabled
LED prj mode	configuration mode active

AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

Article no.	BWU2001 / BWU2002 / BWU2003 / BWU2004 / BWU2187 / BWU2188 / BWU2202 / BWU2204 / BWU2206 / BWU2602
UL-specifications (UL508)	
External protection	an isolated source with a secondary open circuit voltage of $\leq 30V_{DC}$ with a 3A maximum over current protection. Over current protection is not required when a Class 2 source is employed.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.
cTÜV _{us}	the devices • BWU2001 • BWU2002 • BWU2003 • BWU2004 • BWU2187 • BWU2188 • BWU2202 • BWU2204 • BWU2206 • BWU2602 from Bihl + Wiedemann GmbH were safety certified by TÜV Rheinland of North America, Inc. according to UL-standards and meet the safety requirements for the North American market.
Standards	EN 61 000-6-2 EN 61 000-6-4 EN 62 061:2005, SIL 3 EN 61 508:2001:2001, SIL 3 EN ISO 13 849-1:2008, performance-level e
Environment	
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	stainless steel
Protection category IEC 60 529	IP20
Maximum tolerable shock and vibration stress	according to EN 61 131-2
Voltage of insulation	$\geq 500V$
Dimensions (W / H / D in mm)	120 / 100 / 96
Weight	800 g

Article No.	BWU2001 / BWU2002 / BWU2003 / BWU2004 / BWU2202 / BWU2204 / BWU2602	BWU2187 / BWU2188 / BWU2206
Safety monitor		
Number of release circuits in device	4	2
Outputs	relay outputs (output circuits 1 and 2) max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5A DC-13 at 30V	relay outputs (output circuits 1 and 2), each 2 current paths max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V
Display		
LED AUX	auxiliary power	—
4 x LED EDM/Start	state of inputs: LED off: open LED on: closed	—
4 x LED output circuit	state of outputs: LED off: open LED on: closed	—

AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

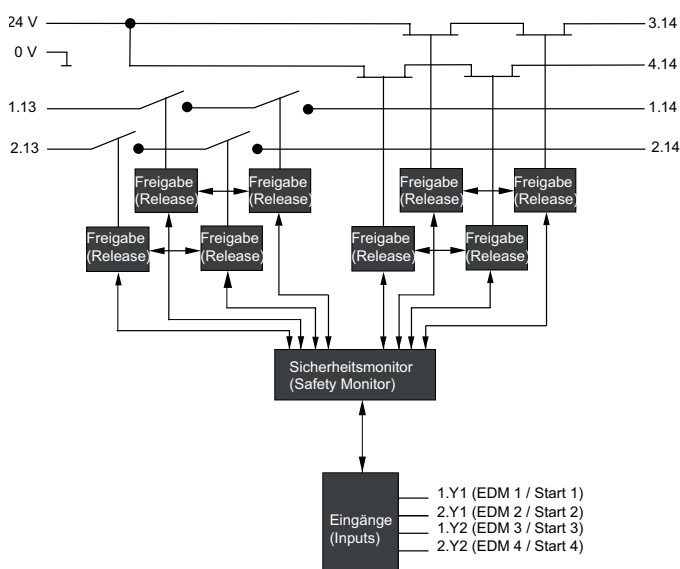
Article No.	Diagnostics interface	AS-i Safety outputs are supported	Number of AS-i circuits Safety Monitor	Max. number of release circuits	Number of release circuits in device	Configuration blocks	Number of AS-i masters
BWU2001	serial	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	2 AS-i Master
BWU2002	serial	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	2 AS-i Master with integrated power supply decoupling
BWU2003	serial	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	1 AS-i Master
BWU2004	serial	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	1 AS-i Master with integrated power supply decoupling
BWU2187	serial	yes	2	16	2 release circuits SIL 3, cat. 4 in device; 2 x relays	256 Devices	1 AS-i Master
BWU2188	serial	yes	2	16	2 release circuits SIL 3, cat. 4 in device; 2 x relays	256 Devices	1 AS-i Master with integrated power supply decoupling
BWU2202	Ethernet	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	2 AS-i Master with integrated power supply decoupling
BWU2204	Ethernet	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	1 AS-i Master with integrated power supply decoupling
BWU2206	Ethernet	yes	2	16	2 release circuits SIL 3, cat. 4 in device; 2 x relays	256 Devices	1 AS-i Master with integrated power supply decoupling
BWU2602	Ethernet safe cross communication	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	2 AS-i Master with integrated power supply decoupling

Article No.	Operating current		
	master power supply, approx 300mA out of AS-i network	master power supply, max. 300mA out of AS-i circuit 1 (approx. 70mA ... 300mA), max. 300mA out of AS-i circuit 2 (approx. 70mA ... 300mA); in sum max. 370mA	Version „1 gateway, 1 power supply, for 2 AS-i networks“, approx. 300mA (PELV voltage)
BWU2001	–	●	–
BWU2002	–	–	●
BWU2003	●	–	–
BWU2004	–	●	–
BWU2187	●	–	–
BWU2188	–	●	–
BWU2202	–	–	●
BWU2204	–	●	–
BWU2206	–	●	–
BWU2602	–	–	●

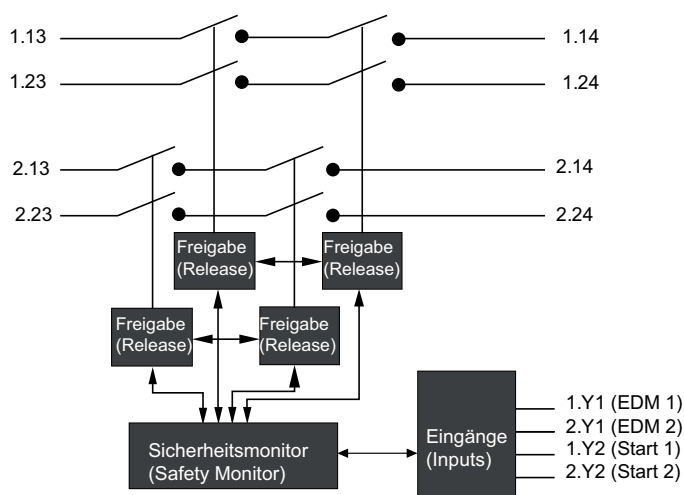
AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

Article no.	Full functional range of PROFIBUS gateways (without AS-i Safety)				
	BWU1567	BWU1568	BWU1569	BWU1777	BWU1891
BWU2001	—	•	—	—	—
BWU2002	—	—	•	•	—
BWU2003	•	—	—	—	—
BWU2004	—	—	—	—	•
BWU2187	•	—	—	—	—
BWU2188	—	—	—	—	•
BWU2202	—	—	•	•	—
BWU2204	—	—	—	—	•
BWU2206	—	—	—	—	•
BWU2602	—	—	•	•	—

Safety Monitor block diagram BWU2001, BWU2002, BWU2003, BWU2004, BWU2202, BWU2204, BWU2602



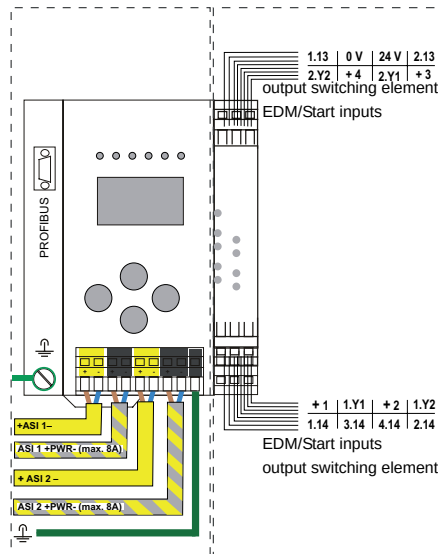
Safety Monitor block diagram BWU2187, BWU2188, BWU2206



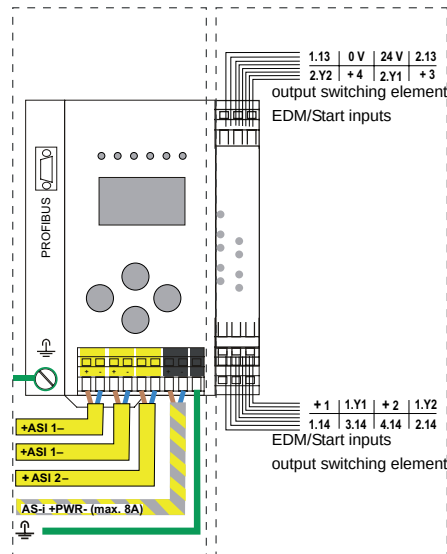
AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

Connections: Gateway + Safety Monitor

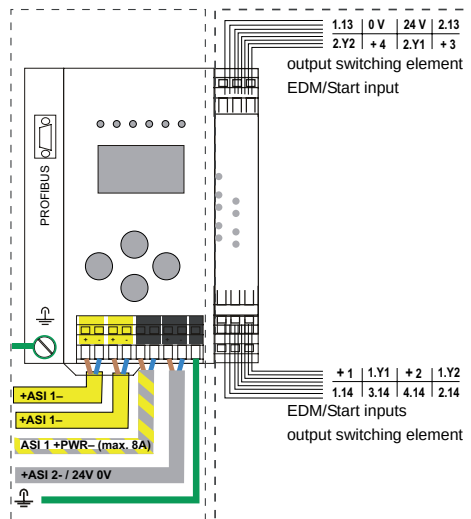
BWU2001



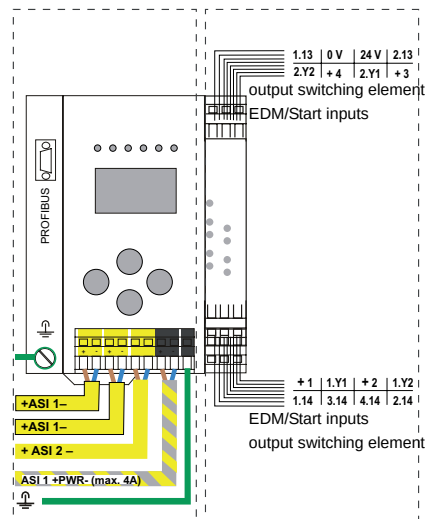
BWU2002, BWU2202, BWU2602



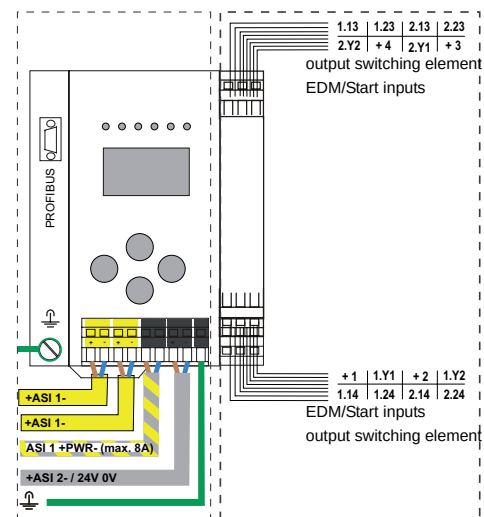
BWU2003



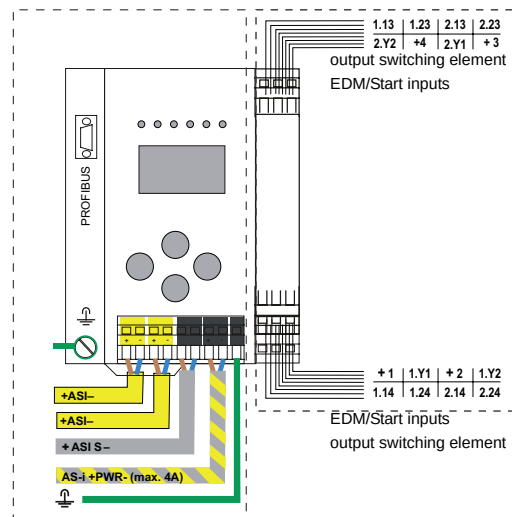
BWU2004, BWU2204



BWU2187



BWU2188, BWU2206



AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor



THE AS-INTERFACE MASTERS

Accessoires:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 257)
- ASIMON 3 G2 and AS-i Control Tools with serial cable for AS-i Masters/Monitors in stainless steel (art. no. BW2071)
- PROFIBUS DP Master Simulator (art. no. BW1257, see page 206)
- AS-i Power Supply 4A (art. nr. BW1649) / AS-i Power Supply 8A (art. nr. BW1997), see page 178

For devices with Ethernet diagnostics interface:

- Software ASIMON 3 G2 and AS-i Control Tools (art. no. BW2501)

AS-i Master/Gateways/ Links/Scanner
AS-i Slaves
AS-i Accessories/ Diagnostics/Development
Other Fieldbuses/ Master Simulators
AS-i Safety
Price Lists

AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

2 / 1 Master, PROFINET Slave

1 Safety Monitor for 2 AS-i networks

- Operation using a single Monitor configuration!
Monitor processes safety slaves on two AS-i networks
Coupling between the two networks superfluous

16 release circuits

- 4 / 2 CAT4, SIL 3 safe output circuits on the Monitor
two sets of safe relays, two sets of fast electronic safe outputs resp.,
two sets of safe relays

Safe AS-i outputs are supported

- 16 independent AS-i outputs
Multiple safe AS-i outputs possible via a single AS-i address

Monitor configuration can be „arbitrarily“ large

- 256 configuration blocks (previously 48)
Identical reaction time due to artificial limitation to 256 configuration blocks

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data



BWU2307



BWU2330

Article Nr.	BWU2237 / BWU2307 / BWU2330
Interfaces	
PROFINET interface	RJ-45
Conformance Class	B
Baud rates	10/100 MBaud
Diagnostics interface	RS 232
AS-i cycle time	
AS-i cycle time	150 µs * (number of slaves + 2)
Safety Monitor	
Release circuits	16
Start delay	< 10 ms
Max. turn-off time	< 40 ms
Inputs: 4 x EDM/Start	EDM: inputs to monitor external devices Start: Start inputs switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 µs)
Outputs: 4 x output switching elements	relay outputs (output circuits 1 and 2) max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5A DC-13 at 30V
Card slot	chip card for storage of configuration data
Electrical Data	
Operating voltage	AS-i voltage 30V DC
Voltage of insulation	≥ 500V
Display	
LCD	indication of slave addresses and error messages in plaintext
LED power	power on
LED PROFINET (green)	PROFINET master recognized
LED config error	configuration error

AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

Article Nr.	BWU2237 / BWU2307 / BWU2330
LED U AS-i	AS-i voltage OK
LED AS-i active	AS-i normal operation active
LED prg enable	automatic addresses programming enabled
LED prj mode	configuration mode active
LED AUX	auxiliary power
4 x LED EDM/Start	state of inputs: LED aus: open LED an: closed
4 x LED output circuit	state of outputs: LED aus: open LED an: closed
UL-specifications (UL508)	
External protection	an isolated source with a secondary open circuit voltage of $\leq 30V_{DC}$ with a 3A maximum over current protection. Over current protection is not required when a Class 2 source is employed.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.
cTÜVus	the devices • BWU2237 • BWU2307 • BWU2337 from Bihl + Wiedemann GmbH were safety certified by TÜV Rheinland of North America, Inc. according to UL-standards and meet the safety requirements for the North American market.
Standards	EN 61 000-6-2 EN 61 000-6-4 EN 62 061:2005, SILCL 3 EN 61 508:2001, SIL 3 EN ISO 13 849-1:2008, Performance-Level e
Ambiente	
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	stainless steel
Protection category IEC 60 529	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Dimensions (L / W / H in mm)	120 / 100 / 96
Weight	800 g

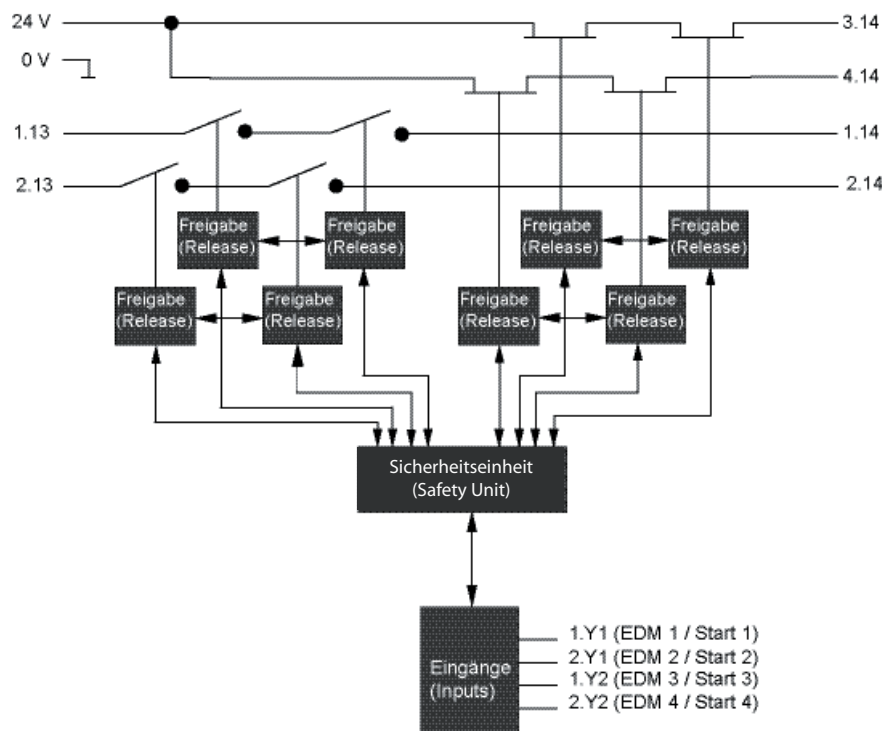
Article No.	Diagnostic interface	AS-i Safety outputs are supported	Number of AS-i circuits Safety Monitor	Max. number of release circuits	Number of release circuits in device	Configuration blocks	Number of AS-i masters
BWU2237	RS 232	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 devices	2 AS-i Masters with integrated power supply decoupling
BWU2307	RS 232	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 devices	1 AS-i Master
BWU2330	RS 232	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 devices	2 AS-i Masters

AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

Article No.	Operating current	
	master power supply, approx 300mA out of AS-i network	master power supply, max. 300mA out of AS-i circuit 1 (approx. 70mA ... 300mA), max. 300mA out of AS-i circuit 2 (approx. 70mA ... 300mA); in sum max. 370mA
BWU2237	•	–
BWU2307	–	•
BWU2330	–	•

Article No.	Full functional range of PROFINET gateways		
	BWU1912	BWU2238	BWU2239
BWU2237	–	•	–
BWU2307	•	–	–
BWU2330	–	–	•

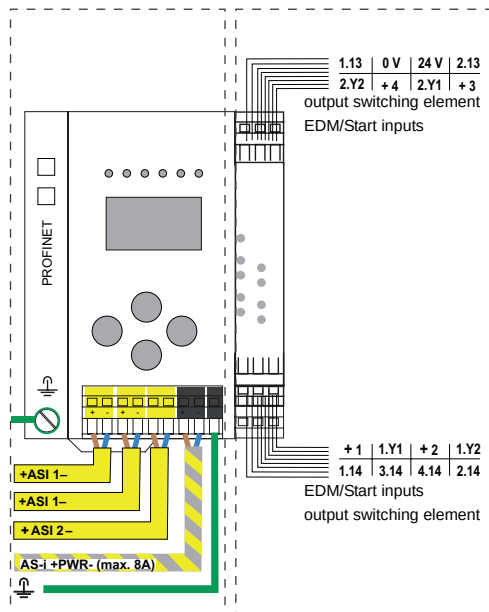
Safety Monitor block diagram



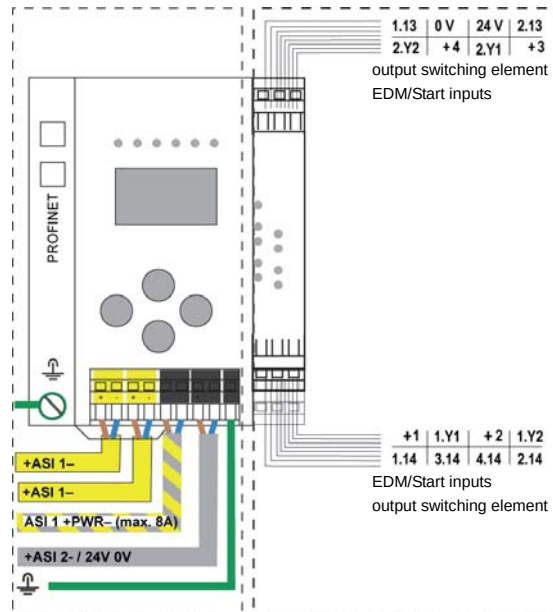
AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

Connections: Gateway + Safety Monitor

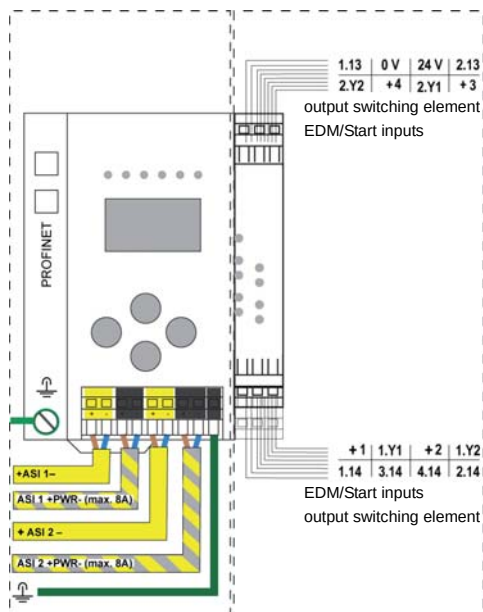
BWU2237



BWU2307



BWU2330



Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 257)
- ASIMON 3 G2 and AS-i Control Tools with serial cable for AS-i Masters/Monitors in stainless steel (art. no. BW2071)
- AS-i Power Supply 4A (art. nr. BW1649) / AS-i Power Supply 8A (art. nr. BW1997), see page 178

AS-i 3.0 EtherNet/IP + Modbus TCP Gateways with integrated Safety Monitor

AS-i 3.0 EtherNet/IP + Modbus TCP-Gateways with integrated Safety Monitor

2 / 1 Master, EtherNet/IP + Modbus TCP Slave

- switch integrated

1 Safety Monitor for 2 AS-i networks

- Operation using a single Monitor configuration!
Monitor processes safety slaves on two AS-i networks
Coupling between the two networks superfluous

16 release circuits

- 4 / 2 CAT4, SIL 3 safe output circuits on the Monitor
two sets of safe relays, two sets of fast electronic safe outputs

Safe AS-i outputs are supported

- 16 independent AS-i outputs
Multiple safe AS-i outputs possible via a single AS-i address

Monitor configuration can be „arbitrarily“ large

- configuration blocks (previously 48)
Identical reaction time due to artificial limitation to 256 configuration block

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data



BWU2267

BWU2317



Article no.	BWU2267 / BWU2273 / BWU2317
Interfaces	
Ethernet interfaces	RJ-45: 10/100 Mbaud EtherNet + Modbus TCP according to IEEE 802.3, switch integrated
Diagnostics interface	RS 232
AS-i cycle time	
AS-i cycle time	150 µs * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
Safety monitor	
Release circuits	16
Start delay	< 10 ms
Max. turn-off time	< 40 ms
Inputs: 4 x EDM/Start	EDM: inputs to monitor external devices Start: Start inputs switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 µs)
Outputs: 4 x output switching elements	relay outputs (output circuits 1 and 2) max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5A DC-13 at 30V
Card slot	chip card for storage of configuration data
Display	
LCD	indication of slave addresses and error messages in plaintext
LED power	power on
LED net	Ethernet network active
LED config error	configuration error
LED U AS-i	AS-i voltage o.k.
LED AS-i active	AS-i normal operation active
LED prg enable	automatic addresses programming enabled

AS-i 3.0 EtherNet/IP + Modbus TCP Gateways with integrated Safety Monitor



THE AS-INTERFACE MASTERS

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

Article no.	BWU2267 / BWU2273 / BWU2317
LED prj mode	configuration mode active
LED AUX	auxiliary power
4 x LED EDM/Start	state of inputs: LED off: open LED on: closed
4 x LED output circuit	state of outputs: LED off: open LED on: closed
UL-specifications (UL508)	
External protection	an isolated source with a secondary open circuit voltage of $\leq 30V_{DC}$ with a 3A maximum over current protection. Over current protection is not required when a Class 2 source is employed.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.
cTUVus	the devices • BWU2267 • BWU2273 • BWU2317 from Bihl + Wiedemann GmbH were safety certified by TÜV Rheinland of North America, Inc. according to UL-standards and meet the safety requirements for the North American market.
Standards	EN 61 000-6-2 EN 61 000-6-4 EN 62 061:2005, SIL 3 EN 61 508:2001, SIL 3 EN ISO 13 849-1:2008, performance-level e
Environment	
Housing	stainless steel
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Protection category IEC 60 529	IP20
Maximum tolerable shock and vibration stress	according to EN 61 131-2
Voltage of insulation	$\geq 500V$
Dimensions (W / H / D in mm)	100 / 120 / 96
Weight	800 g

Article No.	BWU2267	BWU2273	BWU2317
Modbus TCP			
Modbus TCP from ident. no. ' (see lateral label)	13077	13078	13076

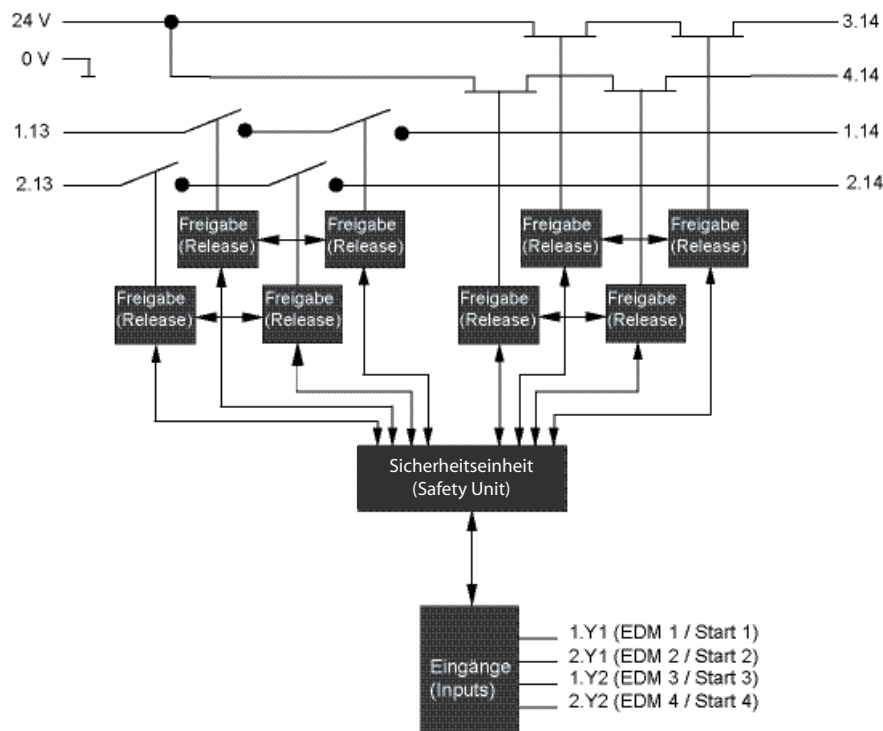
Article No.	Diagnostics interface	AS-i Safety outputs are supported	Number of AS-i circuits Safety Monitor	Max. number of release circuits	Number of release circuits in device	Configuration blocks	Number of AS-i masters
BWU2267	RS 232	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	2 AS-i Masters with integrated power supply decoupling
BWU2273	RS 232	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	1 AS-i Master
BWU2317	RS 232	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	2 AS-i Masters

AS-i 3.0 EtherNet/IP + Modbus TCP Gateways with integrated Safety Monitor

Article No.	Operating current	
	master power supply, approx 300mA out of AS-i network	master power supply, max. 300mA out of AS-i circuit 1 (approx. 70mA ... 300mA), max. 300mA out of AS-i circuit 2 (approx. 70mA ... 300mA); in sum max. 370mA
BWU2267	•	–
BWU2273	–	•
BWU2317	–	•

Article No.	Full functional range of EtherNet/IP gateways (without AS-i Safety)		
	BWU2379	BWU2380	BWU2381
BWU2267	–	–	•
BWU2273	•	–	–
BWU2317	–	•	–

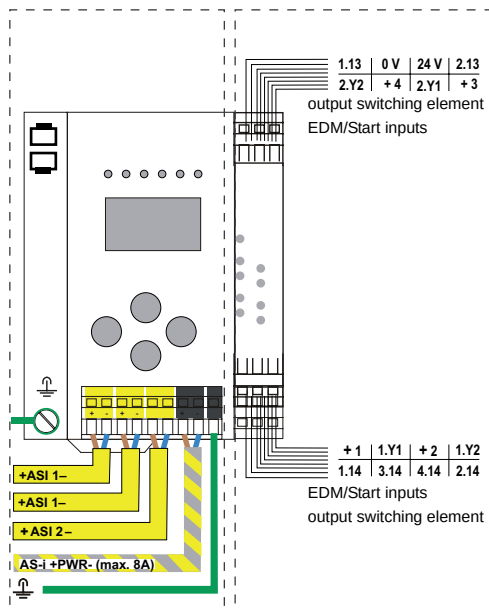
Safety Monitor block diagrams



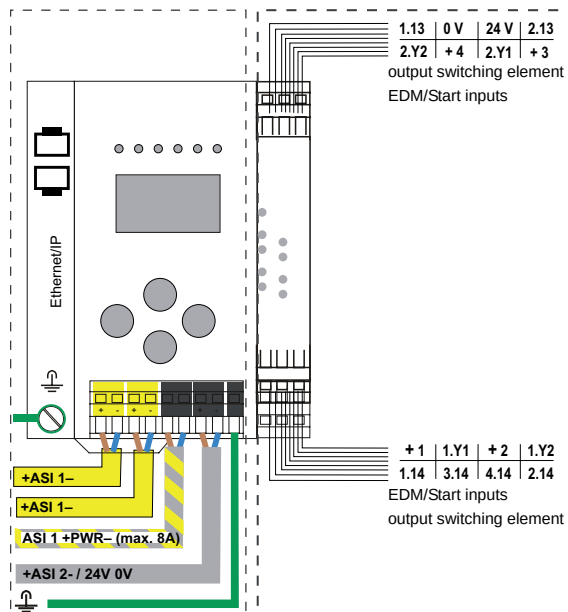
AS-i 3.0 EtherNet/IP + Modbus TCP Gateways with integrated Safety Monitor

Connections: Gateway + Safety Monitor

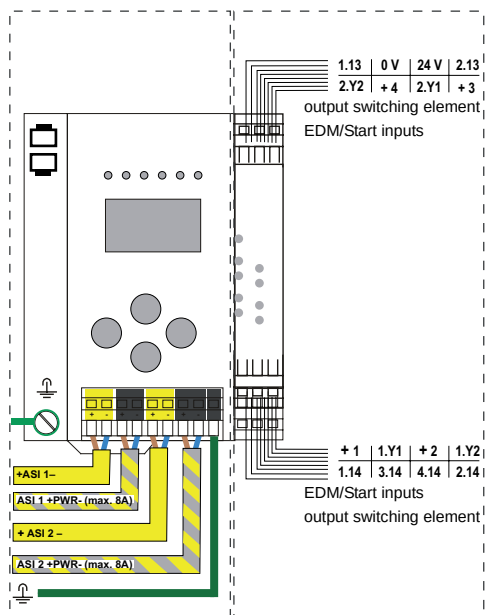
BWU2267



BWU2273



BWU2317



Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 257)
- ASIMON 3 G2 and AS-i Control Tools with serial cable for AS-i Masters/Monitors in stainless steel (art. no. BW2071)
- AS-i Power Supply 4A (art. nr. BW1649) / AS-i Power Supply 8A (art. nr. BW1997), see page 178

AS-i 3.0 EtherCAT Gateways with integrated Safety Monitor

AS-i 3.0 EtherCAT Gateways with integrated Safety Monitor

2 / 1 Master, EtherCAT Slave

1 Safety Monitor for 2 AS-i networks

- Operation using a single Monitor configuration!
Monitor processes safety slaves on two AS-i networks
Coupling between the two networks superfluous

16 release circuits

- 4 / 2 CAT4, SIL 3 safe output circuits on the Monitor
two sets of safe relays, two sets of fast electronic safe outputs

Safe AS-i outputs are supported

- 16 independent AS-i outputs
Multiple safe AS-i outputs possible via a single AS-i address

Monitor configuration can be „arbitrarily“ large

- configuration blocks (previously 48)
Identical reaction time due to artificial limitation to 256 configuration block

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data



BWU2281 / BWU2338

Article no.	BWU2281 / BWU2338
Interfaces	
Interface EtherCAT	RJ-45
Baud rate	10/100 MBaud
Diagnostics interface	RS 232
AS-i cycle time	
AS-i cycle time	150 µs * (number of slaves + 2)
Safety monitor	
Release circuits	16
Start delay	< 10 ms
Max. turn-off time	< 40 ms
Inputs: 4 x EDM/Start	EDM: inputs to monitor external devices Start: Start inputs switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 µs)
Outputs: 4 x output switching elements	relay outputs (output circuits 1 and 2) max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5A DC-13 at 30V
Card slot	chip card for storage of configuration data
Electrical data	
Operating voltage	AS-i voltage 30V DC
Voltage of insulation	≥ 500V
Display	
LCD	indication of slave addresses and error messages in plaintext
LED power	power on
LED EtherCAT	EtherCat network active
LED config error	configuration error
LED U AS-i	AS-i voltage OK
LED AS-i active	AS-i normal operation active
LED prg enable	automatic addresses programming enabled
LED prj mode	configuration mode active
LED AUX	auxiliary power

AS-i 3.0 EtherCAT Gateways with integrated Safety Monitor

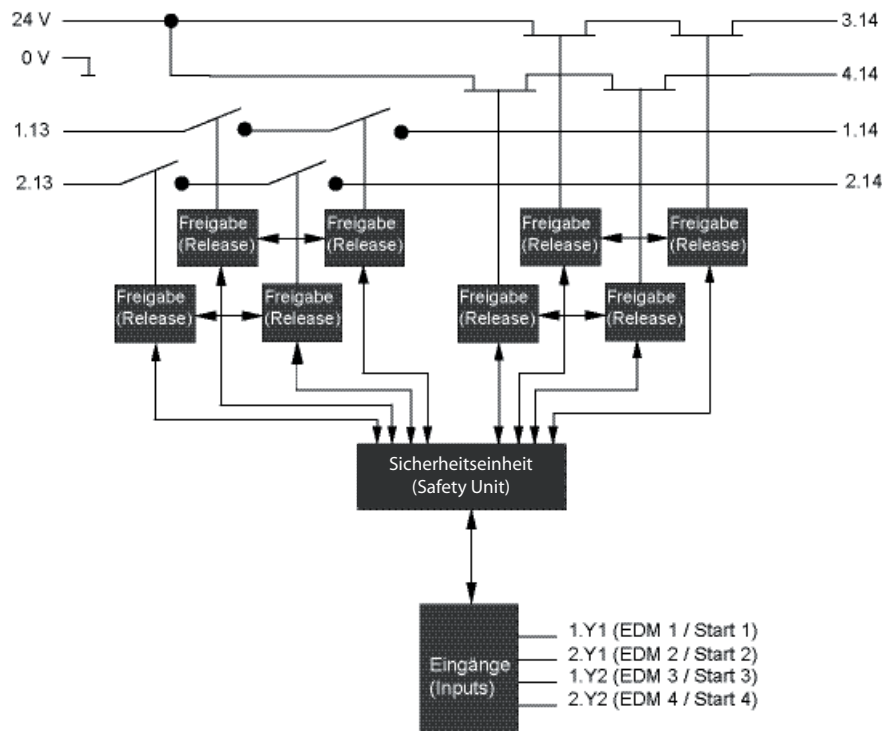
Article no.	BWU2281 / BWU2338
4 x LED EDM/Start	state of inputs: LED off: open LED on: closed
4 x LED output circuit	state of outputs: LED off: open LED on: closed
UL-specifications (UL508)	
External protection	an isolated source with a secondary open circuit voltage of $\leq 30V_{DC}$ with a 3A maximum over current protection. Over current protection is not required when a Class 2 source is employed.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.
cTUVus	the devices • BWU2281 • BWU2338 from Bihl + Wiedemann GmbH were safety certified by TÜV Rheinland of North America, Inc. according to UL-standards and meet the safety requirements for the North American market.
Standards	EN 61 000-6-2 EN 61 000-6-4 EN 62 061:2005, SIL 3 EN 61 508:2001, SIL 3 EN ISO 13 849-1:2008, performance-level e
Environment	
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	stainless steel
Protection category IEC 60 529	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Dimensions (L / W / H in mm)	120 / 100 / 96
Weight	800 g

Article No.	Diagnostics interface	AS-i Safety outputs are supported	Number of AS-i circuits Safety Monitor	Max. number of release circuits	Number of release circuits in device	Configuration blocks	Number of AS-i masters
BWU2281	RS 232	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	2 AS-i Masters with integrated power supply decoupling
BWU2338	RS 232	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 Devices	1 AS-i Master with integrated power supply decoupling

Article No.	Operating current	
	master power supply, approx 300mA out of AS-i network	master power supply, max. 300mA out of AS-i circuit 1 (approx. 70mA ... 300mA), max. 300mA out of AS-i circuit 2 (approx. 70mA ... 300mA); in sum max. 370mA
BWU2281	●	—
BWU2338	—	●

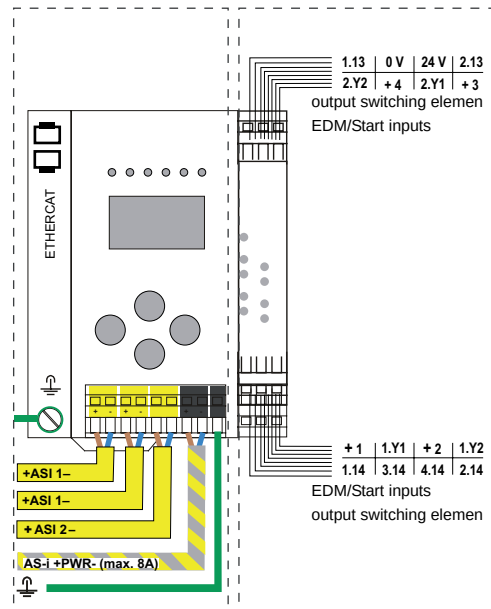
AS-i 3.0 EtherCAT Gateways with integrated Safety Monitor

Safety Monitor block diagrams

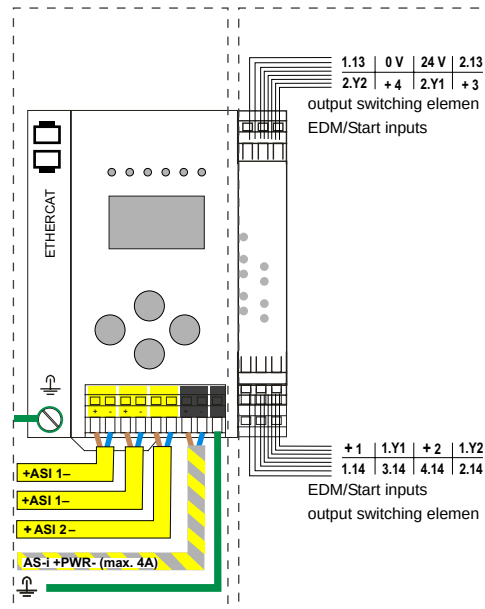


Connections: Gateway + Safety Monitor

BWU2281



BWU2338



Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 257)
- ASIMON 3 G2 and AS-i Control Tools with serial cable for AS-i Masters/Monitors in stainless steel (art. no. BW2071)
- AS-i Power Supply 4A (art. nr. BW1649) / AS-i Power Supply 8A (art. nr. BW1997), see page 178

AS-i 3.0 Gateways, PROFIsafe via PROFINET or PROFIBUS

AS-i 3.0 Gateways, PROFIsafe via PROFINET or PROFIBUS

2 / 1 Master, PROFINET / PROFIBUS Slave

- AS-i Safety input slaves report via PROFIsafe
- AS-i Safety output slaves switch via PROFIsafe

1 Safety Monitor for 2 AS-i networks

- Operation using a single Monitor configuration!
Monitor processes safety slaves on two AS-i networks
Coupling between the two networks superfluous

Safe AS-i outputs are supported

- Multiple safe AS-i outputs possible via a single AS-i address

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data



BWU2479



BWU2214 / BWU2215



BWU2598 / BWU2615



BWU2383 / BWU2421 /
BWU2647



Article no.	BWU2214 / BWU2215 / BWU2383 / BWU2421 / BWU2479 / BWU2598 / BWU2615 / BWU2647
AS-i	
AS-i cycle time	150 µs * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
Display	
LCD	indication of slave addresses and error messages in plaintext
LED power	power on
LED config error	configuration error
LED U AS-i	AS-i voltage OK
LED AS-i active	AS-i normal operation active
LED prg enable	automatic addresses programming enabled
LED prj mode	configuration mode active
UL-specifications (UL508)	
External Protection	an isolated source with a secondary open circuit voltage of $\leq 30V_{DC}$ with a 3A maximum over current protection. Over current protection is not required when a Class 2 source is employed.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.
cTÜVus	the devices • BWU2214 • BWU2215 • BWU2383 • BWU2421 • BWU2479 • BWU2598 • BWU2615 • BWU2647 from Bihl + Wiedemann GmbH were safety certified by TÜV Rheinland of North America, Inc. according to UL-standards and meet the safety requirements for the North American market.

AS-i 3.0 Gateways, PROFIsafe via PROFINET or PROFIBUS

Article no.	BWU2214 / BWU2215 / BWU2383 / BWU2421 / BWU2479 / BWU2598 / BWU2615 / BWU2647
Norms	EN 50 295 EN 61 000-6-2 EN 61 000-6-4 EN 954-1:2005, SIL3 EN 62 061:2005, SIL 3 EN 61 508:2006, SIL 3 EN ISO 13 849-1:2008, Performance-Level e EN ISO 13 849-2:2008
Environment	
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	stainless steel
Protection category IEC 60 529	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Voltage of insulation	≥ 500
Weight	800 g

Article no.	BWU2479	BWU2214 / BWU2215	BWU2598 / BWU2615	BWU2383 / BWU2421 / BWU2647
Interface				
PROFIBUS				
Baud rates	9,6 kBaud up to 12 000 kBaud, automatic recognition			–
DP functions	imaging of the AS-i slaves as I/O data of the PROFIBUS complete diagnosis and configuration via the PROFIBUS DP			–
PROFINET				
PROFINET interface	–			RJ-45
Conformance Class	–			B
Baud rates	–			10/100MBaud
Safety monitor				
Release circuits	–	4		
Start delay	–	< 10 s		
Inputs: 4 x EDM/Start	–	EDM: inputs to monitor external devices Start: Start inputs switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 ms)		
Outputs: 4 x output switching elements	–	relay outputs (output circuits 1 and 2) max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V		
	–	semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5A DC-13 at 30V		
Display				
LED PROFINET	–			PROFINET master recognized
LED PROFIBUS	PROFIBUS master recognized			–
LED AUX	–	auxiliary power		
4 x LED EDM/Start	–	state of inputs: LED off: open LED on: close		
4 x LED Ausgangskreis	–	state of output circuits: LED off: open LED on: close		
Environment				
Dimensions (W / H / D in mm)	75 / 120 / 87	100 / 120 / 96	100 / 120 / 106	100 / 120 / 96

AS-i 3.0 Gateways, PROFIsafe via PROFINET or PROFIBUS

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

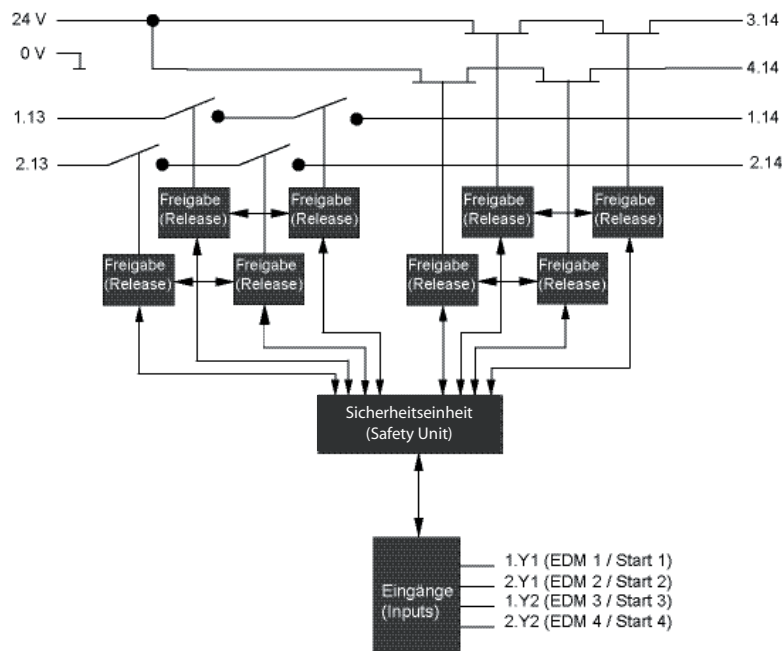
Article no.	Diagnostics interface	AS-i Safety outputs are supported	Number of AS-i circuits Safety Monitor	Number of release circuits in device	Configuration blocks	Number of AS-i Masters
BWU2214	RS 232	yes	2	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	PROFIsafe (F-CPU)	2 AS-i Masters
BWU2215	RS 232	yes	2	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	PROFIsafe (F-CPU)	2 AS-i Masters with integrated power supply decoupling
BWU2383	RS 232	yes	2	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	PROFIsafe (F-CPU)	2 AS-i Masters with integrated power supply decoupling
BWU2647	RS 232	yes	2	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	PROFIsafe (F-CPU) + ASIMON 256 Devices	2 AS-i Masters with integrated power supply decoupling
BWU2421	RS 232	yes	2	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	PROFIsafe (F-CPU)	2 AS-i Masters
BWU2479	RS 232	yes	2	–	PROFIsafe (F-CPU)	1 AS-i Masters
BWU2598	Ethernet, RJ-45	yes	2	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	PROFIsafe (F-CPU) + ASIMON 256 Devices	1 AS-i Master with integrated power supply decoupling
BWU2615	Ethernet, RJ-45	yes	2	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	PROFIsafe (F-CPU) + ASIMON 256 Devices	2 AS-i Masters with integrated power supply decoupling

Article no.	Operating current		
	Master power supply, ca. 300mA out of AS-i circuits	Master power supply, max. 300mA out of AS-i circuit 1 (approx. 70mA ... 300mA), max. 300mA out of AS-i circuit 2 (approx. 70mA ... 300mA); in sum max. 370mA	Version „1 gateway, 1 power supply, for 2 AS-i networks“, approx. 300mA (PELV voltage)
BWU2214	–	●	–
BWU2215	–	–	●
BWU2383	–	–	●
BWU2647	–	–	●
BWU2421	–	●	–
BWU2479	●	–	–
BWU2598	–	●	–
BWU2615	–	–	●

AS-i 3.0 Gateways, PROFIsafe via PROFINET or PROFIBUS

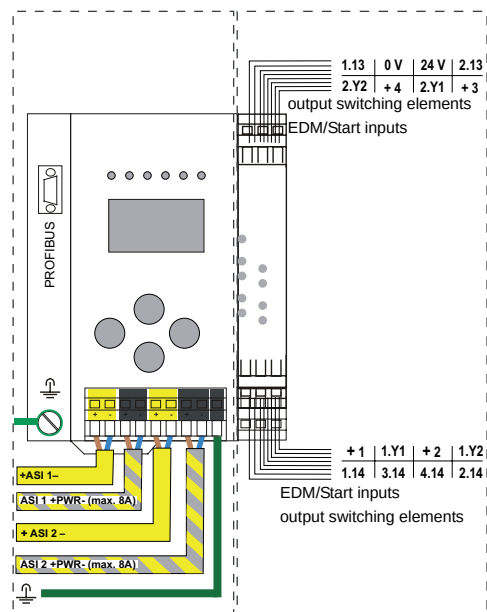
Article no.	Functional range of the PROFIBUS Gateway					
	BWU1567	BWU1568	BWU1569	BWU1891	BWU2238	BWU2239
BWU2214	—	•	—	—	—	—
BWU2215	—	—	•	—	•	—
BWU2383	—	—	—	—	•	—
BWU2647	—	—	—	—	•	—
BWU2421	—	—	—	—	—	•
BWU2598	—	—	—	•	—	—
BWU2615	—	—	—	—	•	—

Safety Monitor block diagram BWU2214, BWU2215, BWU2383, BWU2421, BWU2598, BWU2615, BWU2647:

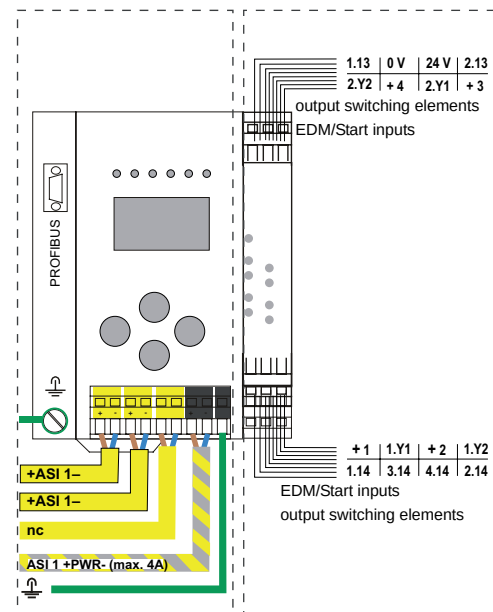


Connections: Gateway + Safety Monitor:

BWU2214, BWU2421

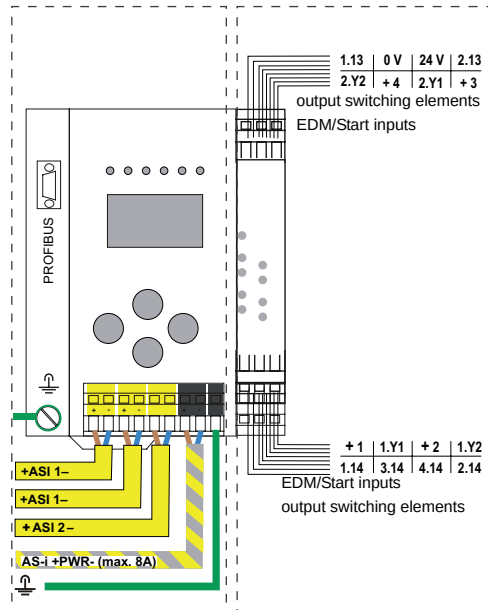


BWU2598

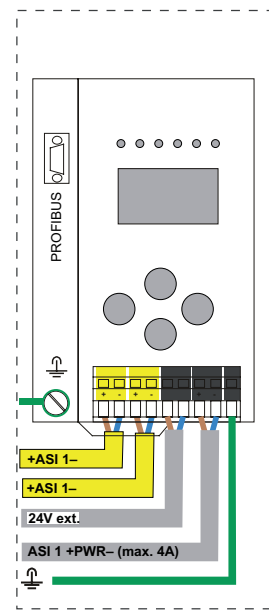


AS-i 3.0 Gateways, PROFIsafe via PROFINET or PROFIBUS

BWU2215, BWU2383, BWU2615, BWU2647



BWU2479



Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 257)
- ASIMON 3 G2 and AS-i Control Tools with serial cable for AS-i Master/Monitors in stainless steel (art. no. BW2071)
- AS-i Power Supply 4A (art. nr. BW1649) / AS-i Power Supply 8A (art. nr. BW1997, see page 178)

For devices with PROFIBUS interface:

- Serial PROFIBUS Master (art. no. BW1258, see page 207)
- PROFIBUS-DP Master simulator (art. no. BW1257, see page 206)

Overview AS-i Safety Monitor

Housing	Module	Art. No.	Characteristics	P.
	AS-i Safety Monitor in stainless steel, generation II	BWU2205	16 release circuits, 2 independent output switching elements, Ethernet diagnostics interface	251
	AS-i Safety Monitor in stainless steel, generation II	BWU2000	16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	251
		BWU2186	16 release circuits, 2 independent output switching elements, RS 232 diagnostics interface	251
	Safety Basic Monitor	BWU2441	AS-i Master disengageable, 8 release circuits, 8 / 4 safe inputs and 2 (4) electronical safe outputs, USB interface	254
		BWU2567	successor for AS-i consortial Safety Monitor, compatible replacement	
		BWU2569	enhanced	
	Safety Basic Monitor Starter Kit	BW2512		256
	Safe contact expander	BWU2539	2 independent channels	257
		BWU2548	1 independent channel	
	AS-i Safety Monitor	BW1764	advanced monitor, 1 release circuit, 40 ms	260
		BW1765	advanced monitor, 2 release circuits, 40 ms	

AS-i Safety Monitors in Stainless Steel

AS-i Safety Monitors in Stainless Steel for 2 AS-i networks

1 AS-i Safety Monitor for 2 AS-i networks

- Operation using a single Monitor configuration!
Monitor processes safety slaves on two AS-i networks
Coupling between the two networks superfluous



BWU2186



BWU2000



BWU2205

Redundant power supply out of AS-i:

- all fundamental functions of the device remain available even in case of power failure in one of the two AS-i networks

16 release circuits

- 4 / 2 release circuits SIL 3, cat. 4 on the monitor
2 x relays + 2 x fast electronic safe outputs resp.
2 x relays

Safe AS-i outputs are supported

- 16 independent AS-i outputs
Multiple safe AS-i outputs possible via a single AS-i address

Monitor configuration can be „arbitrarily“ large

- 256 configuration blocks (previously 48)
Identical reaction time due to artificial limitation to 256 configuration blocks

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data



The AS-i Safety Monitor in stainless steel housing is a safety switching device with 16 independent release circuits. The configuration and commissioning is a simple drag and drop with the program editor ASIMON 3 G2. The configuration data can be stored on the chip card and read back.

With the help of the LCD display and buttons the safety monitor can be operated on the spot. The display is also used for the display of slave addresses and error messages.

The AS-i monitor supports safe outputs, so that sensor-controlled safety components and other safety components up to category 4 / SIL 3 can be connected.

In case an emergency stop should be required or if a fault occurs, the AS-i safety monitor in its protective mode can switch off the system within a response time of 40 ms at most.

Article no.	BWU2000 / BWU2186 / BWU2205
Safety monitor	
Release circuits	4, increaseable up to 16 release circuits
Start delay	< 10 ms
Max. turn-off time	< 40 ms
Card slot	chip card for storage of configuration data
Electrical data	
Operating current	max. 200mA out of AS-i Kreis 1 (approx. 45mA ... 200mA) max. 200mA out of AS-i Kreis 2 (approx. 45mA ... 200mA) in sum max. 245mA
Operating voltage	24V DC (26,5V ... 31,6V out of AS-i)
Voltage of insulation	> 500V
Display	
LCD	indication of slave addresses and error messages in plaintext
LED ready	LED on: start-up/restart-disable active LED flashing: external test necessary

Article no.	BWU2000 / BWU2186 / BWU2205
UL-specifications (UL508)	
External protection	an isolated source with a secondary open circuit voltage of $\leq 30V_{DC}$ with a 3A maximum over current protection. Over current protection is not required when a class 2 source is employed.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.
cTÜV _{us}	the devices • BWU2000 • BWU2186 • BWU2205 from Bihl + Wiedemann GmbH were safety certified by TÜV Rheinland of North America, Inc. according to UL-standards and meet the safety requirements for the North American market.
Standards	EN 61 000-6-2 EN 61 000-6-4 EN 62 061:2005, SIL 3 EN 61 508:2001, SIL 3 EN ISO 13 849-1:2008, performance-level e
Environment	
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Housing	stainless steel
Protection category IEC 60 529	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Dimensions (L / W / H in mm)	120 / 85 / 96
Weight	800 g

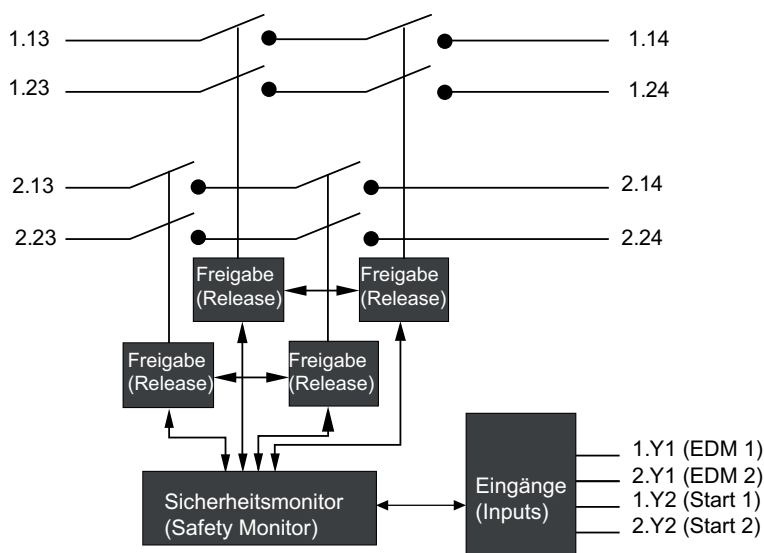
Article no.	BWU2000	BWU2186	BWU2205
Interfaces			
Diagnostics interface	RS 232	RS 232	Ethernet, RJ-45
Baud rates	19,2 kBaud, no parity, 1 start bit, 1 stop bit, 8 data bits	19,2 kBaud, no parity, 1 start bit, 1 stop bit, 8 data bits	–
SAfety Monitor			
Number of release circuits in device	4	2	2
Inputs: EDM/Start	4 x EDM: inputs to monitor external devices 4 x Start: Start inputs switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 µs)	2 x EDM / inputs of external device monitoring circuits 1 and 2 2 x Start / start inputs, output circuits 1 and 2 switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 µs)	2 x EDM / inputs of external device monitoring circuits 1 and 2 2 x Start / start inputs, output circuits 1 and 2 switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 µs)
Outputs: Output switching elements	4 x relay outputs (output circuits 1 and 2) max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V 4 x semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5A DC-13 at 30V	4 x output switching elements, output circuits 1 and 2 max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V	4 x output switching elements, output circuits 1 and 2 max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V
Display			
LED U AS-i / fault	communication error on AS-i line / error lock, release circuit active	–	communication error on AS-i line / error lock, release circuit open
LED U AS-i 1 / U AS-i 2	–	AS-i 1 / AS-i 2 sufficiently voltage supplied	–
LED fault	–	LED on: communication error on AS-i network LED flashing: at least 1 OSSD in state „red flashing“	–

AS-i Safety Monitors in Stainless Steel

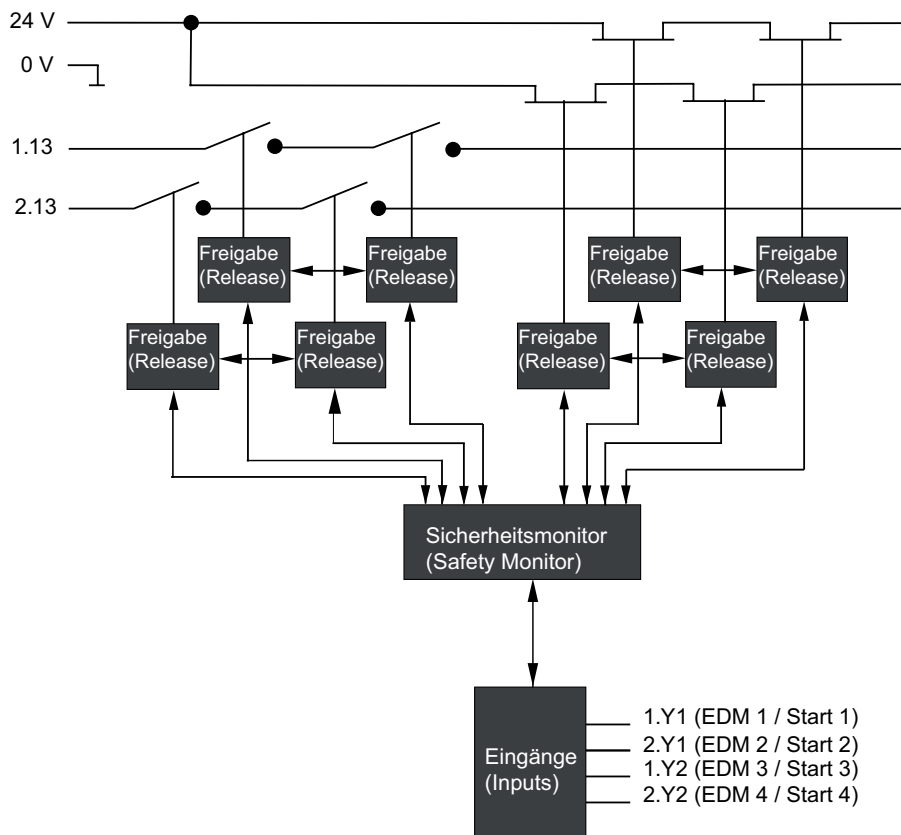
Article no.	BWU2000	BWU2186	BWU2205
2 LEDs channel 1 / channel 2	contacts of the safety outputs (OSSD) are: LED off: open LED on: closed LED flashing: delay time is running at stop category 1	—	contacts of the safety outputs (OSSD) are: LED off: open LED on: closed LED flashing: delay time is running at stop category 1
4 x LED EDM/Start	state of inputs: LED off: open LED on: closed	state of inputs: LED off: open LED on: closed	—
4 x LED output circuits	state of inputs: LED off: open LED on: closed	state of inputs: LED off: open LED on: closed	—
LED AUX	—	auxiliary power	—

Article No.	AS-i Safety outputs are supported	Number of AS-i circuits Safety Monitor	Max. number of release circuits	Configuration blocks	Diagnostics interface
BWU2000	yes	2	16	256 devices	RS 232
BWU2186	yes	2	16	256 devices	RS 232
BWU2205	yes	2	16	256 devices	Ethernet

Safety Monitor block diagram BWU2186, BWU2205

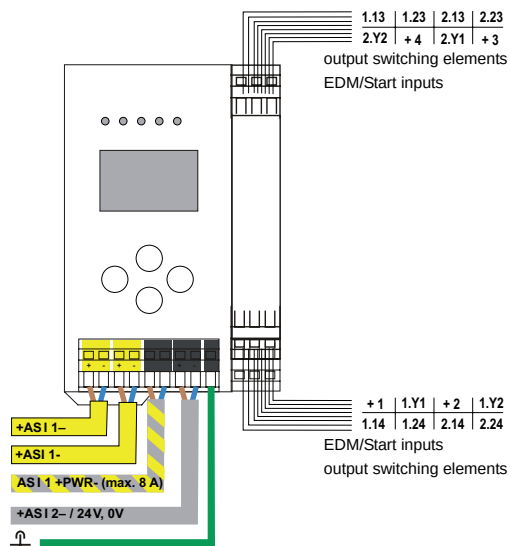


Safety Monitor block diagram BWU2000

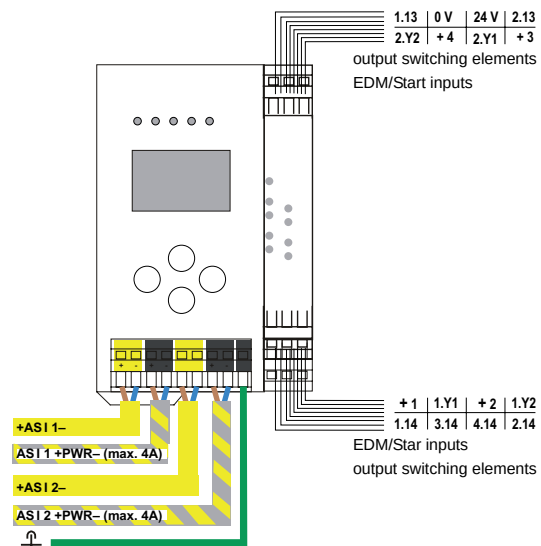


Connections: Safety Monitor

BWU2186, BWU2205



BWU2000



Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 257)
- AS-i Power Supply 4A (art. nr. BW1649) / AS-i Power Supply 8A (art. nr. BW1997), see page 178

BWU2186, BWU2000:

- ASIMON 3 G2 und AS-i Control Tools with serial cable for AS-i Master/Monitors in Stainless Steel (Art.-Nr. BW2071)

BWU2205:

- Software ASIMON 3 G2 and AS-i Control Tools (Art.-Nr. BW2501)

Safety Basic Monitors

2 (4) local electronical safe outputs

Up to 8 / 4 local safe inputs

- optionally the safe inputs will be used as well as standard inputs and signal outputs

Safe AS-i outputs are supported

- max. 8 independent AS-i outputs
multiple safe AS-i outputs possible via a single address

Chip card for storage of configuration data

Protection category IP20



BWU2441 / BWU2567 / BWU2569

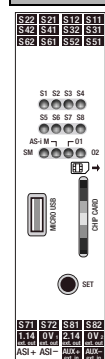


Article no.	BWU2441 / BWU2567 / BWU2569
Connection	
Connection	COMBICON clamp
Safety Monitor	
Respond delay	< 40ms
AS-i Master	
AS-i Master	integrated
Interface	
Interface	USB, chip card slot
AS-i	
AS-i voltage	18 ... 31,6V
Max. AS-i current consumption	200 mA
AUX	
AUX voltage	20 ... 30V (PELV)
Max. AUX current consumption	4A max.
Input	
Supply voltage inputs	of AUX (24V auxiliary power)
Network connection between the safe input terminals	max. resistance 150Ω
Output	
8 / 4 safe inputs cat. 4 or 8 standard in -and outputs	switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100μs)
2 (4) output switching elements	semiconductor outputs (output circuits 1 and 2) max. contact load: 700mA DC-13 at 24V
Supply voltage outputs	of AUX (24V auxiliary power)
Max. output current signal outputs	10mA each output
Max. output current for OSSD supply	1,4A (S71)
Test pulse	when output is switched on minimal distance between 2 test pulses: 250ms, pulse length to 1ms
Display	
4x LEDs S1, S2, S3, S4 (yellow)	state of input S1, S2, S3 and S4
4x LEDs S5, S6, S7, S8 (yellow)	state of input S5, S6, S7 and S8
LED SM (green/yellow/red)	state of Safety Monitor
LED AS-i M (green/yellow/red)	state of AS-i Master
LED O1 (green/yellow/red)	output 1 has switched
LED O2 (green/yellow/red)	output 2 has switched

Article no.	BWU2441 / BWU2567 / BWU2569
1 button	service
Environment	
Applied standards	EN 954-1 Kat 4 EN 61 508:2001 EN 62 061:2005 EN ISO 13 849-1:2008
Housing	DIN-rail mounting
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Protection class DIN 60 529	IP20
Voltage of insulation AS-i/AUX	500V
Dimensions (W / H / D in mm)	22,5 / 99 / 114

Article no.	BWU2441	BWU2567	BWU2569
AS-i Safety Monitor			
Safety Monitor	Safety Basic Monitor	Safety Basic Monitor, successor for AS-i consortial Safety Monitor, compatible replacement	Safety Basic Monitor, enhanced
Optimized to AS-i Monitor operations	no	yes	no
Release circuits	8	8 additional 8 release circuits (9 - 16) for actuating standard AS-i outputs	
Antivalent switches for local inputs	no	yes	
Standstill detectors of local inputs	no	yes	
Electrical data			
Power supply decoupling unit	integrated	–	integrated

BWU2441 / BWU2567 / BWU2569



Clamps	Description
S22, S21, S12, S11	safety input terminal input 1
S42, S41, S32, S31	safety input terminal input 2
S62, S61, S52, S51	safety input terminal input 3
S71, S72, S81, S82	safety input terminal input 4
1.14 _{ext.out}	semiconductor output 1
2.14 _{ext.out}	semiconductor output 2
0 V _{ext.out}	mass connection for semiconductor output
AS-i+, AS-i-	connection to the AS-i Bus
	Micro USB
AUX+ _{ext.in} , AUX- _{ext.in}	power supply input

Accessories:

- Software ASIMON 3 G2 and AS-i Control Tools (art. no. BW2501, see page 298)
- AS-i Safety 4I/2O Module, 8 / 4 safety inputs and 2 (4) electronical safety outputs in IP20 (art. no. BWU2314, see page 270) as supplementary module
- AS-i Speed Monitor (art. no. BWU2427, see page 266) as supplementary module
- USB cable for Safety Basic Monitor (art. no. BW2530, see page 298)

Safety Basic Monitor Starter Kit



THE AS-INTERFACE MASTERS

Safety Basic Monitor Starter Kit

**Limited quantity
—
only while stocks last.**



Article no. BW2512

The Safety Basic Monitor (BWU2569) is supplied in a suitable case with

- 1 USB connector cable for Safety Basic Monitor (BW2530)
- 1 emergency stop button with plug-in-shoe connection (BW2527)
- 1 24V mains power supply
- 4 rocker switch
- 1 screwdriver
- Programming software ASIMON and AS-i Control Tools for Safety Monitors and AS-i Masters (BW2501)

More information about the aforementioned articles can be found online at www.bihl-wiedemann.de.

AS-i Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

Price Lists

Safe contact expander

Safe contact expander

1 or 2 independent channels

4 contact sets per channel



BWU2539

BWU2548

Article no.	BWU2539 / BWU2548
General data	
Type of device	safe contacts, instantaneous
Number of contact sets per channel	4
Input	
Signal level	0-signal: < 2,4V DC 1-signal: 18 ... 26,5V DC
Permissible test pulse time	max. 1,5 ms
Rated current	60mA per channel
Output	
Connection	force-guided
Short circuit protection of output circuits (external)	3A quick; 2A slow
Electrical life (switching operations)	AC1 (360 S/h) ca. 100 000
Operate delay / delay time	< 20 ms / <20 ms
Switching frequency	15Hz
Rated impulse voltage	4 kV ¹
Contact load EDM (1.51, 1.52 and 2.51, 2.52)	
Switching current	max. 20mA
Contact load contact set (1.13, 1.14, 1.23, 1.24 and 2.13, 2.14, 2.23, 2.24)	
Switching voltage AC	10 ... 230V
Switching voltage DC	10 ... 230V
Insulation to input	double insulation
Switching current	5mA... 3A
Contact load contact set (1.33, 1.34, 1.43, 1.44 and 2.33, 2.34, 2.43, 2.44)	
Switching voltage AC	10 ... 230V
Switching voltage DC	10 ... 230V
Insulation to input	basic insulation
Switching current	5mA... 3A
Total current (per channel)	12A (see "Diagram: Total current through all the contact sets of a channel:")
Usage category (DIN EN60 347-4-1 / EN 60 947-5-1)	AC1: 230V/3A (ca. 150 x 10 ³ cycles) AC 15: 230V/3A (ca. 80 x 10 ³ cycles) DC 1: 24V/3A (ca. 500 x 10 ³ cycles) DC 13: 24V/3A/0,1 Hz (ca. 50 x 10 ³ cycles)
B _{10d} (AC15)	1,96 x 10 ⁶ cycles
B _{10d} (DC13)	780 x 10 ³ cycles
LED displays	
LED 1 (CH 1)	safe input 1
LED 3 (EDM 1)	EDM channel 1
Environment	
Overvoltage category	III
Degree of pollution	2
Ambient temperature	-20°C ... 50°C (-4°F ... 122°F)

Article no.	BWU2539 / BWU2548
Storage temperature	-40°C ... 70°C (-40°F ... 158°F)
Relative humidity	not condensing
Mechanical lifetime	approx. $10 \times 10^{6\text{swi}}$
Protection class (DIN 60 529)	housing IP20 (only suitable for use in electrical operating rooms / control cabinets with IP54 minimum protection rating)
Dimensions (L / W / H in mm)	99 / 22,5 / 114

1. Safe isolation, reinforced insulation and 6 kV between A1/A2, 51/52, 43/44, 33/34 and 23/24, 13/14. Outputs one below the other have basic insulation.

Article no.	BWU2539	BWU2548
Number of independent channels	2	1
LED 2 (CH 2)	safe input 2	—
LED 4 (EDM 2)	EDM channel 2	—
Mass	270 g	200 g

Connection examples:

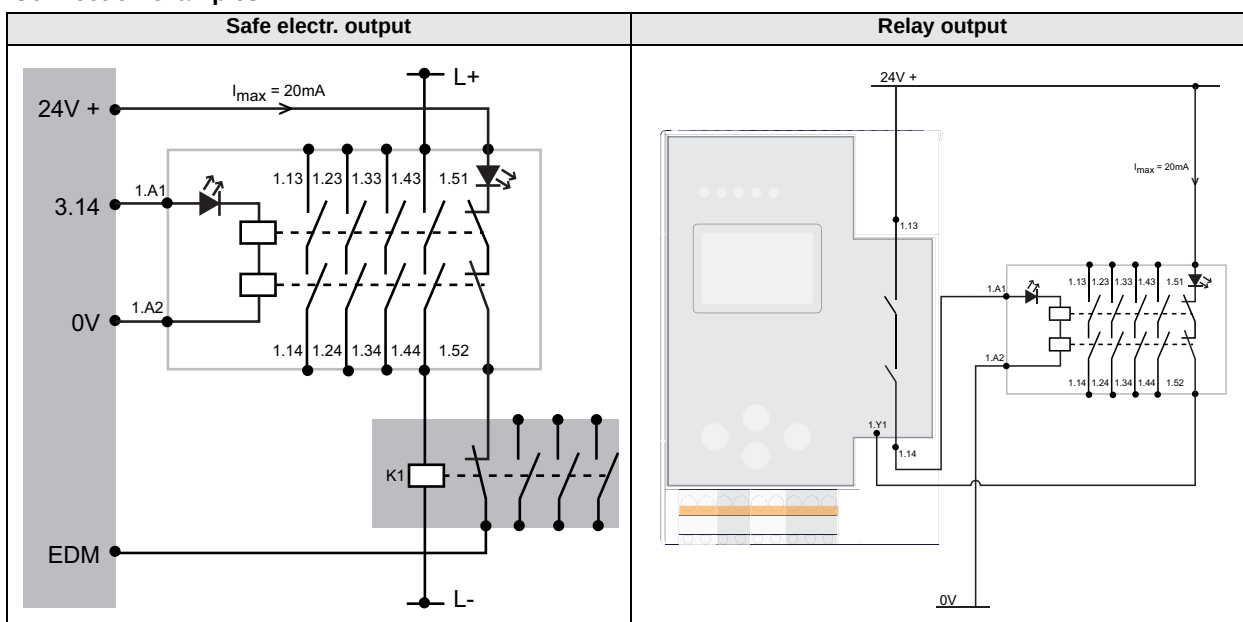
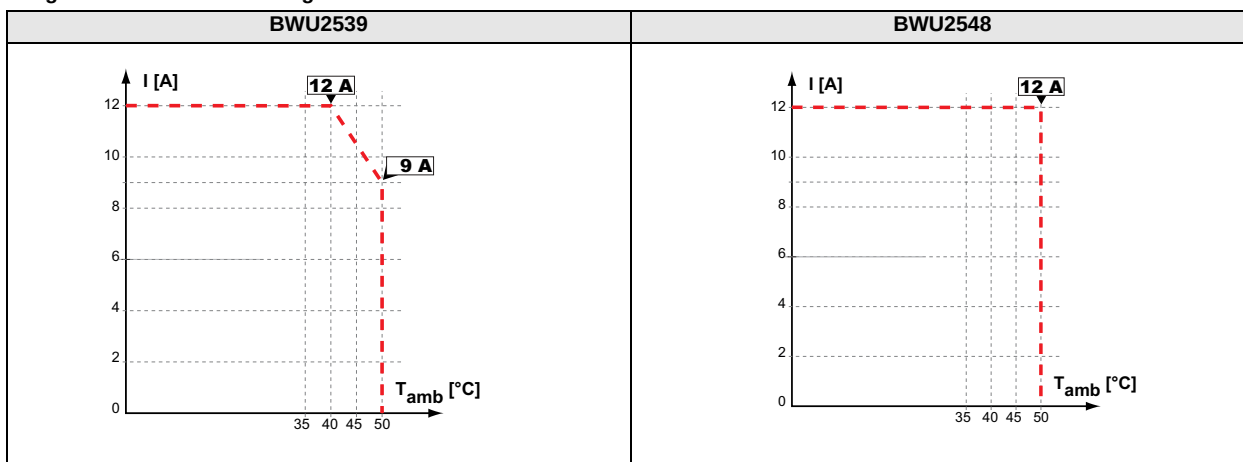
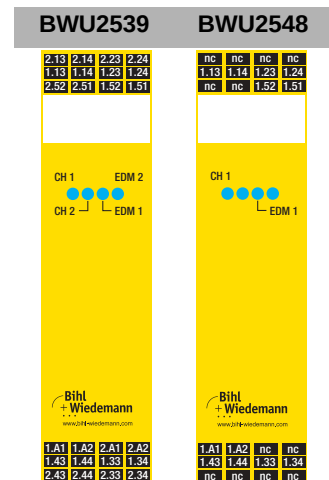


Diagram: Total current through all the contact sets of a channel:



Safe contact expander

BWU2539	BWU2548
output channel 1.1: terminals 1.13, 1.14 output channel 1.2: terminals 1.23, 1.24 output channel 1.3: terminals 1.33, 1.34 output channel 1.4: terminals 1.43, 1.44	
output channel 2.1: terminals 2.13, 2.14 output channel 2.2: terminals 2.23, 2.24 output channel 2.3: terminals 2.33, 2.34 output channel 2.4: terminals 2.43, 2.44	—
EDM (feedback circuit) channel 1: terminals 1.51, 1.52	
EDM (feedback circuit) channel 2: terminals 2.51, 2.52	—
channel 1 working contacts 1.A1, 1.A2	
channel 2 working contacts 2.A1, 2.A2	—
BWU2539	BWU2548



AS-i Safety Monitor

Emergency stop control device

2 release circuits

Meets safety-relevant standards
up to category 4/SIL 3



The AS-i Safety Monitor allows the connection of Safety at Work slaves for safety-relevant tasks.

During intended connection the AS-i Safety Monitor permits the use of sensor-steered safety devices and further safety parts up to category 4 by EN 954-1.

Likewise the prescribed emergency stop function can be taken over by the AS-i Safety Monitor for all not hand-guided machines

and furthermore the dynamic monitoring of the restart and the contactor control function.

Further the use of extensive logic components is made available. Also the grouping of AS-i slaves (e.g. to the partial disconnection of machines) is possible.

Article no.	BW1764 / BW1765
Connection	
Connections	screw terminals
General data	
Start delay	< 10 s
Respond delay	< 40 ms
Safety Monitor	advanced monitor
Electrical data	
Interface	RS 232
Baud rate	9 600 Baud, no parity, 1 start bit, 1 stop bit, 8 data bits
Operating voltage	24V DC (26,5 ... 31,6V out of AS-i)
Button	1 (Service)
Display	
LED green	contacts of the safety outputs (OSSD) are: out: open lighting: closed flashing: delay time is running at stop category 1
LED yellow	lighting: start lock/restart lock active flashing: external test necessary
LED red	contacts of the safety outputs (OSSD) are: lighting: open / flashing: error
LED green (POWER)	AS-i voltage OK
LED red (AS-i)	communication error
Environment	
Operating temperature	-20°C ... +60°C
Storage temperature	-30°C ... +70°C
Housing	DIN-rail mounting
Protection category	housing IP20
Standards	EN 50 295 EN 60 947-5-1 IEC61508 (bis SIL 3) IEC 61 496-1, EN 610 204-1 EN 1088 EN 418 EN 954-1 (up to category 4)
Dimensions (L, W, H)	105 / 45 / 120

Article no.	BW1764	BW1765
Release circuits	1-channel	2-channel
Operating current	approx. 150 mA out of 24V DC approx. 45 mA out of AS-i	approx. 200 mA out of 24V DC approx. 45 mA out of AS-i
Weight	360 g	450 g

Accessories:

- Programminng software ASIMON with cable (article no. BW1770)
- Interface cable for connection of the Safety Monitor to the PC (article no. BW1771)
- Interface cable for connection of 2 Safety Monitors (article no. BW1772)

AS-i Master/Gateways/ Links/Scanner	
AS-i Slaves	
AS-i Accessories/ Diagnostics/Development	
Other Fieldbuses/ Master Simulators	
AS-i Safety	
Price Lists	

Overview AS-i Safety Slaves

Housing	Module	Art. No.	Characteristics	P.
	AS-i Speed Monitor	BWU2427	2 independent axis, chip card	266
	Speed Monitor head unit and Speed Monitor for 2 axis	BW2538	prewired complet set, parameterization of the speed via USB, monitoring up to 40 axis with expansion modules possible	267
	Connecting cable for Speed Monitor	BW2476 BW2477 BW2494	connector-ferrule connector-ferrule plug-plug	268
	Adapter for Speed Monitor	BW2497 BW2499	AMP Mini-I/O connector for e.g. Elau MC-4 AMP Mini-I/O connector for e.g. B+R Acopos Sin Cos Interface	269
	AS-i Safety In-/Output Module	BWU2314	8 / 4 safety inputs and 2 (4) electronical safety outputs	270
		BWU2236	relay output module with diagnostic slave, 1 EDM- and 2 / 1 safety inputs	272
	AS-i Safety Output Module	BWU2045 BWU2173	relay output module with diagnostic slave and 1 EDM input output module with diagnostic slave, 1 EDM input, 3I and 2O	276 280

Housing	Module	Art. No.	Characteristics	P.
	AS-i Safety Input Module (M12)	BWU2270	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP67, AS-i connection via profile cable	284
		BWU2284	2 / 1 safety inputs (2 channels) for floating contacts, protection category IP67, AS-i connection via profile cable	
		BWU2369	2 / 1 safety inputs (2 channels) for floating contacts, protection category IP67, AS-i connection via M12	
		BWU2370	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP67, AS-i connection via M12	
	AS-i Safety Input Module	BWU1939	2 / 1 safety inputs (2 channels) for floating contacts, protection category IP20	286
		BWU2577	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP20	
	Emergency stop- and push button modules	BW2529	AS-i Safety stop button module, lighted (red/green), IP65, M12	288
		BW2527	Emergency stop button with plug-in-shoe connection	
		BW2528	AS-i light button module, 2 buttons each 2-colored lighted (red/green), IP65, M12	
	AS-i Safety OEM Slave	BW2426	with 2 safe inputs and 2 standard outputs, supply out of AS-i, LED display, potted, with connection line	290
		BW2521	with 2 safe inputs and 2 standard outputs, supply out of AS-i, LED display, potted, with pin connection	
		BW1896	with screw terminals	292
		BW1751	with plug-in screw terminals	
		BW1801	with wiring pins	
		BW1934	no connection	
	AS-i OEM Slave	BW2522	with 2 standard inputs and 2 standard outputs, supply out of AS-i, LED display, potted, with pin connection	290
		BW2574	with 2 standard inputs and 2 standard outputs, supply out of AS-i, LED display, potted, with connection line	

Housing	Module	Art. No.	Characteristics	P.
	AS-i Substructure Module in IP67	BW2349	for 4-channel module in 45 mm-housing	294
		BW2350	for 4-channel module in 45 mm-housing, centerline spacing CNOMO	
		BW2351	for 8-channel module in 60 mm-housing, centerline spacing CNOMO	

AS-i Speed Monitor

Supplied by AS-i and external 24 V

Chip card

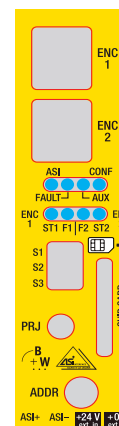


Article no. BWU2427

The Speed Monitor controls the speed of maximum two axis and gives a sure signal to the AS-i Bus, when the speed is below a preset threshold.

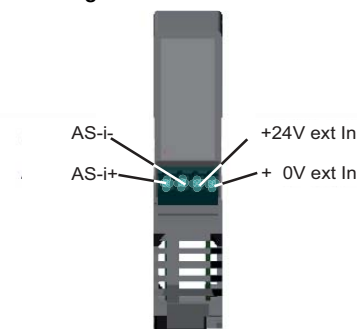
Article no.	BWU2427
Connection	4-fold COMBICON clamp and 2 AMP Mini-IO plug connections
AS-i profile	safe input slaves: S-0.B.E., ID1=F diagnostic slaves: S-7.A.5., ID1=7 (default)
AS-i voltage	18-31,6 V
Max. AS-i current consumption	150 mA
AUX voltage	18-30 V
Max. AUX current consumption	200 mA
Voltage of insulation AS-i/AUX	500 V
Inputs	2x encoder
Parameterisation range for the speed limit	25 Hz-200 kHz
Supply voltage	out of AS-i and 24 V external
Displays	
LED 1 green (ASI)	AS-i voltage present
LED 2 red (FLT)	offline
LED 3 green (AUX)	24 V DC AUX present
LED 4 yellow (CONF)	OFF = normal mode
LED 5 yellow (ST1)	state encoder 1 (ENC 1)
LED 6 yellow (F1)	safety, low frequency or zero-speed axis 1
LED 7 yellow (F2)	safety, low frequency or zero-speed axis 2
LED 8 yellow (ST2)	state encoder 2 (ENC 2)
Applied standards	EN 62 061:2005 SIL 3 EN 954-1 cat. 4 EN ISO 13 849-1:2008/PLe
Housing	Phoenix-ME-MAX housing
Storage temperature	0°C ... +55 °C
Operating temperature	-25°C ... +85 °C
Tolerable loading referring to humidity	according to EN 61 131-2
Protection class DIN 60 529	housing IP20
Dimensions (L / W / H in mm)	99 / 22,5 / 114

Connections, switches, chip card



ENC 1 rotary encoder 1
ENC 2 rotary encoder 2
S1, S2, S3 function selector switch
CHIP CARD chip card
PRJ projecting button
ADDR address socket

Terminal assignment



Accessories:

- Cable: BW2476, BW2477, BW2494
- Adapter: BW2497
- Rotary encoder simulator: BW2506

Speed Monitor head unit and Speed Monitor for 2 axis

Speed Monitor head unit

and

Speed Monitor for 2 axis

Spring-type terminals

Prewired



Article no. BW2538

The article BW2538 consists of the following:

- AS-i Speed Monitor (BW2427)
- Safety Basic Monitor (BW2441)

More information about these articles can be found at www.bihl-wiedemann.de

Connecting cable for Speed Monitor

Connection cable safety Speed Monitor

Connection cable for the connection of rotary encoder



Article no. BW2476: connection cable, 1,5 m, connector-ferrule

Article no. BW2477: connection cable, 5,0 m, connector-ferrule

Article no. BW2494: connection cable, 1,5 m, plug-plug

Art. no.	BW2476	BW2477	BW2494
Application	for the connection of rotary encoders, shielded		
Achievement	connector-ferrule		plug-plug
Cable			
Wire	0,2 mm², 3 pairs, copper alloy		
Casing	Ø 5,89 mm, color: chrome, material: PVC		
Resistance cable	78,7Ω/km		
Resistance shield	55,8Ω/km		
Shield	aluminium polyester		
RoHS-compliant	yes		
Length	1,5 m	5,0 m	1,5 m
Connector			
Insertion force	30N/8P max.		
Terminating resistor	50mΩ max.		
Operating voltage	30 V AC		
Nominal current	1 A		
Insulation resistance	500MΩ min.		
Housing	engineering plastic (UL 94V-0), surface: complete NI coat		
Contacts	Copper alloy		

Cross section:

Contacts:

1	2	1 B / sin sw
		2 B / sin gn
3	4	3 nc
		4 nc
5	6	5 A / cos ws
		6 A / cos sw
7	8	7 Ub rt
		8 GND sw

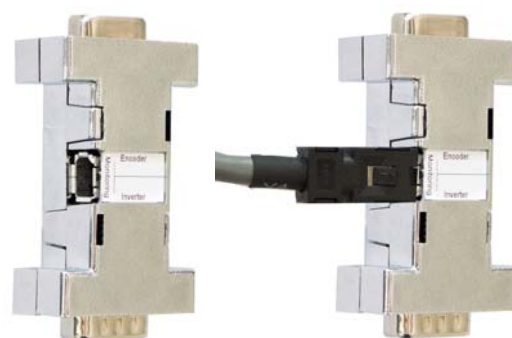
The pairs are always twisted

BW2476/BW2477

BW2494



Overview adapter for Speed Monitor



The adapters are designed for attachment between frequency inverter and feedback cable. All pins are wired 1:1.

The connection for speed monitoring is led laterally out.

Article no.	Plug type	Pole connector	Pole socket	Output Speed Monitor	Pin Sin	Pin Sin	Pin Cos	Pin Cos	GND	Suitable for e.g.
BW2497	Sub-D	9	9	AMP Mini-I/O connector	2	1	4	3	9	Elau MC-4
BW2499	Sub-D	15	15	AMP Mini-I/O connector	3	11	1	9	2	B+R Acopos Sin Cos Interface

Further occupancy possibilities are available on request.

Accessories:

Connecting cable 1,5 m, plug-plug (art. no. BW2494)

AS-i Safety 4I/2O Module, 8 / 4 safety inputs and 2 (4) electronical safety outputs in IP20

AS-i Safety 4I/2O Module

AS-i Safety Module with 8 / 4 safety inputs and 2 (4) electronical safety outputs

Optimal costs for safety in- and outputs on AS-i

Module width of 22.5 mm for optimal use of space in the service cabinet

Universal module for as many use cases, optimized for service and commissioning

Protection category IP20



Article no. BWU2314

Technical realisation:

- It may be less signals are processed. The module uses only the necessary AS-i addresses.
- If the safety input E2 is not needed, the protection feedback can optionally connected on E2. The transfer occurs as usual on the diagnostic slave Diagnoseslave of the safety AS-i outputs.
- No limitation of cable length at safety inputs (the maximum loop resistance is 150 Ohm).
- 8 / 4 safety inputs for floating contacts, 2 / 1 safety input optionally for optical protective equipment.
- Fast preprocessing: The response time from the disconnection of the local OSSD input to the shutdown of the output is optionally less than 5 ms.

- A secure signal exchange of 2 signals between Safety Monitor and AS-i Safety Module as well as between two AS-i Safety Modules is possible.

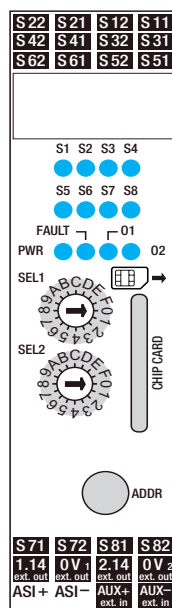
Diagnosis and commissioning:

- LED displays according to other Safety Slaves or to the Monitor.
- Simple selection of AS-i Slaves with the help of two rotary switches. The addressing occurs, as usual, via an AS-i addressing device or the AS-i Master.
- Chipcard for the simple exchange.
- Fixed Safety Code series for each AS-i address. Each module generates by same address programming same code series.

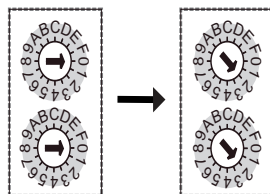
Article no.	BWU2314
Connection	COMBICON clamp
AS-i profile	safety input slaves: S-0.B.F.0 diagnostic slaves: S-7.A.5.E
AS-i voltage	22 ... 31,6 V
Max. AS-i current consumption	200 mA
AUX voltage	20 ... 30 V (PELV)
Max. AUX current consumption	4 A max.
Voltage of insulation AS-i/AUX	500 V
Inputs	8 / 4 safety inputs for floating contacts E3 + E4 optionally for optical protective equipment switching current statical 4 mA at 24 V, dynamic 30 mA at 24 V (T=100 µs)
Supply voltage inputs	out of 24 V auxiliary power
Input level	10 mA, R < 150 Ohm
Outputs	2 (4) output switching elements (semiconductor) max. contact load: 0,7 A DC-13 at 30 V
Supply voltage outputs	out of 24 V auxiliary power
Max. output current for OSSD supply	1,4 A
Test pulse	when output is switched on minimal distance between 2 test pulses: 250 ms, pulse length to 1 ms
Indicators	
4 x LEDs yellow (S1, S2, S3, S4)	state of input S1, S2, S3 and S4
4 x LEDs yellow (S5, S6, S7, S8)	state of input S5, S6, S7 and S8
LED green (PWR)	AS-i power supply
LED red (FAULT)	AS-i error LED

AS-i Safety 4I/2O Module, 8 / 4 safety inputs and 2 (4) electronical safety outputs in IP20

Article no.	BWU2314
LED yellow (O1)	output 1 has switched
LED yellow (O2)	output 2 has switched
Applied standards	EN 954-1 Cat 4 EN 61 508:2001 EN 62 061:2005 EN ISO 13 849-1:2008
Housing	DIN-rail mounting
Storage temperature	0°C ... +55 °C
Operating temperature	-25°C ... +85 °C
Tolerable loading referring to humidity	according to EN 61 131-2
Protection class DIN 60 529	housing IP20
Dimensions (L / W / H in mm)	99 / 22,5 / 114,5



Clamps	Description
S22, S21, S12, S11	safety input terminal input 1
S42, S41, S32, S31	safety input terminal input 2
S62, S61, S52, S51	safety input terminal input 3
S71, S72, S81, S82	safety input terminal input 4
1.14 _{ext.out}	semiconductor output 1
2.14 _{ext.out}	semiconductor output 2
0 V _{1 ext.out} , 0 V _{2 ext.out}	mass connection for semiconductor output
AS-i+, AS-i-	connection to the AS-i-Bus
ADDR	address socket
AUX+ _{ext.in} AUX- _{ext.in}	power supply input



Addressing	
POS	Acceptation
0-0	RUN
1-1	addressing Safety Input 1
2-2	addressing Safety Input 2
3-3	addressing Safety Input 3, contacts
4-4	addressing Safety Input 4, contacts
5-5	addressing Safety Input 3, OSSD (see manual for details)
6-6	addressing Safety Input 4, OSSD (see manual for details)
7-7	addressing Safety Output 1
8-8	addressing Safety Output 1, diagnostic
9-9	addressing Safety Output 2
A-A	addressing Safety Output 2, diagnostic
D-D	reset to factory defaults

AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM- and 2 / 1 safety inputs



THE AS-INTERFACE MASTERS

Safety + standard I/O in one module

Safety relay output with galvanically isolated contact sets,
approved up to 230 V

Additionally 1 EDM input, 2 / 1 safety inputs

EN 954-1 Cat 4, IEC 61 508 SIL 3, EN 13 849-1/PLc Cat 4, EN IEC 62 061 SIL 3

Protection category IP20



Article no. BWU2236

The stainless steel AS-i Safety Monitor controls the safety relays of the AS-i Safety Relay Output Module by using a safety AS-i single address. To set the safety AS-i address, the dip-switch has to be in the ON/PRG position. Addressing can then be accomplished by using an AS-i addressing device, for example. Several AS-i Safety Relay Output modules can have the same safety address and can be controlled

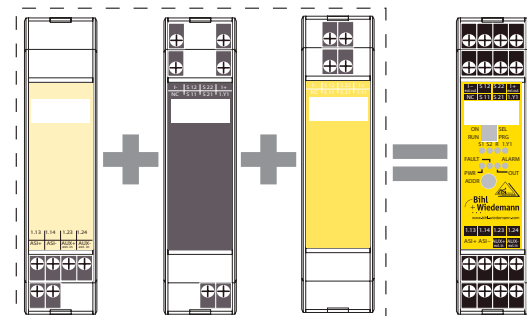
via this same safety address on a AS-i circuit. All AS-i Safety Relay Output Modules with the same safety address are controlled simultaneously.

In addition to the safety single address the module also supports an AB-address e.g. used to transmit the states of the standard inputs and a safety input address.

Article no.	BWU2236
Inputs	1 EDM, diagnostic, 2 / 1 safety inputs (Cat. 4/SIL 3)
Outputs	1 relay 3 A, 24 V, DC-13 or 3 A, 230 V, AC-15
Max. resistance between S 11 - S12; S 21 - S 22	150 Ohm
AS-i profile diagnostic AB slave	S-7.A.E
ID1 Code diagnostic AB slave	5 _{hex} (default), value modifiable
AS-i profile safety input	S-7.B.0
ID1 Code safety input	F _{hex} (default), value modifiable
External device monitoring (EDM)	reference potential over I+, I-
Indicators	
2 x LED yellow (S 1, S 2)	state of safety inputs (S 11 - S 12, S 21 - S 22)
1 x LED yellow (R)	release status
1 x LED yellow (1.Y1)	state of EDM input 1.Y1
LED green (PWR)	AS-i voltage ON
LED red (FAULT)	AS-i Fault
LED yellow (OUT)	for definition see table "device colors"
LED red (ALARM)	PLC indicates alarm
Current input out of AS-i	< 200 mA
Operating voltage	AS-i (30 V _{DC})
AUX _{ext. in} voltage supply	24 V _{DC} (± 20%)
Voltage of insulation (relay contact for AS-i resp. AUX _{ext. in})	≥ 6 kV
Current input out of AUX _{ext. in}	< 30 mA
Voltage of insulation AS-i to AUX _{ext. in}	≥ 500 V
Current capacity max. I+	max. 100 mA

BWU2236: 3 AS-i modules in one housing!

safety relay output 1 diagnostic- and 1 EDM input safety input (2 channels) BWU2236



safety address AB address safety address 2 safety addresses + AB address

AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM- and 2 / 1 safety inputs

Article no.	BWU2236
Applied standards	EN 954-1 Cat 4 IEC 61 508 SIL 3 EN 13 849-1/PLc Cat 4 EN IEC 62 061 SIL 3
Housing	din-rail mounting
Ambient operating temperature	0°C ... +55 °C
Storage temperature	-25°C ... +85 °C
Dimensions (L / W / H in mm)	114 / 22,5 / 99
Protection class DIN EN 60 529	IP20 (only for use in electrical service rooms / cabinets with minimum IP54 protection suitable)

Diagnostic Slave

(Programming instructions (Bit values of the inputs/outputs, AB slave))

Bit	AS-i output	Bit	AS-i input
00	1: Alarm LED <i>on</i> 0: Alarm LED <i>off</i>	I0	Diagnostic (for definition see table "device colors")
01	Parameter P1=1 not used	I1	
	Parameter P1=0 1: output controlled by safety release 0: inhibits output on irrespective of safety release		
02	not used	I2	
03	inexistent	I3	Parameter P2=0 1: feedback for user: <i>safety release on</i> 0: feedback for user: <i>safety release off</i>
			Parameter P2=1 1.Y1

Peripheral fault indicates unavailable 24 V ext.

Diagnostic (device colors)

Value	Color	Description	State change	LED "Out"
0	green	output on		on
1	green flashing	—		—
2	yellow	restart inhibit	auxillary signal 2	1 Hz
3	yellow flashing	—		—
4	red	output off		off
5	red flashing	waiting for "reset of error condition"	auxillary signal 1	8 Hz
6	grey	internal error, such as "fatal error"	only via "Power On" on device	all LEDs flashing
7	green/yellow	output released, but not switched on	switching-on by setting of O1	off

Programming instructions Diagnostic Slave (bit values of the AS-i parameter)

Bit P1	
P1=1	safety output controlled by safety release only
P1=0	safety output controlled by output O1 in addition to safety release
Bit P2	
P2=1	input 1.Y1 at AS-i bit I 3
P2=0	feedback for user: release <i>on</i>
Bits P0, P3:	
not used	

AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM- and 2 / 1 safety inputs

Release		AS-i Safety Relay Output Module, safety release from the AS-i safety monitor...	
		... not received	... received
AS-i parameter (AB slave) changes the function of output bit O1	AS-i Parameter P1=1 (default) O1=0	safety output contact set open	safety output contact set closed
	AS-i Parameter P1=1 O1=1	safety output contact set open	safety output contact set closed
	AS-i Parameter P1=0 O1=0	safety output contact set open	safety output contact set open
	AS-i Parameter P1=0 O1=1	safety output contact set open	safety output contact set closed

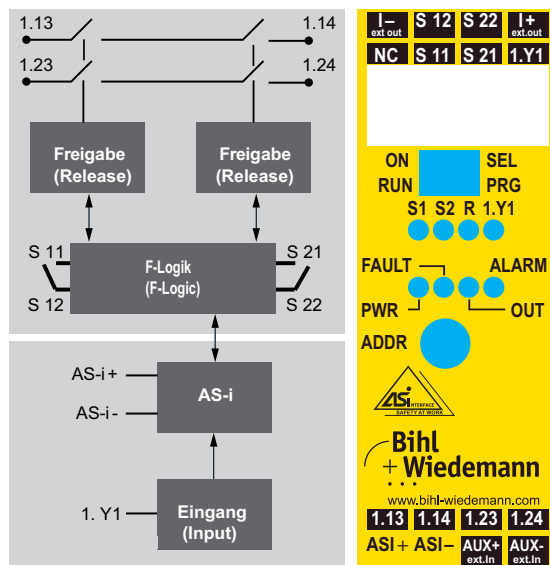
Safety input

Programming instructions (bit values of the safety input address)

Bit	AS-i output	Bit	AS-i input
	outputs not used	I0, I1	safety input S 1
		I2, I3	safety input S 2

Peripheral fault indicates cross-connection between the safety inputs.

Operating elements and clamp assignment



Clamps	Description
S11, S12, S21, S22	safety input clamps
1.13, 1.14	safety output contact set 1
1.23, 1.24	safety output contact set 2
I ⁻ ext. out	reference potential for EDM-/start input (1. Y1)
I ⁺ ext. out	
1. Y1	EDM / start input
AS-i+, AS-i-	AS-i network connection
AUX ⁺ ext.in	voltage supply for safety input (24 V _{DC} ext.)
AUX ⁻ ext.in	

LEDs	State	Signal / Description
PWR (green)	no operating voltage	
	operating voltage present, safety-related AS-i address and/or AS-i AB address is „0“ or no 24 V ext. in (auxiliary power)	
	operating voltage present	
FAULT (red)	AS-i communication OK	
	no 24 V ext. in (auxiliary power)	
	no data exchange with AB slave and/or safety-related AS-i address	

AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM- and 2 / 1 safety inputs

OUT (yellow)		output relays contacts open
		restart inhibit, waiting for the start signal, the output relays switch-on after the start signal
		device is in unlockable error state. Waiting for "reset of error condition signal". After receiving this signal the device follows up with normal operation.
		output relays contacts closed
ALARM (red)		AS-i output bit 0 is <i>not</i> set
		AS-i output bit 0 is set
S1, S2, 1.Y1 (yellow)		the corresponding input is <i>not</i> connected
		the corresponding input is connected
S1, S2 (yellow)		cross-connection at the safety inputs
R (yellow)		release not issued
		release issued
S1, S2, R, 1.Y1 (yellow)		(running light) switch is adjust to ON/PRG position

 LED on  LED flashing  LED off

	In case all LEDs are blinking simultaneously in fast rythm a fatal error has been detected. This message is reset by a short-run disconnection of the power supply (Power On Reset).
---	---

AS-i Safety Relay Output Module with Diagnostic Slave and 1 EDM input

Bihl + Wiedemann

THE AS-INTERFACE MASTERS

Safety + standard I/O in one module

**AS-i Safety relay output with galvanically isolated contact sets,
approved up to 230 V**

EN 954-1 Cat 4, IEC 61 508 SIL 3, EN 13 849-1/PLe Cat 4, EN IEC 62 061 SIL 3

Protection category IP20



Article no. BWU2045

The stainless steel AS-i Safety Monitor controls the safety relays of the AS-i Safety Relay Output Module by using a safety AS-i single address. To set the safety AS-i address, the dip-switch has to be in the PRG position. Addressing can then be accomplished by using an AS-i addressing device, for example. Several AS-i Safety Relay Output modules can have the same safety address and can be controlled via this same safety address on a AS-i circuit. All AS-i Safety Relay Out-

put Modules with the same safety address are controlled simultaneously.

In addition to the safety single address the module also supports an AB-address e.g. used to transmit the states of the standard inputs. To set the AB address of the inputs, e.g. with an AS-i addressing device, the dip-switch has to be in the RUN position.

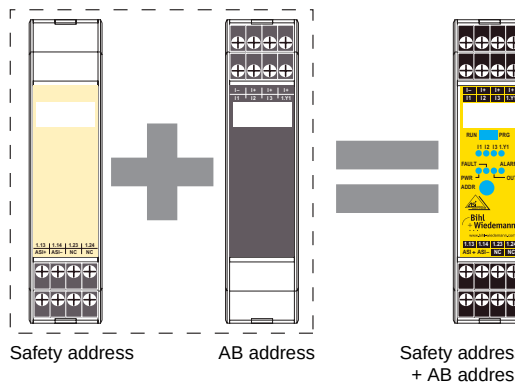
Article no.	BWU2045
Inputs	1 diagnostic + 1 EDM
Outputs	1 relay 3 A, 24 V, DC-13 or 3 A, 230 V, AC-15
AS-i profile	S.7.A.E
ID1 Code	5 _{hex} (default), value modifiable
External device monitoring (EDM)	supplied out of AS-i, approx. 24 V, approx. 10 mA
Indicators	
3 x LED yellow (I1, I2, I3)	state of standard inputs I1, I2, I3
1 x LED yellow (1.Y1)	state EDM input 1.Y1
LED green (PWR)	AS-i voltage ON
LED red (FAULT)	AS-i Fault
LED yellow (OUT)	for definition see table "device color"
LED red (ALARM)	PLC indicates alarm
Operating current	< 200 mA
Current supply of sensors	90 mA
Operating voltage	AS-i (30 V _{DC})
Voltage of insulation	≥ 6 kV
Applied standards	EN 954-1 Cat 4 IEC 61 508 SIL 3 EN 13 849-1/PLe Cat 4 EN IEC 62 061 SIL 3
Housing	Din-rail mounting
Ambient operating temperature	0°C ... +55 °C
Storage temperature	-25°C ... +85 °C
Dimensions (L / W / H in mm)	114 / 22,5 / 99
Protection class DIN EN 60 529	Housing IP20

BWU2045: 2 AS-i modules in one housing!

1 safety relay
output

1 diagnostic- and
1 EDM input

BWU2045



AS-i Safety Relay Output Module with Diagnostic Slave and 1 EDM input

Diagnostic operation ID1 = 5_{hex} (default)

Programming instructions (Bit values of inputs/outputs Diagnostic Slave)

Bit	AS-i output	Bit	AS-i input
O0	1: Alarm LED <i>on</i> 0: Alarm LED <i>off</i>	I0	Diagnostic (for definition see table device colors)
O1	Parameter P1=1 Parameter P1=0	I1	
	not used 1: output controlled by safety release 0: inhibits output on irrespective of safety release	I2	
O2	not used	I3	1.Y1
O3	inexistent		

Diagnostic (device colors)

Value	Color	Description	State change	LED "Out"
0	green	output on		on
1	green flashing	–		–
2	yellow	restart inhibit	auxillary signal 2	1 Hz
3	yellow flashing	–		–
4	red	output off		off
5	red flashing	waiting for "reset of error condition"	auxillary signal 1	8 Hz
6	grey	internal error, such as "fatal error"	only via "Power On" on device	all LEDs flashing
7	green/yellow	output released, but not switched on	switching-on by setting of O1	off

Programming instructions

Programming instructions Diagnostic Slave (bit values of the AS-i parameter)

Bit P1	
P1=1	safety output controlled by safety release only
P1=0	safety output controlled by output O1 in addition to safety release
Bits P0, P2, P3:	
not used	

Release		AS-i Safety Relay Output Module, safety release from the AS-i safety monitor...	
		... not received	... received
AS-i Parameter (Diagnostic Slave) changes the function of output bit O1	AS-i Parameter P1=1 (default) O1=0	safety output contact set open	safety output contact set closed
	AS-i Parameter P1=1 O1=1	safety output contact set open	safety output contact set closed
	AS-i Parameter P1=0 O1=0	safety output contact set open	safety output contact set open
	AS-i Parameter P1=0 O1=1	safety output contact set open	safety output contact set closed

3l standard inputs (instaed of diagnostic) ID1=7_{hex}, or ID1=F_{hex}

Connection of sensors

Programming instructions (Bit values of inputs/outputs AB-Slave)

Bit	AS-i output	Bit	AS-i input
O0	1: Alarm LED <i>on</i> 0: Alarm LED <i>off</i>	I0	I1
O1	Parameter P1=1 Parameter P1=0	I1	I2
	not used 1: output controlles by safety release 0: inhabits output on irrespective of safety release	I2	Parameter P2=0 Parameter P2=1
O2	not used	I3	1: feedback for user: <i>safety release on</i> 0: feedback for user: <i>safety release off</i>
O3	inexistent	I3	1.Y1

AS-i Safety Relay Output Module with Diagnostic Slave and 1 EDM input

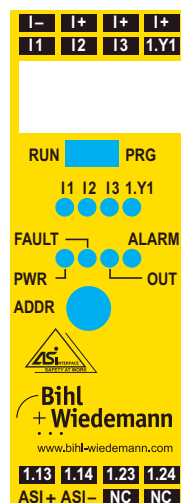
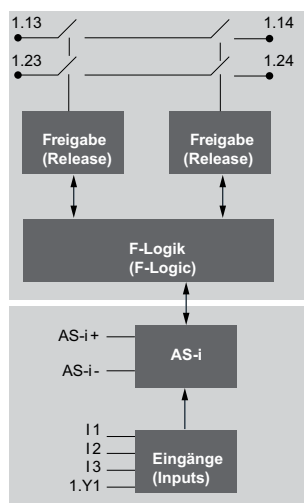
Programming instructions

Programming instructions AB slave (bit values of the AS-i parameter)

Bit P2	
P2=1	feedback: safety release at AS-i bit I2
P2=0	input I3 at AS-i bit I2
Bit P1	
P1=1	safety output controlled by safety release only
P1=0	safety output controlled by output O1 in addition to safety release
Bits P0, P3	
not used	

Release		AS-i Safety Relay Output Module, safety release from the AS-i safety monitor...	
		... not received	... received
AS-i parameter (AB slave) changes the function of out- put bit O1	AS-i Parameter P1=1 (default) O1=0	safety output contact set open	safety output contact set closed
	AS-i Parameter P1=1 O1=1	safety output contact set open	safety output contact set closed
	AS-i Parameter P1=0 O1=0	safety output contact set open	safety output contact set open
	AS-i Parameter P1=0 O1=1	safety output contact set open	safety output contact set closed

Operating elements and clamp assignment



Clamps/Switch	Description
I1, I2, I3	standard inputs I1, I2 and I3
1.13, 1.14	safety output contact set 1
1.23, 1.24	safety output contact set 2
I-, I+	supply voltage for inputs (out of AS-i)
1.Y1	EDM / input for electronic device monitoring
AS-i+, AS-i-	AS-i network connection
ADDR	addressing socket
PRG	protective mode not possible. Programming of safety-related AS-i address enabled
RUN	protective mode possible. Programming of non safety-related AS-i address enabled

AS-i Safety Relay Output Module with Diagnostic Slave and 1 EDM input

LEDs	State	Signal / Description
PWR (green)		no operating voltage
	 1 Hz	operating voltage present, safety-related AS-i address and/or AS-i AB address is „0“
		operating voltage present
FAULT (red)		AS-i communication OK
		no data exchange with AB slave
OUT (yellow)		output relays contacts open
	 1 Hz	restart inhibit, waiting for the start signal, the output relays switch-on after the start signal
	 8 Hz	device is in unlockable error state. Waiting for "reset of error condition signal". After receiving this signal the device follows up with normal operation.
		output relays contacts closed
ALARM (red)		AS-i output bit A0 is <i>not</i> set
		AS-i output bit A0 is set
I1, I2, I3, 1.Y1 (yellow)		the corresponding input is <i>not</i> connected
		the corresponding input is connected
	 (running light) switch is adjust to PRG position	

 LED on  LED flashing  LED off



In case all LEDs are blinking simultaneously in fast rhythm a fatal error has been detected.
This message is reset by a short-run disconnection of the power supply (Power On Reset).

AS-i Safety Output Module with Diagnostic Slave, 1 EDM input, 3I and 2O

Safety and standard I/O in one module

Electronical safety output

Additional 3 standard inputs, 1 EDM input, 2 outputs

EN 954-1 Cat 4, IEC 61 508 SIL 3, EN 13 849-1/PLe Cat 4, EN IEC 62 061 SIL 3

Protection category IP20



Article no. BWU2173

The stainless steel AS-i Safety Monitor controls the outputs of the AS-i Safety Output Module by using a safety AS-i single address. To set the safety AS-i address, the dip-switch has to be in the ON/PRG position. Addressing can then be accomplished by using an AS-i addressing device, for example. Several AS-i Safety Output Modules can have the same safety address and can be controlled via this same safety address on a AS-i circuit. All AS-i

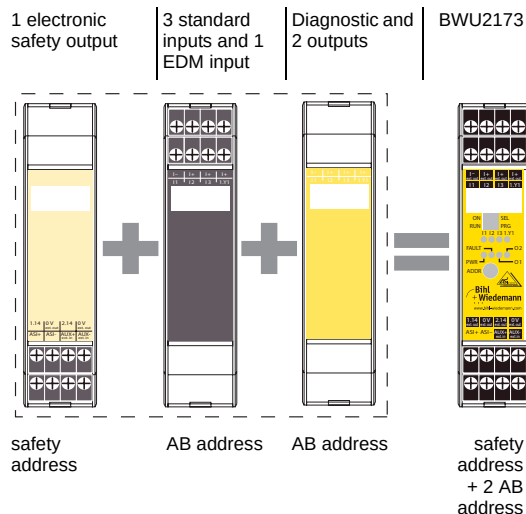
Safety Output Modules with the same safety address are controlled simultaneously.

In addition to the safety single address the module also supports an AB-address used to transmit the states of the standard inputs or of the electronic device monitoring (EDM).

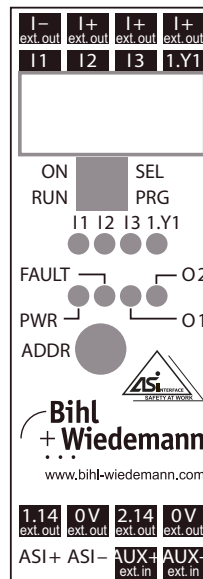
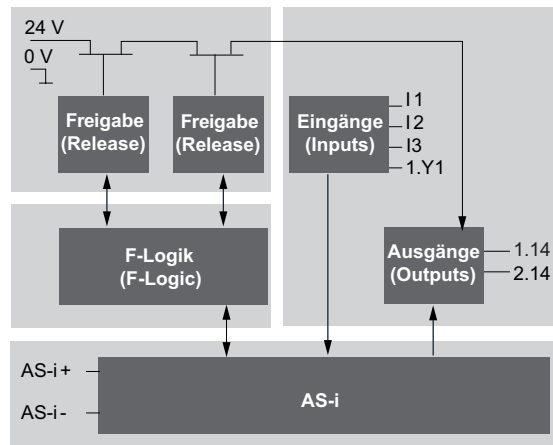
Another AB slave is available for diagnostic.

Article no.	BWU2173
Inputs	3 standard, diagnostic + 1 EDM
Outputs	2 x output switching elements max. contact load: 0,5 A DC-13 at 30 V
Test pulse	if output is switched on: 1 pulse per second, pulse length 1ms
External device monitoring (EDM)	supplied out of 24 V, approx. 10 mA
Indicators	
3 x LED yellow (I1, I2, I3)	state of inputs I1, I2 and I3
1 x LEDs yellow (1.Y1)	state of EDM input 1.Y1
LED green (PWR)	AS-i voltage ON
LED red (FAULT)	AS-i Fault
LED yellow (O1)	output 1 closed
LED yellow (O2)	output 2 closed
Operating current	< 200 mA
Current supply of sensors	100 mA
Operating voltage	AS-i (30 V _{DC})
Voltage of insulation	≥ 500 V
External supply	24 V ±20%
Applied standards	EN 954-1 Cat 4 IEC 61 508 SIL 3 EN IEC 62 061 SIL 3 EN 13 849-1/PLe Cat 4
Housing	Din-rail mounting
Ambient operating temperature	0°C ... +55 °C
Storage temperature	-25°C ... +85 °C
Dimensions (L / W / H in mm)	114 / 25 / 105
Protection class DIN EN 60 529	housing IP20
Weight	150 g
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2

BWU2173: 3 AS-i modules in one housing!



AS-i Safety Output Module with Diagnostic Slave, 1 EDM input, 3I and 2O



Clamps	Description
I1, I2, I3	standard inputs I1, I2 and I3
1.14	semiconductor output 1
1.24	semiconductor output 2
I-, I+	supply voltage for inputs
1.Y1	EDM 1 / input for electronic device monitoring
AS-i+, AS-i-	AS-i network connection
AUX ⁺ ext.in ⁺ AUX ⁻ ext.in ⁻	voltage supply input

Programming instructions (bit values of inputs/outputs, 3I standard inputs and 1 EDM input)

Bit	AS-i output	Bit	AS-i input
O0	not used	I0	I1
O1	not used	I1	I2
O2	not used	I2	I3
O3	inexistent	I3	1.Y1

Peripheral fault indicates overload of the sensor supply.

Programming instructions (bit values of the diagnostic slave)

Bit	AS-i output	Bit	AS-i input
O0	Parameter P1=1 not used	I0	diagnostic (for definition see table device colors)
	Parameter P1=0 1: output O 1 controlled by safety release 0: inhibits output O 1 on irrespective of safety release	I1	
O1	Parameter P1=1 not used	I2	
	Parameter P1=0 1: output O 2 controlled by safety release 0: inhibits output O 2 on irrespective of safety release	I3	Parameter P2=0 Parameter P2=1
O2	not used		1.Y1 1: feedback for user: safety release on 0: feedback for user: safety release off
O3	inexistent		

Peripheral fault indicates unavailable 24 V ext.

Diagnostic (device colors)

Value	Color	Description	State change	LED "Out"
0	green	output on		on
1	green flashing	—		—
2	yellow	restart inhibit	auxillary signal 2	1 Hz
3	yellow flashing	—		—
4	red	output off		off
5	red flashing	waiting for "reset of error condition"	auxillary signal 1	8 Hz
6	grey	internal error, such as "fatal error"	only via "Power On" on device	all LEDs flashing
7	green/yellow	output released, but not switched on	switching-on by setting of O1	off

AS-i Safety Output Module with Diagnostic Slave, 1 EDM input, 3I and 2O

Programming instructions (bit values of the AS-i parameter, diagnostic slave)	
Bit P1	
P1=1	safe output controlled by safety release only
P1=0	safe output controlled by output O0=1 and O1=1 in addition to safety release
Bit P2	
P2=1	feedback for user: release on AS-i bit I3
P2=0	input 1.Y1 at AS-i bit I3
Bits P0, P3:	
	not used

Release	AS-i Parameter	AS-i Safety Output Module, safety release from the AS-i safety monitor	
		... not received	... received
AS-i parameter (AB slave) changes the function of output bit O0 and O1	P1=1 (default) O0=0	semiconductor output 1 open	semiconductor output 1 closed
	P1=1 O0=1	semiconductor output 1 open	semiconductor output 1 closed
	P1=0 O0=0	semiconductor output 1 open	semiconductor output 1 open
	P1=0 O0=1	semiconductor output 1 open	semiconductor output 1 closed
	P1=1 (default) O1=0	semiconductor output 2 open	semiconductor output 2 closed
	P1=1 O1=1	semiconductor output 2 open	semiconductor output 2 closed
	P1=0 O1=0	semiconductor output 2 open	semiconductor output 2 open
	P1=0 O1=1	semiconductor output 2 open	semiconductor output 2 closed

LEDs	State	Signal / Description
PWR (green)		no operating voltage
	 1 Hz	operating voltage present, safety-related AS-i address and/or AS-i AB address is „0“ or no 24 V ext. in (auxiliary power)
		operating voltage present
FAULT (red)		AS-i communication OK
		no data exchange with at least one AB slave
		no 24 V ext. in (auxiliary power)
O1, O2 (yellow)		semiconductor output open
	 1 Hz	restart inhibit, waiting for the start signal, the semiconductor output switches on after the start signal
	 8 Hz	device is in unlockable error state; waiting for "reset of error condition signal"; after receiving this signal the device follows up with normal operation
		semiconductor output closed

AS-i Safety Output Module with Diagnostic Slave, 1 EDM input, 3I and 2O

I1, I2, I3, 1.Y1 (yellow)		the corresponding input is <i>not</i> connected
		the corresponding input is connected
	  	(running light) switch is adjust to ON/PRG position

 LED on  LED flashing  LED off

	In case all LEDs are blinking simultaneously in fast rythm a fatal error has been detected. This message is reset by a short-run disconnection of the power supply (Power On Reset).
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AS-i Safety Input Module (M12), IP67

**AS-i Safety Input Module (M12), IP67,
for optoelectronic protective devices or
floating contacts**

Applications up to category 4/PLe/SIL 3



BWU2369 / BWU2370



BWU2270 / BWU2284

Article no.	BWU2270 / BWU2370 / BWU2284 / BWU2369
Connection	
Connection	M12
AS-i	
AS-i voltage	22 ... 31,6V
AUX	
AUX voltage	24V (20 ... 30V DC) (PELV)
Inputs	
Number	2 / 1 safety inputs (with two channels) for OSSDs or floating contacts
Outputs	
Number	2, electronic
Power supply	out of AUX voltage
Max. output current	1A per output
Indicator	
2x LED Out1, Out2 (yellow)	state of output Out1, Out2
LED ASI (green)	AS-i voltage on
LED FLT/FAULT (red)	LED on: AS-i communication error, slave does not participate in the normal exchange of data, e.g. slave address 0 LED flashing: peripheral fault
LED AUX (green)	24V DC AUX on
Environment	
Applied standards	EN ISO 13 849-1:2008/PLe Cat4 EN ISO 13 849-2:2008 EN 62 061:2005 SIL 3 EN 50 295 EN 61 000-6-2 EN 61 000-6-4 EN 954-1 Cat4
Operating temperature	0°C ... +55°C
Storage temperature	-40°C ... +85°C
Protection class DIN EN 60 529	IP67
Max. tolerable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 .. 55 Hz, 0,5 mm amplitude

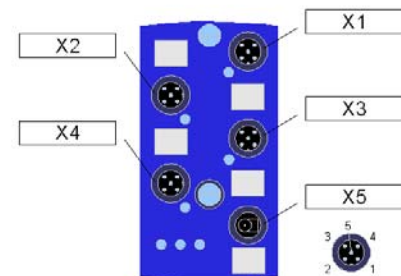
Article no.	AS-i and 24V connection		Safe inputs		Peripheral fault by			Dimensions in mm W / H / D
	profile cable	M12	floating	OSSD	cross connection S1 to S2	output overload	AUX voltage missing	
BWU2270	●	—	—	●	—	●	●	45 / 80 / 42
BWU2284	●	—	●	—	●	●	—	45 / 80 / 42
BWU2369	—	●	●	—	●	●	—	45 / 116,5 / 47,5
BWU2370	—	●	—	●	—	●	●	45 / 116,5 / 47,5

BWU2270 u. BWU2284: The matching substructure modules are available as accessories with two different drilling patterns.

BWU2369 u. BWU2370: They are supplied including mounted substructure modules (no additional profile cable connection possible)

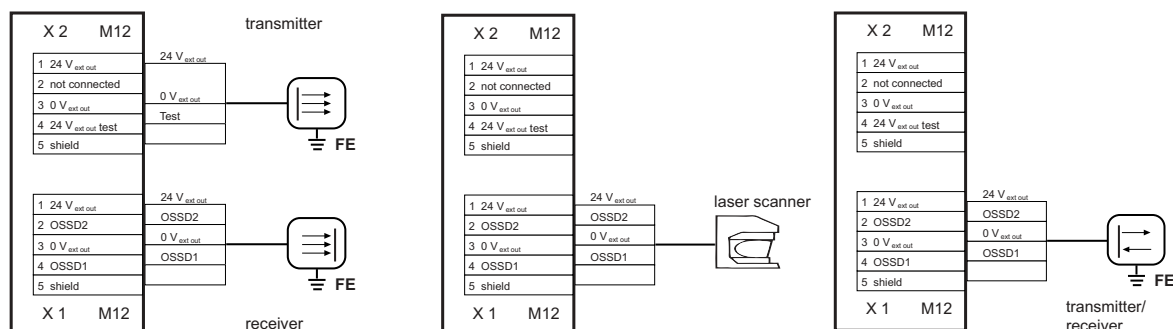
Article no.	BWU2270 / BWU2370	BWU2284 / BWU2369
Safe input	OSSD	floating contact
AS-i profile	S-7.B.1, ID1=F	S-7.B.0, ID1=F
Max. AS-i current consumption	60mA	80mA
Max. AUX current consumption	4A max.	3A max.
Power supply of inputs	out of AUX voltage	out of AS-i voltage
Input level	$V_{in} > 11V$ for High-Level, Input current $> 2,5mA$ bei 15V	10 mA, $R < 150\Omega$
OSSD input test pulses	0 ... 50 Hz	–
OSSD input test pulse width	$U_{aux} \geq 21,5V = 0 \dots 1$ ms test pulses possible $U_{aux} \geq 17V = 0 \dots 0,8$ ms test pulses possible $U_{aux} < 17V = 0 \dots 0,6$ ms	–
Start delay	< 22 ms	–
Max. cable capacity X1	unlimited	I/O: max. 15 m
2x LED S1, S2 (yellow)	state of input OSSD1, OSSD2	state of input S1, S2
Applied standards	EN 61 131-2	–

Programming	AS-i Bit setting			
	D0	D1	D2	D3
	Safe input			
BWU2284 / BWU2369	S1	S1	S2	S2
BWU2270 / BWU2370	OSSD1	OSSD1	OSSD2	OSSD2
	Output			
All	Out 1	Out 2	not used	
	Parameter bit			
BWU2270	P0: watchdog (0 off / 1 on)			
BWU2284	P0 not used			
BWU2270 / BWU2284	P1, P2, P3 not used			



Connections M12										
BWU2270 / BWU2370					BWU2284 / BWU2369					
Name/ Number	1	2	3	4	5	1	2	3	4	5
X 1	24V _{ext} out	OSSD2	0V _{ext} out	OSSD1	shield	S1+	S1-	S2+	S2-	nc
X 2	24V _{ext} out	nc	0V _{ext} out	24V _{ext} out	shield	S2+	S2-	nc	nc	nc
X 3	nc	Out2	0V _{ext} out	Out1	nc	nc	Out2	0V _{ext} out	Out1	nc
X 4	nc	nc	0V _{ext} out	Out2	nc	nc	nc	0V _{ext} out	Out2	nc
X 5	Addressing socket (with protection cap) (BWU2270)					Addressing socket (with protection cap) (BWU2284)				
	AS-i M12 (BWU2370)					AS-i M12 (BWU2369)				
	AS-i+	0V _{ext} in	AS-i-	+24V _{ext} in	nc	AS-i+	0V _{ext} in	AS-i-	+24V _{ext} in	nc

Connection examples BWU2270, BWU2370



Accessories:

- AS-i substructure module for 4-channel module in 45 mm-housing (article no. BW2349, see also page 294)
- AS-i substructure module (CNOMO) for 4-channel module in 45 mm-housing (article no. BW2350, see also page 294)
- Protection caps for not used M12 sockets (article no. BW2368, see also page 198)

AS-i Safety Input Module, IP20

AS-i Safety Input Module, IP20, for optoelectronic protective devices or 'floating contacts



BWU1939 BWU2577

The AS-i Safety Input Module (BWU1939) has 2 / 1 safety inputs with 2 standard semiconductor outputs. With the help of the AS-i Safety Slave it is possible to supply applications up to category 4. The supply of the safe input is made out of AS-i. If the bus communication is interrupted, the outputs are switched to their de-en-

ergised state by the watchdog. Besides the outputs are short-circuit-protected, overload-proof and inverse-polarity protected.

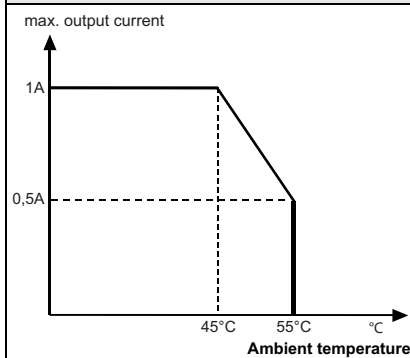
Using the outputs, you can drive up to 2 indicator lights, with the power being drawn from the separated 24V.

Article no.	BWU1939 / BWU2577	
Connection		
Connection	COMBICON	
AS-i		
AS-i voltage	22 ... 31,6V	
AUX		
AUX voltage	24V (20 ... 30V _{DC}) (PELV)	
Output		
Outputs	2, electronic, short-circuit-protected	
Power supply of outputs	out of AUX voltage	
Display		
LED green (AS-i)	AS-i voltage on	
LED green (AUX)	24V _{DC} AUX on	
2x LED yellow	safe inputs	
2x LED yellow	outputs	
Environment		
Applied standards	EN ISO 13849-1:2008/PLc Cat 4 EN ISO 13849-2:2008 EN 61 000-6-2, EN 61 000-6-4 EN 62 061:2005 SIL3 EN 954-1 Kat 4 EN 50 295	
Protection category EN 60 529	IP20 (only suitable for use in electrical operating rooms / control cabinets with IP 54 minimum protection rating)	
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude	
Dimensions (L / W / H in mm)	99,6 / 22,5 / 50,5	

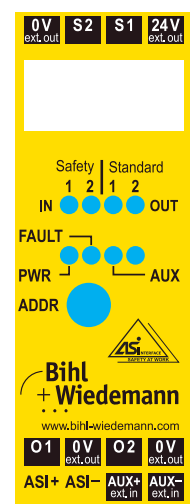
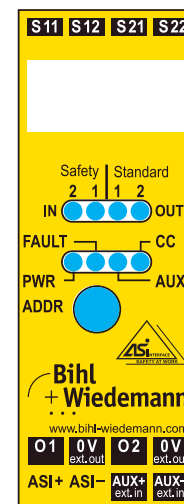
Article no.	BWU1939	BWU2577
Length of connector cable	I/O: max. 15 m	outputs < 30 m
AS-i profile	S-7.B.0, ID1=F	S-7.B.1, ID1=F
Max. current input out of AS-i	< 80mA	60mA
Max. current input out of AUX	1,5 A at output short-circuit	4 A max.
Input	2 / 1 safety inputs (2 channels) for floating contacts	2 / 1 safe inputs (2 channels) for OSSDs
Power supply of inputs	out of AS-i voltage	out of AUX voltage
Input level	10mA, R < 150Ω	V _{in} > 11V für High-Level, Input current ≥ 5mA at 15V
Power supply for external sensor	—	1,8A out of AUX voltage
OSSD input test pulses	—	0 ... 50 Hz

Article no.	BWU1939	BWU2577
OSSD input test pulse width	–	$U_{aux} \geq 21,5V = 0 \dots 1 \text{ ms}$ test pulses possible $U_{aux} \geq 17V = 0 \dots 0,8 \text{ ms}$ test pulses possible $U_{aux} < 17V = 0 \dots 0,6 \text{ ms}$
Loading capacity of outputs	max. 100mA per output	1A per output*
Max. resistance of the switches	200Ω	–
LED red (FLT) / (FAULT)	red: communication fault or address is 0 red, flashing: overload, internal input supply or outputs	red: AS-i communication error, slave does not participate in the normal exchange of data, e.g. slave address 0 red, flashing: overload or AUX voltage missing
LED red (CC)	cross connection at input lines, peripheral fault	–
Applied standards	EN 61 000-6-2, EN 61 000-6-4 EN 62 061:2005 EN 954-1 Cat 4	EN 61 496 EN 61 131-2 EN 62 061 SIL 3 EN 50 295
Operating temperature	0°C ... +70°C	0°C ... +55°C
Storage temperature	-40°C ... +70°C	-40°C ... +85°C

*Derating BWU2577



Programming:	AS-i Bit-setting				BWU1939				BWU2577			
	D0	D1	D2	D3								
	Safe input											
BWU1939	S11	S12	S21	S22								
BWU2577	S1		S2									
BWU1939 / BWU2577	Output											
	O1	O2	not used	not used								
	Parameter bit											
	P0: watchdog (0 off / 1 on), P1, P2, P3 not used											



Emergency stop- and push button modules

Simple assembly concept,
geared to 40 mm profile rail

- timesaving one-hole-screw-fastening technology, especially suitable for aluminum track rail (BW2528 und BW2529)
- alternative direct mounting with M4 screws (BW2528)



BW2529

BW2527

BW2528

Protection class IP54



Article no.	BW2529	BW2527	BW2528
Connection			
Connections	M12	plug-in-shoe connection 2,8 x 0,8 mm	M12
AS-i			
AS-i Profile	S-7.B.0	–	S-7.A.7
AS-i voltage	18 ... 31,6V	–	18 ... 31,6V
Max. AS-i current consumption	< 50mA	–	< 80mA
Display			
LED (green)	see table: BW2529 Options	–	D0 / D2
LED (red)	see table: BW2529 Options	–	D1 / D3
Robustness			
Robustness	–	according to IEC 60 068-2-3 and 2-30	–
Shock resistance	according to EN 60 068-2-27		
Vibration resistance	according to EN 60 068-2-6		
Environmental stability	according to EN 60 068-2	according to IEC 60 068-2-11	according to EN 60 068-2
Environment			
Applied standards	EN ISO 13 849-1:2008/ PLe Kat 4 EN ISO 13 849-2:2010 EN 62 061:2005 SIL 3 EN ISO 13 850:2008 EN ISO 60 947 -5-1:2004 EN 61 000-6-2 EN 61 000-6-4	–	EN 61 000-6-2 EN 61 000-6-4
AS-i standard	EN 50 295	–	EN 50 295
Operating temperature	0°C ... +70°C	-25°C ... +70°C	0°C ... +70°C
Storage temperature	-25°C ... +85°C	-40°C ... +80°C	-25°C ... +85°C
Protection category DIN 60 529	IP54 (in unlocked state)	IP54 / IP20	IP54
Installation depth		27 mm	
Contacts	gold contacts, for 100% reliables switching		
Contact assignment	2 0		NO contact, per button 1 NO contact
Shock resistance min.	100 N		
Mushroom diameter	30 mm		–
Life cycle min. (switching cycle)	50.000		1.000.000
Dimensions (W / H / D in mm)	123 / 42 / 60	60 / 30 / 30	123 / 42 / 40

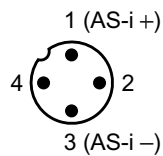
BW2529 Options:

Operation by switch					
Parameter bit		LED display			
P1	P0	green	red	yellow	yellow flashing (1Hz)
1 ¹	1 ¹	unlocked	operated	–	no AS-i communication
0	1	operated	unlocked		

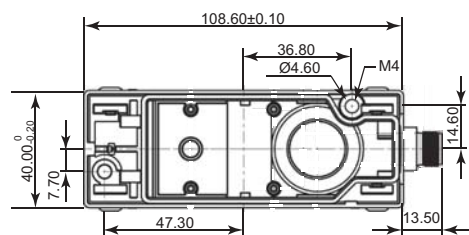
Operation via AS-i					
Parameter bit		LED Display			
P1	P0	green	red	yellow	yellow flashing (1Hz)
x	0	DO1	DO0	DO0 + DO1	no AS-i communication

¹ default

BW2528	D0	D1	D2	D3	DI0	DI1
Button above	green	red	-	-	x	-
Button below	-	-	green	red	-	x

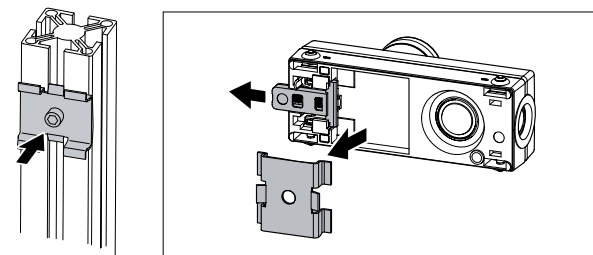


BW2528 Drilling pattern for direct mounting via screws:

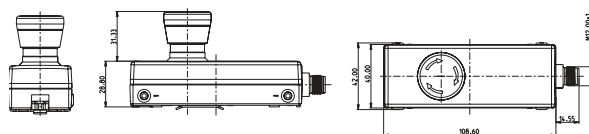


Alternatively to the metal clip-mounting it's possible to screw the base directly with M4 screws.

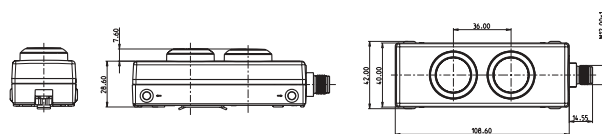
BW2528 and BW2529 Image for rail mounting: (BW2529 Mounting only about retaining clip!)



BW2529 Dimensions:



BW2528 Dimensions:



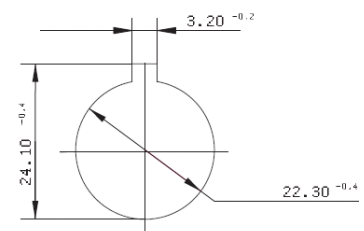
BW2527:



Please note mounting color marking!

Installation openings:

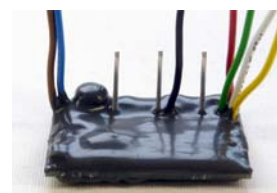
for 22,3 mm to IEC 60 947-5-1 suitable. All control elements are equipped with an twisting protection nose



AS-i Safety OEM Slave



BW2426



BW2521



The AS-i Safety OEM Slave (BW2426 und BW2521) meets the requirements of AS-i Safety. With the help of the AS-i Safety OEM Slave it is possible to supply applications up to Safety Category 4 / SIL 3. The supply of the safe inputs is made out of AS-i. The standard outputs are powered also out of AS-i.

The AS-i 2E/2A OEM Slave (BW2574 and 2522) which meets the requirements of the AS-i Specification 3.0. is the board based solution for an AS-i slave. The board is completely powered by AS-i. Using the inputs, you can interrogate up to 2 mechanical switch-

ing elements. Using the outputs, you can drive up to 2 indicator lights. Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well. Advanced addressing (AB-technology, up to 62 slaves) is possible.

All articles: The inputs and outputs are short circuit and overload protected. If bus communication is interrupted (master failure), the outputs are switched to their currentless switching state by the watchdog.



Article no.	BW2426 / BW2521 / BW2522 / BW2574
Connection	
Length of connector cable	I/O: max. 1, 5 m
AS-i	
Current input out of AS-i	< 120mA
Voltage range AS-i	22 ... 31,6V
Output	
Outputs	2, electronic
Loading capacity of outputs	20mA per output (total ≤ 40mA) out of AS-i
Input	
Max. loop resistance (switch)	200Ω
Display	
LED red	AS-i communication error
LED green	AS-i voltage
2x LED yellow	inputs
2x LED yellow	outputs
Environment	
EMC directions	EN 61 000-6-2 EN 61 000-6-4
Ambient operating temperature	-5°C ... +70°C
Storage temperature	-40°C ... +70°C
Protection category (EN 60 529)	IP00 potted
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude
Dimensions (L / W / H in mm)	43 / 30 / 10

Article no.	Connection		Inputs 2 safe	Inputs 2 electronic	Applied standards EN ISO 13 849-1:2008/PLc Cat 4 EN ISO 13 849-2:2008 EN 62 061 SIL 3 EN 50 295
	90 mm wire	90 mm wire / contact pins			
BW2426	●	–	●	–	●
BW2521	–	●	●	–	●
BW2522	–	●	–	●	–
BW2574	●	–	–	●	–

Programming:	AS-i bit-setting			
	D0	D1	D2	D3
	Input			
BW2426 / BW2521	S1	S1	S2	S2
BW2574 / BW2522	I1	I2	I2	I1
	Output			
BW2426 / BW2521 / BW2522 / BW2574	O1	O2		
BW2426 / BW2521 / BW2522 / BW2574	P0, P1, P2, P3 not used			

Programming:	BW2426 / BW2521	BW2574 / BW2522
IO Code	7	7
ID Code	B	A
ID2 Code	0	E

Signal	BW2426	BW2521	BW2522	BW2574
AS-i +	BN	BN	BN	BN
AS-i -	BU	BU	BU	BU
S11, S12	RD, RD	Pin, RD	–	–
S21, S22	YE, YE	Pin, YE	–	–
O1	WH	WH	WH	WH
O2	GR	GR	GR	GR
0V	BK	Pin, BK	Pin, BK	BK
I1	–	–	RD	RD
I2	–	–	YE	YE
I1+	–	–	Pin	RD
I2+	–	–	Pin	YE

AS-i Safety OEM Slave

Connection of 2 safe switching contacts

Applications up to category 4

Safe inputs supplied by AS-i

Outputs supplied by galvanically isolated 24 V



BW1896



BW1751



Article no. BW1896 with plug-in screw terminals

Article no. BW1751 with screw terminals

Article no. BW1801 with wiring pins

Article no. BW1934 no connection

The AS-i Safety OEM Slave meets the requirements of AS-i Safety. With the help of the AS-i Safety OEM Slave it is possible to supply applications up to category 4. The supply of the safe inputs is made out of AS-i. The outputs are powered out of galvanical separated 24 V. Besides the in- and outputs are short-circuit-protected, overload-proof and pole-protected.

If bus communication is interrupted, the outputs are switched to their currentless switching state by the watchdog.

Using the outputs, you can drive up to 2 indicator lights, with the power being drawn from the separated 24 V.

Customer-specific special orders are possible on short notice. The circuit board dimensions and the plug connections can be changed as well.

The AS-i Safety OEM Slave offers additionally 2 holes for assembly angles.

Article no.	BW1896	BW1751	BW1801	BW1934
Connection	plug-in screw terminals	screw terminals	wiring pins	-
Current input out of AS-i	< 80 mA			
Current input out of 24 V	1,5 A at output short-circuit			
Voltage range AS-i	22 .. 31,6 V			
Voltage range 24 V	24 V (20 .. 30 V DC) (PELV)			
Outputs	2, electronic, short-circuit-protected			
Loading capacity of outputs	max. 100 mA per output			
Length of connector cable	I/O: max. 15 m			
Max. resistor of the switches	200 Ohm			
Displays				
LED red	error			
LED green	power			
2x LED yellow	safe inputs			
2x LED yellow	outputs			
Operating voltage	via AS-i			
EMC directions	EN 61 000-6-2, EN 61 000-6-4, EN ISO 13 849-1:2008			
Functional safety	EN 954-1:1996 (up to category 4), EN 62 061:2005			
Ambient operating temperature	0°C .. +70°C			
Storage temperature	-40°C .. +70°C			
Protection category (EN 60 529)	IP00			
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 .. 55 Hz, 0,5 mm amplitude			
Dimensions (L / W / H in mm)	73 / 37,5 / 12			

Programming (Bit-setting)

Data bit

(Input via AS-i)

Bit Function

D0 Safe input S1/Output A1

D1 Safe input S1/Output A2

D2 Safe input S2

D3 Safe input S2

Parameter bit

Bit Function

P0 Not used

P1 Not used

P2 Not used

P3 Not used

Programming:

Address preset 0

changeable via bus master or programming devices

IO code 7

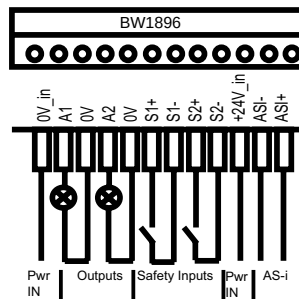
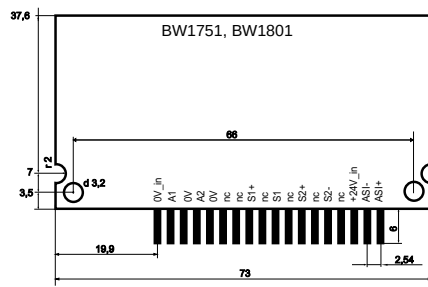
ID code B

ID2 code 0

Hint:

The module can not be used with the OEM carrier board BW1484.

AS-i Safety OEM Slave



AS-i-Master/Gateways/
Links/Scanner

AS-i Slaves

AS-i Accessories/
Diagnostics/Development

Other Fieldbuses/
Master Simulators

AS-i Safety

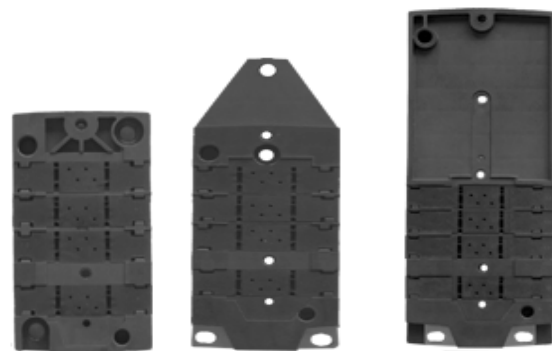
Price Lists

AS-i Substructure Module in IP67

BW2349: suitable for mounting on symmetrical DIN profile rail 35 mm or for wall-mounting

BW2350 and BW2351: fixing centres CNOMO compliant; also suitable for wall mounting

Protection category IP67



BW2349

BW2350

BW2351

Article no. BW2349 AS-i Substructure Module for 4-channel module in 45 mm-housing

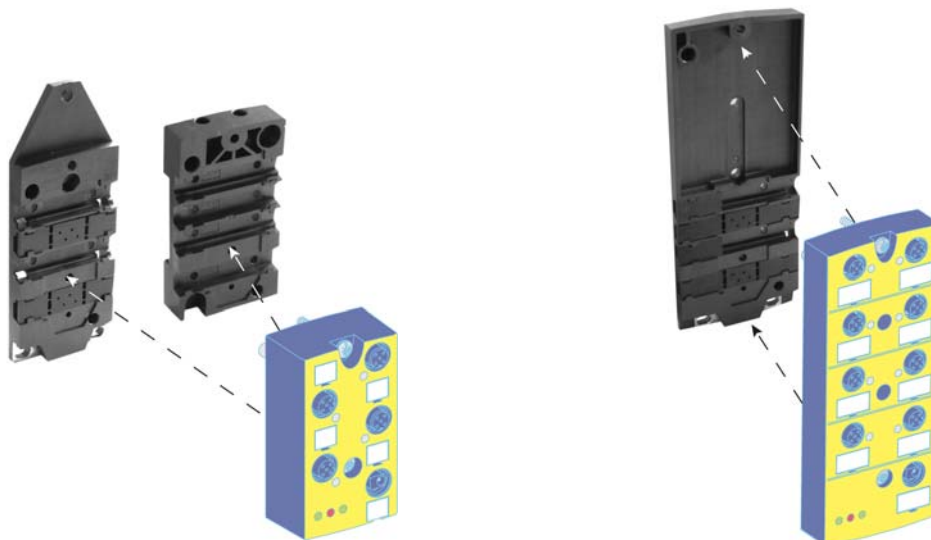
Article no. BW2350 AS-i Substructure Module (CNOMO) for 4-channel module in 45 mm-housing

Article no. BW2351 AS-i Substructure Module (CNOMO) for 8-channel module in 60 mm-housing

AS-i substructure modules are a necessary accessory for AS-i modules of the product family M12 modules in IP67.

Article no.	BW2349	BW2350	BW2351
Cable	max. 2 yellow AS-i flat cables (AS-i) and 2 black AS-i flat cables (AUX) simultaneously connectable to the formation of junctions mounting is possible in two directions		
Mounting	2-point	4-point (centerline spacing CNOMO)	4-point (centerline spacing CNOMO)
Mounting on symmetrical DIN rail 35 mm	yes	no	no
Connection	cut clamp terminals (IDC method)		
Protection category	IP67		
Dimensions (L / W / H in mm)	81 / 45 / 15	117 / 45 / 10	152 / 60 / 11
Weight	45 g	40 g	66 g

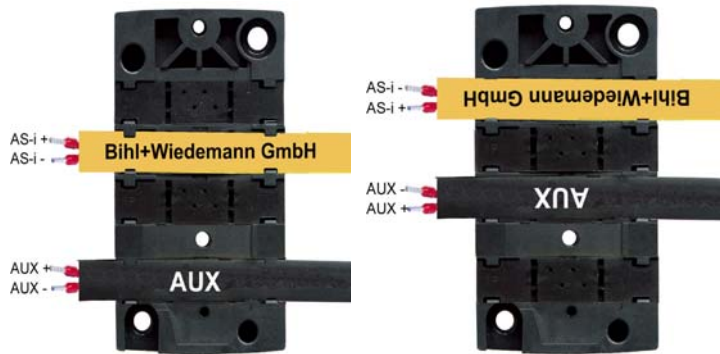
Substructure modules and appropriate modules:



AS-i Substructure Module in IP67

Wiring examples:

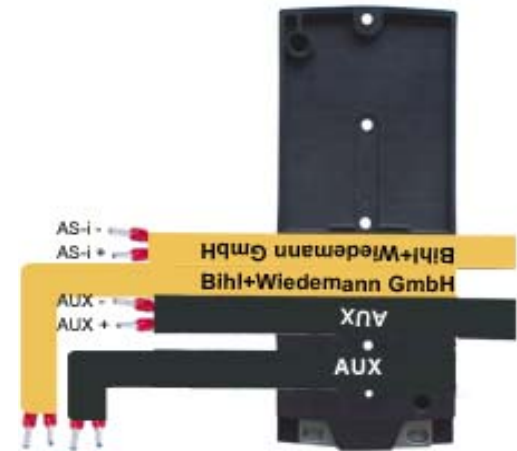
on a 4-channel module:



normal direction

turned direction

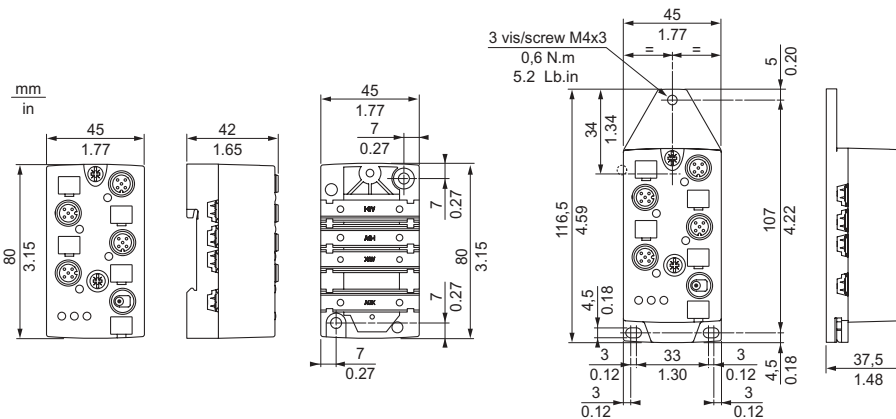
junctions on a 8-channel module:



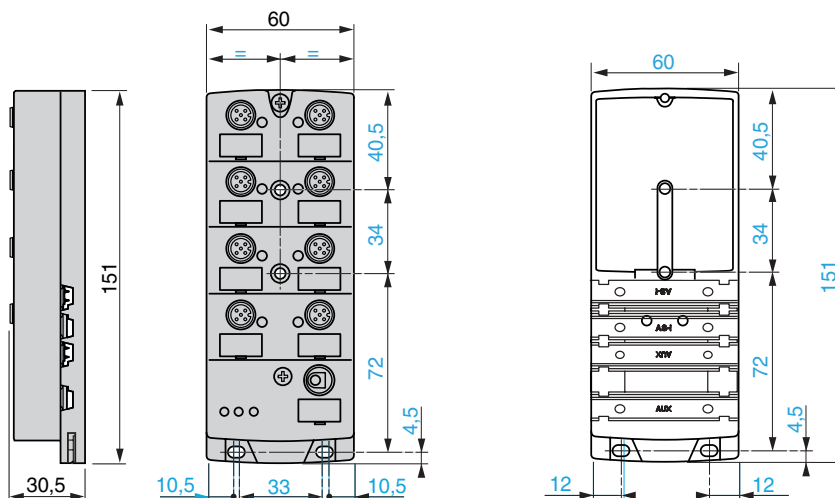
junctions

Dimensions:

4-channel module:

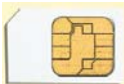


8-channel module:

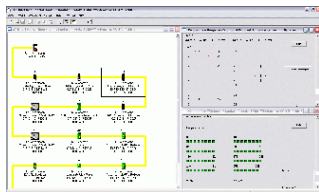


AS-i Master/Gateways/ Links/Scanner					
AS-i Slaves					
AS-i Accessories/ Diagnostics/Development					
Other Fieldbuses/ Master Simulators					
AS-i Safety					
Price Lists					

Overview AS-i Safety Accessories

Housing	Module	Art. No.	Characteristics	P.
	Programming software ASIMON and AS-i Control Tools	BW2071	with serial cable for AS-i Master/Monitor in stainless steel	298
	Programming software ASIMON	BW2501	for Safety Monitors and AS-i Masters	
		BW2145	with serial cable for AS-i Master/Monitor in stainless steel	
		BW1770	with cable BW1771 and BW1772 only for use with the Safety Monitors BW1764 and BW1765	
	Serial cable	BW1575	for AS-i Masters and AS-i Monitors in stainless steel	298
	USB connector cable	BW2530	for Safety Basic Monitors	298
	Interface cable	BW1771	for connection of the Safety Monitor to a PC	298
	Interface cable	BW1772	for connection of 2 Safety Monitors	298
	AS-i Chipcard	BW2222	memory capacity 128 kbyte	299
		BW2079	memory capacity 32 kbyte	

Software AS-i Safety Monitor



Article no. BW2071

Programming software ASIMON 3 G2 and AS-i Control Tools with serial cable for AS-i Masters/Monitors in stainless steel

Article no. BW2501

Programming software ASIMON 3 G2 and AS-i Control Tools for Safety Monitors and AS-i Masters

Article no. BW2145

Programming software ASIMON 3 G2 with serial cable for AS-i Masters/Monitors in stainless steel

Article no. BW1770

Programming software ASIMON with cable BW1771 and BW1772 only for use with the Safety Monitors BW1764 and BW1765

Note: when ASIMON 3 G2 are supplied with the following two options include:

1. as "Construction Version" with full functionality
2. as a "Service Version" with limited functionality (restriction: no edit function for ASIMON configurations)

Serial cable for AS-i Masters and AS-i Monitors in stainless steel



Article no. BW1575

Only deliverable in combination with the programming software ASIMON 3 G2 or AS-i Control Tools, article no. BW2071, BW2145, BW1602

Connection	D-sub data cable 9-pin, Mini-DIN plug 6-pin
Length	1,8 m

USB connector cable for Safety Basic Monitor BWU2441



Article no. BW2530

Connection	USB type A – Micro USB
Length	2 m
Colour	black

Interface cable for connection of the Safety Monitor to the PC

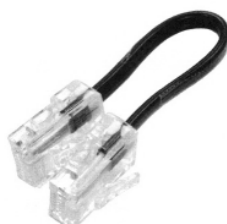


Article no. BW1771

Only deliverable in combination with the programming software ASIMON, article no. BW1770

Connection	RS 232 interface
Length	2 m

Interface cable for connection of two Safety Monitors



Article no. BW1772

Only deliverable in combination with the programming software ASIMON, article no. BW1770

Connection	2 x RJ45
Length	0,1 m

Chip card for Bihl+Wiedemann AS-i products



Article no.	BW2079	BW2222
Memory capacity	32 kByte	128 kByte
Weight	ca. 1 g	
Dimensions (L / W / H in mm)	25 / 15 / 1	
Accessories for the following devices	BWU2044	BWU2186
	BWU2027	BWU2187
Accessories: BW2079 for all Standard and all Safety products with chip card by Bihl + Wiedemann. BW2222 for Safety Monitors and Gateways in Stainless Steel Safety Version 4.X (for maximum 4 Safety configurations on a chip card).		



Zertifikat

Certificate

Registrier-Nr.

Registered No.

44 799 08 554284

Zeichen des Auftraggebers
Customer's reference

Auftragsdatum
Date of order

15.11.2007

Aktenzeichen
File reference

8000554284

Prüfbericht Nr.
Test report no.

08 799 554284

**Name und Anschrift
des Auftraggebers**

Bihl + Wiedemann GmbH
Floßwörthstraße 41
68199 Mannheim

*Name and address of
the customer*

Geprüft nach:

EN 61508:2001

Funktionale Sicherheit sicherheitsbezogener
elektrischer/elektronischer/programmierbarer
elektronischer Systeme, SIL 3

Tested in accordance with

EN ISO 13849-1:2006

Sicherheit von Maschinen – Sicherheits-
bezogene Teile von Steuerungen, PL e

EN 954-1:1996

Sicherheit von Maschinen – Sicherheits-
bezogene Teile von Steuerungen, Teil 1:
Allgemeine Gestaltungsgrundsätze, Kategorie 4

EN 62061:2005

Funktionale Sicherheit sicherheitsbezogener
elektrischer/elektronischer/programmierbarer
elektronischer Steuerungssysteme, SILCL3

Beschreibung des Produktes

Sicherheitsgeräte (AS-i-Gateways/-Monitore) Typenreihe BW....
..2186, ..2187, ..2188
..2000, ..2001, ..2002, ..2003, ..2004

Description of product

Softwarestand V2008-04-25

Bemerkung

Bei der Konfiguration und Parametrierung des AS-i-Systems, der Slaves
und des Profisafe-Systems sind bezüglich der jeweiligen Einsatzfälle
(Sicherheitsfunktionen) die entsprechenden Produkt- und Anwendungs-
normen zu beachten.

Remark

Dieses Zertifikat bescheinigt das Ergebnis der Prüfung an dem vor-
gestellten Prüfgegenstand. Eine allgemein gültige Aussage über die
Qualität der Produkte aus der laufenden Fertigung kann hieraus nicht
abgeleitet werden.

TÜV NORD CERT GmbH
Zertifizierungsstelle für Produktsicherheit
Certification body for product safety

Gültig bis / Valid until: 08.05.2011

Hannover, 08.05.2008

Bitte beachten sie auch die umseitigen Hinweise
Please also pay attention to the information stated overleaf

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THE AS-INTERFACE MASTERS

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