



## 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**.

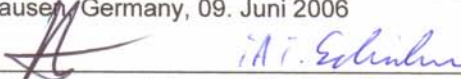
Das Produkt hat die Bezeichnung  
The Product has the designation

**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

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# Who is Bihl+Wiedemann?



THE AS-INTERFACE MASTERS

## 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.

**Head Office**

Bihl+Wiedemann GmbH  
Floßwörthstraße 41  
D-68199 Mannheim  
Phone: (+49) 621/339 96-0  
Fax: (+49) 621/339 22 39  
E-Mail:  
mail@bihl-wiedemann.de

**Argentina**

AUMECON S.A  
Acassuso 4768  
AR – 1605 Munro – Buenos Aires  
- ARGENTINIEN  
Tel.: (+54) 11 / 47 56-31 71  
Tel.: (+54) 11 / 47 56-00 79  
Tel.: (+54) 11 / 47 56-12 51  
Fax: (+54) 11 / 47 62-63 31  
E-Mail: ventas@aumecon.com.ar

**Australia**

TURCK Australia Pty Ltd.  
Unit 5, 6-7 Gilda Court  
Mulgrave, Victoria. 3170  
Australia  
Phone: (+61) 1300 132 566  
E-Mail: insidesalesau@turck.com

**Brazil**

Next Projetos e Automação Ltda.  
Rua Afonso Pena, 223 – Jardim Niero  
CEP: 13290-000 – Louveira/SP  
Brazil  
Phone: (+55) 19 / 38 78 - 05 01  
E-Mail: vendas@nextpa.com.br

**Canada**

TURCK Inc.  
3000 Campus Drive  
Plymouth  
Minnesota 55441-2656  
USA  
Phone: (+1) 763 / 553 - 73 00  
Toll free: (+1) 888 / 544 - 77 69  
Fax: (+1) 763 / 553 - 07 08  
E-Mail: InsideSales@turck.com

**China**

Bihl+Wiedemann Automation  
(Taicang) Co., Ltd.  
必威自动化设备 (太仓) 有限公司  
No.6 West Beijing Road  
太仓市北京西路 6 号  
Taicang, Jiangsu Prov., P.R.China 215400  
邮编 Zip: 215400  
电话 Tel.: (+86) 512 / 5320 6660  
传真 Fax: (+86) 512 / 5320 6662  
电子邮件 E-Mail:  
china@bihl-wiedemann.cn

**Shanghai B.I.W Mech Electrical Co., Ltd.**

上海宝宜威机电有限公司  
1F, Building 5, No.188, Xinjun Ring Rd.,  
Caohejing Pujiang Hi-Tech Park,  
上海市闵行区漕河泾经济开发区浦江高  
科技园区  
新骏环路 188 号 5 号楼 1F  
Shanghai P. R. China 201114  
邮编 Zip:201114  
电话 Tel.: (+86) 21 / 50 27 - 72 48  
传真 Fax: (+86) 21 / 50 27 - 72 47  
电邮 E-Mail: sales@biw.net.cn

**Colombia**

DAKORA S.A.S  
Kra. 1A # 11-130 Of. 107  
Centro Empresarial Ofi-Chia P.H  
Chia, Cundinamarca  
Colombia  
Phone: (+57) 1 / 861 19 77  
Fax: (+57) 31 86 99 77 94  
E-Mail: ventas@dakora.com.co

**Denmark**

Bihl+Wiedemann Nordic ApS  
Gydevang 39 - 41  
DK - 3450 Allerød  
Phone: (+45) 70 27 60 20  
Fax: (+45) 70 27 60 21  
E-Mail: mail@bihl-wiedemann.dk

**Finland**

Bihl+Wiedemann Nordic ApS  
Gydevang 39 - 41  
DK - 3450 Allerød  
Phone: (+45) 70 27 60 20  
Fax: (+45) 70 27 60 21  
E-Mail: mail@bihl-wiedemann.dk

**Sarlin Oy Ab**

Kaivokselantie 3 - 5, 01610 Vantaa  
P. O. Box 750  
FI - 00101 Helsinki  
Phone: (+358) 10 550 4233  
Fax: (+358) 10 550 4201  
E-Mail: juha.nieminen@sarlin.com

**Germany**

Bihl+Wiedemann GmbH  
Floßwörthstraße 41  
D - 68199 Mannheim  
Phone: (+49) 621/339 96-0  
Fax: (+49) 621/339 22 39  
E-Mail: mail@bihl-wiedemann.de

**B-AT Ingenieurbüro GmbH**

Waldweg 22  
D - 28832 Achim  
Phone: (+49) 42 02 - 76 57 80  
Fax (+49) 42 02 - 76 57 81  
E-Mail: jhaack@b-at.de  
Zip code areas: 20 ... 32, 49

**France**

Pascal Devaucoup  
Bihl+Wiedemann GmbH  
8, rue des Allobroges  
F - 38180 Seyssins – Grenoble  
Phone: (+33) 4/57 93 16 53  
Mobile : (+33) 6/74 95 05 61  
Fax: (+33) /4 38 12 08 06  
E-Mail:  
asiexpertfrance@bihl-wiedemann.com

**Great Britain**

Functional Safety Engineering Ltd.  
Duttons Way  
Shadsworth Business Park  
Blackburn  
Lancashire  
BB1 2QR, UK  
Phone: (+44) 12 54 / 68 59 50  
Fax: (+44) 12 54 / 68 59 51  
E-Mail: sales@fseltd.co.uk

**IMTEX Controls Ltd.**

T/a Imtex Monitoring & Control  
Unit 5a, Valley Industries  
Hadlow Road, Tonbridge  
Kent, TN11 0AH, UK  
Phone: (+44) 1732/850 360  
Fax: (+44) 1732/852 133  
E-Mail: sales@imtex-controls.com

**LC Automation Ltd.**

Duttons Way  
Shadsworth Business Park  
Blackburn  
Lancashire  
BB1 2QR, UK  
Phone: (+44) 12 54 / 68 59 00  
Fax: (+44) 12 54 / 68 59 01  
E-Mail: sales@lca.co.uk

**Scattergood & Johnson Ltd.**

Lowfields Road  
Leeds Yorkshire  
LS12 6ET, UK  
Phone: (+44) 113 /2 43 02 03  
Fax: (+44) 113 /2 42 09 59  
E-Mail: automation@scatts.co.uk

**Sigmapi Systems Ltd.**

37-39 George Street  
Newcastle-Under-Lyme  
Staffordshire, ST5 1JU, UK  
Phone: (+44) 17 82 / 74 01 34  
Fax: (+44) 17 82 / 61 99 08  
E-Mail: pc@sigmapisystems.com

**Ireland**

IAZ  
Industrial Automation Technology Ltd.  
M13 McConnell Business Hall  
Wexford Enterprise Centre  
Rosslare Road  
IRL - Wexford  
Phone: (+353) 53 / 918 45 55



Fax: (+353) 53 / 918 45 58  
Mobile: (+353) 87 / 812 96 91

**Israel**

Ariel & Berger Ltd.  
93 Herbert Samuel St.  
IL - Hadera  
Phone: (+972) 4/6 32 27 81  
Fax: (+972) 4/6 32 47 63  
E-Mail: aabltd@bezeqint.net

**Italy**

AlHof  
Via Melegnano 20  
I - 20019 Settimo Milanese MI  
Phone: (+39) 02/28 50 081  
Fax: (+39) 02/39 19 51 14  
E-Mail: alhof@alhof.com

**Mexico**

TURCK Inc.  
3000 Campus Drive  
Plymouth  
Minnesota 55441-2656  
USA  
Phone: (+1) 763 / 553 - 73 00  
Toll free: (+1) 888 / 544 - 77 69  
Fax: (+1) 763 / 553 - 07 08  
E-Mail: InsideSales@turck.com

**Netherlands**

CEMATIC-ELECTRIC B.V.  
Postbus 777  
NL - 7550 AT Hengelo  
Phone: (+31) 74 / 243 34 22  
Fax: (+31) 74 / 291 33 33  
E-Mail:  
sales@cematic-electric.nl

New Zealand  
Vynco Industries (N.Z.) Limited  
P.O. Box 12249  
40 Fairfax Avenue  
Penrose  
NZ - Auckland 1061  
Phone: (+64) 9 / 525 60 51  
Fax: (+64) 9 / 525 57 99  
Email: vyncoauck@vynco.co.nz

**Norway**

Bihl+Wiedemann Nordic ApS  
Gydevang 39 - 41  
DK - 3450 Allerød  
Phone: (+45) 70 27 60 20  
Fax: (+45) 70 27 60 21  
E-Mail: mail@bihl-wiedemann.dk

**Poland**

Newtech Engineering Sp. z o.o.  
ul. Sowińskiego 3  
PL - 44100 Gliwice  
Phone: (+48) 32 / 237 61 98  
Fax: (+48) 32 / 237 61 97  
newtech@newtech.com.p

**South Afrika**

Innomatic (Pty) Ltd  
P.O. Box 76435  
Wendywood 2144  
South Africa  
Phone: (+27) 11 / 840 08 40  
Fax: (+27) 11 / 466 - 02 23  
E-Mail: sales@innomatic.co.za

**Spain**

ELION S.A.  
c / Farell 5  
E - 08014 Barcelona  
Phone: (+34) 93 / 2 98 - 20 00  
Fax: (+34) 93 / 2 98 - 20 48  
E-Mail: elion@elion.es

**LOGITEK, S.A.**

c / Francesc Carbonell, 35-37  
E - 08034 Barcelona  
Phone: (+34) 93 / 252 - 38 10  
Fax: (+34) 93 / 204 -2 8 85  
E-Mail: logitek@logitek.com

**Sweden**

Bihl+Wiedemann Nordic ApS  
Gydevang 39 - 41  
DK - 3450 Allerød  
Phone: (+45) 70 27 60 20  
Fax: (+45) 70 27 60 21  
E-Mail: mail@bihl-wiedemann.dk

Sensor Control Nordic AB  
Sollentunavägen 49  
SV - 19140 Sollentuna  
Phone: (+46) 8 / 6 68 21 00  
Fax: (+46) 8 / 6 69 01 10  
E-Mail: info@scn.se

TR Electronic Sweden AB  
Enebybergsvägen 10B  
SV - 18236 Danderyd  
Phone: (+46) 8 / 756 72 20  
Fax: (+46) 8 / 756 76 80  
E-mail: info@trelectronic.se

**Switzerland**

Weidmüller Schweiz AG  
Rundbuckstrasse 2  
CH - 08212 Neuhausen am Rheinfall  
Phone: (+41) 52 / 674 07 07  
Fax: (+41) 52 / 674 07 08  
E-Mail: info@weidmueller.ch

**Thailand**

Zigma Act Co., Ltd.  
- Head Quarter Office -  
166/26 Soi Charoenporn,  
Charunsanitwong Rd.,  
Banchanglor, Bangkoknoi  
T - Bangkok 10700  
Phone: (+66) 2 / 915 23 00  
Fax: (+66) 2 / 915 23 23  
E-Mail: piti@zigmaact.com

**Turkey**

Elektro AS  
Elektrik-Elektronik San. ve Tic.  
Bankalar Okcumusa Cad.  
Sishane Sok. Sishane Han  
No.: 3 / Kat: 3  
TR - 80020 Karaköy - Istanbul  
Phone: (+90) 212 / 252 68 00 - 01  
Fax: (+90) 212 / 252 68 - 02  
E-Mail: elektroas@elektroas.com

**USA**

TURCK Inc.  
3000 Campus Drive  
Plymouth  
Minnesota 55441-2656  
USA  
Phone: (+1) 763 / 553 - 73 00  
Toll free: (+1) 888 / 544 - 77 69  
Fax: (+1) 763 / 553 - 07 08  
E-Mail: InsideSales@turck.com

## 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.



Slaves					
Address	Current	Accum.	Address	Current	Accum.
0			16		
1			17		
2			18		
3			19		
4		1 2	20		
5 *	16	1 B2	21		
6			22		

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 Masters<sup>1</sup>. 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 page 54)

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 build 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.

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-Masters/Gateways/Links/Scanner

Housing	Fieldbus	Art. No.	Characteristics	P.
	<b>AS-i 3.0 PROFIBUS Gateway in Stainless Steel</b>	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	18
		BWU1891	1 AS-i Master, PROFIBUS slave, with decoupling coils	
	<b>AS-i 3.0 PROFIBUS Gateway in Stainless Steel</b>	BWU2544	1 AS-i Master, PROFIBUS slave, Ethernet diagnostics interface	18
		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	
	<b>AS-i 3.0 DeviceNet Gateway in Stainless Steel</b>	BWU1818	1 AS-i Master	21
		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	
	<b>AS-i 3.0 CANopen Gateway in Stainless Steel</b>	BWU1821	1 AS-i Master	23
		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	
	<b>AS-i 3.0 Modbus Gateway in Stainless Steel</b>	BWU1641	1 AS-i Master, Modbus Slave	25
		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.
	<b>AS-i 3.0 EtherCAT-Gateway in Stainless Steel</b>	BW2162	1 AS-i Master	27
		BW2163	2 AS-i Master	
		BW2164	2 AS-i Master 1 gateway + 1 AS-i power supply for 2 AS-i networks	
	<b>AS-i CC-Link Gateway in Stainless Steel</b>	BW2611	1 AS-i Master, AS-i Earth Fault Detector integrated, AS-i Noise Detector integrated	29
	<b>AS-i 3.0 Ethernet/IP + Modbus TCP Gateway in Stainless Steel</b>	BWU2379	1 Master	31
		BWU2380	2 AS-i Masters	
		BWU2381	2 AS-i Masters 1 gateway + 1 AS-i power supply for 2 AS-i networks	
	<b>AS-i 3.0 PROFINET Gateway in Stainless Steel</b>	BWU1912	1 Master	33
		BWU2238	2 AS-i Masters 1 gateway + 1 AS-i power supply for 2 AS-i networks	
		BWU2239	2 AS-i Masters	
	<b>AS-i 3.0 Ethernet Gateway in Stainless Steel</b>	BW1659	1 AS-i Master, Modbus TCP Slave, Class 1 Div 2	35
		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	
	<b>AS-i 3.0 EtherNet/IP Gateway in Stainless Steel</b>	BW1834	1 AS-i Masters, Class 1 Div 2	37
		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	
	<b>AS-i 3.0 RS 232 Master in Stainless Steel</b>	BWU1955	1 AS-i 3.0 Master with serial interface	39
	<b>AS-i 3.0 Master for Allen-Bradley ControlLogix</b>	BW1611	complete set: AS-i 3.0 Master/Scanner for Allen-Bradley ControlLogix BWU1488 plus accessories BW1563	40
		BWU1488	2 AS-i 3.0 Masters	
		BW1716	2 AS-i 3.0 Masters, Class 1 Div 2	
	<b>AS-i 3.0 Master for Allen-Bradley CompactLogix/MicroLogix</b>	BW1610	complete set: AS-i 3.0 Master/Scanner for Allen-Bradley CompactLogix and MicroLogix BWU1416 plus accessories BW1563	41
		BWU1416	1 AS-i 3.0 Master	



Housing	Fieldbus	Art. No.	Characteristics	P.
	<b>AS-i/PROFIBUS Gateway</b>	BW1253	1 AS-i Master, PROFIBUS slave, IP65	42
		BW1371	1 AS-i Master, PROFIBUS slave, IP65 with M12 connector	
	<b>AS-i/CC-Link Gateway</b>	BW1435	1 AS-i Master, AS-i 2.1	43
	<b>AS-i/Modbus Plus Gateway</b>	BWU1583	1 AS-i 2.1 Master, Modbus Plus node	44

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 PROFIBUS Gateways in Stainless Steel

Recognition of duplicate AS-i addresses<sup>1</sup>

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated

Optional Control III, programmable in C<sup>2</sup>

GSD file integrated<sup>3</sup>

AS-i Power24V capable<sup>4</sup>



BWU2544 / BWU2545 /  
BWU2546

BWU1567 / BWU1568 /  
BWU1569 / BW1653 /  
BW1654 / BW1655 /  
BWU1773 / BWU1774

BWU1746



Article no.	BWU1567 BWU1568 BWU1569	BW1653 BW1654 BW1655 Class 1 Div. 2 (Group A, B, C & D, T-Code 4)	BWU1746	BWU1773 BWU1774 BWU1891	BWU2544 BWU2545 BWU2546
<b>Interface</b>					
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 DP Master				
Card slot	-				Chip card for storage of configuration data
<b>AS-i</b>					
Cycle time	150µs * (number of slaves + 2)				
Operating voltage	AS-i voltage 30V DC				
<b>Anzeige</b>					
7-Segment display	-	-	AS-i slave addresses, error codes	-	-
LCD	menu, AS-i indication of slave addresses, error messages in plain text		-	menu, AS-i indication of slave addresses, error messages in plain text	
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 address programming enabled				
LED prj mode	master is in configuration mode				
<b>Environment</b>					
Applied standards	EN 61 000-6-2 EN 61 000-6-4				
Housing	Stainless Steel				
Operating temperature	0°C ... +55°C				
Storage temperature	-25°C ... +85°C				
Protection category DIN EN 60 529	IP20				
Maximum tolerable shock and vibration stress	according EN 61 131-2				
Voltage of insulation	≥ 500V				
Dimensions (W / H / D in mm)	75 / 120 / 83		42 / 120 / 40	75 / 120 / 83	75 / 120 / 93
Weight	460 g		300 g	460 g	

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 PROFIBUS Gateways in Stainless Steel

Article no.	Number AS-i Master	Duplicate addresses inspector	AS-i Detector	Programming and diagnosis interface	Safety Monitor integrated	Preprocessing	AS-i Spec.
BWU1567	1 Master	yes	yes	RS232	optional	no	3.0
BWU1568	2 Master	yes	yes	RS232	optional	no	3.0
BWU1569	2 Master out of 1 power supply	yes	yes	RS232	optional	no	3.0
BW1653	1 Master	yes	yes	RS232	no	no	3.0
BW1654	2 Master	yes	yes	RS232	no	no	3.0
BW1655	2 Master out of 1 power supply	yes	yes	RS232	no	no	3.0
BWU1746	1 Master	no	yes	no	no	no	3.0
BWU1773	1 Master	no	yes	no	no	no	3.0
BWU1774	2 Master	no	yes	no	no	no	3.0
BWU1891	1 Master	yes	yes	RS232	no	no	3.0
BWU2544	1 Master	yes	yes	Ethernet	optional	Control III	3.0
BWU2545	2 Master	yes	yes	Ethernet	optional	Control III	3.0
BWU2546	2 Master	yes	yes	Ethernet	optional	Control III	3.0

Bemessungsbetriebsstrom				
Article no.	Master power supply, max. 200mA out of AS-i circuit 1 (ca. 70mA ... 200mA), max. 200mA out of AS-i circuit 2 (ca. 70mA ... 200mA); in sum max. 270mA	Master power supply, ca. 200mA out of AS-i circuit 1 ca. 70mA out of AS-i circuit 2	Version „1 gateway, 1 power supply for 2 AS-i networks“, approx. 250mA (PELV voltage)	Master power supply, ca. 200mA out of AS-i circuit
BWU1567	-	-	-	●
BWU1568	●	-	-	-
BWU1569	-	-	●	-
BW1653	-	-	-	●
BW1654	-	●	-	-
BW1655	-	-	●	-
BWU1746	-	-	-	●
BWU1773	-	-	-	●
BWU1774	-	●	-	-
BWU1891	-	-	-	●
BWU2544	-	-	-	●
BWU2545	●	-	-	-
BWU2546	-	-	●	-

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 PROFIBUS Gateways in Stainless Steel

Article no.	BWU1567	BWU1568	BWU1569	BW1653 BW1654	BW1655	BWU1746 BWU1773 BWU1774 BWU1891 BWU2544	BWU2545	BWU2546
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	-	-	-	-	-	-	-	•
AS-i earth fault monitor distinguishes between AS-i cable and sensor cable	-	-	-	-	-	-	-	•
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	-	-	•	-	•	-	-	•

### <sup>1</sup> (Recognition of duplicate AS-i addresses) except

BWU1746, BWU1773, BWU1774

### <sup>2</sup>(Optional programmable in C) and

### <sup>3</sup> (GSD file integrated)

BWU2544, BWU2545, BWU2546

### <sup>4</sup> AS-i Power24V

The gateways BWU2544, BWU2545 and BWU2546 are AS-i Power24V capable. That means, that all devices can be operated directly on a 24V (PELV) power supply.

The gateway BWU2546 is 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-operation a BW1943 power supply decoupling unit.

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

BWU1567, BWU1568, BWU1569, BWU1653, BWU1654, BWU1655, BWU1773, BWU1774

Currently supplied devices correspond as standard AS-i 3.0.

### Accessories:

- Software „AS-i Control Tools“ (art. no. BW1203, see also page 54)
- Power Supply 4A (art. no. BW1649) /8A (art. no. BW1593, see also page 174)
- AS-i Power Supply Decoupling Unit (art. no. BW1943, see also page 182)
- PROFIBUS DP master simulator (art. no. BW1257, see also page 202)
- Control III, Programming in C (art. no. BW2582, see also page 55)

# 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.	<b>BWU1818</b>
Art. no.	<b>BW1824 Class 1 Div 2 (Group A, B, C &amp; D, T-Code 4)</b>
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 54)
- DeviceNet Master Simulator with USB interface (art. no. BW1420, s. page 204)
- Data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226)
- AS-i Power Supply 4 A (art. no. BW1649, s. page 174)

### 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.		<b>BW1825 Class 1 Div 2 (Group A, B, C &amp; D, T-Code 4)</b>		<b>W1826 Class 1 Div 2 (Group A, B, C &amp; D, T-Code 4)</b>
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 54)
- DeviceNet Master Simulator (art. no. BW1420, s. page 204)
- Data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226)
- AS-i Power Supply 4 A (art. no. BW1649, s. page 174)
- Power Supply 4 A (art. no. BW1597)/8 A (art. no. BW1598) for art. no. BW1826 and BWU1820 (s. page 178)

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 54)
- CANopen master simulator (art. no. BW1453, s. page 205)
- Data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226)
- AS-i power supply 4 A (art. no. BW1649, s. page 174)

### 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	
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	
Operating temperature	0°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 61131-2	
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)
- 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 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 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**



<b>Art. no.</b>	<b>BWU1641</b>
<b>Art. no.</b>	<b>BW1656 Class 1 Div. 2 (Group A, B, C &amp; D, T-Code 4)</b>
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 206)

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 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.		<b>BW1657 Class 1 Div. 2 (Group A, B, C &amp; D, T-Code 4)</b>		<b>BW1658 Class 1 Div. 2 (Group A, B, C &amp; D, T-Code 4)</b>
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 206)
- Power Supply 4 A (art. no. BW1649)/8A (art. no. BW1593) for BWU1643 and BW1658, see also page 178

# 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 54)
- Cross-Link cable (art. no. BW1304, see also page 194)

# 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 54)
- Cross-Link cable (art. no. BW1304, see also page 194)
- Power supply 4A (art. no. BW1649, see also page 174)/8A (art. no. BW1593, see also page 178) for art. no. BWU1652

# AS-i CC-Link Gateway in Stainless Steel

## AS-i CC-Link Gateway in Stainless Steel

AS-i Earth Fault Detector integrated

AS-i Noise Detector integrated



<b>Article no.</b>	<b>BWU2611</b>
<b>Connection</b>	
Connections	AS-i: COMBICON CC-Link: screw terminal blocks
<b>Interface</b>	
CC-Link interface	according to CC-Link specification
Baud rates	156 Kbps up to 10 MBps
Type	remote device
Occupied stations	2-4
CC-Link functions	imaging of the AS-i slaves as RW data on CC-Link. complete diagnosis and configuration via CC-Link
<b>AS-i</b>	
Cycle time	150µs* (number of slaves + 2)
Operating current	power supply A, approx. 200 mA out of AS-i
Operating voltage	AS-i voltage 30V DC
<b>Display</b>	
LCD	menu, displaying AS-i slave addresses and error messages
LED power	voltage ON
LED cc-link	CC-Link status
LED config error	configuration error
LED U AS-i	AS-i voltage o.k.
LED AS-i active	AS-i in normal operation
LED prg enable	automatic address programming enabled
LED prj mode	configuration mode active
<b>Environment</b>	
Applied standards	EN 61 000-6-2 EN 61 000-6-4
Housing	Stainless Steel
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Protection category (EN 60 529)	IP20
Allowable shock -and vibration stress	according to EN 61 131-2
Voltage of insulation	≥ 500V
Dimensions (L / W / H in mm)	85 / 120 / 83
Weight	520 g

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

**Pin assignment:**

	Signal	Color
1	DA	blue
2	DB	white
3	DG	yellow
4	SLD	n/a
5	F G	n/a

**Accessories:**

- Power supply 4A (art. no. BW1649)/8A (art. no. BW1593, see also page 178)

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 Ethernet/IP + Modbus TCP Gateway in Stainless Steel

**EtherNet/IP + Modbus TCP in one device**

**Integrated switch**

**Recognition of Duplicate AS-i Addresses**

**AS-i Earth Fault Detector integrated**

**AS-i Noise Detector integrated**

**Optional Control III, programming in C**

**AS-i Power24V-capability<sup>1</sup>**



BWU2379



BWU2380 / BWU2381



<b>Article no.</b>	<b>BWU2379 / BWU2380 / BWU2381</b>
<b>Interface</b>	
Ethernet interface	RJ-45: 10/100 MBaud Ethernet + Modbus TCP acc. to IEEE 802.3, integrated switch
Baud rate	10/100 MBaud
Card slot	Chip card for storage of configuration data
<b>AS-i</b>	
Cycle time	150µs * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
<b>Display</b>	
LCD	menu, AS-i indication of slave addresses, error messages in plain text
LED power	power ON
LED ser active	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 slave programming enabled
LED prj mode	configuration mode active
<b>Environment</b>	
Applied standards	EN 61 000-6-2 EN 61 000-6-4
Housing	Stainless Steel
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Protection category DIN EN 60 529	IP20
Tolerable loading referring to impacts and vibrations	gemäß EN 61 131-2
Voltage of insulation	≥ 500V
Dimensions (W / H / D in mm)	85 / 120 / 83
Weight	500 g

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

Article no.	Number AS-i Master	Duplicate addresses inspector	AS-i Detector	Programming and diagnosis interface	Safety Monitor integrated	Preprocessing	AS-i Spec.
BWU2379	1 Master	yes	yes	RS232	optional	Control III	3.0
BWU2380	2 Master	yes	yes	RS232	optional	Control III	3.0
BWU2381	2 Master out of 1 power supply	yes	yes	RS232	optional	Control III	3.0

Operating current			
Article no.	Master power supply, max. 200mA out of AS-i circuit 1 (ca. 70mA ... 200mA), max. 200mA out of AS-i circuit 2 (ca. 70mA ... 200mA); in sum max. 270mA	Version „1 gateway, 1 power supply for 2 AS-i networks“, approx. 250mA (PELV voltage)	Master power supply, ca. 200mA out of AS-i circuit
BWU2379	–	–	•
BWU2380	•	–	–
BWU2381	–	•	–

Article no.	BWU2379	BWU2380	BWU2381
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	–	–	•
AS-i earth fault monitor distinguishes between AS-i cable and sensor cable	–	–	•
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	–	–	•

## <sup>1</sup>AS-i Power24V

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 gateway BWU2381 is optimized with integrated data coupling coils and adjustable self-resetting fuses for safe use also of powerful 24V power supplies.

The gateways BWU2379 and BWU2380 will add in Power24V-operation a BW1943 power supply decoupling unit.

## Accessories:

- Software "AS-i Control Tools" (art. no. BW1203, see also page 54)
- Power supply 4A (art. no. BW1649)/8A (art. no. BW1593, see also page 174)
- AS-i Power Supply Decoupling Unit (art. no. BW1943, see also page 182)
- Control III, Programming in C (art. no. BW2582, see also page 55)



# AS-i 3.0 PROFINET-Gateway in Stainless Steel

**PROFINET IO, offers IRT-technology, 1 integrated Switch**

**Recognition of duplicate AS-i addresses**

**AS-i Earth Fault Detector integrated**

**AS-i Noise Detector integrated**

**Optional Control III, programming in C**

**AS-i Power24V-capability<sup>1</sup>**



BWU1912



BWU2238 / BWU2239



<b>Article no.</b>	<b>BWU1912 / BWU2238 / BWU2239</b>
<b>Interface</b>	
PROFINET interface	RJ-45
Conformance Class	B
Baud rates	10/100 MBaud
Card slot	Chipcard for storage of configuration data
<b>AS-i</b>	
Cycle time	150ms * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
<b>Anzeige</b>	
LCD	menu, AS-i indication of slave-addresses, error messages in plain text
LED power	power ON
LED ser active	PROFINET-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 address programming enabled
LED prj mode	in configuration mode
<b>Environment</b>	
Applied standards	EN 61 000-6-2 EN 61 000-6-4
Housing	Stainless Steel
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Protection category DIN EN 60 529	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Voltage of insulation	≥ 500V
Dimensions (W / H / D in mm)	85 / 120 / 83
Weight	500 g

# AS-i 3.0 PROFINET-Gateway in Stainless Steel

Article no.	Number of AS-i Masters	Duplicate addresses inspector	AS-i Detector	Programming and diagnosis interface	Safety Monitor integrated	Preprocessing	AS-i Spec.
BWU1912	1 Master	yes	yes	RS232	optional	Control III	3.0
BWU2238	2 Master out of 1 power supply	yes	yes	RS232	optional	Control III	3.0
BWU2239	2 Master	yes	yes	RS232	optional	Control III	3.0

Operating current			
Article no.	Master power supply, max. 200mA out of AS-i circuit 1 (ca. 70mA ... 200mA), max. 200mA out of AS-i circuit 2 (ca. 70mA ... 200mA); in sum max. 270mA	Version „1 gateway, 1 power supply for 2 AS-i networks“, approx. 250mA (PELV voltage)	Master power supply, ca. 200mA out of AS-i circuit
BWU1912	–	–	●
BWU2238	–	●	–
BWU2239	●	–	–

Article no.	BWU1912	BWU2238	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	–	–	●
Current measurement of the AS-i circuits	–	●	–
Self-resetting adjustable fuses	–	●	–
AS-i earth fault monitor distinguishes between AS-i cable and sensor cable	–	●	–
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	–	●	–

## <sup>1</sup>AS-i Power24V

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 Gateway BWU2238 is optimized with integrated data coupling coils and adjustable self-resetting fuses for safe use also of powerful 24V power supplies.

The Gateways BWU1912 and BWU2239 will add in Power24V-operation a BW1943 power supply decoupling unit.

## IRT-technology and integrated Switch for BWU1912 from ID no.12824 (see lateral label)

Currently supplied devices correspond as standard AS-i 3.0

## Accessories:

- Software „AS-i Control Tools“ (art. no. BW1203, see also page 54)
- Power Supply 4A (art. no. BW1649) /8A (art. no. BW1593, see also page 178)
- AS-i Power Supply Decoupling Unit (art. no. BW1943, see also page 182)
- Control III, Programming in C (art. no. BW2582, see also page 55)

# 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 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 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)	
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 referring 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 54)
- Cross-Link cable (art. no. BW1304)
- AS-i power supply 4 A (art. no. BW1649, s. page 174)

# 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 54)
- Cross-Link cable (art. no. BW1304)
- AS-i power supply 4 A (art. no. BW1649, s. page 174)
- 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

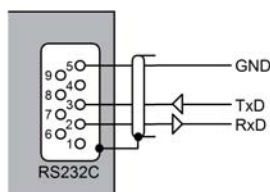


Graphical display	Art. no. BWU1955 AS-i 3.0 without RS 232 diagnostic interface, without duplicate address' recognition
Operating current	approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
Baud rates	1200, 2400, 4800, 9600, 19200, 38400, 57600 baud, automatic recognition
Serial 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 referring to impacts and vibrations	according EN 61 131-2
Weight	460 g

### Accessories:

- Software "AS-i Control Tools" (art. no. BW1203, page 54)
- AS-i power supply 4 A (art. no. BW1649, page 174)
- 24 V to 30 V AS-i power supply 2 A (art. no. BW1760, page 177)
- D-sub-data cable 9-pin, 1,8 m (art. no. BW1058)

### Pin assignment:



AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnosics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

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

## 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

## 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:

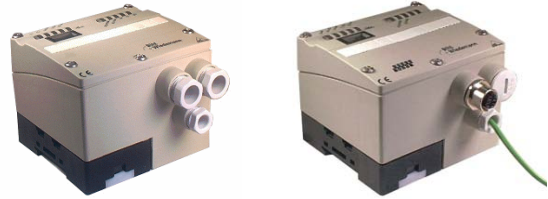
- Software "AS-i Control Tools" with serial transmission cord for Allen-Bradley AS-i Master (art. no. BW1563)

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

### AS-i Specification 2.1

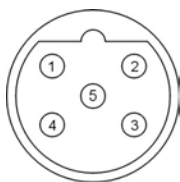
Entirely powered by AS-i

### 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 Adress 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	

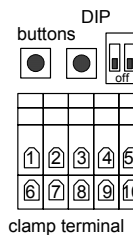
M12 Connector:



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 54)
- Serial PROFIBUS Master (art. no. BW1258, see page 203)
- PROFIBUS DP Master Simulator DP V0 and DP V1 (art. no. BW1257, see page 202)
- Transmission cords (art. no. BW1097, see page 193)

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/CC-Link Gateway in Protection Class IP65

Entirely powered by AS-i

Advanced AS-i diagnostics

AS-i Specification 2.1

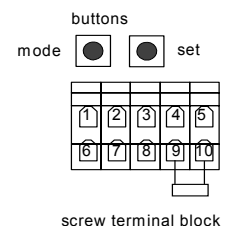


Article no.	BW1435
Connections	AS-i: electromechanical interface (penetration technique) CC-Link: heavy gauge terminals and screw terminal blocks
Operating current	master power supply A, approx. 200 mA out of the AS-i circuit
Operating voltage	AS-i voltage 30 V DC
CC-Link interface	according to CC-Link 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

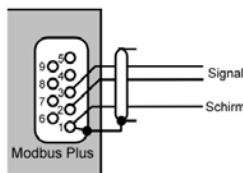
Termination resistor:  
To be removed if module is not at the end of the line



## 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

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 Masters OEM Modules/PC Boards

Housing	Master/Module	Art. No.	Characteristics	P.
	AS-i 3.0 Master PCI Board	BW1922	with advanced diagnostics	47
		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	48
	AS-i PC104	BW1229	AS-i 2.1	49
	AS-i Master M-Module	BW1230	AS-i 2.1	50
	AS-i Master OEM Module	BW1670	for use together with the Evaluation Kit BW1565	51
		BW1588	for AS-i 3.0 customer applications	
		BW2176	with option for AS-i chip programming	
		BW1554	sample for different options	
	Evaluation kit for AS-i Master OEM Module	BW1565	easy configuration of the AS-i Master OEM Module	52

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 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 fullfills 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**

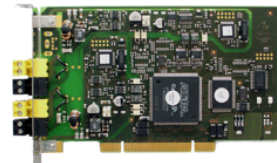
**AS-i 3.0 Master Board (BW1911)  
for AT-PCs with Compact PCI slots**

### Advanced AS-i diagnostics (BW1922):

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



BW1922



BW2087



BW1911



**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 54)
- AS-i power supply 4 A (art. no. BW1649, s. page 174)
- OPC Server
- AS-i power supply decoupling unit for 2 AS-i circuits (art. no. BWU1943, s. page 182)
- DLL drivers for Win 2000 and Win XP; Linux driver

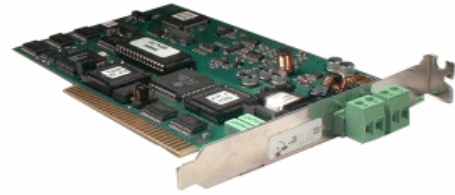
## AS-i Master Board for AT-PCs

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 54)

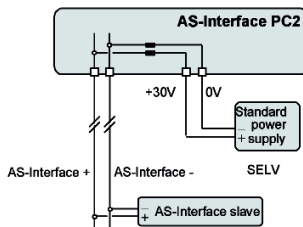
Examples in ANSI C and PASCAL, both with source code

Drivers for:  
Microsoft C, Borland C

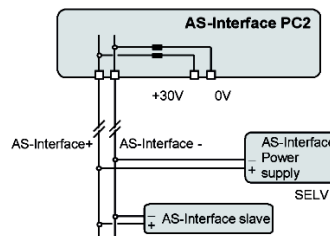
DLL drivers for:  
Win 3.11, Win 95/98, Win NT 4.0, Win 2000

OPC Server

#### AS-i Connections:



Power supply with a conventional power supply unit



Power supply with an AS-Interface power supply unit

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 Module in PC/104 format

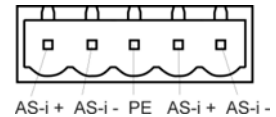
with AS-i Control function

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 54)

#### 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

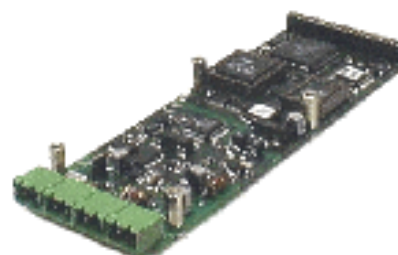
OPC Server

## 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.

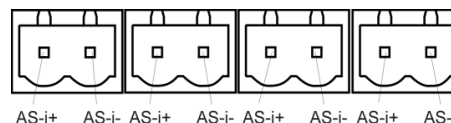
Beside the use in VMEbus or other systems through carrier boards (for example 3U or 6U carrier boards) this AS-i Master module can be implemented as embedded AS-i Master into specific controllers.

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:



AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

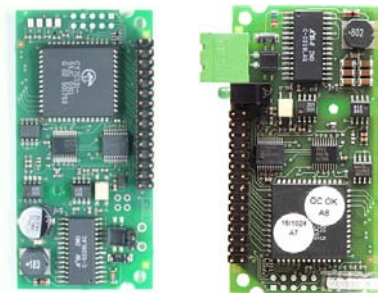
## AS-i Master Board as OEM Module

AS-i-Master OEM Module for integration in specific electronics

AS-i Specification 3.0

AS-i Master specialities as AS-i Safety diagnostics, AS-i Analyser functions etc.

Assembly variants optional, please contact us!



BW1670

BW1554



Article no. BW2176 with option for AS-i chip programming

Article no. BW1670 for use together with the evaluation kit BW1565

Article no. BW1588 for AS-i 3.0 for customer applications

Article no. BW1554 sample for different options

The AS-i Master realizes the functionality of a complete AS-i Master 3.0 on an OEM Module.

The module is supporting the following features:

- +5 V operating voltage
- 8 bit data bus
- 10 bit address bus
- Interrupt-capable
- AS-i connection also at 2.54 mm connection
- Wiring pin 2 x 15 pins 2.54 mm for the DPRAM Interface and serial interface (TTL)
- Optional: AS-i connection through COMBICON connectors on the front (BW1554)

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 3.0 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.

The AS-i Master OEM board BW1588 is the optimal version for use together with the main board of a customer today. AS-i has to be connected by soldering a cable on the board.

BW1670 has additionally two wiring pins for the AS-i connection so that this board can be used together with the evaluation kit without any change.

BW1554 is showing further possibilities like LEDs, a Combicon for AS-i connection and so on.

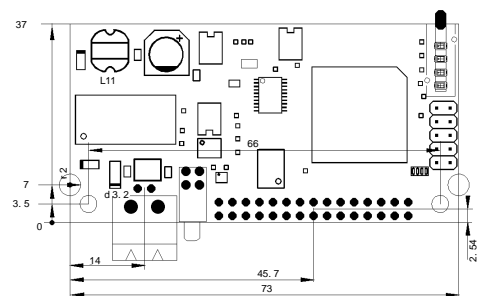
Customer-specific special versions are possible on short notice!

Article no.	BW1554/BW1588/BW1670/BW2176
AS-i Specification	3.0
Type	OEM Module
Dimensions (L /W /H)	73 mm, 37 mm, 14 mm
Weight	25 g
Interface	8 bit bus interface; galvanic separation to AS-i
Operating voltage	5 V DC and AS-i voltage
Operating current	approx. 100 mA out of power supply approx. 70 mA from AS-i
Voltage of insulation	≥ 500 V
EMC directions	according EN 50 081-2, EN 61 000-6-2, EN 50 295
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +70°C
Tolerable loading referring to humidity	according EN 61 131-2
Tolerable loading referring to impacts	according EN 61 131-2
Tolerable loading referring to vibrations	according EN 61 131-2
AS-i cycle time per AS-i circuit	150 µs*(number of slaves + 2)

For more details see data sheet.

### Accessories:

- Evaluation Kit for AS-i Master OEM Module (Art. no. BW1565)
- AS-i Configurator (Windows) "AS-i Control Tools"



## 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.

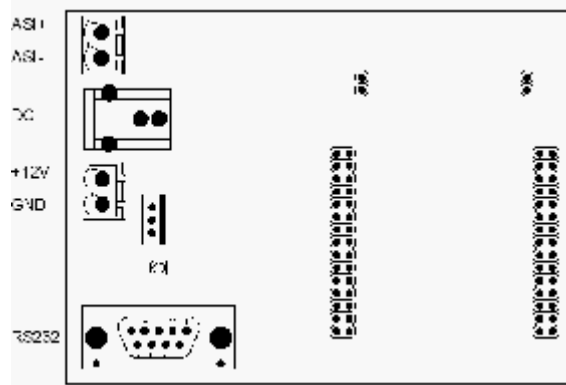
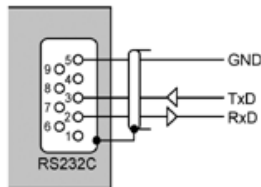
With the help of the evaluation kit for the AS-i Master OEM Module the development of an AS-i Master will be very easy.

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



AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves



AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

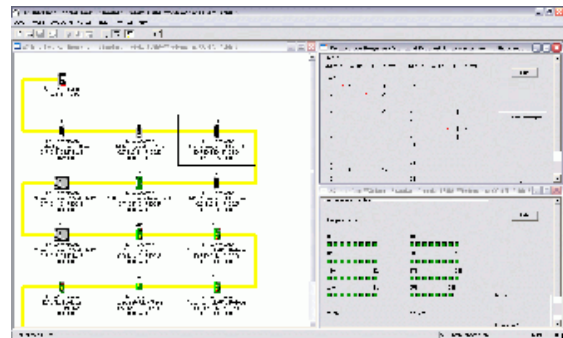
## Overview Software

Software	Art. No.	Characteristics	P.
 <b>AS-i Control Tools</b>	BW1602	with serial cable for AS-i Master in Stainless Steel	54
	BW1563	with serial cable for Allen-Bradley AS-i Master	
	BW1203	Software AS-i Control Tools	
 <b>Control III, Programming in C (Mini-PLC)</b>	BW2582	Activation of the „control“-functions, chip card for easy device replacement, Ethernet programming- and diagnostic interface	55
<b>OPC server for AS-i Masters</b>	BW1222		55
<b>Windows drivers for AS-i Masters</b>	BW1099	16 Bit DLL	57
	BW1224	32 Bit DLL	
	BW1815	.NET and 32 Bit DLL	
<b>Windows NT4 drivers (Kernel mode drivers)</b>	BW1102	for AS-i PC2 board	57
	BW1223	for AS-i PCI board	
<b>Linux drivers for AS-i PCI Board</b>	BW1816	LINUX kernel 2.0 and 2.2	57
	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

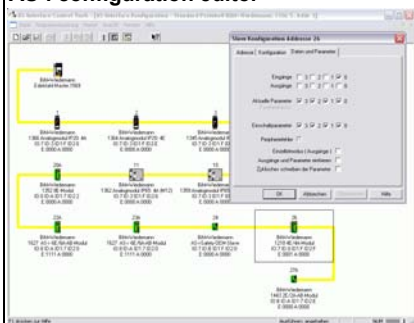

of Bihl+Wiedemann AS-i Masters and AS-i Gateways



**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**

<p><b>General information</b></p>	<ul style="list-style-type: none"> <li>operating system: Win 98 SE, Win NT4, Win Me, Win 2000, Win XP, Vista 32-bit, Windows 7 (32 bit or 64 bit)</li> <li>comprehensible operator guidance</li> <li>simple installation</li> <li>language: English/German</li> <li>extensive help menu</li> </ul>
<p><b>AS-i configuration editor</b></p> 	<p>opening, saving, editing and managing of AS-i configurations tool for the commissioning of AS-i</p> <ul style="list-style-type: none"> <li>graphical display of the AS-i network</li> <li>alternative plain text display of the AS-i network</li> <li>-many devices icons out of an icon archive</li> <li>-simple embedding of own icons and devices</li> <li>display of the actual configuration on the AS-i (slave-profiles in plain language)</li> <li>comparison of actual configuration with the projected one</li> <li>programming of slave addresses</li> <li>projecting of the actual configuration</li> <li>reading of inputs</li> <li>writing of outputs</li> <li>writing of parameters</li> <li>projecting of individual slaves (Offline/Online)</li> <li>slave can be given its own name</li> </ul>
<p><b>AS-i address assistant</b></p>	<ul style="list-style-type: none"> <li>automatic address of the AS-i slaves (no handheld necessary)</li> </ul>
<p><b>Advanced AS-i diagnostics</b></p> 	<ul style="list-style-type: none"> <li>display of AS-i slaves which caused configuration errors</li> <li>judgement of the quality of the AS-i communication by means of error counters for every AS-i slave</li> <li>extended AS-i diagnostic functions</li> <li><b>AS-i Safety diagnostic without additional software for the AS-i monitor possible</b></li> </ul>
<p><b>AS-i Master identity</b></p>	<ul style="list-style-type: none"> <li>reading and writing of AS-i Master and AS-i Control flags</li> </ul>
<p><b>Further functions</b></p>	<ul style="list-style-type: none"> <li>offline/online mode</li> <li>opening and saving of AS-i configuration files</li> <li>opening and saving of AWL-files</li> </ul>
<p><b>Can be used with the following AS-i Masters</b></p>	<ul style="list-style-type: none"> <li>AS-i/PROFIBUS Gateways, AS-i/Modbus Gateways, AS-i/DeviceNet Gateways, AS-i/Ethernet TCP/IP Gateway</li> <li>AS-i Control - AS-i Master with RS 232, RS 485, RS 422</li> <li>AS-i PC2, AS-i PC104, AS-i PCI Board</li> <li>AS-i Master/Scanner for Allen-Bradley ControlLogix, CompactLogix/MicroLogix 1500</li> </ul>

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

## 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.<sup>1</sup>



Chip card for easy device replacement



Ethernet programming- and diagnostic interface

Chip card of the replacement of the devices

Ethernet interface allows remote administration



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.

<b>Article no.</b>	<b>BW2582</b>
<b>General</b>	
	<ul style="list-style-type: none"> <li>• Complete IDE with Eclipse and GCC.</li> <li>• Complete debugging of the control program with Eclipse and GDB.</li> </ul>

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 <sup>32</sup> ms
In -and outputs	up to 496 E/A's and 248 analog values via AS-i slaves

# Activation of the "Control"-functions

AS-i Master/Gateways/  
Links/Scanner

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

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

AS-i Slaves

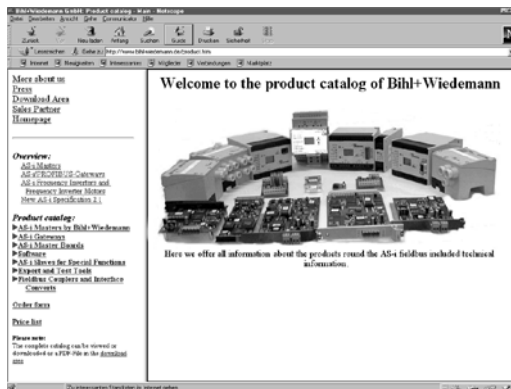
AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists





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 examples 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

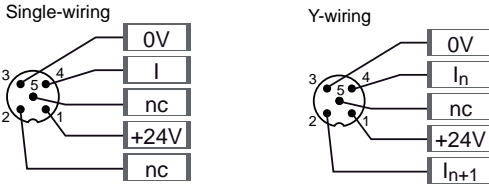
Housing, construction: IP20, 22,5 mm				
Housing	Inputs digital	Outputs digital	AS-i address <sup>4</sup>	Art. no.
4 x COMBICON 	4	4	1 AB Slave	<b>BWU1938</b>
6 x COMBICON 	8	8	2 AB Slaves	<b>BWU2490</b>
				page 61

Selection matrix: housing, construction: Stainless Steel in IP20					
Housing	Inputs digital	Outputs digital	Input voltage (sensor supply) <sup>2</sup>	AS-i address <sup>4</sup>	Art. no.
45 mm deep 	4	4 x relay	out of AS-i	1 Single Slave	<b>BWU1926</b>
	4	3 x relay	out of AS-i	1 AB Slave	<b>BWU1808</b>
	4	4 x electronic	out of AUX	1 AB Slave	<b>BWU1907</b>
	4	4 x electronic	out of AUX	1 Single Slave	<b>BWU2565</b>
	8	0	out of AUX	2 AB Slaves	<b>BWU2077</b>
	0	8 x electronic	–	2 AB Slaves	<b>BWU2078</b>
90 mm deep 	4	4 x relay	out of AS-i	1 Single Slave	<b>BWU2555</b>
	8	0	out of AUX	2 AB Slaves	<b>BWU2556</b>
					page 64

Selection matrix: housing, construction: IP67, M12							
Housing	Inputs digital	Outputs digital	M12 wiring <sup>1</sup>	Input voltage (sensor supply) <sup>2</sup>	AS-i connection <sup>3</sup>	AS-i address <sup>4</sup>	Art. no.
4 x M12 	4	0	Y	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2552</b>
	4	0	Single	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2620</b>
	4	4	Y	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2487</b>
	0	4	Y	–	AS-i profile cable	1 AB Slave	<b>BWU2594</b>
8 x M12 	4	4	Y	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2626</b>
	4	4	Single	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2617</b>
	4	4	Single	out of AUX	AS-i via M12	1 AB Slave	<b>BWU2645</b>
	8	0	Y	out of AS-i	AS-i profile cable	2 AB Slaves	<b>BWU2651</b>
	0	8	Y	–	AS-i profile cable	2 AB Slaves	<b>BWU2652</b>
							page 68

**Output voltage (actuator supply):** the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power) . By supply out of AS-i there is no connection to earth or external potential allowed.

<sup>1</sup>**M12 wiring:** either as a single-wiring or Y-wiring



<sup>2</sup>**Input voltage (sensor supply):** the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power). By supply out of AS-i there is no connection to earth or external potential allowed

<sup>3</sup>**AS-i connection:** the connection to AS-i and to AUX (auxiliary 24V power) is made either via the yellow AS-i profile cable with piercing technology or an M12 socket

<sup>4</sup>**AS-i address:** 1 AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/AS-i network), mixed use allowed

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety



Price Lists

Cost efficient solution in IP20



BWU1938

BWU2490

Selection matrix:				
Selection matrix: housing, construction: IP20, 22,5 mm				
Housing	Inputs digital	Outputs digital	AS-i address <sup>1</sup>	Article no.
4 x COMBICON 	4	4	1 AB Slave	BWU1938
6 x COMBICON 	8	8	2 AB Slaves	BWU2490

<sup>1</sup>AS-i address: 1 AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/AS-i network), mixed use allowed

Article no.	BWU1938 / BWU2490	
<b>Connection</b>		
AS-i connection	COMBICON plug	
Periphery connection	COMBICON plug	
Length of connector cable	unlimited	
<b>AS-i</b>		
Profile	S-7.A.7 (ID1=7 fixed)	Slave 1: S-7.A.7 (ID1=7 default), Slave 2: S-7.A.7 (ID1=6 default)
AS-i address	1 AB	2 AB
Operating voltage	18 ... 31.6V	
Max. current consumption	60mA	120mA
Quiescent current	60mA	120mA
Required Master profile	≥M4	
From AS-i specification	3.0	
<b>AUX</b>		
Voltage	18 ... 30V	
Max. current consumption	4A	8A
<b>Input</b>		
Number	4	8
Power supply	supply out of external 24V	
Power supply of attached sensors	max. 1,2A permanent operation	
Switching threshold	inputs 24V U<5V (low) U>15V (high)	

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

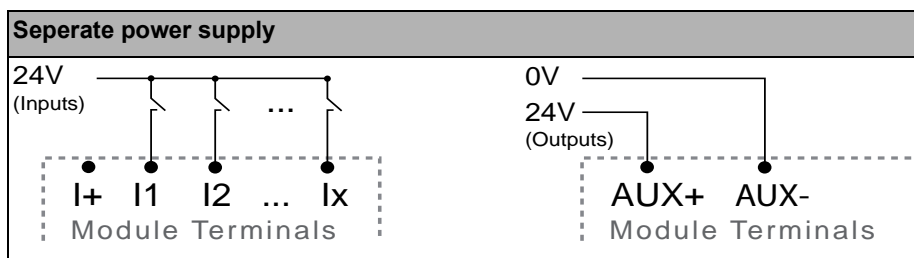
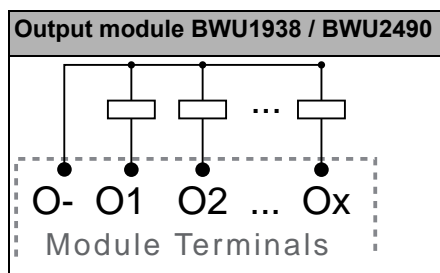
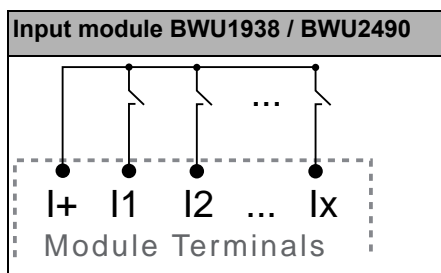
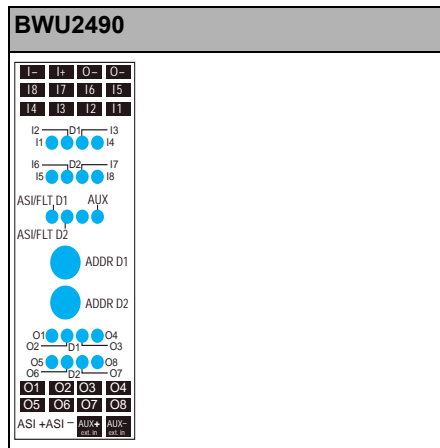
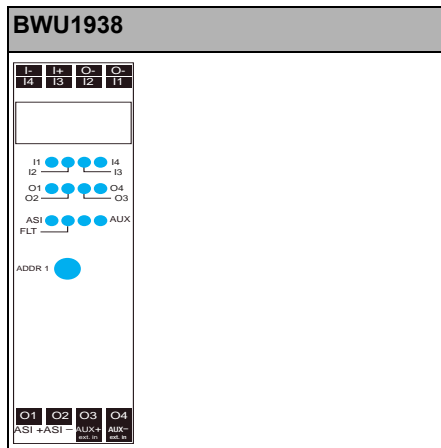
AS-i Safety

Price Lists

Article no.	BWU1938 / BWU2490	
<b>Output</b>		
Number	4, electronic	8, electronic
Power supply	supply out of external 24V	
Max. output current	1A (Σ 3A max.)	1A (Σ 3A max. O1-O4, O5-O8)
<b>Display</b>		
LED AS-i (green)	flashing: adress 0, on: AS-i voltage o.k.	–
LED FLT/FAULT (red)	flashing: overload inputs/ overload outputs, on: communication error	–
LED AUX (green)	green: AUX voltage on	
AS-i/FLT D1 (red/green)	–	reen: slave online, no error red: no data exchange yellow/red flashing: adress 0 red/green flashing: peripheral fault
AS-i/FLT D2 (red/green)	–	green: slave online, no error red: no data exchange yellow/red flashing: adress 0 red/green flashing: peripheral fault red flashing: slave is switched off because slave 1 has adress 0
LEDs I1 ... In (yellow)	state of inputs I1-I4	state of inputs I1-I8
LEDs O1 ... On (yellow)	state of outputs O1-O4	state of outputs O1-O8
<b>Environment</b>		
Applied standards	EN 61 000-6-2 EN 61 000-6-3	
Operating temperature	0°C ... +60°C	
Storage temperature	-25°C ... +85°C	
Protection category DIN EN 60 529	IP20	
Voltage of insulation	500V	
Dimensions (W / H / D) in mm	22,5 / 99 / 114	

Programming	Bit setting			
	D0	D1	D2	D3
	Input			
BWU1938	I1	I2	I3	I4
BWU2490	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			
BWU1938	O1	O2	O3	O4
BWU2490	Slave 1: O1	Slave 1: O2	Slave 1: O3	Slave 1: O4
	Slave 2: O5	Slave 1: O6	Slave 1: O7	Slave 1: O8
	Parameter bit			
	P0	P1	P2	P3
BWU1938 / BWU2490	0= Off / 1= On (watchdog)	0= On / 1= Off (data input filter 128µs)	not used	not used

Connections		
BWU1938		
	ASI+, ASI-	AS-i connection
	AUX+, AUX-	External supply input
	I+, I-	Sensor supply
	O-	GND for outputs
	I1 - I4	Inputs
	O1 - O4	Outputs
BWU2490		
	ASI+, ASI-	AS-i connection
	AUX+, AUX-	External supply input
	I+, I-	Sensor supply
	O-	GND for outputs
	I1 - I8	Inputs
	O1 - O8	Outputs



## Robust housing solution for cabinet mounting



BW1808 / BW1907 /  
BW1926 / BW2077 /  
BW2078 / BW2565

BW2555 / BW2556



Selection matrix:					
Housing, construction: Stainless Steel, IP20					
Housing	Inputs digital	Outputs digital	Input voltage (sensor supply) <sup>1</sup>	AS-i address <sup>2</sup>	Art. no.
45 mm deep	4	4 x relay	out of AS-i	1 Single Slave	BWU1926
	4	3 x relay	out of AS-i	1 AB Slave	BWU1808
	4	4 x electronic	out of AUX	1 AB Slave	BWU1907
	4	4 x electronic	out of AUX	1 Single Slave	BWU2565
	8	0	out of AUX	2 AB Slaves	BWU2077
	0	8 x electronic	–	2 AB Slaves	BWU2078
90 mm deep	4	4 x relay	out of AS-i	1 Single Slave	BWU2555
	8	0	out of AUX	2 AB Slaves	BWU2556

**Output voltage (actuator supply):** the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power). By supply out of AS-i there is no connection to earth or external potential allowed.

**Replacement, AS-i version 2.0:** Single Slaves work even with the first AS-i Masters

<sup>1</sup>**Input voltage (sensor supply):** the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power). By supply out of AS-i there is no connection to earth or external potential allowed

<sup>2</sup>**AS-i address:** 1 AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/AS-i network), mixed use allowed

Artikel Nr.	BW1808	BW1907	BW1926	BW2077	BW2078	BW2555	BW2556	BW2565
<b>Connection</b>								
Length of connector cable	I: max. 1.5 m, O: unlimited	I: max. 1.5 m, O: max. 1.5 m	I: max. 1.5 m, O: unlimited	I: max. 1.5 m	O: max. 1.5 m	I: max. 1.5 m, O: unlimited	I: max. 1.5 m	I: max. 1.5 m, O: max. 1.5 m
<b>AS-i</b>								
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-0.A.E, ID1=7 (fixed)	S-7.A.7, ID1=7 (fixed)	S-7.F.E, ID1=F (default)	2 x S-0.A.E, ID1=7 (fixed)	7. F. E, ID1=7 (fixed)
AS-i address	1 AB		1 Single	2 AB		1 Single	2 AB	1 Single
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
From AS-i specification	3.0		2.1	3.0		2.1	3.0	2.1
Qiescent current	< 30mA (no sensors, outputs= 0)							



Artikel Nr.	BW1808	BW1907	BW1926	BW2077	BW2078	BW2555	BW2556	BW2565
<b>AUX</b>								
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.
		(AUX-O) 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.			(total) 8A max.
<b>Input</b>								
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)		
<b>Output</b>								
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
Max. output current	–	0,5A permanent operation per output	–	–	0,5A permanent operation per output	–	–	0,5A permanent operation per output
<b>Display</b>								
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
<b>Environment</b>								
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			-25°C ... +60°C		-25°C ... +70°C	-25°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)	50 / 120 / 45				50 / 120 / 90			50 / 120 / 45

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbusses/  
Master Simulators

AS-i Safety

Pice Lists

AS-i Master/Gateways/  
Links/Scanner

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 / BW2556	not used			

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

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

Other Fieldbussee/  
Master Simulators

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!

AS-i Safety

Connections:		
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

Pice Lists

Connections:		
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
	O1 - O8	Outputs

BW2078																															
		AS-i +, AS-i -		Connection to the AS-i bus																											
<table border="1"> <tr><td>AS-i+</td><td>AS-i-</td></tr> <tr><td>0V 1 ext.in</td><td>+24 V 1 ext.in</td></tr> <tr><td>0V 1</td><td>O 1</td></tr> <tr><td>0V 1</td><td>O 2</td></tr> <tr><td>0V 1</td><td>O 3</td></tr> <tr><td>0V 1</td><td>O 4</td></tr> <tr><td>AS-i+</td><td>AS-i-</td></tr> </table>		AS-i+	AS-i-	0V 1 ext.in	+24 V 1 ext.in	0V 1	O 1	0V 1	O 2	0V 1	O 3	0V 1	O 4	AS-i+	AS-i-	<table border="1"> <tr><td>+24V1 ext.in</td><td>0V 1 ext.in</td></tr> <tr><td>+24V2 ext.in</td><td>0V 2 ext.in</td></tr> <tr><td>O 5</td><td>0V 2</td></tr> <tr><td>O 6</td><td>0V 2</td></tr> <tr><td>O 7</td><td>0V 2</td></tr> <tr><td>O 8</td><td>0V 2</td></tr> </table>		+24V1 ext.in	0V 1 ext.in	+24V2 ext.in	0V 2 ext.in	O 5	0V 2	O 6	0V 2	O 7	0V 2	O 8	0V 2	+24V1 ext.in 0V1 ext.in +24V2 ext.in 0V2 ext.in 0V1 0V2 01 - O8	Supply inputs for outputs outputs A1 - A4 Supply inputs for outputs outputs A5 - A8 Reference potential for outputs A1 - A4 Reference potential for outputs A5 - A8 Outputs
AS-i+	AS-i-																														
0V 1 ext.in	+24 V 1 ext.in																														
0V 1	O 1																														
0V 1	O 2																														
0V 1	O 3																														
0V 1	O 4																														
AS-i+	AS-i-																														
+24V1 ext.in	0V 1 ext.in																														
+24V2 ext.in	0V 2 ext.in																														
O 5	0V 2																														
O 6	0V 2																														
O 7	0V 2																														
O 8	0V 2																														
<ul style="list-style-type: none"> <li>● ADDR 1</li> <li>● ADDR 2</li> <li>● PWR</li> <li>● FLT</li> <li>● O1</li> <li>● O2</li> <li>● O3</li> <li>● O4</li> <li>● AUX 1</li> <li>● AUX 2</li> <li>● O5</li> <li>● O6</li> <li>● O7</li> <li>● O8</li> </ul>																															

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbusses/  
Master Simulators

AS-i Safety

Pice Lists

AS-i Master/Gateways/  
Links/Scanner

2x2 connectors for profile cable

2 color LEDs per output,  
state (yellow), overload (red)



BWU2487



BWU2552 /  
BWU2594 /  
BWU2620

BWU2617 / BWU2626 /  
BWU2645 / BWU2651 /  
BWU2652



AS-i Slaves

**Selection matrix:**

Housing, construction: IP67, M12							
Housing	Inputs digital	Outputs digital	M12 wiring <sup>1</sup>	Input voltage (sensor supply) <sup>2</sup>	AS-i connection <sup>3</sup>	AS-i address <sup>4</sup>	Art. no.
4 x M12 	4	0	Y	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2552</b>
	4	0	Single	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2620</b>
	4	4	Y	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2487</b>
	0	4	Y	none	AS-i profile cable	1 AB Slave	<b>BWU2594</b>
8 x M12 	4	4	Y	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2626</b>
	4	4	Single	out of AS-i	AS-i profile cable	1 AB Slave	<b>BWU2617</b>
	4	4	Single	out of AUX	AS-i via M12	1 AB Slave	<b>BWU2645</b>
	8	0	Y	out of AS-i	AS-i profile cable	2 AB Slaves	<b>BWU2651</b>
	0	8	Y	none	AS-i profile cable	2 AB Slaves	<b>BWU2652</b>

AS-i Accessories/  
Diagnostics/Development

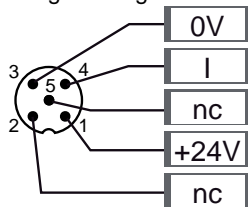
Other Fieldbuses/  
Master Simulators

**Output voltage (actuator supply):** the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power) . By supply out of AS-i there is no connection to earth or external potential allowed.

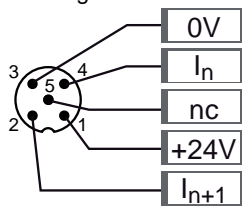
**Replacement, AS-i version 2.0:** Single Slaves work even with the first AS-i Masters

<sup>1</sup>**M12 wiring:** either as a single-wiring or Y-wiring

Single-wiring



Y-wiring



<sup>2</sup>**Input voltage (sensor supply):** the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power). By supply out of AS-i there is no connection to earth or external potential allowed.

<sup>3</sup>**AS-i connection:** the connection to AS-i and to AUX (auxiliary 24V power) is made either via the yellow AS-i profile cable with piercing technology or an M12 socket

<sup>4</sup>**AS-i address:** AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/per AS-i network), mixed use allowed

AS-i Safety

Price Lists

# AS-i Digital Modules, IP67, M12

Article no.	BWU2552	BWU2620	BWU2487	BWU2594	BWU2626	BWU2617	BWU2645	BWU2651	BWU2652	
<b>Connection</b>										
AS-i/AUX connection	profile cable and piercing						M12	profile cable and piercing		
Periphery connection	M12, Y-wiring	M12	M12, Y-wiring			M12		M12, Y-wiring		
<b>AS-i</b>										
Profile	S-0.A.E (ID1=7 default)		S-7.A.7 (ID1=7 fixed)				Slave 1: S-0.A.E (ID1=7 fixed), Slave 2: S-0.A.E (ID1=6 default)		Slave 1: S-7.A.7 (ID1=7 fixed), Slave 2: S-7.A.7 (ID1=6 default)	
AS-i address	1 AB						2 AB			
Operating voltage	30V (18 ... 31.6V)									
Required Master profile	≥M3			≥M4				≥M3	≥M4	
From AS-i specification	2.11			3.0				2.11	3.0	
Max. AS-i current consumption	200mA			80mA	200mA		60mA	400mA	100mA	
<b>AUX</b>										
Voltage	-		24V (18 ... 30V)				-		24V (18 ... 30V)	
Max. AUX current consumption	-		2A	3A			-		6A	
<b>Input</b>										
Number	4			-	4		8	-		
Power supply	supply out of AS-i			-	supply out of AS-i		supply out of AUX	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)									
<b>Output</b>										
Number	-		4				-		8	
Power supply	-		supply out of AUX						-	
Max. output current	-		500mA per output	1A (Σ 3A max.)			-		1A (Σ 3A max. für=O1-O4 + Σ 3A max. for=O5-O8)	
<b>Display</b>										
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						-			
AS-i FLT 1 (red/green)	-						green: Slave online, no error red: no exchange of data yellow/red flashing: address 0 red/green flashing: peripheral fault			

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 Digital Modules, IP67, M12



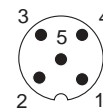
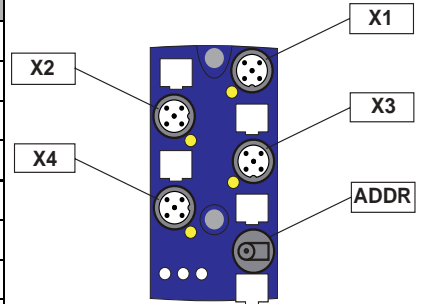
THE AS-INTERFACE MASTERS

- AS-i Master/Gateways/  
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- AS-i Slaves
- AS-i Accessories/  
Diagnostics/Development
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Master Simulators
- AS-i Safety
- Price Lists

Article no.	BWU2552	BWU2620	BWU2487	BWU2594	BWU2626	BWU2617	BWU2645	BWU2651	BWU2652
AS-i FLT 2 (red/green)				-					green: Slave online, no error red: no exchange of data yellow/red flashing: address 0 red/green flashing: peripheral fault red flashing: Slave is switched off because Slave 1 has address 0
LED AUX (green)	-				on: 24V DC AUX on off: no 24V DC AUX			-	on: 24V DC AUX on off: no 24V DC AUX
2x LEDs I1 / I2 and I3 / I4 (yellow)	-		state of inputs I1 / I2 and I3 / I4: at least 1 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 1 output O1 / O2 (or O3 / O4) is on			-			
4x LEDs (yellow)	state of inputs I1 to I4		-	state of inputs I1 to I4			state of inputs I1 to I8	state of outputs O1 to O8	
4x LEDs (yellow)	-		state of outputs O1 to O4						
<b>Environment</b>									
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				

Programming		AS-i Bit assignment			
Bit	D0	D1	D2	D3	
	Input				
BWU2487 / BWU2552 / BWU2617 / BWU2620 / BWU2626	I1	I2	I3	I4	
Output					
BWU2487 / BWU2594 / BWU2617 / BWU2626	O1	O2	O3	O4	
Parameter bit					
	P0	P1	P2	P3	
BWU2487 / BWU2594 / BWU2617 / BWU2626 / BWU2645 / BWU2652	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 / BWU2651	0= Off / 1= On (peripheral fault)				

Connections							
Article no.	M12 connection	Marking	Pin1	Pin2	Pin3	Pin4	Pin5
BWU2487	X1	I1/I2	24V <sub>out</sub> of AS-i	I2	0V <sub>out</sub> of AS-i	I1	nc
	X2	O1/O2	24V <sub>out</sub> of AS-i	O2	0V <sub>ext.</sub>	O1	nc
	X3	I3/I4	24V <sub>out</sub> of AS-i	I4	0V <sub>out</sub> of AS-i	I3	nc
	X4	O3/O4	24V <sub>out</sub> of AS-i	O4	0V <sub>ext.</sub>	O3	nc
BWU2594	X1	O1	0V <sub>ext</sub> out	O2	0V <sub>ext</sub> out	O1	nc
	X2	O2	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O2	nc
	X3	O3	0V <sub>ext</sub> out	O4	0V <sub>ext</sub> out	O3	nc
	X4	O4	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O4	nc
BWU2552	X1	I1	24V <sub>out</sub> of AS-i	I2	0V <sub>out</sub> of AS-i	I1	nc
	X2	I2	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I2	nc
	X3	I3	24V <sub>out</sub> of AS-i	I4	0V <sub>out</sub> of AS-i	I3	nc
	X4	I4	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I4	nc
BWU2620	X1	I1	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I1	nc
	X2	I2	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I2	nc
	X3	I3	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I3	nc
	X4	I4	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I4	nc
	ADDR (dummy plug)	connection for AS-i addressing device					



AS-i Master/Gateways/  
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AS-i Slaves

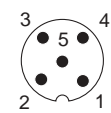
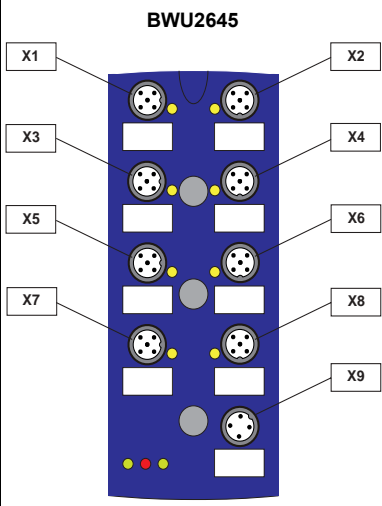
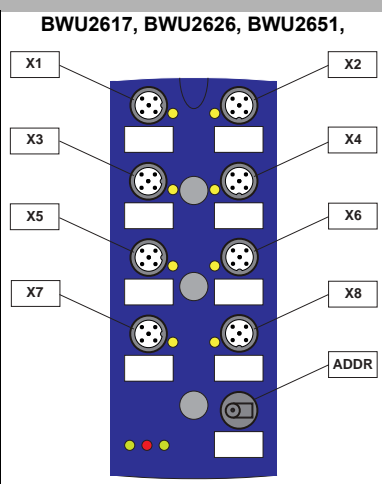
AS-i Accessories/  
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Other Fieldbuses/  
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AS-i Safety

Price Lists

Connections							
Article no.	M12 connection	Marking	Pin1	Pin2	Pin3	Pin4	Pin5
BWU2617	X1	I1	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I1	nc
	X2	I2	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I2	nc
	X3	I3	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I3	nc
	X4	I4	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I4	nc
	X5	O1	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O1	nc
	X6	O2	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O2	nc
	X7	O3	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O3	nc
	X8	O4	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O4	nc
	ADDR (dummy plug)	connection for AS-i addressing device					
BWU2626	X1	I1	24V <sub>out</sub> of AS-i	I2	0V <sub>out</sub> of AS-i	I1	nc
	X2	I2	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I2	nc
	X3	I3	24V <sub>out</sub> of AS-i	I4	0V <sub>out</sub> of AS-i	I3	nc
	X4	I4	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I4	nc
	X5	O1	0V <sub>ext</sub> out	O2	0V <sub>ext</sub> out	O1	nc
	X6	O2	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O2	nc
	X7	O3	0V <sub>ext</sub> out	O4	0V <sub>ext</sub> out	O3	nc
	X8	O4	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O4	nc
	ADDR (dummy plug)	connection for AS-i addressing device					
BWU2645	X1	I1	24V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	I1	nc
	X2	I2	24V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	I2	nc
	X3	I3	24V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	I3	nc
	X4	I4	24V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	I4	nc
	X5	O1	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O1	nc
	X6	O2	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O2	nc
	X7	O3	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O3	nc
	X8	O4	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O4	nc
	X9	AS-i	AS-i+	0V <sub>ext</sub> in	AS-i-	24V <sub>ext</sub> in	-
BWU2651	X1	I1	24V <sub>out</sub> of AS-i	I2	0V <sub>out</sub> of AS-i	I1	nc
	X2	I2	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I2	nc
	X3	I3	24V <sub>out</sub> of AS-i	I4	0V <sub>out</sub> of AS-i	I3	nc
	X4	I4	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I4	nc
	X5	I5	24V <sub>out</sub> of AS-i	I6	0V <sub>out</sub> of AS-i	I5	nc
	X6	I6	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I6	nc
	X7	I7	24V <sub>out</sub> of AS-i	I8	0V <sub>out</sub> of AS-i	I7	nc
	X8	I8	24V <sub>out</sub> of AS-i	nc	0V <sub>out</sub> of AS-i	I8	nc
	ADDR (dummy plug)	connection for AS-i addressing device					
BWU2652	X1	O1	0V <sub>ext</sub> out	O2	0V <sub>ext</sub> out	O1	nc
	X2	O2	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O2	nc
	X3	O3	0V <sub>ext</sub> out	O4	0V <sub>ext</sub> out	O3	nc
	X4	O4	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O4	nc
	X5	O5	0V <sub>ext</sub> out	O6	0V <sub>ext</sub> out	O5	nc
	X6	O6	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O6	nc
	X7	O7	0V <sub>ext</sub> out	O8	0V <sub>ext</sub> out	O7	nc
	X8	O8	0V <sub>ext</sub> out	nc	0V <sub>ext</sub> out	O8	nc
	ADDR (dummy plug)	connection for AS-i addressing device					

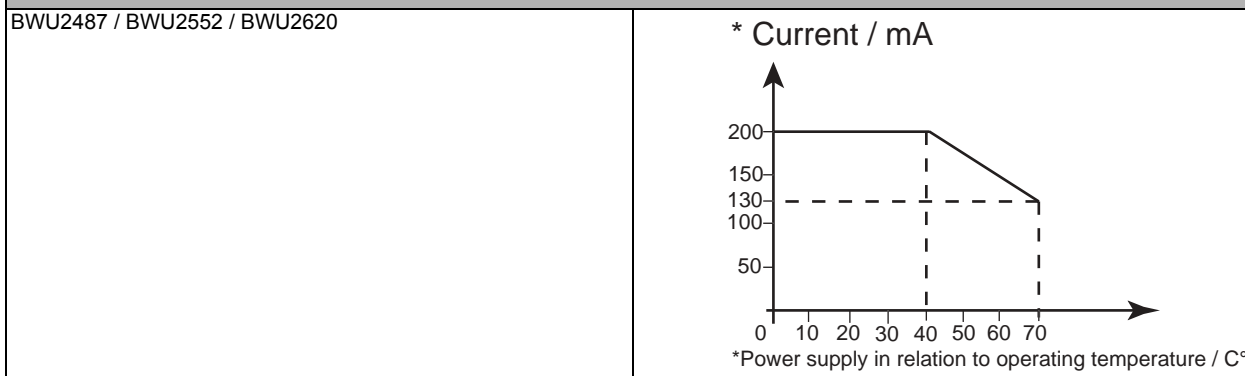




## Connections

Signal name	Explanation
Ix	digital input x
Ox	digital outputx
24V <sub>ext out</sub>	power supply, out of external voltage, positive pole (AUX, acuator supply)
0V <sub>ext out</sub>	power supply, out of external voltage, negative pole (AUX, acuator supply)
24V <sub>out of AS-i</sub>	power supply, out of AS-i, positive pole (sensor supply)
0V <sub>out of AS-</sub>	power supply, out of AS-i, negative pole (sensor supply)

## Power supply of attached sensors



### 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 194)

# 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, $\Sigma$ 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

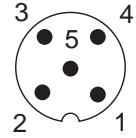
##### Bit P3:

not used

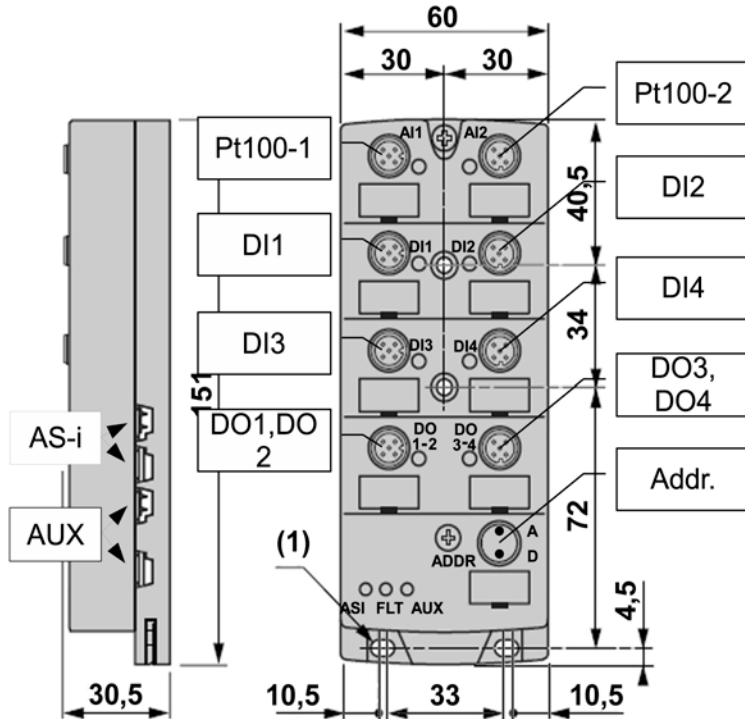
# AS-i Analog Module, 2 inputs Pt100 + 4 digital inputs/outputs in IP67 (M12)

## Connections

Connector / M12 Pin number	1	2	3	4	5
<b>AI1</b>	CH1+	CH1S+	CH1-	CH1S-	Shield
<b>AI2</b>	CH2+	CH2S+	CH2-	CH2S-	Shield
<b>DI1</b>	24 V ext out	DI2	0 V ext out	DI1	nc
<b>DI2</b>	24 V ext out	nc	0 V ext out	DI2	nc
<b>DI3</b>	24 V ext out	DI4	0 V ext out	DI3	nc
<b>DI4</b>	24 V ext out	nc	0 V ext out	DI4	nc
<b>DO1-2</b>	0 V ext out	DO2	0 V ext out	DO1	nc
<b>DO3-4</b>	0 V ext out	DO4	0 V ext out	DO3	nc
<b>ADDR A, ADDR D</b>	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
DIx	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)

AS-i Master/Gateways/  
Links/Scanner



















AS-i Slaves




AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators



AS-i Safety

Price Lists

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
AI2 (yellow)		no Pt100 sensor connected or sensor out of range
	DI1, DI2, DI3, DI4 (yellow)	
		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 present

 LED on    LED flashing    LED off

## Overview Analog Modules AS-i

Housing, construction: IP20, 22,5 mm						
Housing	Inputs analog	Outputs analog	Input voltage (sensor supply) <sup>1</sup>	Output voltage (actuator supply) <sup>2</sup>	AS-i address <sup>3</sup>	Art. no.
4 x COMBICON 	2x (4 ... 20mA / 0 ... 10V)	0	random, from AS-i or AUX, default AS-i	–	1 AB Slave	<b>BWU1897</b>
	2x (4 ... 20mA / 0 ... 10V)	0	random, from AS-i or AUX, default AS-i	–	1 Single Slave	<b>BWU1345</b>
	0	2x (0 ... 20mA / 0 ... 10V)	–	random, from AS-i or AUX, default AS-i	1 Single Slave	<b>BWU1412</b>
	0	2x (0 ... 20mA / 0 ... 10V)	–	random, from AS-i or AUX, default AUX	1 Single Slave	<b>BWU1727</b>
	0	2x (-10V ... +10V)	–	out of AUX	1 Single Slave	<b>BWU2224</b>
6 x COMBICON 	4x 4 ... 20mA	0	random, from AS-i or AUX, auto switching	–	1 Single Slave	<b>BWU1364</b>
	4x 0 ... 10V	0	random, from AS-i or AUX, auto switching	–	1 Single Slave	<b>BWU1365</b>
	4x Pt100	0	out of AS-i	–	1 Single Slave	<b>BWU1368</b>
	4 x thermocouple inputs type J	0	out of AS-i	–	1 Single Slave	<b>BWU1933</b>
	4 x thermocouple inputs type K	0	out of AS-i	–	1 Single Slave	<b>BWU2243</b>
	0	4x 0 ... 20mA	–	random, from AS-i or AUX, auto switching	1 Single Slave	<b>BWU1366</b>
	0	4x 0 ... 10V	–	random, from AS-i or AUX, auto switching	1 Single Slave	<b>BWU1367</b>
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AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves



AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

# Analog Modules AS-i

Housing, construction: IP65, PG						
Housing	Inputs analog	Outputs analog	Input voltage (sensor supply) <sup>1</sup>	Output voltage (actuator supply) <sup>2</sup>	AS-i address <sup>3</sup>	Art. no.
<b>3 PG</b> 	2x 4 ... 20mA	0	random, from AS-i or AUX, default AS-i	–	1 Single Slave	<b>BWU1232</b>
	2x 0 ... 10V	0	random, from AS-i or AUX, default AS-i	–	1 Single Slave	<b>BWU1233</b>
	1 load cell	0	out of AS-i	–	1 Single Slave	<b>BWU2240</b>
	0	2x 0 ... 20mA	–	random, from AS-i or AUX, default AS-i	1 Single Slave	<b>BWU1234</b>
	0	2x 0 ... 10V	–	random, from AS-i or AUX, default AS-i	1 Single Slave	<b>BWU1235</b>
<b>8 PG</b> 	4x Pt100	0	out of AS-i	–	1 Single Slave	<b>BWU1254</b>
	4x Pt1000	0	out of AS-i	–	1 Single Slave	<b>BWU1509</b>
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AS-i Master/Gateways/  
Links/Scanner



AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

Housing, construction: IP65, M12						
Housing	Inputs analog	Outputs analog	Input voltage (sensor supply) <sup>1</sup>	Output voltage (actuator supply) <sup>2</sup>	AS-i address <sup>3</sup>	Art. no.
45 mm wide 	2x 4 ... 20mA	0	out of AS-i	–	1 AB Slave	<b>BWU1893</b>
	2x 4 ... 20mA	0	out of AS-i	–	1 Single Slave	<b>BWU1894</b>
	2x 0 ... 10V	0	out of AS-i	–	1 AB Slave	<b>BWU1963</b>
	2x 0 ... 10V	0	out of AS-i	–	1 Single Slave	<b>BWU1964</b>
	2x Pt100	0	out of AS-i	–	1 AB Slave	<b>BWU1895</b>
90 mm wide 	1x (4 ... 20mA / 0 ... 10V)	1x (0 ... 20mA / 0 ... 10V)	out of AS-i	out of AS-i	1 AB Slave	<b>BWU1917</b>
	1x (4 ... 20mA / 0 ... 10V)	1x (0 ... 20mA / 0 ... 10V)	out of AUX	out of AUX	1 AB Slave	<b>BWU1853</b>
	4x 4 ... 20mA	0	random, from AS-i or AUX, auto switching	–	1 Single Slave	<b>BWU1359</b>
	4x 0 ... 10V	0	random, from AS-i or AUX, auto switching	–	1 Single Slave	<b>BWU1360</b>
	4x Pt100, 2/4 wire mode	0	out of AS-i	–	1 Single Slave	<b>BWU1363</b>
	4x Pt100, 2/3 wire mode	0	out of AS-i	–	1 Single Slave	<b>BWU2532</b>
	–	4x 0 ... 20mA	–	out of AUX	1 Single Slave	<b>BWU1722</b>
	–	4x 0 ... 20mA	–	random, from AS-i or AUX, auto switching	1 Single Slave	<b>BWU1361</b>
	–	4x 0 ... 10V	–	random, from AS-i or AUX, auto switching	1 Single Slave	<b>BWU1362</b>
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<sup>1</sup>**Input voltage (sensor supply):** the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power).

By supply out of AS-i there is no connection to earth or external potential allowed

<sup>2</sup>**Output voltage (actuator supply):** the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power) .

By supply out of AS-i there is no connection to earth or external potential allowed

<sup>3</sup>**AS-i address:** 1 AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/AS-i network), mixed use allowed

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 Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists





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



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



Housing, construction: IP20, 22,5 mm						
Housing	Inputs analog	Outputs analog	Input voltage (sensor supply) <sup>1</sup>	Output voltage (actuator supply) <sup>2</sup>	AS-i address <sup>3</sup>	Art. no.
4 x COMBICON 	2x (4 ... 20mA / 0 ... 10V)	0	random, from AS-i or AUX, default AS-i	–	1 AB Slave	<b>BWU1897</b>
	2x (4 ... 20mA / 0 ... 10V)	0	random, from AS-i or AUX, default AS-i	–	1 Single Slave	<b>BWU1345</b>
	0	2x (0 ... 20mA / 0 ... 10V)	–	random, from AS-i or AUX, default AS-i	1 Single Slave	<b>BWU1412</b>
	0	2x (0 ... 20mA / 0 ... 10V)	–	random, from AS-i or AUX, default AUX	1 Single Slave	<b>BWU1727</b>
	0	2x (-10V ... +10V)	–	out of AUX	1 Single Slave	<b>BWU2224</b>
6 x COMBICON 	4x 4 ... 20mA	0	random, from AS-i or AUX, auto switching	–	1 Single Slave	<b>BWU1364</b>
	4x 0 ... 10V	0	random, from AS-i or AUX, auto switching	–	1 Single Slave	<b>BWU1365</b>
	4x Pt100	0	out of AS-i	–	1 Single Slave	<b>BWU1368</b>
	4 x thermocouple inputs type J	0	out of AS-i	–	1 Single Slave	<b>BWU1933</b>
	4 x thermocouple inputs type K	0	out of AS-i	–	1 Single Slave	<b>BWU2243</b>
	0	4x 0 ... 20mA	–	random, from AS-i or AUX, auto switching	1 Single Slave	<b>BWU1366</b>
	0	4x 0 ... 10V	–	random, from AS-i or AUX, auto switching	1 Single Slave	<b>BWU1367</b>

<sup>1</sup>**Input voltage (sensor supply):** the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power). By supply out of AS-i there is no connection to earth or external potential allowed

<sup>2</sup>**Output voltage (actuator supply):** the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power) . By supply out of AS-i there is no connection to earth or external potential allowed

<sup>3</sup>**AS-i address:** 1 AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/AS-i network), mixed use allowed

# Analog Modules AS-i IP20

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

Article Nr.	BWU1345	BWU1364	BWU1365	BWU1368	BWU1897	BWU1933 BWU2243	BWU1366	BWU1367	BWU1412	BWU1727	BWU2224
<b>General Data</b>											
Device type	Input						Output				
<b>Connection</b>											
Periphery connection	COMBICON clamp										
AS-i connection	COMBICON clamp										
<b>AS-i</b>											
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. current consumption	< 80mA				< 100mA		< 80mA			< 100mA	
From AS-i specification	3.0										
<b>AUX</b>											
Voltage	-										18 .. 30V
Max. current consumption	-										100mA
<b>Input</b>											
Resolution	16 Bit (1µA/1mV)	16 Bit (1µA)	16 Bit (1mV)	16 Bit (0,1°C)	14 Bit (1µA/1mV)	16 Bit (0,1°C)	-				
Range of value	4000 ... 20000 dez. / 0 ... 10000 dez.	4000 ... 20000 dez.	0 ... 10000 dez.	-200°C ... +850°C	4000 ... 20000 dez. / 0 ... 10000 dez.	-200°C ... +760°C	-				
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						-				
<b>Output</b>											
Resolution	-					16 Bit (1µA)	16 Bit (1mV)	16 Bit (1µA/1mV)	16 Bit		
Range of value	-					0 ... 20000 dez.	0 ... 10000 dez.	0 ... 20000 dez. / 0 ... 10000 dez.	-10000 ... +10000 dez.		
Resistance of the actuators	-										
Max. output current	-										
Power supply	-					out of AS-i / 24V DC extern					24V DC external (AUX)
<b>Environment</b>											
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 ... +6 0°C	
Storage temperature	-25°C ... +85°C										
Protection category DIN 40 050	IP20										
Voltage of insulation	≥ 500V										

Programming of input					
Bit setting	Article Numbers				
	BWU1345	BWU1364 BWU1365	BWU1368	BWU1897	BWU1933 BWU2243
<b>P0:</b>					
0: 60H filter in A/D converter active 1: 50H filter in A/D converter active	•	•	•	•	•
<b>P1:</b>					
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)	-	-	•	-	•
<b>P2:</b>					
1: peripheral fault is indicated 0: 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)	-	-	•	-	•
<b>P3:</b>					
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, BWU1933, BWU2243						BWU1368					
Channel c.X is						Peripheral fault can be released through channel					
P1	P2	c.1	c.2	c.3	c.4	P1	P2	1	2	3	4
0	0	on	off	off	off	0	0	yes	no	no	no
0	1	on	on	off	off	0	1	yes	yes	no	no
1	0	on	on	on	off	1	0	yes	yes	yes	no
1	1	on	on	on	on	1	1	yes	yes	yes	yes

AS-i Master/Gateways/  
Links/Scanner

Programming of output			
Bit setting	Article Numbers		
	BWU1366, BWU1367	BWU1412, BWU1727	BWU2224
<b>P0:</b>			
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:	•	–	–
<b>P1:</b>			
0: channel 1 is in mode voltage module 1: channel 1 is in mode current module	–	•	–
<b>P2:</b>			
0: peripheral fault is indicated 1: peripheral fault is not indicated	•	•	•
<b>P3:</b>			
0: channel 2 is in mode voltage module 1: channel 2 is in mode current module	–	•	–

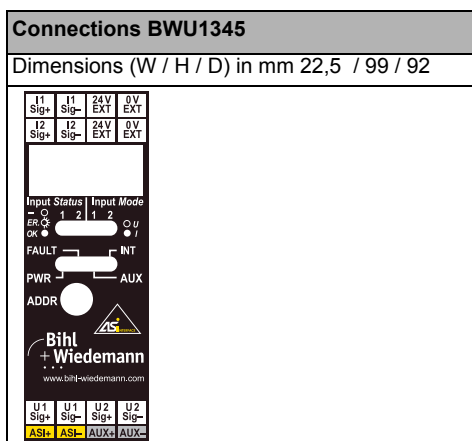
AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Programming notes							
Article no.	ID Code	ID1 Code		ID2 Code	IO Code		
BWU1345	3 <sub>hex</sub>	–		D <sub>hex</sub>	7 <sub>hex</sub>		
BWU1364, BWU1365, BWU1368, BWU1933, BWU2243	3 <sub>hex</sub>	–		E <sub>hex</sub>	7 <sub>hex</sub>		
BWU1366, BWU1367	3 <sub>hex</sub>	–		6 <sub>hex</sub>	7 <sub>hex</sub>		
BWU1412, BWU1727	9 <sub>hex</sub>	–		5 <sub>hex</sub>	7 <sub>hex</sub>		
BWU1897 <sup>1</sup>	A <sub>hex</sub>	Code-Definition			9 <sub>hex</sub>	7 <sub>hex</sub>	
			ID1	14 bit			12 Bit
		channel 1	0; 2; 3	1			
		channel 1 and 2	4; 5; 7 (default)	6			
BWU2224	3 <sub>hex</sub>	F <sub>hex</sub> (default)		5 <sub>hex</sub>	7 <sub>hex</sub>		

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

Other Fieldbuses/  
Master Simulators



AS-i Safety

LEDs BWU1345	
PWR (green)	AS-i voltage
FAULT (red)	AS-i communication error, peripheral fault
AUX (green)	Voltage supply 24V for the analog part
INT (green)	Voltage supply for the analog part out of AS-i
Analog 1 (green)	State of channel 1
Analog 2 (green)	State of channel 2
Analog 1 (green)	On: current measurement; off: voltage measurement
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:**

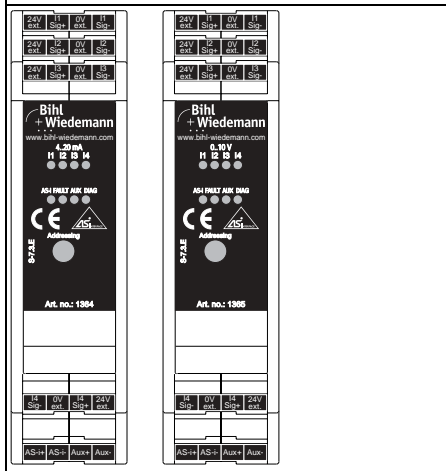
- by supply out of AS-i: 50mA max.
- y external supply: 500mA max. (750mA fuse)

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

Price Lists

## Connections BWU1364, BWU1365

Dimensions (W / H / D) in mm 22,5 / 105 / 114



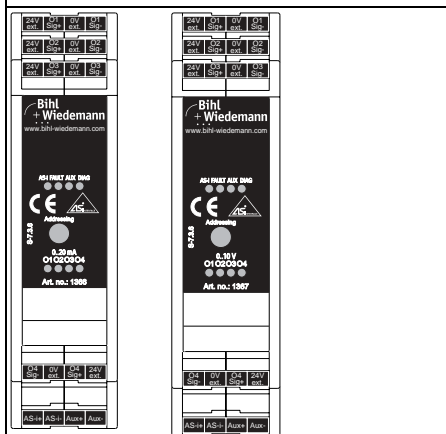
## LEDs BWU1364, BWU1365

PWR (green)	AS-i voltage
FAULT (red)	AS-i communication error, peripheral fault
AUX (green)	Voltage supply 24V for the analog part
DIAG (green)	Diagnosis
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 22,5 / 105 / 114



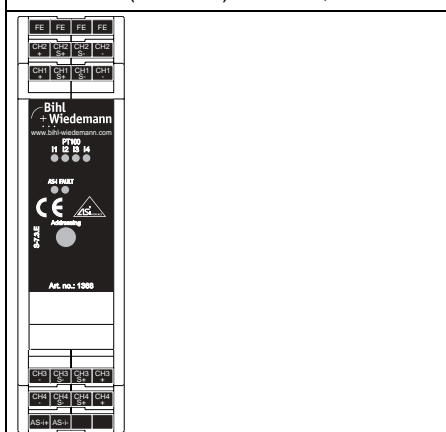
## LEDs BWU1366, BWU1367

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

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.

## Connections BWU1368

Dimensions (W / H / D) in mm 22,5 / 105 / 114



## LEDs BWU1368

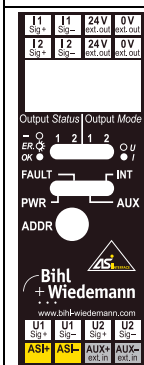
PWR (green)	AS-i voltage
FAULT (red)	AS-i communication error, peripheral fault
I1 ... I4 (yellow)	State of channel I1, I2, I3, I4

The measuring sensors and AS-i are galvanically separated.

AS-i Master/Gateways/  
Links/Scanner

## Connections BWU1412, BWU1727, BWU1897

Dimensions (W / H / D) in mm 22,5 / 99 / 92



## LEDS BWU1412, BWU1727, BWU1897

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

AS-i Slaves

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.

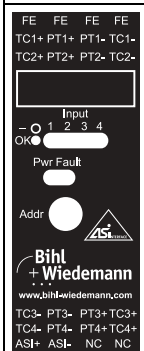
BWU1897: With the help of a 2. slide switch the 2. channel in favor of faster data communication can be switched off.

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

AS-i Accessories/  
Diagnostics/Development

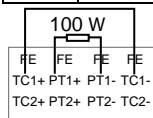
## Connections BWU1933, BWU2243

Dimensions (W / H / D) in mm 22,5 / 105 / 114



## 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 parameter 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!

Other Fieldbuses/  
Master Simulators

## LEDS BWU1933, BWU2243

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

AS-i Safety

Price Lists

**Connections BWU2224**

Dimensions (W / H / D) in mm 22,5 / 105 / 114

nc	nc	24V ext.out	0V ext.out
nc	nc	24V ext.out	0V ext.out

Output Status

1 2

ERR OK

FAULT AUX

PWR

ADDR

U1 Sig.	U1 Sig.	U2 Sig.	U2 Sig.
ASH	ASH	AUX ext.in	AUX ext.in

**LEDs BWU2224**

PWR (green)	AS-i voltage
FAULT (red)	On: AS-i communication error; flashing: peripheral fault
AUX (green)	Voltage supply 24V for the analog part
1 (yellow)	State of channel 1
2 (yellow)	State of channel 2

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.

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



BWU1232 / BWU1233 /  
BWU1254 / BWU1509 /  
BWU2240

BWU1234 / BWU1235



AS-i Master/Gateways/  
Links/Scanner



AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

Housing, construction: IP65, PG						
Housing	Inputs analog	Outputs analog	Input voltage (sensor supply) <sup>1</sup>	Output voltage (actuator supply) <sup>2</sup>	AS-i address <sup>3</sup>	Art. no.
 3 PG	2x 4 ... 20mA	0	random, from AS-i or AUX, default AS-i	–	1 Single Slave	<b>BWU1232</b>
	2x 0 ... 10V	0	random, from AS-i or AUX, default AS-i	–	1 Single Slave	<b>BWU1233</b>
	1 load cell	0	out of AS-i	–	1 Single Slave	<b>BWU2240</b>
	0	2x 0 ... 20mA	–	random, from AS-i or AUX, default AS-i	1 Single Slave	<b>BWU1234</b>
	0	2x 0 ... 10V	–	random, from AS-i or AUX, default AS-i	1 Single Slave	<b>BWU1235</b>
 8 PG	4x Pt100	0	out of AS-i	–	1 Single Slave	<b>BWU1254</b>
	4x Pt1000	0	out of AS-i	–	1 Single Slave	<b>BWU1509</b>

<sup>1</sup>**Input voltage (sensor supply):** the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power).

By supply out of AS-i there is no connection to earth or external potential allowed

<sup>2</sup>**Output voltage (actuator supply):** the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power) .

By supply out of AS-i there is no connection to earth or external potential allowed

<sup>3</sup>**AS-i address:** 1 AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/AS-i network), mixed use allowed

Article no.	BWU1232	BWU1233	BWU1234	BWU1235	BWU1254	BWU1509	BWU2240
<b>General data</b>							
Device type	Input		Output		Input		Input
<b>Connection</b>							
Periphery connection	cage clamp terminals						
AS-i connection	via AS-i substructure module						
<b>AS-i</b>							
Profile	S-7.3. D ID1=F (default)		S-7.3.5 ID1=F (default)		S-7.3.E ID1=F (default)		S-7.5.5 ID1=F (default)
Slave-type	Single Slave (up to 31)						
Required Master profile	≥ M3						≥ M4
From AS-i specification	3.0						
Operating voltage	AS-i voltage 30V DC						
Max. current consumption	< 80mA						
<b>AUX</b>							
Voltage	18 .. 30V						–
Max. current consumption	500mA						–



Article no.	BWU1232	BWU1233	BWU1234	BWU1235	BWU1254	BWU1509	BWU2240
<b>Input</b>							
Number	2 analog		-		4x Pt100	4x Pt1000	1 load cell
Resolution	16 Bit/1µA	16 Bit/1mV	-		16 Bit/0,1°C		16 Bit
Range of value	4000 ... 20000 dec.	0 ... 10000 dec.	-		-2000°C ... +8500°C		adjustable
Internal resistance	50Ω	100kΩ	-		-		
Max. input voltage	-	25V	-		-		
Max. input current	40mA	-		-			
Voltage supply	24V extern or out of AS-i		-		out of AS-i		
Power supply of attached sensors	max. 500mA	max. 200mA	-		-		max. 50mA
<b>Output</b>							
Number	-		2 analog		-		-
Resolution	-		16 Bit/1µA	16 Bit/1mV	-		
Range of value	-		0 ... 20000 dec.	0 ... 10000 dec.	-		
Resistance of the actuator	-		max. 600Ω	100kΩ	-		
Max. output voltage	-		11,5V		-		
Max. output current	-		23mA	-			
Voltage supply	-		24V extern or out of AS-i		-		-
Power supply of attached actuators	-		max. 500mA	max. 100mA	-		
<b>Environment</b>							
Applied standards	EN 50 081-2 EN 61 000-6-2				EN 50 082 EN 50 081	EN 50 081-2 EN 61 000-6-2	
Housing	housing for DIN-rail mounting						
Operating temperature	0°C ... +70°C						
Storage temperature	-25°C ... +85°C						
Protection category DIN 40 050	IP65						
Voltage of insulation	≥ 500V						

<b>Programming</b>			
Bit setting	Article number		
	BWU1232, BWU1233	BWU1234, BWU1235	BWU1254, BWU1509
<b>P0:</b>			
0: 60H filter in A/D converter active 1: 50H filter in A/D converter active	•	-	•
<b>P1:</b>			
0: channel 2 is not projected 1: channel 2 is projected	•	-	-
0: 3 wire-mode 1: 2 wire-mode	-	-	-
A peripheral fault can be released through channel X (bit combination P1 and P2)	-	-	•
<b>P2:</b>			
1: peripheral fault is indicated 0: peripheral fault is not indicated	•	•	-
0: relay 1 on 1: relay 1 off	-	-	-
A peripheral fault can be released through channel X (bit combination P1 and P2)	-	-	•
<b>P3:</b>			
0: relay 2 on 1: relay 2 off	-	-	-
0: 3 wire-mode 1: 2 wire-mode	-	-	•

AS-i Master/Gateways/  
Links/Scanner

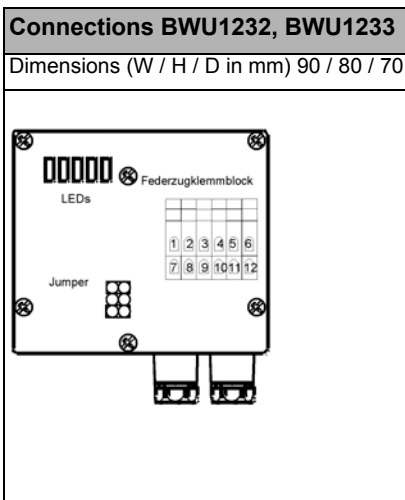
Combination of input bits P1 and P2					
BWU1254, BWU1509					
Channel c.X is					
P1	P2	c.1	c.2	c.3	c.4
0	0	on	off	off	off
0	1	on	on	off	off
1	0	on	on	on	off
1	1	on	on	on	on

Parameter:						
BWU2240						
0	1	B	C	D	E	F
set Tare	delete Tare	filter 4s	filter 3 s	filter 2 s	filter 1 s	no filter

AS-i Slaves

Programming hints:				
Article no.	ID-Code	ID1-Code	ID2-Code	IO-Code
BWU1232, BWU1233	3 <sub>hex</sub>	F <sub>hex</sub> (default)	D <sub>hex</sub>	7 <sub>hex</sub>
BWU1234, BWU1235	3 <sub>hex</sub>	F <sub>hex</sub> (default)	5 <sub>hex</sub>	7 <sub>hex</sub>
BWU1254, BWU1509	3 <sub>hex</sub>	F <sub>hex</sub> (default)	E <sub>hex</sub>	7 <sub>hex</sub>
BWU2240	3 <sub>hex</sub>	F <sub>hex</sub> (default)	D <sub>hex</sub>	7 <sub>hex</sub>

AS-i Accessories/  
Diagnostics/Development



**Terminal assignment:**

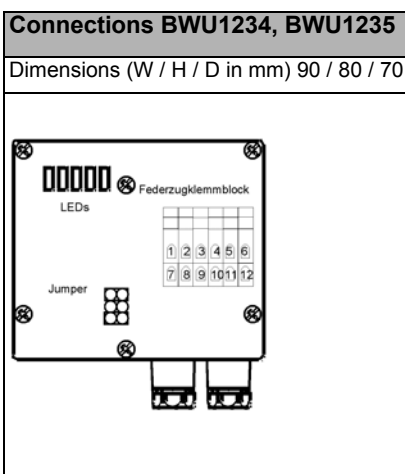
1	24V <sub>ext.</sub>
2	Sig. + Ch2
3	0V <sub>ext.</sub>
4	Sig. - Ch2
5	Shield
6	Shield
7	24V <sub>ext.</sub>
8	Sig. + Ch1
9	0V <sub>ext.</sub>
10	Sig. - Ch1
11	FG
12	FG

**LEDs:**

LED PWR (green)	AS-i voltage o.k.
LED AUX (green)	AUX voltage o.k.
LED FAULT (red)	communication error or peripheral fault
LED INT (green)	supply voltage for the analogue part out of AS-i

The sensors can be supplied by AS-i or external voltage (according to PELV) via the black ribbon cable

Other Fieldbuses/  
Master Simulators



**Terminal assignment:**

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

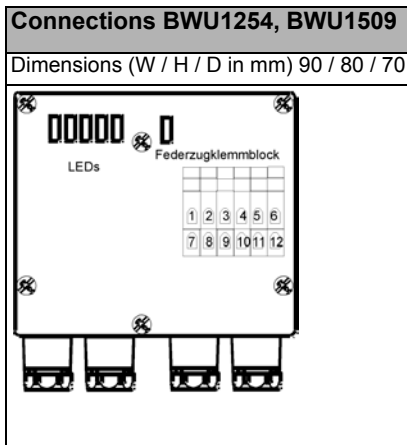
**LEDs:**

LED PWR (green)	AS-i voltage o.k.
LED AUX (green)	AUX voltage o.k.
LED FAULT (red)	communication error or peripheral fault
LED Analog 1 (green)	state of channel 1
LED Analog 2 (green)	state of channel 2

The actuators can be supplied by AS-i or external voltage (according to PELV) via the black ribbon cable

AS-i Safety

Price Lists

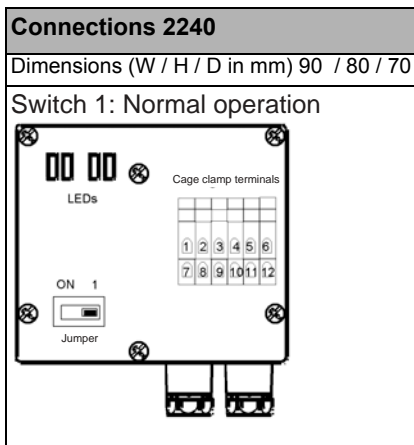


Terminal assignment:	
1	Channel 1+
2	Channel 1 Sense -
3	Channel 1 -
4	Channel 2+
5	Channel 2 Sense -
6	Channel 2 -
7	Channel 3+
8	Channel 3 Sense -
9	Channel 3 -
10	Channel 4+
11	Channel 4 Sense -
12	Channel 4 -

LEDs:	
LED PWR (green)	AS-i voltage o.k.
LED FAULT (red)	communication error or peripheral fault
LED Analog 1 (green)	state of channel 1
LED Analog 2 (green)	state of channel 2
LED Analog 3 (green)	state of channel 3
LED Analog 4 (green)	state of channel 4

Measuring range:	
-200°C ... +850°C	

1, 4, 7, 10 are internally connected



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

LEDs:	
LED PWR (green)	AS-i voltage o.k.
LED FAULT (red)	communication error or peripheral fault
LED CAL (yellow)	calibration
LED IN (green)	load cell connected

In a 4 wired load-cell Pin 7 with 8 and Pin 11 with 12 are bridged

**Accessories:**

- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (art. no. BW1181, see also page 191)
- AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (art. no. BW1183, see also page 191)
- AS-i substructure module to connect 2 AS-i flat cables (art. no. BW1180, see also page 191)
- AS-i substructure module to connect 2 AS-i round cables (art. no. BW1182, see also page 191)
- Software "AS-i Control-Tools" with serial cable for AS-i Master in Stainless Steel (art. no. BW1602, page 48)



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



BWU1361 / BWU1362 / BWU1722 /  
BWU1853 / BWU1917 / BWU1363 /  
BWU2532 / BWU1359 / BW1360 /

BWU1893  
BWU1894  
BWU1895  
BWU1963  
BWU1964



Housing, construction: IP65, M12						
Housing	Inputs analog	Outputs analog	Input voltage (sensor supply) <sup>1</sup>	Output voltage (actuator supply) <sup>2</sup>	AS-i address <sup>3</sup>	Art. no.
45 mm wide 	2x 4 ... 20mA	0	out of AS-i	–	1 AB Slave	<b>BWU1893</b>
	2x 4 ... 20mA	0	out of AS-i	–	1 Single Slave	<b>BWU1894</b>
	2x 0 ... 10V	0	out of AS-i	–	1 AB Slave	<b>BWU1963</b>
	2x 0 ... 10V	0	out of AS-i	–	1 Single Slave	<b>BWU1964</b>
	2x Pt100	0	out of AS-i	–	1 AB Slave	<b>BWU1895</b>
90 mm wide 	1x (4 ... 20mA / 0 ... 10V)	1x (0 ... 20mA / 0 ... 10V)	out of AS-i	out of AS-i	1 AB Slave	<b>BWU1917</b>
	1x (4 ... 20mA / 0 ... 10V)	1x (0 ... 20mA / 0 ... 10V)	out of AUX	out of AUX	1 AB Slave	<b>BWU1853</b>
	4x 4 ... 20mA	0	random, from AS-i or AUX, auto switching	–	1 Single Slave	<b>BWU1359</b>
	4x 0 ... 10V	0	random, from AS-i or AUX, auto switching	–	1 Single Slave	<b>BWU1360</b>
	4x Pt100, 2/4 wire mode	0	out of AS-i	–	1 Single Slave	<b>BWU1363</b>
	4x Pt100, 2/3 wire mode	0	out of AS-i	–	1 Single Slave	<b>BWU2532</b>
	–	4x 0 ... 20mA	–	out of AUX	1 Single Slave	<b>BWU1722</b>
	–	4x 0 ... 20mA	–	random, from AS-i or AUX, auto switching	1 Single Slave	<b>BWU1361</b>
	–	4x 0 ... 10V	–	random, from AS-i or AUX, auto switching	1 Single Slave	<b>BWU1362</b>

<sup>1</sup>Input voltage (sensor supply): the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power).

By supply out of AS-i there is no connection to earth or external potential allowed

<sup>2</sup>Output voltage (actuator supply): the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power) .

By supply out of AS-i there is no connection to earth or external potential allowed

<sup>3</sup>AS-i address: 1 AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/AS-i network), mixed use allowed

Article no.	BWU1893	BWU1894	BWU1895	BWU1963	BWU1964	BWU1359	BWU1360	BWU1363 BWU2532
<b>General data</b>								
Device type	Input							
<b>Connection</b>								
Periphery connection	M12 plug							
AS-i connection	via AS-i substructure module							
<b>AS-i</b>								
Profile	S-7.A.9	S-7.3.D	S-7.A.9	S-7.A.9	S-7.3.D	S-7.3.E		
Slave-Type	AB Slave (up to 62)	Single Slave (up to 31)	AB Slave (up to 62)	AB Slave (up to 62)	Single Slave (up to 31)	Single Slave (up to 31)		
Required Master profile	≥ M4	≥ M3	≥ M4	≥ M4	≥ M3			
Operating voltage	AS-i voltage 30V DC							
Max. AS-i current consumption	< 200mA		< 80mA	< 200mA			< 100mA	< 80mA
<b>AUX</b>								
Voltage	-						18 ... 30V	
Max. AUX current consumption	-						500mA	
<b>Input</b>								
Resolution	normal: 14 Bit, fast: 11Bit	14 Bit	11 or. 14 Bit	16 Bit (1µA)	16 Bit (1mV)	16 Bit (0,1°C)		
Range of value	4000 ... 20000 dez. / 0 ... 27648 dez. <sup>1</sup>	-2000 ... +850 0 dez. -12000 ... 13000 dez	0 ... 10000 dez. 0 ... 27648 dez. <sup>1</sup>	4000 ... 20000 dez.	0 ... 10000 dez.	-200°C ... +85 0°C		
Internal resistance	82Ω	-	130KΩ	50Ω	100KΩ	-		
Max. input voltage	-		25V	-	25	-		
Max. input current	40mA		-	40mA		-		
Power supply	24V out of AS-i				24V external or out of AS-i			
Power supply of attached sensors	max. 70mA		-	max. 70mA		max. 500mA out of external 24V, max. 40mA out of AS-i	max. 500mA out of external 24V, max. 100mA out of AS-i	-
<b>Environment</b>								
Applied standards	EN 61 000-6-2 EN 61 000-6-4				EN 50 081-2 EN 61 000-6-4			
Housing	housing for DIN-rail mounting							
Operating temperature	0°C ... +70°C					-20°C ... +70°C	0°C ... +70°C	
Storage temperature	-20°C ... +85°C							
Protection category DIN 40 050	IP65							
Voltage of insulation	≥ 500V							
Dimensions (W / H / D) in mm	45 / 80 / 45				90 / 80 / 45			

<sup>1</sup>Siemens format

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

# Analog Modules AS-i IP65, M12

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.	BWU1853	BWU1917	BWU1361, BWU1362	BWU1722
<b>General data</b>				
Device type	In-/Output		Output	
<b>Connection</b>				
Periphery connection	M12 plug			
AS-i connection	via AS-i substructure module			
<b>AS-i</b>				
Profile	S-6.0.x		S-7.3.6	
Slave-Type	2, 3 o. 4 Single Slaves (up to 31)		Single Slave (up to 31)	
Required Master profile	≥ M4		≥ M3	
Operating voltage	AS-i voltage 30V DC			
Max. AS-i current consumption	< 200mA		< 100mA	
<b>AUX</b>				
Voltage	18..30V	-	18..30V	
Max. AUX current consumption	1A	-	500mA	
<b>Input</b>				
Resolution	16 Bit (1µA) or 16 Bit (1mV)		-	
Range of value	4000 ... 20000 dez. / 0 ... 10000 dez.		-	
Internal resistance	4-20mA: 50Ω 0-10V: 100kΩ		-	
Max. input voltage	25V		-	
Max. input current	40mA		-	
Power supply	24V external	24V out of AS-i	-	
Power supply of attached sensors	max. 1A in total (sensors and actuators)	max. 200mA in total (sensors and actuators)	-	
<b>Ausgang</b>				
Resolution	16 Bit (1µA) or 16 Bit (1mV)		16 Bit (1µA)	16 Bit (1mV)
Range of value	4000 ... 20000 dez. / 0 ... 10000 dez.		0 ... 20000 dez.	0 ... 10000 dez.
Resistance of actuators	0-10V: min. 3,3kΩ	0-20mA: max. 600Ω		max. 600Ω
Max. output voltage	11,5V		-	
Max. output current	23mA			
Power supply	24V external	24V out of AS-i	24V external or out of AS-i	
Power supply of attached actuators	max. 1A in total (sensors and actuators)	max. 200mA in total (sensors and actuators)	-	max. 1,1A in total
<b>Environment</b>				
Applied standards	EN 61 000-6-2 EN 61 000-6-4		EN 50 081-2 EN 61 000-6-4	
Housing	housing for DIN-rail mounting			
Operating temperature	0°C ... +70°C			
Storage temperature	-20°C ... +85°C			
Protection category DIN 40 050	IP65			
Voltage of insulation	≥ 500V			

Programming input								
Bit setting	Article number							
	BWU1893	BWU1894	BWU1895	BWU1963 BWU1964	BWU1359	BWU1360	BWU1363	BWU2532
<b>P0:</b>								
1: Peripheral fault is indicated 0: Peripheral fault is not indicated	•	•	•	•	_1	_1	_1	_1
1: Bridge between Pin 3 and 4 active 0: Bridge between Pin 3 and 4 active	-	-	-	-	•	-	-	-
1: 50 Hz filter in A/D converter active 0: 60 Hz filter in A/D converter active	-	-	-	-	-	-	•	•
<b>P1:</b>								
1: 4000 ... 20000 dez. 0: 0 ... 27648 dez. (Siemens format)	•	•	-	-	-	-	-	-
1: 2 wire-mode 0: 4 wire-mode	-	-	•	-	-	-	-	-
1: 0 ... 10000 dez. 0: 0 ... 27648 dez. (Siemens format)	-	-	-	•	-	-	-	-
<b>P2:</b>								
1: normal 0: fast	•	•	-	•	-	-	-	-
1: -200°C ... +850°C 0: -120°C ... +130°C	-	-	•	-	-	-	-	-
<b>P3:</b>								
1: channel 2 on 0: channel 2 off	-	•	•	-	-	-	-	-
1: Peripheral fault is indicated 0: Peripheral fault is not indicated	-	-	-	-	•	•	-	-
1: 2 wire-mode 0: 4 wire-mode	-	-	-	-	-	-	•	-
1: 2 wire-mode 0: 3 wire-mode	-	-	-	-	-	-	-	•

<sup>1</sup>For peripheral fault setting see the table "Bit combinations P1 and P2"

Bit combinations P1 and P2					
BWU1359, BWU1360, BWU1363, BWU2532					
Peripheral fault can be released through channel					
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

AS-i Master/Gateways/  
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Programming	In-/Output	Output	
<b>Bit setting</b>	<b>Article number</b>		
	BWU1853 BWU1917		BWU1361 BWU1362 BWU1722
<b>Parameter (first adress)</b>	<b>Parameter</b>		
<b>P0:</b>	<b>P0</b>		
1: Automatic switching between current and voltage 0: Current / voltage specified by P1 and P3	•	1: Profil 7.3 is monitored 0: Profil 7.3 is not monitored	•
<b>P1:</b>	<b>P1</b>		
<b>If P0= 0</b> 1: OutI active 0: OutU active, otherwise not used	•	not used	•
<b>P2:</b>	<b>P2</b>		
0: Peripheral fault is indicated 1: Peripheral fault is not indicated	•	1: Peripheral fault is indicated 0: Peripheral fault is not indicated	
<b>P3:</b>	<b>P3</b>		
<b>If P0= 0</b> 1: InI active 0: InU active, otherwise not used	•	not used	•
<b>Parameter (second adress)</b>	-		
<b>P0, P1:</b>	-		
<b>Transformation speed</b> <b>InI, InU</b> 11: fastest: 1ms/8 Bit 01: medium speed/precise: 5 ms/12 Bit 10: highest precision: 20 ms/16 Bit 00: not used	•	-	-
<b>P2:</b>	-		
1: 10V= 10000, 20mA= 20000 0: 10V= 27648, 20mA= 27648 (Siemens format)	•	-	-
<b>P3:</b>	-		
1: Pin 3 and Pin 4 bridged 0: Pin 3 and Pin 4 not bridged	•	-	-

Programming notes						
Article no.	ID-Code	ID1-Code		ID2-Code	IO-Code	
BWU1893, BWU1895, BWU1963 <sup>1</sup>	A	Code definition			9	7
		ID1	14 Bit	11 Bit		
		Channel 1	0; 2; 3	1		
		Channel 1 and 2	4; 5; 7 (Default value ID1=7)	6		
BWU1853, BWU1917	0	- the ID code 1 can be written for all slaves, but only the slave with the lowest address defines the code for the remaining slaves. - ID1 is the same code for all slaves. - The code ID2 for all slaves (different for each according to his profile) is specified by the code ID1.  number of connected AS-i slaves ID1= A: 2 AS-i slaves corresponding to 8 Bit ID1= B: 3 AS-i slaves corresponding to 12 Bit else: 4 AS-i slaves corresponding to 16 Bit		X	6	
BWU1894, BWU1964	3	(Default value ID1=F)		D	7	
BWU1359, BWU1363, BWU2532, BWU2049, BWU1360	3	(Default value ID1=F)		E	7	
BWU1361, BWU1362, BWU1722	3	(Default value ID1=F)		6	7	

1. BWU1893, BWU1895 + 1963 can transfer either 11 or 14 Bi-values Via ID1 the data capacity and the channel number can be defined.



M12 Connections:								
	BWU1359, BWU1360, BWU1893, BWU1894, BWU1963, BWU1964	BWU1853, BWU1917		BWU1895, BWU2086, BWU1363	BWU2532	BWU1361, BWU1362	BWU1722	
		InI, InU	OutI, OutU					
1	24V	24V	Sig+	CH+	CH+	Sig+	Sig+	
2	Sig+	Sig+	24V	CHS+	CHS-	n.c.	24V	
3	0V	0V	Sig-	CH-	CH-	Sig-	Sig-/0V	
4	Sig-	Sig-	0V	CHS-	*	n.c.	n.c.	
5	Shield	Shield	Shield	Shield	Shield	Shield	Shield	

\*) Pin 4 bridged internally to Pin 3

**Accessories:**

- AS-i substructure module to connect 2 AS-i flat cables (article no. BW1180, see page 191)
- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (article no. BW1181, see page 191)
- AS-i substructure module to connect 2 AS-i round cable (article no. BW1182, see page 191)
- AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (article no. BW1183, see page 191)
- AS-i substructure module to connect 2 AS-i flat cables with addressing socket (article no. BW1438, see page 191)

AS-i Master/Gateways/  
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## Overview PCB AS-i modules, board based solutions

Selection matrix: PCB AS-i modules, board based solutions										
Circuit board dimensions <sup>1</sup>	Inputs digital	Inputs analog	Outputs digital	Connec-tion <sup>2</sup>	Coated <sup>3</sup>	LED status display <sup>4</sup>	Input voltage (sensor supply) <sup>5</sup>	Output voltage (actuator supply) <sup>6</sup>	AS-i address <sup>7</sup>	Art. no.
29,7x36,5 	2	–	2	screw terminals	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1443</b>
	2	–	2	screw terminals	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW2393</b>
	2	–	2	solder lugs	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1421</b>
73x37,5 	4	–	3	screw terminals	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1387</b>
	4	–	3	plug-in screw terminals	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW2229</b>
	4	–	3	wiring pins	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1386</b>
	4	–	3	solder lugs	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1408</b>
	4	–	3	solder lugs	none	yes	out of AS-i	out of AUX	1 AB Slave	<b>BW1682</b>
	4	–	4	screw terminals	none	none	out of AS-i	out of AS-i	1 Single Slave	<b>BW1219</b>
	4	–	4	screw terminals	none	none	aus AUX	out of AUX	1 Single Slave	<b>BW1389</b>
	4	–	4	screw terminals	none	yes	out of AS-i	out of AS-i	1 Single Slave	<b>BW1470</b>
	4	–	4	screw terminals	none	yes	out of AS-i	out of AUX	1 Single Slave	<b>BW1628</b>
	4	–	4	connecting wires	yes	yes	out of AS-i	out of AS-i	1 Single Slave	<b>BW2597</b>
	4	–	4	connecting wires	yes	yes	out of AS-i	out of AS-i	1 AB Slave	<b>BW2571</b>
	4	–	4	wiring pins	none	none	out of AS-i	out of AS-i	1 Single Slave	<b>BW1218</b>
	4	–	4	wiring pins	none	yes	out of AS-i	out of AUX	1 AB Slave	<b>BW2591</b>
	4	–	4	solder lugs	none	yes	out of AS-i	out of AS-i	1 Single Slave	<b>BW1468</b>
	8	–	–	screw terminals	none	none	out of AS-i	–	2 AB Slaves	<b>BW1352</b>
	8	–	–	wiring pins	none	none	out of AS-i	–	2 AB Slaves	<b>BW1351</b>
–	–	6	screw terminals	none	none	–	out of AS-i	2 AB Slaves	<b>BW1627</b>	
–	2 x 0 ... 10V	–	wiring pins	none	none	out of AS-i	out of AS-i	1 Single Slave	<b>BW2035</b>	

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

**Replacement, AS-i version 2.0:** Single Slaves work even with the first AS-i Masters

- <sup>1</sup>**circuit board dimensions:** 2 holes for assembly angles
- <sup>2</sup>**connection:** further connection options are available on request.

screw terminals



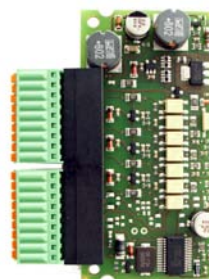
wiring pins



solder lugs



plug-in screw terminals



connecting wires



<sup>3</sup>**Coated:** coating protects components and circuit boards when touched

<sup>4</sup>**LED status display:** the status of the in- and outputs is indicated by LEDs. AS-i LEDs (PWR green and FAULT red) display the state of the AS-i slaves as by AS-i slaves usually and Uaux is indicated with a green LED.

not coated



coated



<sup>5</sup>**Input voltage (sensor supply):** the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power). By supply out of AS-i there is no connection to earth or external potential allowed.

<sup>6</sup>**Output voltage (actuator supply):** the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power) . By supply out of AS-i there is no connection to earth or external potential allowed

<sup>7</sup>**AS-i address:** AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/per AS-i network), mixed use allowed

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

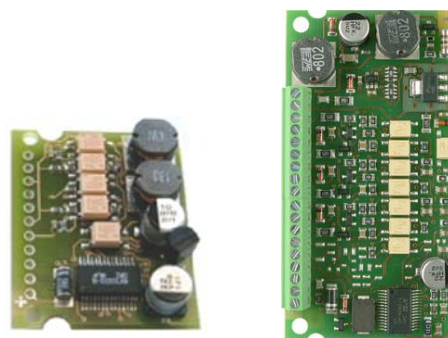
AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators



AS-i Safety

Price Lists

Special variants on request



Selection matrix: PCB AS-i modules, board based solutions

Circuit board dimensions <sup>1</sup>	Inputs digital	Inputs analog	Outputs digital	Connec-tion <sup>2</sup>	Coated <sup>3</sup>	LED status display <sup>4</sup>	Input voltage (sensor supply <sup>5</sup> )	Output voltage (actuator supply) <sup>6</sup>	AS-i address <sup>7</sup>	Art. no.
 29,7x36,5	2	–	2	screw terminals	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1443</b>
	2	–	2	screw terminals	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW2393</b>
	2	–	2	solder lugs	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1421</b>
 73x37,5	4	–	3	screw terminals	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1387</b>
	4	–	3	plug-in screw terminals	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW2229</b>
	4	–	3	wiring pins	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1386</b>
	4	–	3	solder lugs	none	none	out of AS-i	out of AS-i	1 AB Slave	<b>BW1408</b>
	4	–	3	solder lugs	none	yes	out of AS-i	out of AUX	1 AB Slave	<b>BW1682</b>
	4	–	4	screw terminals	none	none	out of AS-i	out of AS-i	1 Single Slave	<b>BW1219</b>
	4	–	4	screw terminals	none	none	aus AUX	out of AUX	1 Single Slave	<b>BW1389</b>
	4	–	4	screw terminals	none	yes	out of AS-i	out of AS-i	1 Single Slave	<b>BW1470</b>
	4	–	4	screw terminals	none	yes	out of AS-i	out of AUX	1 Single Slave	<b>BW1628</b>
	4	–	4	connecting wires	yes	yes	out of AS-i	out of AS-i	1 Single Slave	<b>BW2597</b>
	4	–	4	connecting wires	yes	yes	out of AS-i	out of AS-i	1 AB Slave	<b>BW2571</b>
	4	–	4	wiring pins	none	none	out of AS-i	out of AS-i	1 Single Slave	<b>BW1218</b>
	4	–	4	wiring pins	none	yes	out of AS-i	out of AUX	1 AB Slave	<b>BW2591</b>
4	–	4	solder lugs	none	yes	out of AS-i	out of AS-i	1 Single Slave	<b>BW1468</b>	
8	–	–	–	screw terminals	none	none	out of AS-i	–	2 AB Slaves	<b>BW1352</b>

Selection matrix: PCB AS-i modules, board based solutions										
Circuit board dimensions <sup>1</sup>	Inputs digital	Inputs analog	Outputs digital	Conne- ction <sup>2</sup>	Coated <sup>3</sup>	LED status display <sup>4</sup>	Input voltage (sensor supply) <sup>5</sup>	Output voltage (actuator supply) <sup>6</sup>	AS-i address <sup>7</sup>	Art. no.
	8	–	–	wiring pins	none	none	out of AS-i	–	2 AB Slaves	<b>BW1351</b>
	–	–	6	screw terminals	none	none	–	out of AS-i	2 AB Slaves	<b>BW1627</b>
	–	2 x 0 ... 10V	–	wiring pins	none	none	out of AS-i	out of AS-i	1 Single Slave	<b>BW2035</b>

**Replacement, AS-i version 2.0:** Single Slaves work even with the first AS-i Masters

<sup>1</sup>**circuit board dimensions:** 2 holes for assembly angles

<sup>2</sup>**connection:** further connection options are available on request.

screw terminals

wiring pins

solder lugs

plug-in screw  
terminals

connecting wires



<sup>3</sup>**Coated:** coating protects components and circuit boards when touched

<sup>4</sup>**LED status display:** the status of the in- and outputs is indicated by LEDs. AS-i LEDs (PWR green and FAULT red) display the state of the AS-i slaves as by AS-i slaves usually and Uaux is indicated with a green LED.

not coated

coated



<sup>5</sup>**Input voltage (sensor supply):** the supply of the inputs is made by AS-i or by AUX (auxiliary 24V power). By supply out of AS-i there is no connection to earth or external potential allowed.

<sup>6</sup>**Output voltage (actuator supply):** the supply of the outputs is made by AS-i or by AUX (auxiliary 24V power) . By supply out of AS-i there is no connection to earth or external potential allowed

<sup>7</sup>**AS-i address:** AB Slave (max. 62 AB Slaves/AS-i network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/per AS-i network), mixed use allowed

Technical data for further articles, see the next page!

Article no.	BW1443	BW2393	BW1421	BW1387	BW2229	BW1386	BW1408	BW1682	BW1218	BW1219	
<b>AS-i</b>											
AS-i Profile, S-IO.ID.ID2											
S-B.A.E, ID1 =7 (default)		•						—			
S-7.A.E, ID1 =7 (default)		—				•				—	
S-7.0.F, ID1 =F (default)				—						•	
S-7.A.7, ID1=7 (fix)						—					
2 x S-0.A.2, ID1=7 (default)						—					
2 x S-8.A.0, D1=7 (default)						—					
S-7.3.D, ID1=F (default)						—					
AS-i address	1 AB Slave							1 Single Slave			
Required Master profile	≥M3							≥M0			
Since AS-i specification	2.1							2.0			
AS-i voltage	18 ... 31,6V										
Max. AS-i current consumption	120mA			200mA			230mA		200mA		
<b>AUX</b>											
AUX voltage	—							18 ... 30V		—	
Max. AUX current consumption	—							1,2A		—	
<b>Digital inputs</b>											
Number of inputs	2			4							
Power supply	AS-i										
Input level	U <sub>in</sub> < 2V low, U <sub>in</sub> >10V high										
<b>Digital outputs</b>											
Number of outputs	2			3					4		
Power supply of outputs	AS-i							AUX		AS-i	
Max. output current											
80mA per output, sum ≤ 80mA				•			—				
100mA per output, sum ≤ 180mA				—			•				
150 mA per output, sum ≤ 500 mA				—			•		—		
<b>Analog inputs</b>											
Number of inputs	—										
Power supply	—										
Input level	—										
Input resistance	—										
<b>Display</b>											
LED indicators	none							yes		none	
<b>Environment</b>											
Applied standards	EN 61 000-6-2 EN 61 000-6-3										
Operating temperature	-25°C ... +70°C										
Storage temperature	-40°C ... +85°C										
Allowed shock and vibration stress	acceleration ≤ 15g, T ≤ 11ms, 10 ... 55Hz, 0,5mm amplitude										
<b>Mechanics</b>											
Connectors											
screw terminals	•	—		•	—			—		•	
solder lugs	—	•		—			•		—		
plug-in screw terminals	—			•	—						
wiring pins	—			•	—		•	—			
connecting wires	—										
Max. length of IO-cable	1,5m										
Circuit board dimensions	29,7 x 36,5 x 10mm		73 x 37,5 x 7 mm	73 x 37,5 x 12 mm	73 x 37,5 x 10 mm	73 x 37,5 x 7 mm	73 x 37,5 x 10mm	73 x 37,5 x 7 mm	73 x 37,5 x 10mm		
Coating	none										
Protection class	IP00										

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
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AS-i Safety

Price Lists

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Price Lists

Artikel Nr.	BW1389	BW1470	BW1628	BW2597	BW1468	BW2571	BW2591	BW1352	BW1351	BW1627	BW2035					
<b>AS-i</b>																
AS-i Profil, S-IO.ID.ID2																
S-B.A.E, ID1 =7 (default)	—															
S-7.A.E, ID1 =7 (default)	—															
S-7.0.F, ID1 =F (default)	•			—												
S-7.A.7, ID1=7 (fix)	—				•		—									
2 x S-0.A.2, ID1=7 (dflt.)	—						•		—							
2 x S-8.A.0, D1=7 (dflt.)	—								•		—					
S-7.3.D, ID1=F (default)	—										•					
S-7.0.E, ID1=F (default)	—						•		—							
AS-i address	1 Single Slave				1 AB Slave			2 AB Slaves			1 Single Slave					
Required Master profile	≥M0				≥M4		≥M0		≥M3							
Since AS-i specification	2.0				3.0		2.0		2.1							
AS-i voltage	18 ... 31,6V															
Max. AS-i current consumption	60mA		200mA				230mA		200mA			120mA				
<b>AUX</b>																
AUX voltage	18... 30V		—		18 ... 30V		—		18 ... 30V		—					
Max. AUX current consumption	1,2A		—		2,1A		—		1,2A		—					
<b>Digital inputs</b>																
Number of inputs	4						8			—						
Power supply	AUX		AS-i							—						
Input level	U <sub>in</sub> < 2V low, U <sub>in</sub> >10V high															
<b>Digital outputs</b>																
Number of outputs	4						—			6		—				
Power supply of outputs	AUX		AS-i		AUX		AS-i			AUX		—				
Max. output current	80mA per output, sum ≤ 80mA															
100mA per output, sum ≤ 180mA	•		—		•		—			•		—				
150 mA per output, sum ≤ 500 mA	—		•		—			•		—						
<b>Analog inputs</b>																
Number of inputs	—										2					
Power supply	AS-i															
Input level	—															
Input resistance	—															
<b>Display</b>																
LED indicators	none		yes					none								
<b>Environment</b>																
Applied standards	EN 61 000-6-2, EN 61 000-6-3															
Operating temperature	-25°C ... +70°C															
Storage temperature	-40°C ... +85°C															
Allowed shock and vibration stress	acceleration ≤ 15g, T ≤ 11ms, 10 ... 55Hz, 0,5mm amplitude															
<b>Mechanics</b>																
<b>Connectors</b>																
screw terminals	•			—			•		—		•		—			
screw terminals	—				•		—									
solder lugs	—															
plug-in screw terminals	—						•		—		•		—			
wiring pins	—		•		—		•		—							
connecting wires	1,5m															
Max. length of IO-cable	73 x 37,5 x 10mm		73 x 37,5 x 13 mm		73 x 37,5 x 10 mm		73 x 37,5 x 13 mm			73 x 37,5 x 10 mm		73 x 37,5 x 7 mm		73 x 37,5 x 10 mm		
Circuit board dimensions	none				yes		none		yes		none					
Coating	IP00				IP54		IP00		IP54		IP00					



Programming	Bit setting Digital IO							
	Slave 1				Slave 2			
	D0	D1	D2	D3	D0	D1	D2	D3
	<b>Input</b>							
BW1421, BW1443	—		I1	I2	—			
BW1387, BW1386, BW1408, BW2229, BW1218, BW1219, BW1389, BW1470, BW1628, BW2571, BW2597, BW1468, BW1682, BW2591	I1	I2	I3	I4	—			
BW1351, BW1352	I1	I2	I3	I4	I5	I6	I7	I8
BW1627	—							
BW2393	I1	I2	I1	I2	—			
	<b>Output</b>							
BW1421, BW1443	O1	O2	—					
BW1387, BW1386, BW1408, BW2229, BW1218, BW1219, BW1389, BW1470, BW1628, BW2571, BW2597, BW1468, BW1682, BW2591	O1	O2	O3	O4	—			
BW1351, BW1352	—							
BW1627	O1	O2	O3	—	O4	O5	O6	—
BW2393	O1	O2	—					
	<b>Parameter bit</b>							
	P0		P1		P2		P3	
BW1421, BW1443	not used							
BW1387, BW1386, BW1408, BW2229, BW1218, BW1219, BW1389, BW1470, BW1628, BW2571, BW2597, BW1468, BW1682, BW2591	not used							
BW1351, BW1352	not used							
BW1627	not used							
BW2035	1: peripheral fault is indicated 0: peripheral fault is not indicated		1: 0 ... 10000 dec. 0: 0 ... 27648 dec. (Siemens format)		1: regular 0: fast		1: channel 2 on 0: channel 2 off	
<b>Programming</b>								
BW1421, BW1443, BW1387, BW1386, BW1408, BW2229, BW1218, BW1219, BW1389, BW1470, BW1628, BW2571, BW2597, BW2035, BW2393	Address preset 0 changeable via bus master or programming devices							
BW1351, BW1352	Address preset 0 + 0 changeable only via AS-i Master in configuration mode.							
BW1627	Address preset 0 + 1 changeable only via AS-i Master in configuration mode.							
<b>Dip switch settings</b>								
BW1351, BW1352, BW1627	ON: 2. AS-i Slave is deactivated OFF: 2. AS-i Slave activated							

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AS-i Slaves

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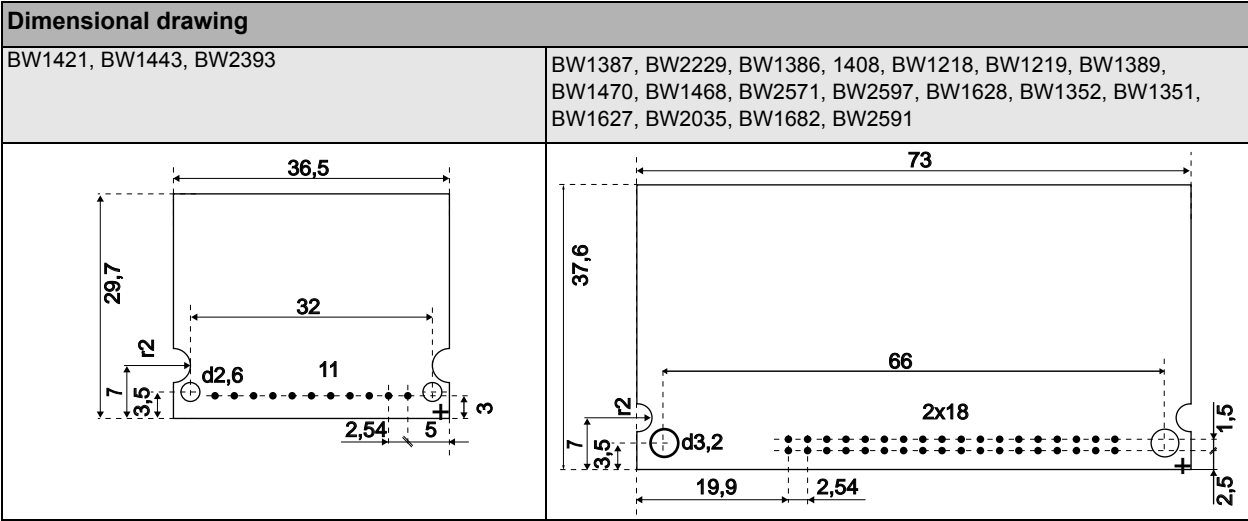
AS-i Safety

Price Lists

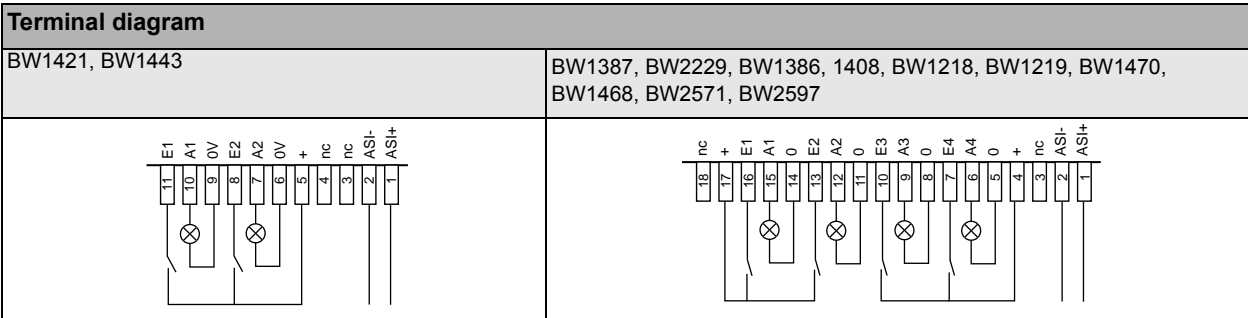
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Links/Scanner

Connections:	
AS-i +, AS-i -	Connection to the AS-i bus
E1 - E4 (I1 - I4)	Inputs
A1 - A4 (O1 - O4)	Outputs
0V	Reference potential for outputs
+ or +24V	Output for 24V power supply for the inputs
+24V_in	Input for 24V power supply
+24V_12, +24_34	Output for 24V power supply for inputs 1+2 and/or 3+4
Sig1+, Sig2+	Positive terminal of analog inputs 1+2
Sig1-, Sig2-	Negative terminal of analog inputs 1+2
nc	not connected

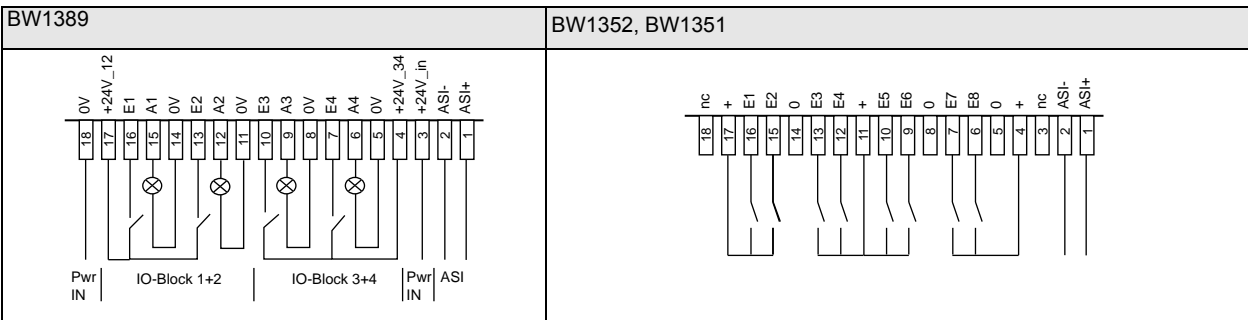
AS-i Slaves



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<p><b>BW1627</b></p>	<p><b>BW1628</b></p> <p>Pwr IN   IO-Block 1+2   IO-Block 3+4   Pwr IN   AS-</p>
<p><b>BW2035</b></p>	<p><b>BW2393</b></p> <p>IO-Block 1+2   AS-</p>
<p><b>BW1682</b></p> <p>PWR IN   PWR OUT   +PWR OUT   PWR IN   AS-</p>	<p><b>BW2591</b></p> <p>PWR IN   PWR OUT   +PWR OUT   PWR IN   AS-</p>

AS-i-Master/Gateways/  
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AS-i Slaves

AS-i Accessories/  
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Master Simulators

AS-i Safety

Price Lists

## 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 Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

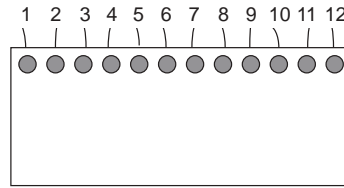
AS-i Safety

Price Lists

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

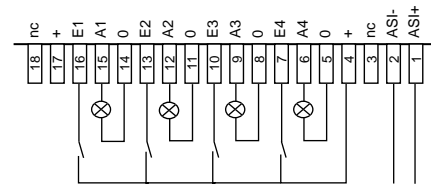
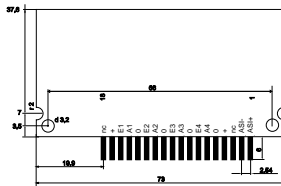
## BW2571 / BW2597

Signal	Connection	
1	AS-i +	BN
2	AS-i -	BU
3	24V <sub>out</sub>	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; Σ180mA	7.O.-F
BW1469	•	•	•	–	100mA; Σ180mA	7.O.-F
BW1470	•	•	•	–	100mA; Σ180mA	7.O.-F
BW1789	•	•	•	–	100mA; Σ180mA	7.O.-F
BW2571	–	–	•	•	80mA; Σ180mA	7. A. 7. 7
BW2597	•	•	•	–	100mA; Σ180mA	7.O.-F

## BW1468 / BW1469 / BW1470 / 1489



AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

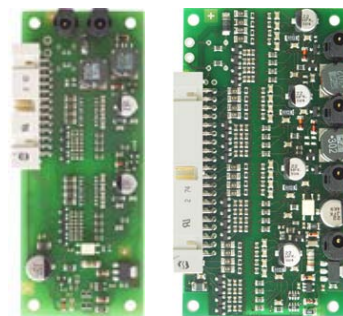
# AS-i 8I/8O / 16I/16O Module

**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			
Ambint 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

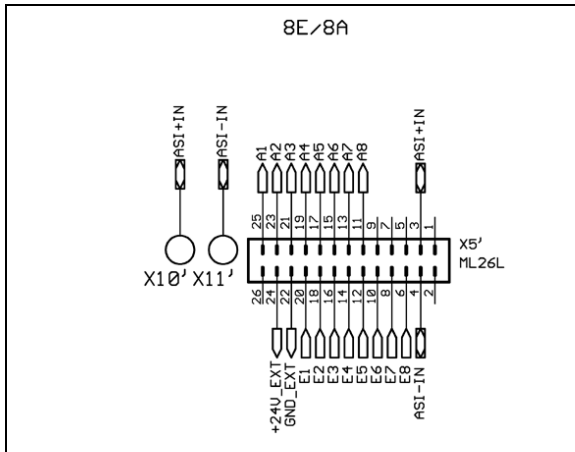
**Programming:**

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

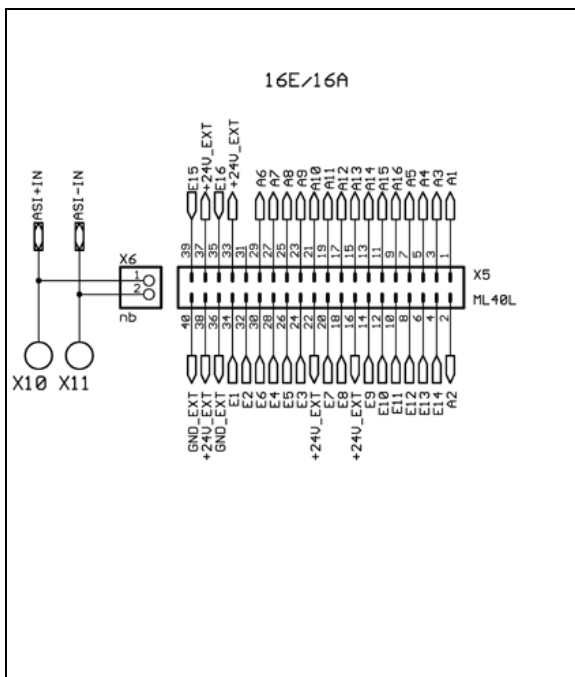
## Connections 8I/8O Module



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

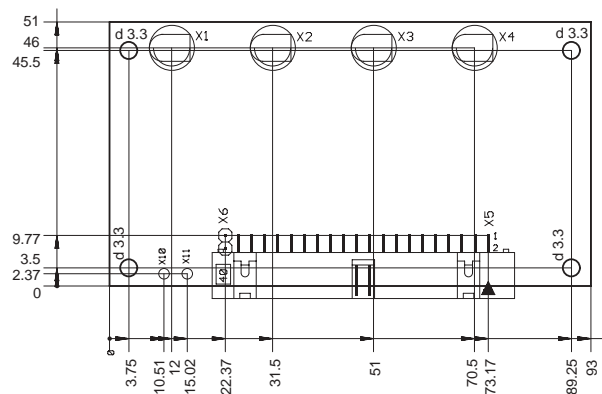
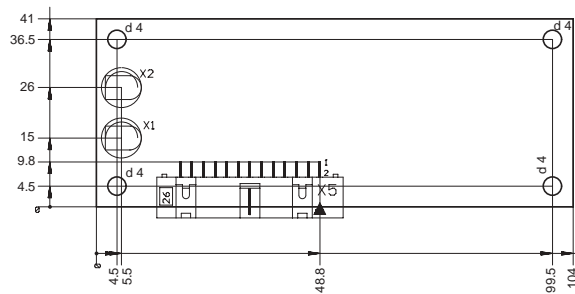
26 pin	Data bit	Signal name
14	ASI1.E3	E4
15	ASI2.A1	A6
16	ASI1.E2	E3
17	ASI2.A0	A5
18	ASI1.E1	E2
19	ASI1.A3	A4
20	ASI1.E0	E1
21	ASI1.A2	A3
22	GND_EXT	GND_EXT
23	ASI1.A1	A2
24	+24V_EXT	+24V_EXT
25	ASI1.A0	A1
26	-	-

## Connections 16I/16O Module



40 pin	Data bit	Signal name
1	ASI1.A0	A1
2	ASI1.A1	A2
3	ASI1.A2	A3
4	ASI4.E1	E14
5	ASI1.A3	A4
6	ASI4.E0	E13
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

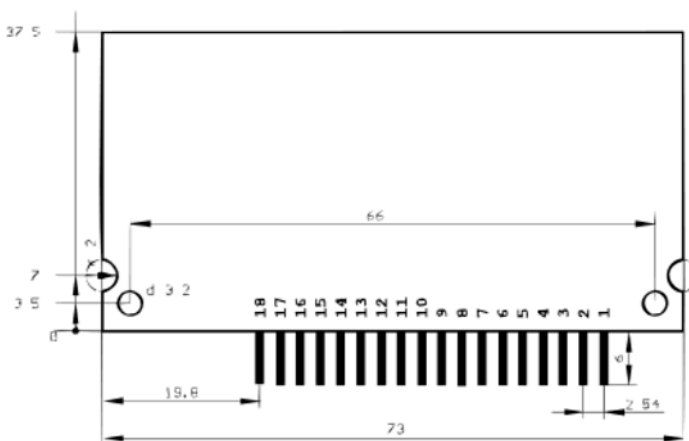
**Programming**  
(Bit-setting)

**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



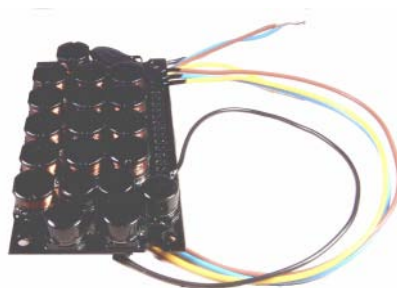
## AS-i OEM Power Supply Module

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

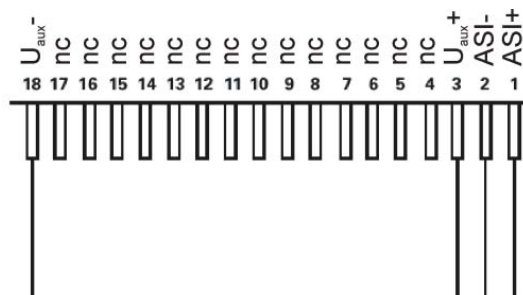
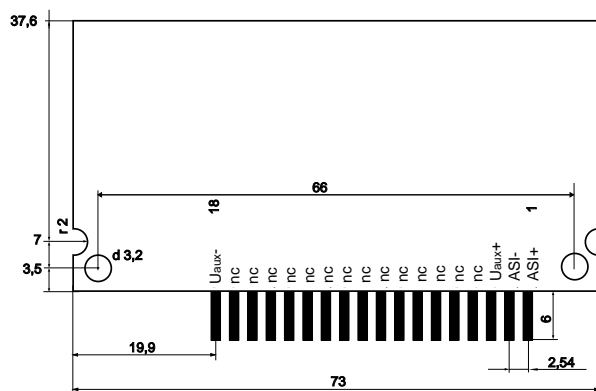


### Article no. BW1485

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 ≤ 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

# Specialities



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

## Overview AS-i Specialities

Housing	Module	Art. No.	Characteristic	P.
	<b>AS-i 3.0 Universal Module in IP65</b>	BWU1931	analog and digital inputs/outputs in one module	
	<b>AS-i Counter Module</b>	BWU2218	2-channel input	118
		BWU2219	2 x 2-channel input	
		BWU2189	4 x 2-channel input	
		BWU1723	1-channel input (analog)	120
		BWU1711	1-channel input (0 to 15)	121
	<b>AS-i Analog Module: 2 inputs for Leuze ODSL 30 distance sensors</b>	BW1908	0 ... 65 m	122
		BW1664	0 ... 30 m	
	<b>AS-i Code Block</b>	BW1527	with 2 code switches	124
 	<b>AS-i/AS-i Coupler</b>	BW1187	connection of 2 AS-i networks via 2 internal 4I/4O slaves	123
		BWU1280	connection of 2 AS-i networks via 2 internal 4I/4O slaves, 125 protection category IP65	

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

## 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, treshold value 13 V 1 status input 0 ... 10 Hz, treshold 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:

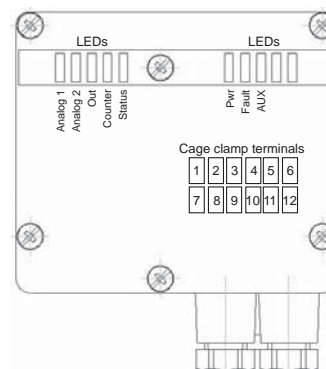
- 1: upward counting
- 0: downward counting

#### 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 Master/Gateways/

AS-i Slaves

AS-i Accessories/

Other Fieldbuses/

AS-i Safety

Price Lists

# AS-i 3.0 Universal Module in IP65

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 <sub>hex</sub>		
ID2 code	C <sub>hex</sub>	D <sub>hex</sub>	E
IO code	7 <sub>hex</sub>		
<b>Displays</b>			
LEDs green (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 <sub>DC</sub> )		
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 191)
- AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (article no. BW1181, see page 191)
- AS-i substructure module to connect 2 AS-i round cable (article no. BW1182, see page 191)
- AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply (article no. BW1183, see page 191)
- AS-i substructure module to connect 2 AS-i flat cables with addressing socket (article no. BW1438, see page 191)

## 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 (underflow) 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 <sub>hex</sub>
ID2 code	C <sub>hex</sub>
IO code	7 <sub>hex</sub>
<b>Displays</b>	
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

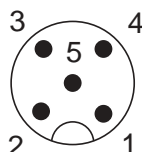
P3	Counting direction
0	count downwards
1	count upwards

**Accessories:**  
AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (art. no. BW1181, see also page 191)

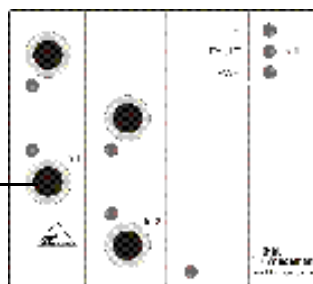
AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (art. no. BW1183, see also page 191)

### 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 <sub>hex</sub>
IO code	0 <sub>hex</sub>
ID1 code	F <sub>hex</sub>
ID2 code	E <sub>hex</sub>
<b>Displays</b>	
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

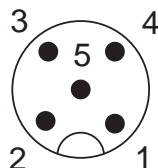
#### Accessories:

AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (art. no. BW1181, see also page 191)

AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (art. no. BW1183, see also page 191)

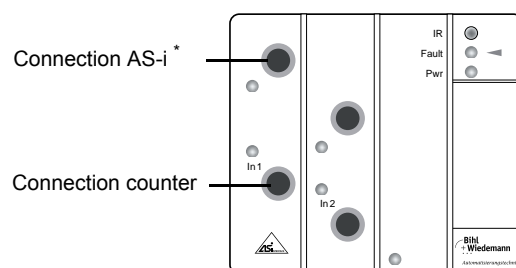
#### Connection AS-i

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 <sub>hex</sub>	
ID2 code	D <sub>hex</sub>	9 <sub>hex</sub>
IO code	7 <sub>hex</sub>	
<b>Displays</b>		
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

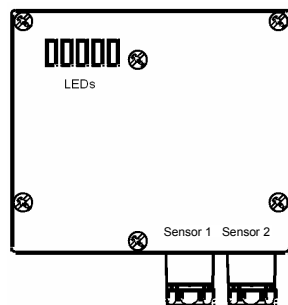
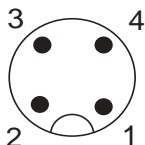
### Accessories:

AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply (art. no. BW1181, see also page 191)

AS-i substructure module to 1 AS-i round cable, 1 round cable for additional supply (art. no. BW1183, see also page 191)

### 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.

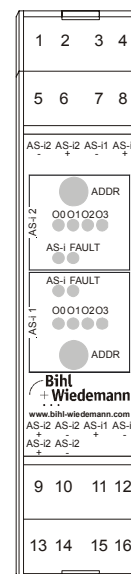
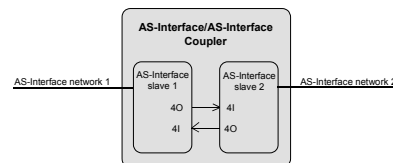
Each AS-i slave has got 6 LEDs, 4 LEDs for the 4 outputs, one power LED and 1 LED for AS-i faults. Furthermore each slave has got an address socket.

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 <sub>hex</sub>
ID-Code (slave 1 and 2)	F <sub>hex</sub>
ID1-Code (slave 1 and 2)	F <sub>hex</sub>
ID2-Code (slave 1 and 2)	E <sub>hex</sub>
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<sub>hex</sub> to F<sub>hex</sub> (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

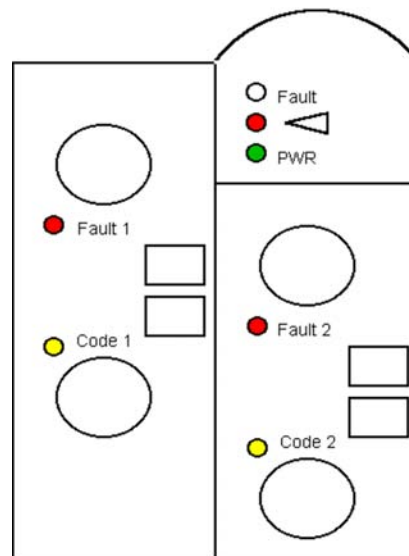
transmitted via AS-i and can be processed easy in the I/O area of the controller.

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 <sub>hex</sub>
ID code (slave 1 and 2)	A <sub>hex</sub>
ID1 code	F <sub>hex</sub>
ID2 code	E <sub>hex</sub>
LED red (Fault)	communication error
LED green (PWR)	AS-i voltage OK
<b>LEDs for slave 1 and 2:</b>	
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 191)
- AS-i substructure module to connect 2 AS-i round cable (Article no. BW1182, see also page 191)

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbussee/  
Master Simulators

AS-i Safety

Preis Lists

# AS-i/AS-i Coupler in IP65

## 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.

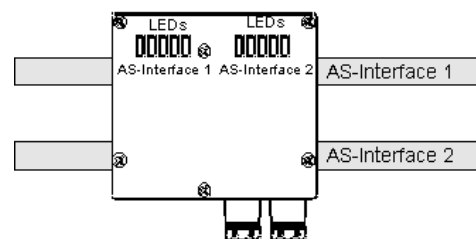
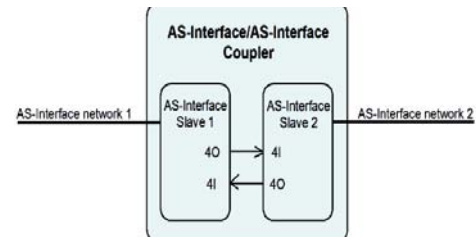
Each AS-i slave has got 5 LEDs, 4 LEDs for the 4 outputs and one power LED. Furthermore each slave has got an address socket.

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 <sub>hex</sub>
ID-Code (slave 1 and 2)	F <sub>hex</sub>
ID1-Code (slave 1 and 2)	F <sub>hex</sub>
ID2-Code (slave 1 and 2)	E <sub>hex</sub>
LEDs for slave 1 and 2	
2x 4 LEDs yellow	output 1 up to output 4
2x 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.
	<b>Cylindrical AS-i Actuator 1I/3O</b>	BWU1647	AB slave (up to 62 slaves)	129
	<b>AS-i Slave for SEW frequency inverters</b>	BW2038	with M12 sockets, protection category IP65	130
	<b>AS-i 3.0 Motor Modules</b>	BW2437	AS-i 3.0 4I/4O Module for MOVI-SWITCH	131
		BWU2398	for 2 Roller Drives, speed setting of AS-i parameter, for each two Interroll motors EC200 or EC300	132
		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 134 rotary switches	

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

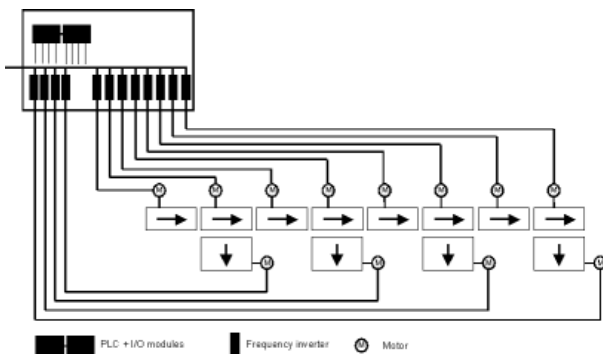
Price Lists

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



### Application sample

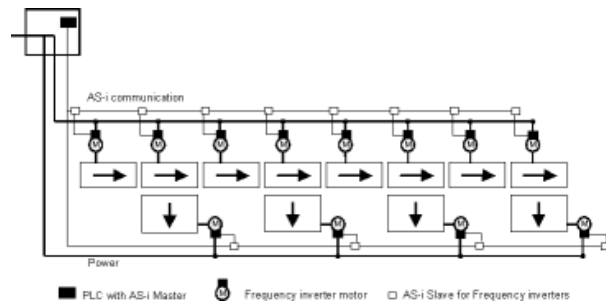
The AS-i - originally designed to network binary sensors and actuators - offers in combination with the AS-i slaves for frequency inverters and decentralizes frequency inverters frequency inverter motors a possibility to create new plant structures together with drives. The advantages of AS-i like small 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 cabling 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 cabling 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 cabling, 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.

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists



# 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



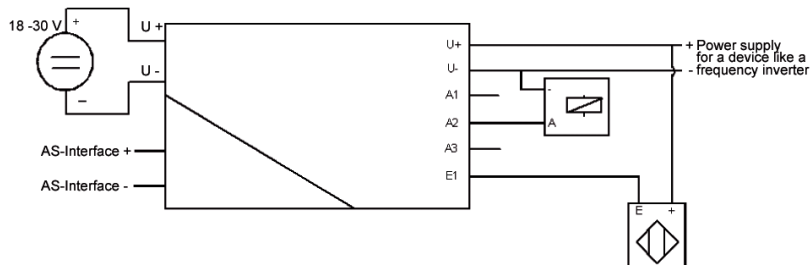
### Article no. BWU1647: AB slave (up to 62 slaves)

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 fittings.

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)

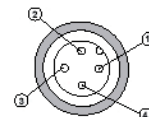
**Accessories:** Reduction sleeve M25/M18x1 (Art. no. BW1282)  
Reduction sleeve PG16/M18x1 (Art. no. BW1241)

#### 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

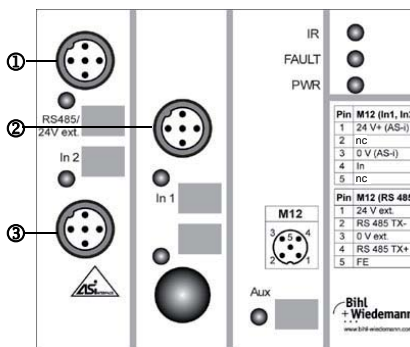
### Reasons for peripheral fault (flashing Fault LED):

- 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

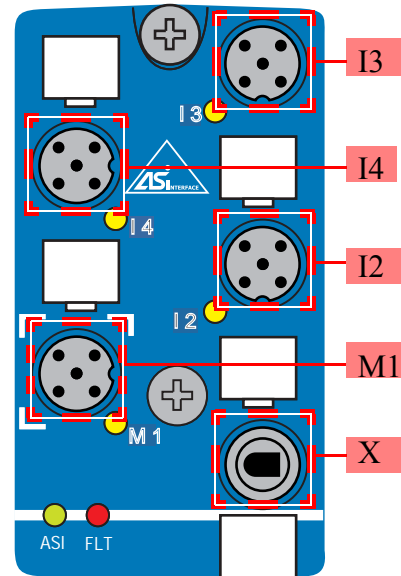
Article no.	BW2437
Connection	AS-i: flat cable and piercing, periphery: M12
AS-i profile	S-7.F.E, ID1=7 (default)
AS-i voltage	18 ... 31.6 V
Max. AS-i current consumption	400 mA
Number of inputs	4
Power supply of inputs	motor fault inputs: AS-i supply sensor inputs: AS-i supply
Input level	$U_{in} < 5 V$ low, $U_{in} > 10 V$ 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  $\mu$ 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 <sub>out</sub> of AS-i	I 3	0 V <sub>out</sub> 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 <sub>out</sub> 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<sub>ext</sub> 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
<b>AS-i</b>	
AS-i profile	S-7.A.7, ID1 = 7 (fixed)
AS-i voltage	18 ... 31.6 V
Max. AS-i current consumption	200 mA
<b>AUX</b>	
AUX voltage	18 ... 30 V
Max. AUX current consumption	8 A continuously, 11 A peak
<b>Inputs</b>	
Number of inputs	4
Power supply of inputs	Motor fault inputs: external supply Sensor inputs: AS-i supply
Input level of sensors	U <sub>in</sub> < 5 V low, U <sub>in</sub> > 10 V high
Power supply of attached sensors	120 mA
<b>Outputs</b>	
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.
<b>Indicator</b>	
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)	<b>LED on:</b> AS-i communication error, slave does not participate in the normal exchange of data, e.g. slave address 0 <b>LED flashing:</b> peripheral fault
LED green (AUX)	24 V <sub>DC</sub> AUX on
<b>Environment</b>	
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

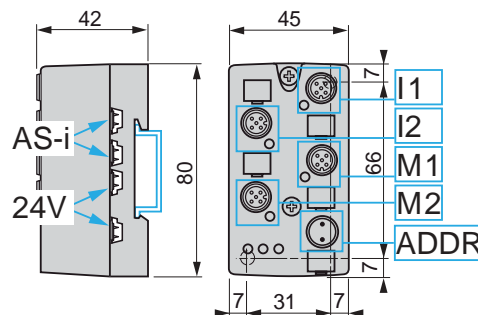
Article no.	intended use
BWU2398	module for each two Interroll motors EC200 or EC300
BWU2575	module for each two Interroll motors EC310

### Configuration analog-value O1/O3

P0	P1	P2	BWU2398		BWU2575	
			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				
	1	2	3	4	5
I 1 (input 1)	24 V <sub>out</sub> of AS-i	I 1	0 V <sub>out</sub> of AS-i	I 1	nc
I 2 (input 2)		I 2		I 2	
M 1 (motor 1)	24 V <sub>ext in</sub>	O 2 (0: 0 V; 1: 24 V)	0 V <sub>ext in</sub>	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 194)

**AS-i module for two motors e.g. Interroll (EC200, EC300 or EC310)  
Itoh Denki series 50XE/XP - POWER MOLLER (R) BRUSHLESS 24VDC etc.**



### 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<sub>ext</sub> and the sensors by AS-i. The module is 35V-resistant and brake resistor compatible.

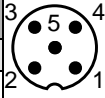
<b>Article no.</b>	<b>BWU2478</b>	
<b>Connection</b>		
Connection	AS-i: flat cable and piercing, peripheral: M12	
<b>AS-i</b>		
AS-i Profile	digital slave S-7.A.7, ID1=7	analog slave S-7.5.5, ID1=F
AS-i voltage	18 ... 31.6V	
Max. AS-i current consumption	200mA	
<b>AUX</b>		
Max. AUX current consumption	8 A continuously, 11A peak	
Overvoltage tolerated by reaction	35V brake resistor compatible	
Supply of the motors	out of AUX, 3A continuously, 6A max.	
<b>Input</b>		
Number of inputs, sensors	4	
Power supply of inputs	sensor inputs: AS-i power supply	
Input level	U <sub>in</sub> < 5V low, U <sub>in</sub> > 10V high, 3KΩ	
Power supply of attached sensors	< 100mA (sum)	
<b>Output</b>		
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)	
<b>Display</b>		
4x LEDs yellow (I1, I2, I3, I4)	state of inputs I1, 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	
<b>Environment</b>		
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	

# AS-i 3.0 Motor Module

<b>Article no.</b>	<b>BWU2478</b>
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 <sub>out</sub> of AS-i	-	GND	I1	-
I2 (input I2)				I2	
I3 (input I3)				I3	
I4 (input I4)				I4	
M1 (motor 1)	24V <sub>ext</sub> out	Rotating direction	0V <sub>ext</sub> out	Start output / disturbance input*2	Analog output 0...10V
M21 (motor 2)					
ADDR	Connection for AS-i addressing device				



AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

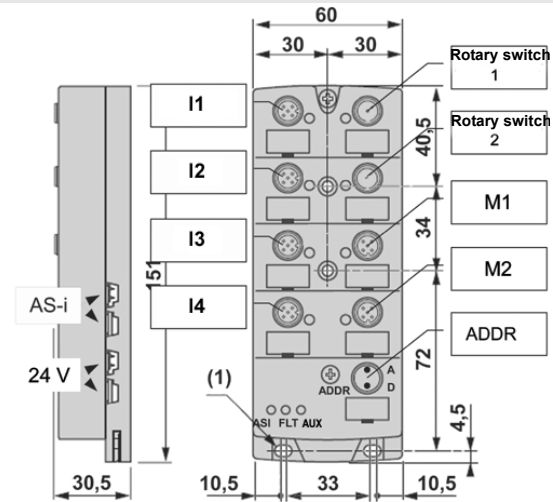
Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

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

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

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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 194)



## Overview - AS-i Building Automation

Housing	Module	Art. No.	Characteristic	P.
	<b>AS-i EnOcean Slaves</b>	BW2375	for connection of EnOcean wireless sensors, housing: white, AB Slave, AS-i Specification 3.0	138
		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	
	<b>AS-i Module for controlling damper actuators</b>	BW2028	supplied by AS-i, AS-i Specifications 2.1/3.0	139
		BW2080	supplied by AS-i, meets requirements for Switzerland (JGBSK), AB Slave, AS-i Specifications 2.1/3.0	141
	<b>AS-i Module for controlling 230 V blinds</b>	BW2114	supplied by AS-i, 2 AB Slaves, AS-i Specifications 2.1/3.0	143
	<b>AS-i 4I OEM Module for building services engineering</b>	BW2388	4I AB Slave potted, for use in round flush-mounted boxes	145
	<b>AS-i Modules for building services engineering</b>	BW2137	4I/4O, AB Slave with spring-type terminal, AS-i Specification 3.0	146
		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	147
		BW2536	2 analog and 2 digital outputs, Single Slave with spring-type terminal, AS-i Specification 3.0	149
	<b>AS-i OEM Module for building services engineering</b>	BW2128	4I/3O, AB Slave (up to 62 Slaves), in- and outputs supplied by ext. 24V, AS-i Specification 3.0	151
	<b>AS-i MP Bus Gateway</b>	BW2406	for controlling up to 8 MP Bus participants (e.g. Belimo), 153 MP Bus Master, integrated power supply with overtemperature protection, AS-i 3.0 Single Slave, protection category IP54	153

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 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
<b>Connections</b>			
AS-i	spring clamp terminals		
<b>Properties</b>			
Operating voltage	26,5 ... 31,6V <sub>DC</sub>		
Quiescent current consumption (inputs = 0, outputs = 0)	≤ 30mA		
Max. current consumption	54mA		
Switch power supply	by AS-i		
Voltage range	18 ... 30V <sub>DC</sub>		
Connection ext. antenna	-	-	SNA-socket
<b>Displays</b>			
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		
<b>Conformity to standards</b>			
EMC	EN 61 000-6-2 EN 61 000-6-4		
AS-i Profile	S-7.38 + S-7.A.5		
<b>Housing</b>			
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

**Programming (Bit setting)**

**Parameter bit**

**Bit P1, P2, P3:**  
not used

**Programming:**  
Adress preset 0  
changeable via bus master-programming device

**Accessories:**

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

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 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.

<b>Article no.</b>	<b>BW2028</b>
<b>Connections</b>	
Damper actuator	cage clamp terminals or Belimo-compatible connectors
AS-i	cage clamp terminals
<b>Properties</b>	
Achievement	4 inputs / 2 outputs
Output function	transistor PNP
Operating voltage	26,5 ... 31,6 V <sub>DC</sub>
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 <sub>DC</sub>
Switching threshold of inputs U	≤ 0,8 mA (low); ≥ 5 mA (high) 18 ... 30 V <sub>DC</sub>
Loading capacity	400 mA per output (sum of all outputs ≤ 400 mA) out of AS-i
I/O configuration	7
ID code	D
<b>Displays</b>	
Operating	LED green
Function	LED yellow
Inputs 1 - 4	4 x LEDs yellow
Outputs 1 - 2	2 x LEDs yellow
<b>Standard conformity</b>	
EMC	EN 61 000-6-2, EN 61 000-6-3, EN 61 000-6-4
AS-i profile	S 7. D
<b>Housing</b>	
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

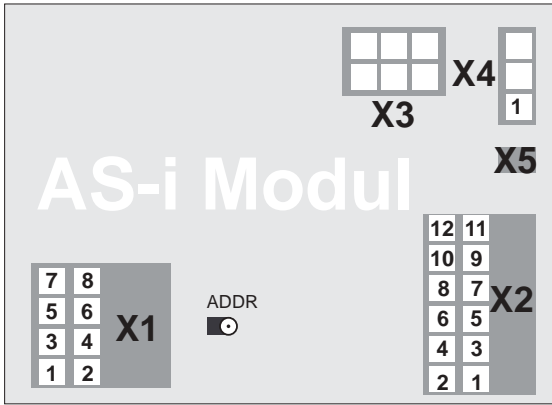
**Programming:**  
**preset: address 0**  
**changeable via busmaster-programming devices**

#### 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 190)
- AS-i passive distributor, AS-i/24 V on M12 (art. no. BW1976, see also page 190)

# 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 to control damper actuators

## 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
<b>Connections</b>	
Damper actuator	cage clamp terminals or Belimo-compatible connectors
AS-i	cage clamp terminals
<b>Properties</b>	
Achievement	3 inputs / 2 outputs
Output function	transistor PNP
Operating voltage	26,5 ... 31,6 V <sub>DC</sub>
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 <sub>DC</sub>
Switching threshold of inputs U	≤ 0,8 mA (low); ≥ 5 mA (high) 18 ... 30 V <sub>DC</sub>
Loading capacity	400 mA per output (sum of all outputs ≤ 400 mA) out of AS-i
I/O configuration	7
ID-Code	A
<b>Displays</b>	
Operating	LED green
Function	LED yellow
Inputs 1 - 3	3 x LEDs yellow
Outputs 1 - 2	2 x LEDs yellow
<b>Standard conformity</b>	
EMC	EN 61 000-6-2, EN 61 000-6-3, EN 61 000-6-4
AS-i profile	S 7.A
<b>Housing</b>	
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 <i>not</i> 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 190)
- AS-i passive distributor, AS-i/24 V on M12 (art. no. BW1976, s. page 190)

# 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

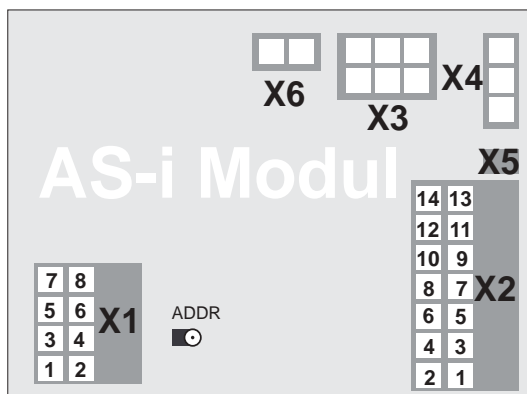
AS-i Safety

Price Lists

**Terminal 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

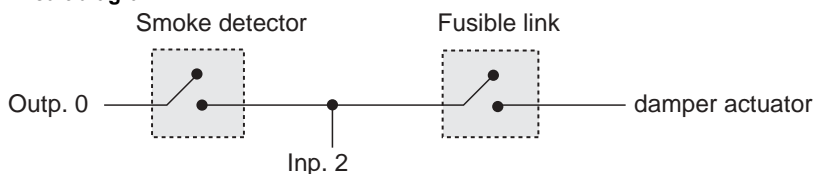


**Variants with bridges:**

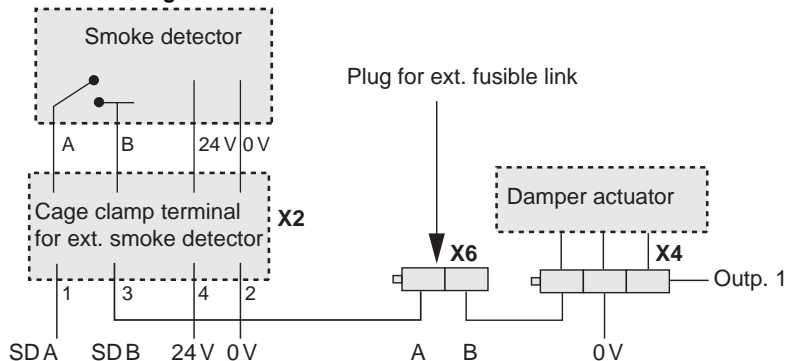
- 1-11: no smoke detector connected  
no fusible link X6 connected
- 1-3: no smoke detector connected

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

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
<b>Connections</b>	
Blinds and 230V supply	cage clamp terminals
AS-i / switch	cage clamp terminals
<b>Properties</b>	
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 <sub>DC</sub>
Quiescent current (inputs = 0, outputs = 0)	≤ 30 mA
Max. current consumption	I <sub>max</sub> ca. 130 mA
Wiring of the inputs	switch contacts
Switch current supply	by AS-i
Voltage range	18 ... 30V <sub>DC</sub>
Switching current of inputs	4 mA
Load capacity	230V <sub>AC</sub> , 4 A each output
<b>Displays</b>	
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
<b>Standard conformity</b>	
EMV	EN 61 000-6-2 EN 61 000-6-4
AS-i profile	S-7.A.E
<b>Housing</b>	
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)

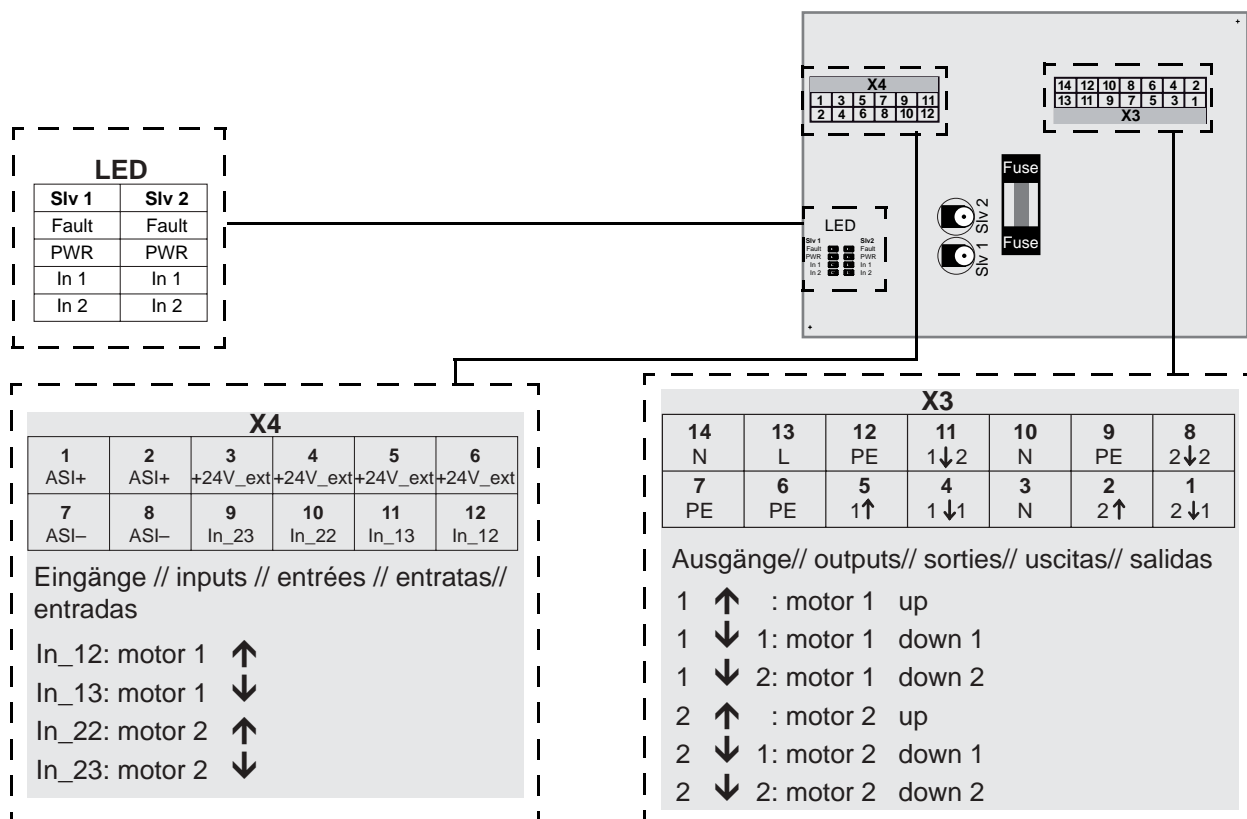
#### Parameter bit

**Bit P1, P2, P3:**  
not used

#### Programming:

preset: address 0  
changeable via  
busmaster-programming devices

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



# 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 Power24V PELV-voltage .

Article number	BW2388
Connection	via connecting wire
AS-i profile	S-7.A.7
AS-i voltage	22 ... 31,6V
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 <sub>B</sub>	< 50mA
Operating voltage	out of AS-i (30V) 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 / 20 /
Length of cable	max. 1,5 m

#### Programming: (Bit-setting)

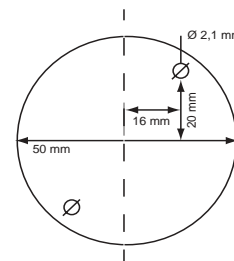
**Data bit**  
**BitFunction**  
D0 Input 1  
D1 Input 2  
D2 Input 3  
D3 Input 4

**Addressing**  
Adresse preset 0

#### Connection assignment:

brown: AS-i +  
blue: AS-i -  
red: E1 to E4+  
yellow: E1  
white: E2  
green: E3  
black: E4

#### Drill holes:



# 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 (elektronisch)	4		3	4	-
Inputs (elektronisch)	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				
<b>Displays</b>					
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

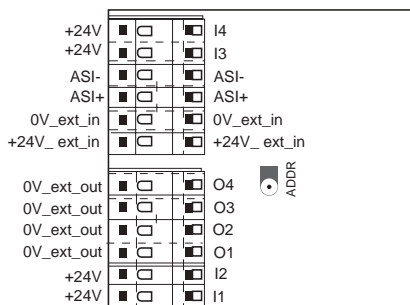
- D0 Input I1/Output O1
- D1 Input I2/Output O2
- D2 Input I3/Output O3
- D3 Input I4/Output O4

#### 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.

<b>Article no.</b>	<b>BW2480</b>
<b>Connection</b>	
Connection	cage clamp terminals
Length of connector cables	max. 15 m
<b>AS-i</b>	
AS-i Profile	S-O.A.O
AS-i voltage	20 ... 30V DC
Operating voltage	via AS-i
Operating current	≤ 70mA
Quiescent current	≤20mA
<b>Input</b>	
Number	4 (electronic)
Capacity	100mA in total supplied by AS-i
<b>Display</b>	
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
<b>Environment</b>	
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-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

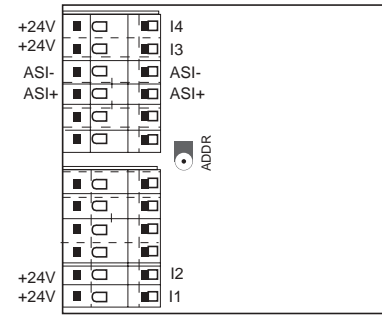
# AS-i Module for building services engineering

AS-i Master/Gateways/  
Links/Scanner

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

AS-i Slaves

Programming hints:	
IO-Code	0
ID-Code	A
ID1-Code	7
ID2-Code	0



AS-i Accessories/  
Diagnostics/Development

**Accessories:**

- Connecting cable 40 cm with M12 plug (art. no. BW2065)
- AS-i passive distributor, AS-i flat cable on M12 (art. no. BW1239)

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

# 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

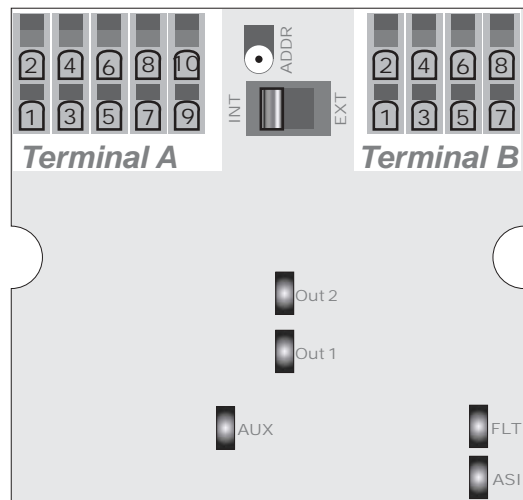


The AS-i analog slave BW2536 is a 2A-module with two additional binary switching outputs and meets the requirements of the new AS-i Specification 3.0.

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.

<b>Article no.</b>	<b>BW2536</b>
<b>Connection</b>	
Connection	cage clamp terminals
<b>AS-i</b>	
AS-i Profil	S-7.A.5
ID-Code	A <sub>hex</sub>
ID2-Code	5 <sub>hex</sub>
IO-Code	7 <sub>hex</sub>
AS-i voltage	AS-i (30V DC)
AS-i current input EXT max.	< 40mA
AS-i current input INT max.	< 140mA
<b>AUX</b>	
AUX voltage max.	24V AC/DC
<b>Output</b>	
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) <b>in total:</b> (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) <b>in total:</b> (digital+analog+supply) ≤ 100mA (≤ 45°C) ≤ 90mA (45°C ... 55°C)
Resolution	16 Bit/1mV
Range of value	0 ... ±10.000 dec. (see table)
<b>Display</b>	
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/3O 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 3 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.

<b>Article no.</b>	<b>BW2128</b>
<b>Connection</b>	
Connection	cage clamp terminals
Length of connector cable	I/O: max. 15 m
<b>AS-i</b>	
Profile	S-7.A.E
voltage	20 ... 30V DC
Operating voltage	via AS-i
Operating current	≤ 70mA
Quiescent current (Input = 0, Output = 0)	≤20mA
<b>Input</b>	
Number	4 (electronic)
<b>Output</b>	
Number	3 (electronic)
Capacity	500mA per output from 24V supply
<b>Display</b>	
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
<b>Environment</b>	
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

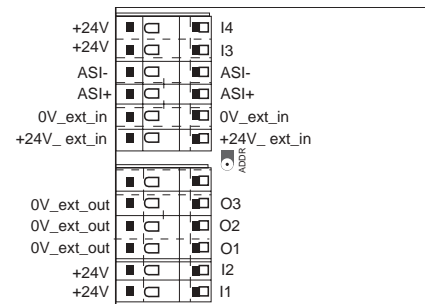
# AS-i OEM-Module for building services engineering

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
<b>Connections</b>	
Power supply and drives	spring terminals
AS-i	spring terminals
MP Bus Terminal	RJ-11
<b>Properties</b>	
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
<b>Displays</b>	
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
<b>Standards</b>	
EMC	EN 61 000-6-2 EN 61 000-6-4
AS-i profil	S-7.4.0
<b>Housing</b>	
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
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## Overview Diagnostics/Commissioning

Housing	Device	Art. no.	Characteristic	P.
	<b>AS-i Analyser InnovationStep 2</b>	BWU1415	complementation of local AS-i Master diagnostic	156
	<b>AS-i Address Programming Device</b>	BW1191	with plug-in recharger 230 V	157
		BW1646	with plug-in recharger 115 V (Version North America)	
	<b>Accessories for AS-i Address Programming Device</b>	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

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 Analyser 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
<b>LED display</b>	
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 162)  
AS-i Bus Termination (Article no. BWU1644, see page 162)

More information can be found online at [www.bihl-wiedemann.com](http://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.
	<b>AS-i Diagnostic Tuner</b>	BWU1843	with AS-i slave address trebling of AS-i cable length	162
	<b>AS-i Tuner</b>	BWU1648	without AS-i slave address trebling of AS-i cable length	
	<b>AS-i Bus Termination</b>	BWU1644	default value of the AS-i Tuner doubling of AS-i cable length	
	<b>Advanced Repeater with Bus Termination</b>	BWU2192	circuit extension by more than 200 m, passive bus termination connectable	164
	<b>Advanced Repeater</b>	BWU1855	circuit extension by more than 100 m	165
		BWU1273	extends network an additional 100 m, protection category IP65	166
	<b>AS-i High Power Repeater</b>	BWU2384	Higher transmission and reception levels to High Power Segment A, protection category IP20	167

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

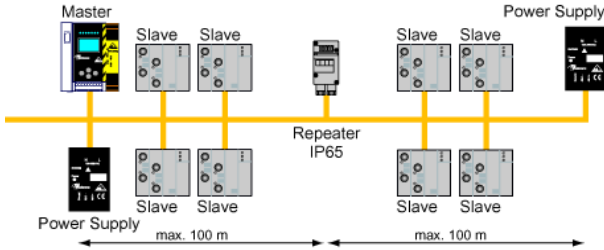
AS-i Safety

Price Lists

## Circuit Extension

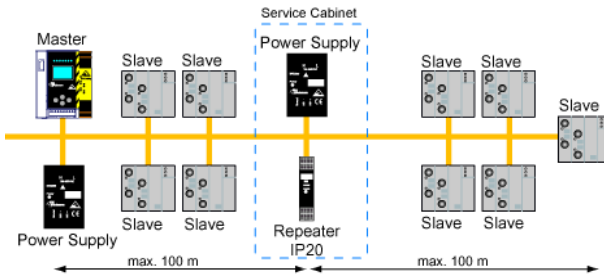
### Circuit Extension by Repeater

Today's standard for networks over 100 m is to supplement one or several repeaters and as many power supplies (configuration B1).



*Config. B1: Conventional solution using repeaters and additional power supplies to realise networks with more than 100 m*

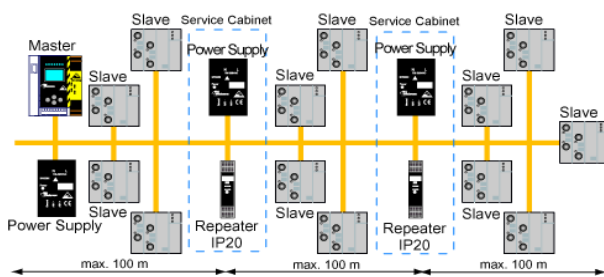
One alternative is the IP20 repeater that is in a service cabinet together with the power supply. The main advantage is the easy mounting of the repeater in the cabinet (configuration B2). The IP20 repeater has been designed with this intention.



*Config. B2: Simplifying the mounting by using the IP20 repeater inside the service cabinet.*

### Optimizing the Energy Distribution with Repeaters

Repeaters may also be used to isolate parts of a network from each other or to feed several segments of a network by separate power (configuration C1).

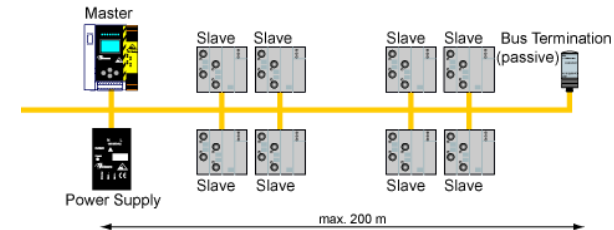


*Config. C1: Separation of 1 network into 3 galvanically isolated segments, e.g. to feed a network that demands 12 A by 3 separate power supplies.*

### Circuit Extension by Bus Termination Plug or by Tuner

If a network of more than 100 m is needed, the answer is no longer "add a repeater and a power supply (for each 100 m)" (configuration B1). Bihl+Wiedemann now offers two more intelligent solutions: The (passive) bus termination and the (active) tuner, both with a protection degree of IP65.

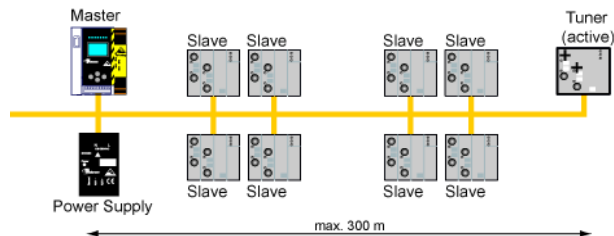
The passive bus termination permits an extension of up to ca. 200 m. However, Bihl+Wiedemann recommends to carefully check the number of repeated telegrams in each installed network (use the error counter in B+W masters or a B+W analyser). If the compensation of the network's impedance is successful, this configuration is the most cost-effective one for an extension (config. D1).



*Config. D1: The passive bus termination permits networks up to ca. 200 m (check the repetition rate, please).*

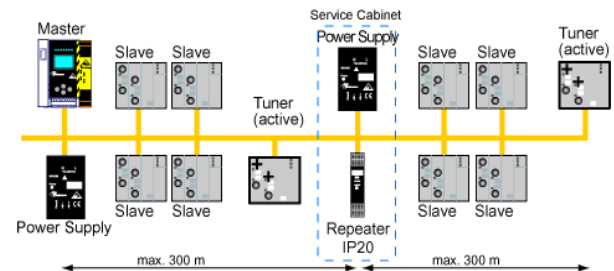
In networks of up to ca. 300 m, it is more secure and feasible to use the Bihl+Wiedemann tuner. This is an active bus termination which adjusts itself automatically to the situation found in the particular network. Thus it reaches farther and works in more conceivable configurations (configuration D2).

Additional benefit: The tuner shows continuously whether compensation has been reached well enough. Three LEDs (green, yellow, red) signal "normal communication", "functioning but with a remarkable amount of repetitions", or "too many repetitions or (sporadic) loss of at least one slave". As opposed to a fixed bus termination, the alignment of the tuner can easily be repeated at any time if the plant is changed.



*Config. D2: The active bus termination by a tuner permits networks up to ca. 300 m. In addition it checks and signals communication quality.*

For even bigger networks, tuners or bus terminations and repeaters can be combined. As up to two repeaters may be used in series, one can achieve lengths of up to 600 m (with passive bus termination) or 900 m (with tuners), respectively. This is shown in configuration D3 with two segments.



*Config. D3: 600 m-network with tuner plus repeater. May be extended up to 900 m.*

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.

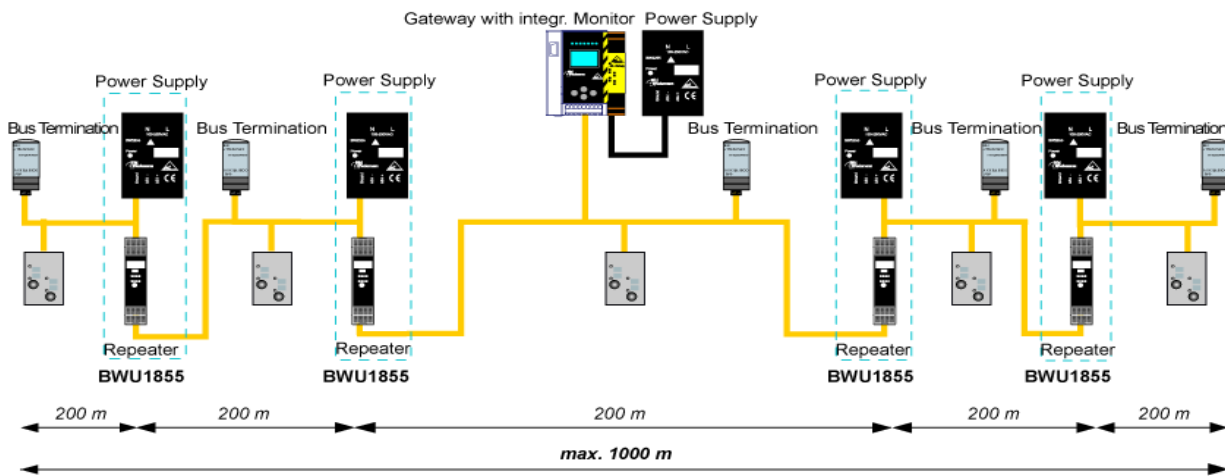
Apart from extension the tuner can even be used to correct an unstable network if the instability is caused by a faulty impedance. Thus networks can be run properly and with a high degree of availability even if their components misfit the specifications to some extent. This effect is due to the active 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

## AS-i Tuner:

Triplification 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.

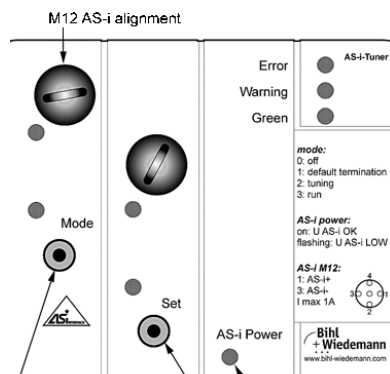
Article No.	BWU1648/BWU1843	BWU1644
Connection	AS-i flat cable/AS-i round cable	
Operating value	AS-i (30 V DC)	
Operating current	60 mA	10 mA
LEDs	5	2
LED green	LED (AS-i Power) on: U AS-i > 26 V LED (AS-i Power) flashing: 18,5 V < U AS-i < 26 V	U AS-i > 26 V
LED red	Error (AS-i Analyser)	-
LED yellow	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

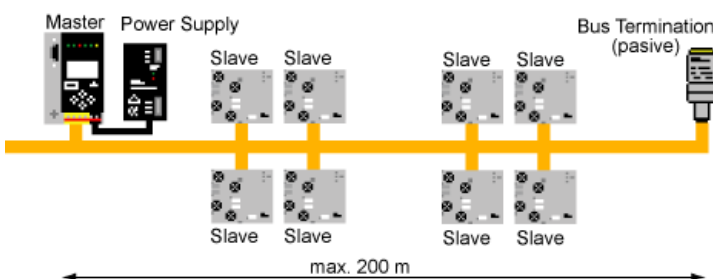
In 0, In 1 binary bits, freely usable  
In 2, In 3 serial communication  
Out 0, Out 1 serial communication  
Out 2 binary bits, freely usable



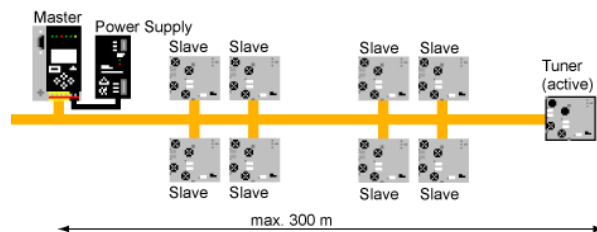
**Rotary switch:**  
BWU1843, BWU1648, BWU1715  
(without slave function)  
0: off  
1: default termination  
2: tuning  
3: run  
**only BWU1843**  
(slave function)  
4: off  
5: default termination  
6: tuning  
7: run

**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 156)
- AS-i passive distributor H (art. no. BW1239, see also page 190)

### 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 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>
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

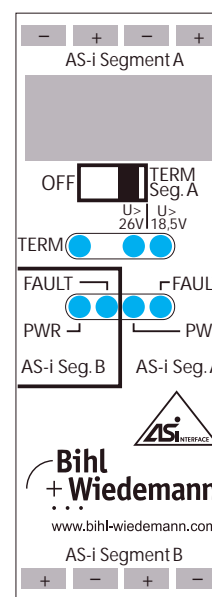
Beside the power supply, the AS-i Repeater with On-Board-Diagnostics displays separately AS-i communication errors. The red AS-i Fault LED flashes as long as there is no AS-i communication. The communication error LED will help the customer to find basic installation problems really fast. The new AS-i 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 174)
- AS-i Bus Termination (art. no. BW1644, see also page 162)
- AS-i Tuner (art. no. BW1648, see also page 162)
- AS-i Repeater in IP65 (art. no. BW1273, see also page 166)
- AS-i Analyser (art. no. BW1415, see also page 156)

# 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 174)
- AS-i bus termination (art. no. BW1644, see also page 162)
- AS-i Tuner (art. no. BW1648, see also page 162)
- AS-i Repeater in IP65 (art. no. BW1273, see also page 166)
- AS-i Analyser (art. no. BW1415, see also page 156)

### 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.

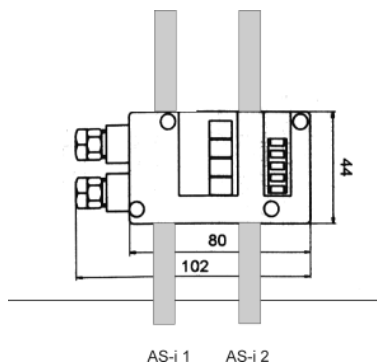
The AS-i Repeaters are compatible with all existing AS-i Repeaters.

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 191) by using of AS-i round cables

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 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:

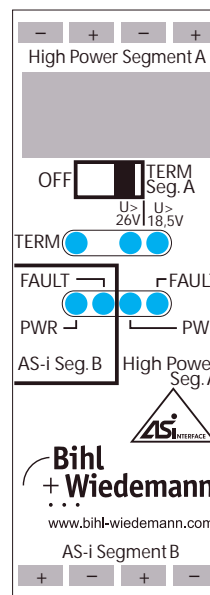
The AS-i High Power Repeater does not occupy any slave address. The total amount of the slaves (31 respectively 62) per AS-i network remains constant. No programming required.

#### Accessories:

- AS-i Power supply (art. no. BW1649, see also page 174)
- AS-i Bus termination (art. no. BWU1644, see also page 162)
- AS-i Tuner (art. no. BWU1648, see also page 162)
- AS-i Repeater in IP65 (art. no. BWU1273, see also page 166)
- AS-i Analyser (art. no. BW1415, see also page 156)
- AS-i Module for Power Decoupling (art. no BW2387, see also page 184)

#### 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.
	<b>AS-i Power Supply 1,8 A</b>	BW2255		AS-i Installation Power supply from 115 V <sub>AC</sub> up to 250 V <sub>AC</sub>	172
	<b>AS-i Power Supply, 4 A/8 A</b>	BW1649		90 V AC up to 265 V AC, wide range supply, 4 A	174
		BW1997		115 V AC/230 V AC, with range switch, 8 A	
	<b>AS-i Wide Range Power Supply 8 A</b>	BW2276		8 A AS-i power supply with integrated filter for input voltage from 195 V <sub>ac</sub> up to 500 V <sub>ac</sub>	175
	<b>24 V to 30 V AS-i Power Supply in Stainless Steel, 2 A</b>	BW1760		24 V DC to 30 V AS-i output voltage	177
	<b>Power Supply for AS-i Master in Stainless Steel, 4 A/8 A</b>	BW1593		Power Supply, 8 A	178
		BW1598		Power Supply, 8 A, Class 1 Div 2	
		BW1597		Power Supply, 4 A, Class 1 Div 2	
	<b>Power Supply, 4 A/8 A, with 3 phases for AS-i Master in Stainless Steel</b>	BW1927		Power Supply, 4 A, for 2 AS-i circuits	180
		BW1676		Power Supply, 8 A, for 2 AS-i circuits	181

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

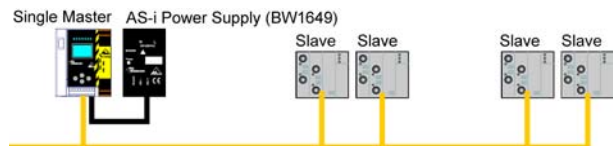
AS-i Safety

Price Lists

Housing	Module	Art. No.	UL	Characteristics	P.
	<b>AS-i Power Supply Decoupling Unit: supply of 2 AS-i networks out of 1 power supply</b>	BWU1943		applicable with double masters without integrated data decoupling	182
	<b>AS-i Power Extender</b>	BWU1197		extends the distance between AS-i power supply and AS-i network, 2,8 A	183
		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	
	<b>AS-i Module for Power Decoupling</b>	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	184

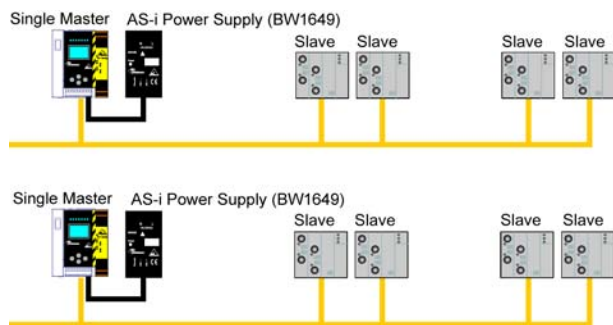
## AS-i Power Supplies

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.



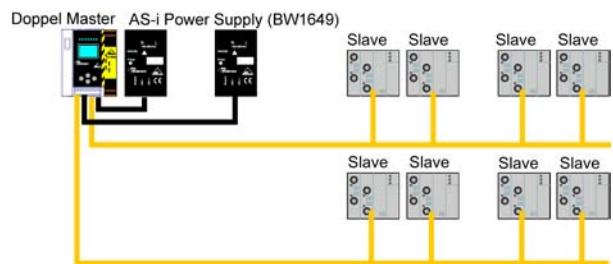
Config. A1: The standard: single network, often with coupling to a higher level network, e.g. to PROFIBUS.

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.



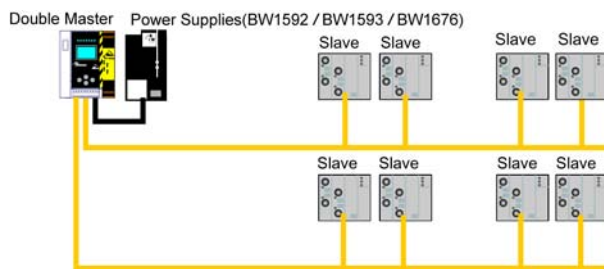
Config. A2: Multiple networks simply duplicating the standard single network.

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.



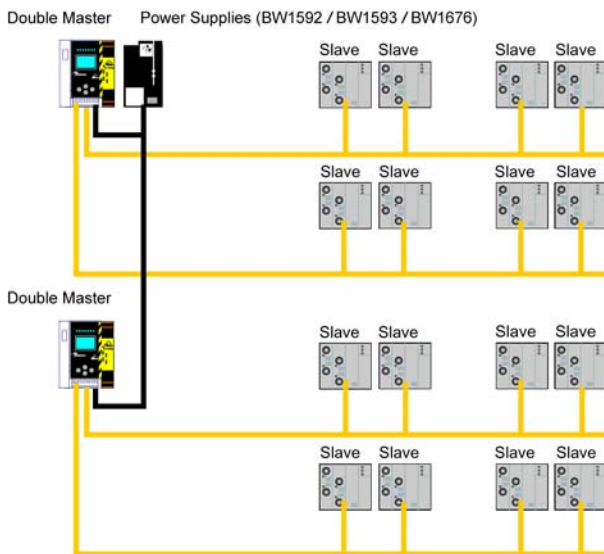
Config. A3: Two networks are served by one double master.

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".

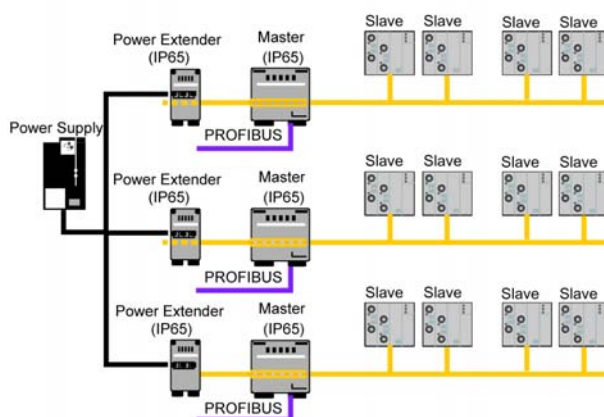
Several double masters can even be supplied from *only one* power supply.



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<sub>AC</sub> up to 250 V<sub>AC</sub>

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.

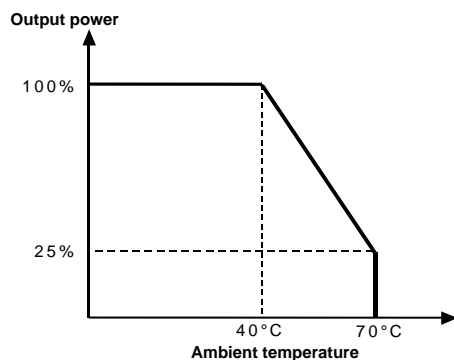
When temperature falls below 60°C, the power supply will again work in normal operation mode.

Article no	BW2255
<b>Input</b>	
Nominal input voltage	100 - 240 V <sub>AC</sub> , 47 - 63 Hz
Input voltage	94 - 265 V <sub>AC</sub>
Nominal input current	0,65 A at 230 V <sub>AC</sub> ; 1,0 A bei 115 V <sub>AC</sub>
Peak inrush current	$I^2t < 1,5 A^2s$
Power factor cos $\varphi$	0,4 capacitive at 230 V <sub>AC</sub> ; 0,55 capacitive at 115 V <sub>AC</sub>
Applicable wire size of input clamps	0,5 ... 2,5 mm <sup>2</sup> (AWG20 ... AWG13)
Tightening torque of the input clamps	0,6 - 0,8 Nm
Insulation stripping length	10 mm
<b>Output</b>	
Output voltage U <sub>out</sub>	31,2V ± 3%
Output current I <sub>out</sub>	0 - 1,8 A
Ripple	< 50 mV <sub>pp</sub> (0 ... 10 kHz); < 10 mV <sub>pp</sub> (35 ... 500 kHz)
Current limitation typ.	2,3 A
Efficiency typ.	88%
Applicable wire size of output clamps	0,5 ... 2,5 mm <sup>2</sup> (AWG20 ... AWG13)
Tightening torque of the output clamps	0,6 - 0,8 Nm
Insulation stripping length	10 mm
<b>Regulation</b>	
Line regulation	< 0,2% at U <sub>in</sub> = 230 V <sub>AC</sub> ± 15%
Load regulation	< 0,5% at 0 A → 1,8 A
Dynamics	< 2 ms at 10 ↔ 90% (I <sub>out max</sub> ), peaks < 2%
<b>Protection and monitoring</b>	
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 <sub>in</sub> = 230 V <sub>AC</sub> ; > 10 ms bei U <sub>in</sub> = 115 V <sub>AC</sub>
<b>Safety</b>	
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)

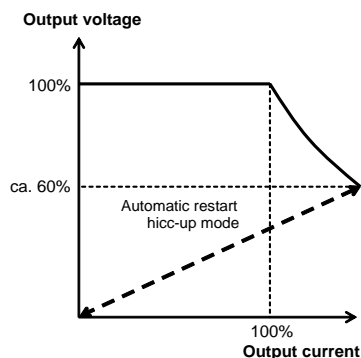
# AS-i Power Supply 1,8 A

<b>EMV CE-certified</b>	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)
<b>AS-i Certification</b>	
AS-i Certification	Pending
<b>Operational data</b>	
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
<b>Displays</b>	
LED green	The green LED indicates normal operation (0 A ... 1,8 A)
<b>Mounting</b>	
Mounting position	vertikal as shown in figure
Input terminals	upper side
Output terminals	lower side
<b>Assembly</b>	Plastic slider for fastening to mounting rails DIN EN 50 022-35
<b>Mechanics</b>	
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

**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.

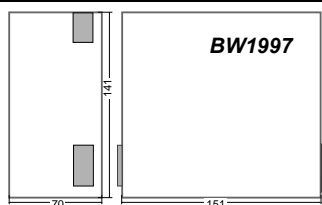
The AS-i Supply powers a fully loaded AS-i system with a maximum output current of 4.0 A or 8.0 A. The sinusoidal current consumption of the power supply prevents harmonic waves. The current is approximately in phase with the voltage by means of the passive power fac-

tor correction and leads to only a little reactive power. This guarantees a power factor  $\cos\phi \geq 0,6$ .

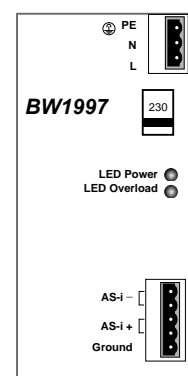
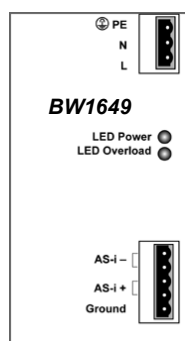
Besides the energy supply the power supply takes over also the function of data decoupling to the power source and the balancing of the two AS-i output lines in relation to the machine ground (shield).

Due to the accurate and transformic coupling the use of unscreened load lines is possible.

Article no.	BW1649	BW1997
<b>Input</b>		
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	
<b>Output</b>		
Output voltage	29,5 ... 31,6V DC	
Remaining ripple	according to AS-i Specification	
Output current	4A	8A
Current limitation	approx. 4,5A	approx. 8,5A
<b>Displays</b>		
LED green (PWR)	power on (at frontside)	
LED red (Overload)	overload error (at frontside)	
<b>Standard conformity</b>		
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 Master/Gateways/  
Links/Scanner  
  
AS-i Slaves  
  
AS-i Accessories/  
Diagnostics/Development  
  
Other Fieldbuses/  
Master Simulators  
  
AS-i Safety  
  
Price Lists

# 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.

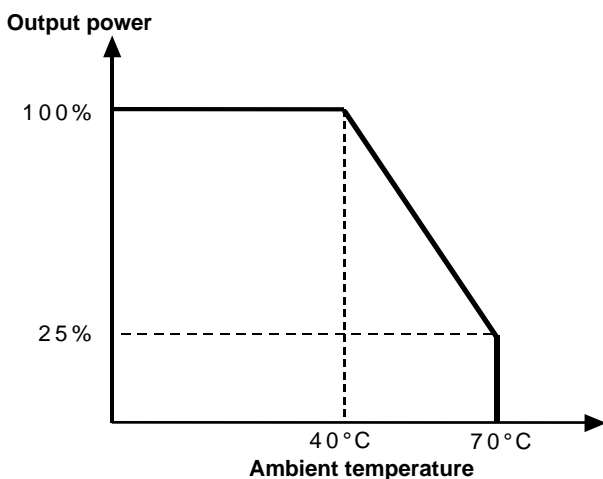
When temperature falls below 60°C, the power supply will again work in normal operation mode.

Article no.	BW2276
<b>Input</b>	
Nominal input voltage	230/400 V <sub>AC</sub> 47-63 Hz
Input voltage	195 - 500 V <sub>AC</sub>
Nominal input current	1 A bei 400 V <sub>AC</sub>
Peak inrush current	< 50 A
Power factor cos φ	0,7 capacitive at 400 V <sub>AC</sub>
PFC norm (harmonics)	EN 61 000-3-2 class A
<b>Output</b>	
Output voltage	31,2V ± 1%
DC output current	0 - 8 A
Ripple	< 60mV <sub>pp</sub> (10 ... 500 kHz)
Current limitation typical	8,5 A
Efficiency typical	88%
<b>Regulation</b>	
Line regulation	< 0,2% at U <sub>on</sub> = 400 V <sub>AC</sub> ± 15%
Load regulation	< 1% at 0 A → 8 A
Dynamics	< 2 ms at 10 ↔ 90% (I <sub>out max</sub> ), peaks < 2%
<b>Protection and monitoring</b>	
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 <sub>in</sub> = 230 V <sub>AC</sub>
<b>Safety</b>	
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)
<b>EMV CE-certified</b>	
Harmonics	EN 55011, EN 50082-1, EN 61000-6-1, EN 61000-6-2
RFI suppression	EN 55022, EN 55011 class B
Static discharge ref. IEC 61000-4-2	ESD 8kV contact discharge, 15kV free air discharge EN 61000-4-2
Electromagnetic fields ref. IEC 61000-4-3	10 V/m EN 61000-4-3
Burst ref. IEC 61000-4-4	4 kV input, 2kV output/capacitive coupling clamp EN 61000-4-4
Surge ref. IEC 61000-4-5	4 kV unsymmetrical, 4 kV symmetrical EN 61000-4-5
Conducted disturbances	10V, 150 kHz ... 80 MHz

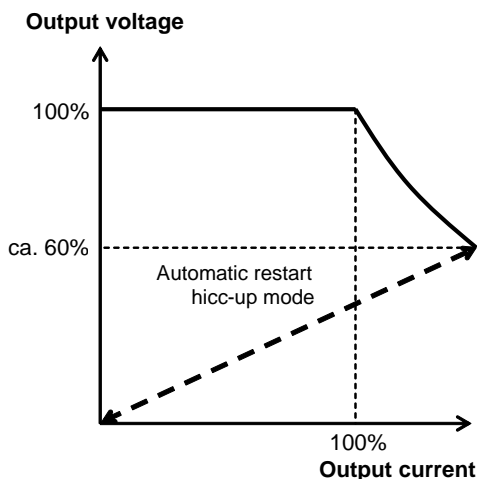
# AS-i Wide Range Power Supply 8 A

ref. IEC 61000-4-6	EN 61000-4-6
<b>Operational data</b>	
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
<b>Displays</b>	
LED green	LED on: normal operation (0 A ... 8 A)
LED red	LED on: overload LED flashing: hicc-up mode
<b>Mounting</b>	
Mounting position	vertical as shown in figure
Input terminals	upper side
Output terminals	lower side
<b>Assembly</b>	
plastic slider	
<b>Mechanics</b>	
Dimensions max. (L / W / H in mm)	70 / 141 / 151
Weight	approx. 1,2 kg

## Derating

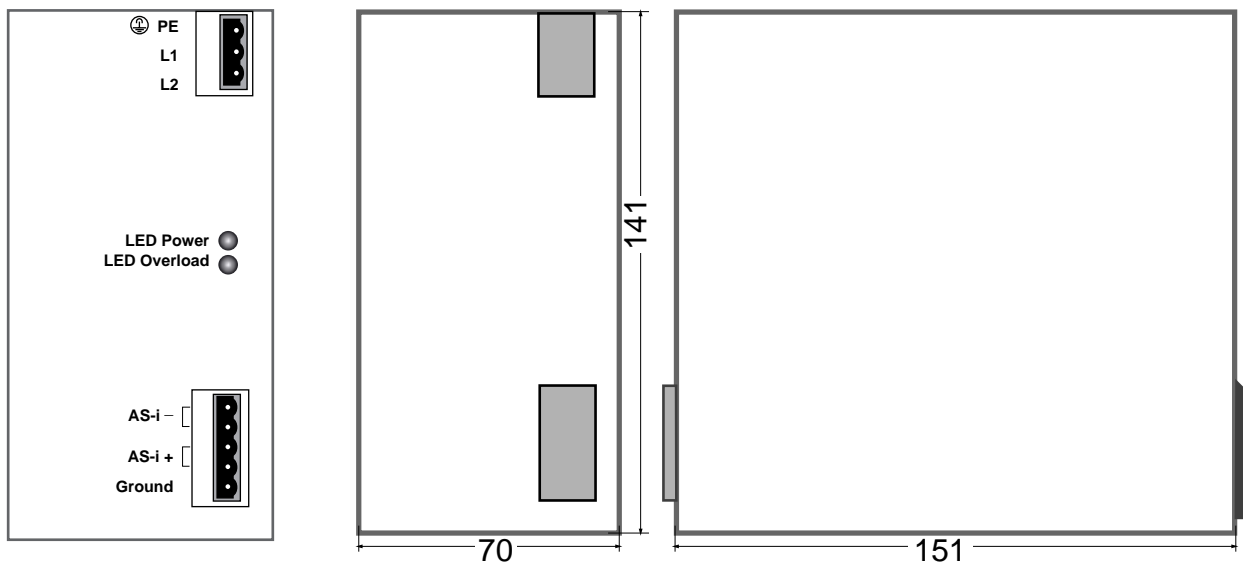


## Current limitation curve



## 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**



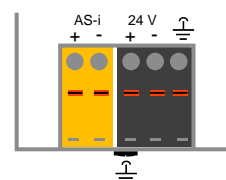
## Article No. BW1760

The AS-i Power Supply in Stainless Steel supplies the AS-i system voltage for the supply of masters, sensors, actuators and modules.

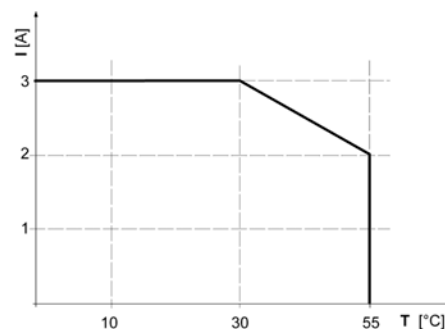
The power supply provides an output current of 2 A.

Article no.	BW1760
<b>Input</b>	
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
<b>Output</b>	
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
<b>Displays</b>	
LED green	power on (at frontside)
LED red	overload error
<b>Housing</b>	
Ambient operating temperature	0°C .. +55°C
Storage temperature	-25°C .. +85°C
Connection	insertable Combicon connectors up to 2,5 mm <sup>2</sup>
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

## 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)

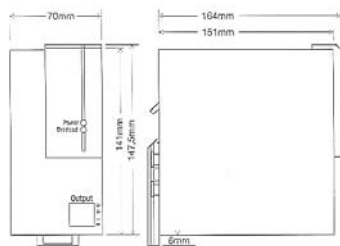
This supply for AS-i powers one respectively two fully loaded AS-i systems with a maximum output current of 4 A respectively 8 A.

These power supplies are qualified only for the gateways in stainless steel in the version "1 power supply for 2 AS-i circuits".

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.

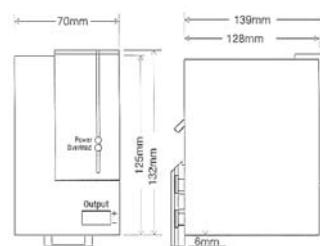
Article no.	BW1593	BW1598 Class1 Div2 (Group A, B, C & D, T-Code 4)	BW1597 Class1 Div2 (Group A, B, C & D, T-Code 4)
			
	30 V 8 A	30 V 8 A	30 V 4 A
<b>Input</b>			
Operating voltage	115/230 V AC, 47 - 63 Hz		
Voltage range	93 - 132 V AC/187 - 265 V AC, 47 - 63 Hz		
Input current	1,8 A at 230 V AC/4,2 A at 115 V AC		0,9 A at 230 V 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		
<b>Output</b>			
Output voltage	30 V <sub>DC</sub> ± 1%		
Output current	8 A		4 A
Ripple	< 50 mV <sub>pp</sub>		
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
<b>Displays</b>			
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		
<b>Electromagnetic compatibility</b>			
Signal error	radio-screened according EN 55022 class B		
Interference resistance	EN 50 082-1/EN 50 082-2, continuous short circuit and idle running protected		

# 4A/8A Power Supply for AS-i Master in Stainless Steel



**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

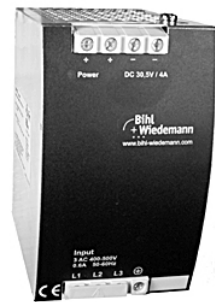
# 4 A Power Supply with 3 Phases for AS-i Master in Stainless Steel

## 4 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. BW1927

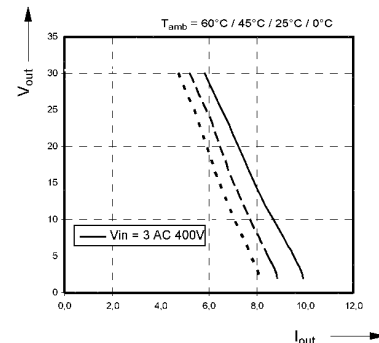
The power supply with 3 phases for AS-i powers one respectively two fully loaded AS-i systems with a maximum output current of 4 A. The power supply is continuous idle running protected and can deliver therefore a variable direct current of 0 - 4 A as output current.

These power supplies are qualified only for the gateways in stainless steel in the version "1" power supply for 2 AS-i circuits"

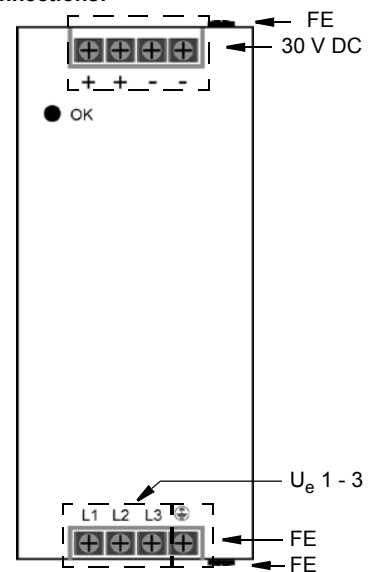
Article no.	BW1927
<b>Input</b>	
Operating voltage	3 x 400 - 500 V <sub>AC</sub> , 47 - 63 Hz
Voltage range	3 x 340 - 576 V <sub>AC</sub> , 47 - 63 Hz
Input current	3 x 0,5 A at 400 V <sub>AC</sub>
Turn on impulse	< 25 A (at cold start, 575 V <sub>AC</sub> )
Prescribed external fusing	circuit breaker with B-characteristic 3 x 10 A or slower action, or alternatively 3 x 10 A HBC fuse
Internal fusing	-
<b>Output</b>	
Output voltage	30,5 V <sub>DC</sub> ± 3%
Accuracy of regulation	2%
Output current	0 - 4 A
Ripple	< 25 mV <sub>pp</sub>
Current limitation at 60°C	typ. 4.2 - 7,4 A
Derating (T <sub>J</sub> = 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%
<b>Display</b>	
LED	power on (at frontside)
<b>Housing</b>	
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
<b>Standards</b>	
<b>EMC:</b> EN 61000-6-3, EN 61000-6-4, EN 61000-6-2, EN 61000-6-1, VDE 0160/W2	
<b>Safety:</b> 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)	
<b>Power factor (PFC):</b> EN 61000-3-2	

### Temperatur performance:

Fig. 1: V<sub>out</sub> vs. I<sub>out</sub> (typ., V<sub>in</sub>=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 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**

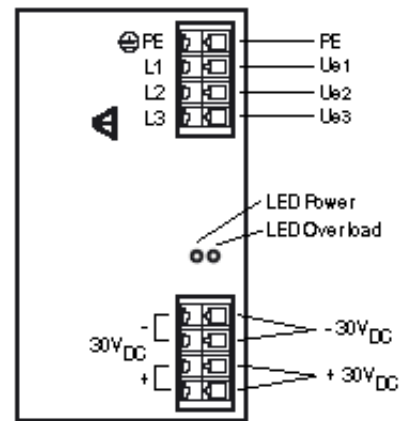


## Article no. BW1676

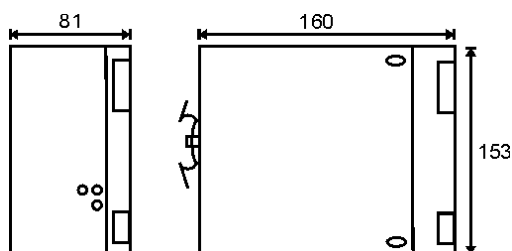
The Power Supply with 3 phases for AS-i powers one respectively two fully loaded AS-i systems with a maximum output current of 8 A. The Power Supply is continuous idle running protected and can deliver therefore a variable direct current of 0 - 8 A as output current.

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
<b>Input</b>	
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
<b>Output</b>	
Output voltage	30 V <sub>DC</sub> ± 1%
Output current	0 - 8 A
Ripple	< 50 mV <sub>pp</sub>
Current limitation (typ.)	12,5 A
Parallel use	yes
Efficiency (typ.)	90%
Hold-up-time	> 5 ms/400 V AC
<b>Displays</b>	
LED green	power on (at frontside)
LED red	overload error (at frontside)
<b>Housing</b>	
Ambient operating temperature	-10° C ...+70° C, by free convection
Storage temperature	-25° C...+85° C
<b>Elektromagnetic Compatibility</b>	
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.

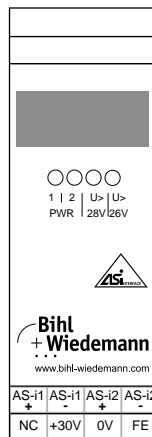
AS-i Power Supply Decoupling Unit is short circuit protected (self-recovering fuse, 6 A).

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 174)
- 8 A Power Supply for AS-i Master in Stainless Steel for 2 AS-i circuits (article no. BW1593, see also page 178)
- 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 181)
- AS-i Advanced Repeater (article no. BW1855, see also page 165)
- 24 V to 30 V AS-i Power Supply in Stainless Steel 2 A (article no. BW1760, see also page 177)

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

**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 mm<sup>2</sup>, 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 191).

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 191)

## 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.

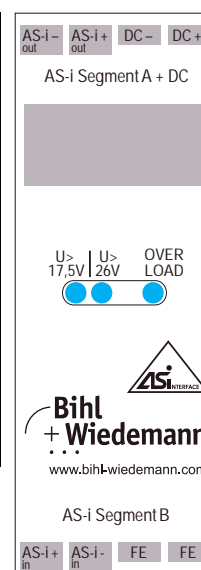
The impedance load of the module corresponds with that of 5 AS-i slaves. This reduces the maximum possible number of slaves for AS-i Segment B to 26 (Single) or 52 (AB).

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 <sub>out</sub>
2	AS-i A <sub>out</sub>
3	DC-
4	DC+
5	n.c.
...	...
12	n.c.
13	AS-i B <sub>in</sub>
14	AS-i B <sub>in</sub>
15	FE
16	FE

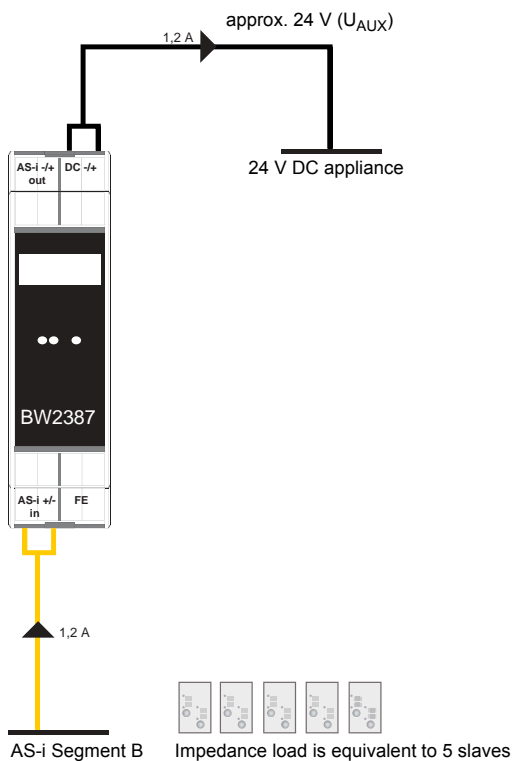


Terminals	Description
AS-i+, AS-i-	Connection to the AS-i bus
DC+, DC-	Voltage input, Voltage output
FE	Function earth

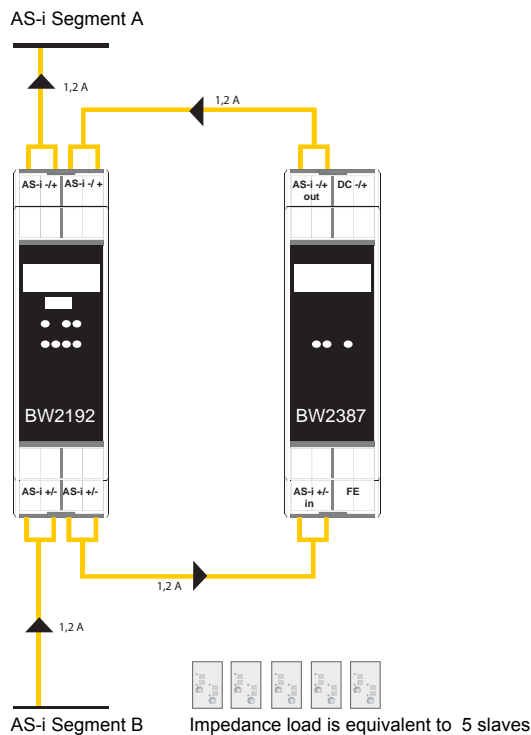


## Connection examples:

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-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



THE AS-INTERFACE MASTERS

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

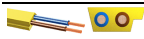














Other Fieldbuses/  
Master Simulators

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	189
		BW1980	with a black jacket for additional auxiliary energy	
    	AS-i Passive Distributors	BW1239	passive distributor AS-i on M12	190
		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	191
		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-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




AS-i Master/Gateways/  
Links/Scanner

Housing	Component	Art. No.	Characteristics	P.
	<b>AS-i Cable-Stripper</b>	BW1920	for AS-i cable with rubberized insulation	192
	<b>AS-i Micro-Wire-Stripper</b>	BW1921	for AS-i cable with an external insulation made of TPE or PUR	


AS-i Slaves

	<b>D-sub-data transmission cord for AS-i Master in IP65</b>	BW1097		193
	<b>D-sub-data transmission cord 9-pin</b>	BW1058		
	<b>D-sub-data transmission cord for AS-i Gateways with CAN interface</b>	BW1226		



AS-i Accessories/  
Diagnostics/Development

	<b>AS-i addressing cable</b>	BW2324	with COMBICON connector	
	<b>Connecting cable</b>	BW1935	with infrared addressing adapter	
	<b>Connecting cable</b>	BW1802	Module/programming device	

Other Fieldbuses/  
Master Simulators

	<b>Protection cap</b>	BW2368	for not used M12 sockets	
	<b>Reduction sleeve</b>	BW1241	PG16/M18x1	
		BW1282	M25/M18x1	
	<b>Cross-Link-cable for AS-i/Ethernet Gateway</b>	BW1304		

AS-i Safety

	<b>AS-i probe</b>	BW1745	AS-i probe	
	<b>Chip card</b>	BW2079	memory capacity 32 kByte	
		BW2222	memory capacity 128 kByte	

Price Lists

## AS-i Profile Cable

### Versions:

- with a yellow jacket for data and power transmission (BW1979)
- with a black jacket for additional auxiliary energy (BW1980)



BW1979



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.

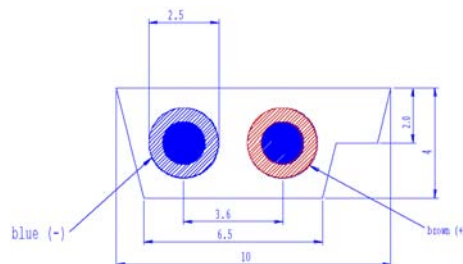
The cable is available in two versions: with a yellow jacket (BW1979) for data and power transfer, and a black jacket (BW1980) variant for additional auxiliary energy.

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 <sub>AUX</sub>
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

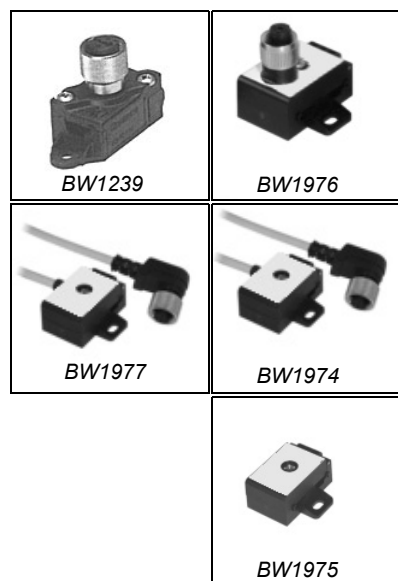
## AS-i Passive Distributor

- 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 possibility 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 <sub>AUX</sub>	1 AS-i	1 x AS-i/1 x U <sub>AUX</sub>	2 x AS-i
	insulation penetration technology				
Rated operational voltage	≤ 35 V PELV ( AS-i, U <sub>AUX</sub> )				
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	–		∅ 4,8 mm		–
Colour	–		grey		–
Cores	–		2 x 0,34 mm <sup>2</sup>	4 x 0,34 mm <sup>2</sup>	–
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:

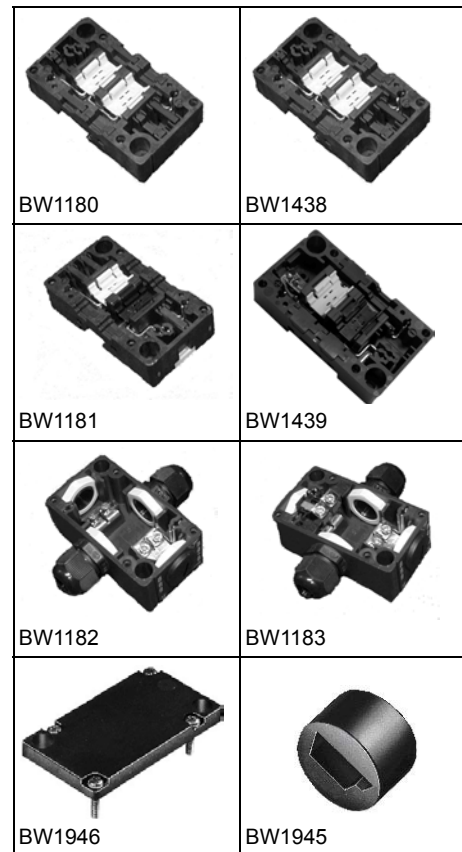
- quick mounting technology for AS-i flat cable
- 2 AS-i flat cables (BW1180)
- 2 AS-i flat cables with addressing jack (BW1438)
- 1 AS-i flat cable,  
1 flat cable for external power supply (BW1181)
- 1 AS-i flat cable,  
1 flat cable for external power supply with addressing jack (BW1439)

#### 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 <sup>2</sup>		-	
Connection	contact pins in the unit				terminals up to 2,5 mm <sup>2</sup>		-	
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	-
Packaging unit	1 piece							50 pieces

## 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

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists



## 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

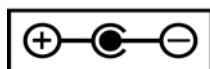


### AS-i/CAN Gateway

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 Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

## 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	
--------------------	--

## 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: <b>BW2079</b> for all Standard and all Safety products with chip card by Bihl + Wiedemann. <b>BW2222</b> 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.
	<b>AS-i 3.0 Function and EMC-Test Master</b>	BW1728	with master RS 232 suitable for SAP4, SAP5, A2SI and ASI4U	196
	<b>AS-i 3.0 SAP4, SAP5, A²SI and ASI4U Programming and Test Tool</b>	BW1783	Compact PCI Board	197
		BW2061	PCI Board with RS 232	
	<b>AS-i Slave Evaluation Board</b>	BW1423	on basis ASI-SW+	198
		BW1190	on basis A²SI	199

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, A<sup>2</sup>SI 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, A<sup>2</sup>SI 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.

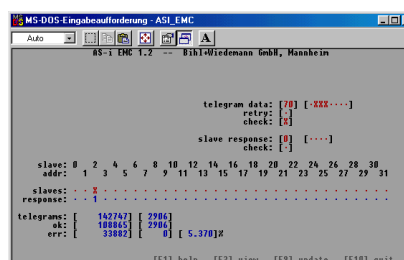
Graphical display	Art. no. BWU1728
Operating current	Master power supply approx. 200 mA out of AS-i circuit
Operating voltage	AS-i voltage 30 V DC
Baud rates	19200 Baud
Serial interface	RS 232
AS-i cycle time	150 µs*(number of slaves + 2)
Displays	
LCD	displaying slave addresses, error messages
LED green (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, A<sup>2</sup>SI and ASI4U
- Software AS-i Control Tools with serial cable for AS-i master in stainless steel (art. no. BW1602, s. page 54)

A DLL-driver for the programming of the A<sup>2</sup>SI- and SAP4-ASIC can be ordered separately on request (art. no. BW1356)

# AS-i 3.0 SAP4/5, A<sup>2</sup>SI, ASI4U Programming and Test Tool

## AS-i 3.0 SAP4, SAP5, A<sup>2</sup>SI 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, A<sup>2</sup>SI 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

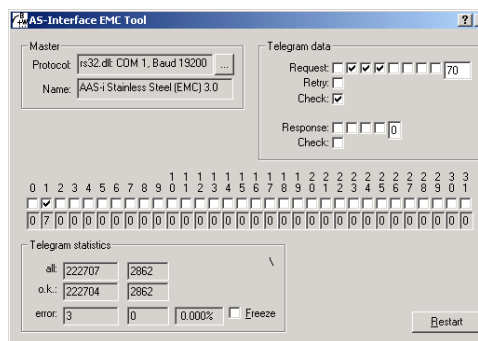
It is possible to put the Master into a state that is not AS-i compliant. This option can be useful for specific tests on AS-i under laboratory conditions (e. g. tests with bursts on the lines or tests with very long wires).

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

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

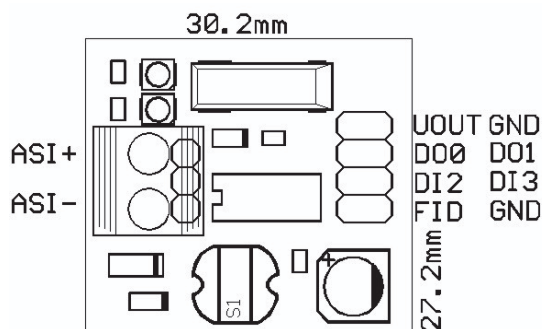
The AS-i Slave Evaluation Board on basis of the ASI-SW+ chip by ZMD can be connected to the AS-i circuit directly and without any additional hardware. It is a complete AS-i slave. Voltage supply is provided by the AS-i line.

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.

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 A<sup>2</sup>SI/SAP4 Programming and Test Tool (Article-no. BW1355) and the AS-i 2.1 Function and EMC-Test Masters (Article no. BW1259, BW1260)

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



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 A<sup>2</sup>SI/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](http://www.zmd.de/as_interface.html)

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

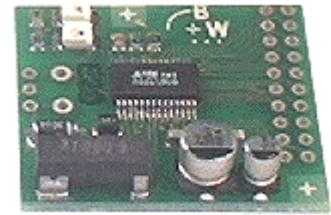
Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

## AS-i Slave Evaluation Board

Article no. BW1190  
on basis A<sup>2</sup>SI



### Article no. BW1190

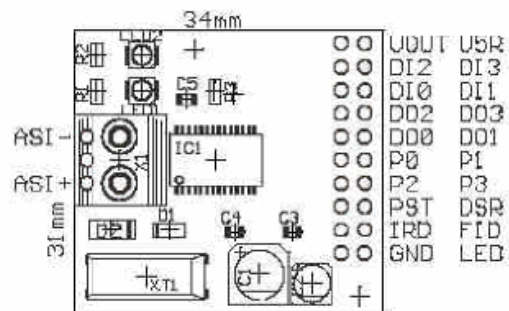
The AS-i Slave Evaluation Board on basis of the A<sup>2</sup>SI chip by ZMD can be connected to the AS-i circuit directly and without any additional hardware. It is a complete AS-i slave. Voltage supply is provided by the AS-i line.

The AS-i Slave Board is suitable for **experiments** and **test 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 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 A<sup>2</sup>SI/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 A<sup>2</sup>SI/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 A<sup>2</sup>SI 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



## Overview Master Simulators

Housing	Master Simulator	Art. No.	Characteristics	P.
	<b>PROFIBUS Master Simulator</b>	BW1131	monitoring software for PROFIBUS DP slaves, PROFIBUS-UART, DP V0	202
		BW1257	monitoring software for PROFIBUS DP slaves, PROFIBUS-UART, DP V0 and DP V1	
	<b>Serial PROFIBUS DP Master</b>	BW1258	PROFIBUS Master with RS 232 interface	203
	<b>DeviceNet Master Simulator</b>	BW1420	with USB interface	204
		BW1625	as PCI board	
	<b>CANopen Master Simulator</b>	BW1453	with USB interface	205
	<b>Interface Converter</b>	BW1094	interface converter RS 232C/RS 485 for Bihl+Wiedemann's AS-i master	206
	<b>Interface Converter</b>	BW2274	USB - RS 232 interface converter	207

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

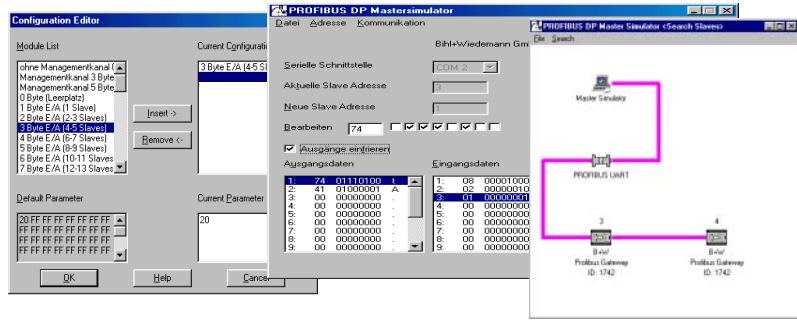
Other Fieldbuses/  
Master Simulators

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 PROFI-safe

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

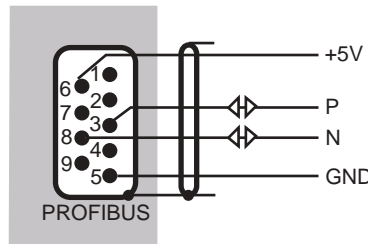
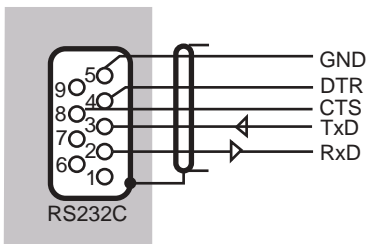
**Requirements:**  
IBM compatible PC  
80386 or higher

**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.



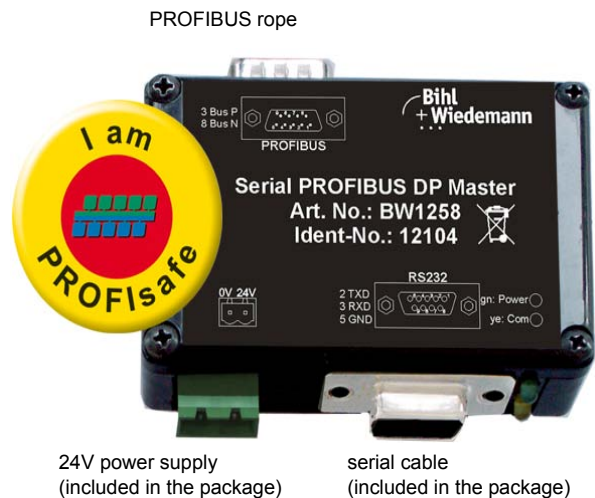
**PROFIBUS Master with RS 232 Interface**

**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

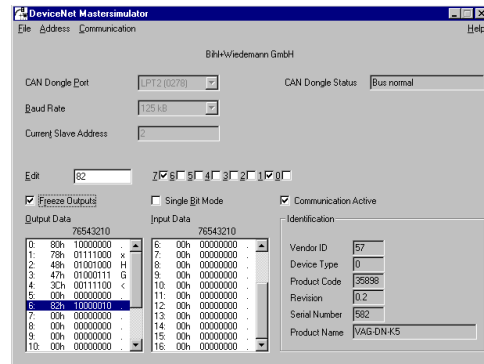
32 Bit DLL an examples (in C as sourcecode) are available for download on the homepage and are not delivered with. CommDTM on request:

## 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.

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

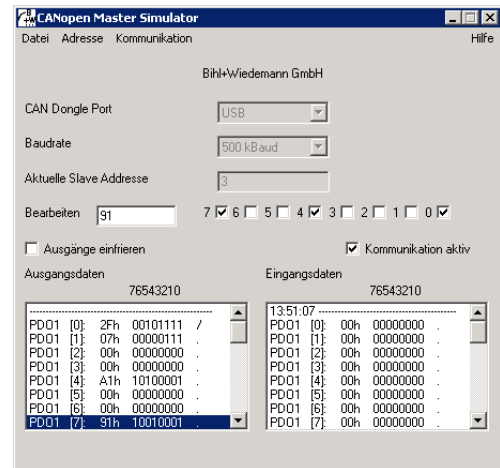
Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

## Monitoring Software for 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:

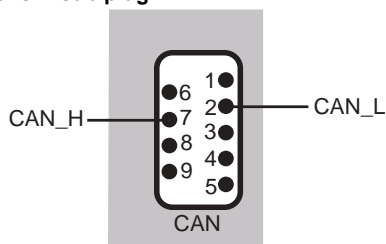
Windows 98, Windows NT,  
Windows 2000, Windows Me,  
Windows XP

#### Specification:

Software:

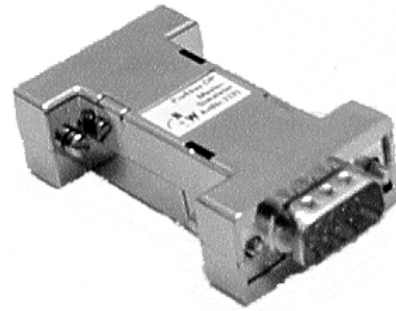
- CANopen Master Simulator
- CANopen dongle

#### Connections D-sub plug:



**Accessories:** D-Sub-data transmission cord for AS-i Gateways with CAN interface (art. no. BW1226, see page 193)

## 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

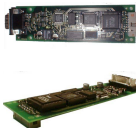


provided 0,80 m USB extension cord to a free USB port of the computer. The connection to the particular device takes place via the 9-pin Sub-D connector at the RS 232 interface

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



## Overview other Fieldbuses/Couplers

Housing	Coupler	Art. No.	Characteristic	P.
	<b>PROFIBUS Option Board</b>	BW1261	straight	210
		BW1271	crooked	
	<b>CAN/PROFIBUS Coupler</b>	BW1184		211
	<b>CANrho/PROFIBUS Coupler</b>	BWU1246		
	<b>CAN/InterBus Coupler</b>	BW1323	InterBus baud rate 500 Kbaud / 2 Mbaud, 10 words	212
		BW2504	InterBus baud rate 500 Kbaud / 2 Mbaud, 1-12 words	

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AS-i Safety

Price Lists

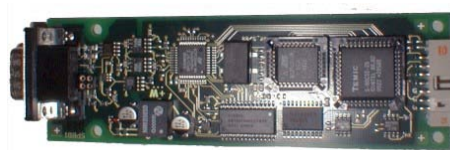
# PROFIBUS Option Board

## How to interface your device to a PROFIBUS network?

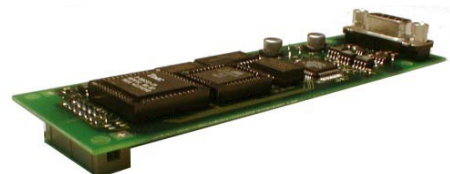
The simplest way:  
PROFIBUS Option Board

Rugged and quick mounting

Coupling via serial interface (TTL-level)



straight



crooked

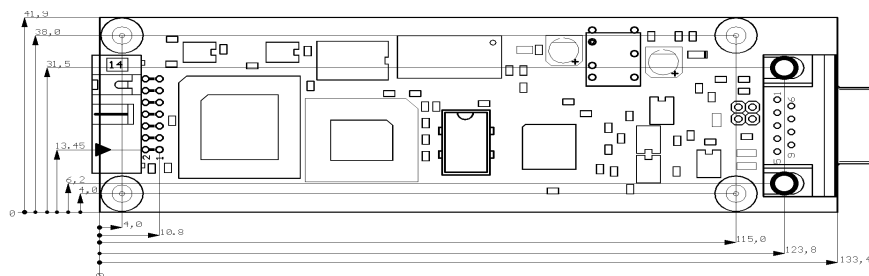


### Article no. BW1261: PROFIBUS Option Board (straight)

### 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 funksions	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	

AS-i Master/Gateways/  
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AS-i Slaves

AS-i Accessories/  
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## 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.).

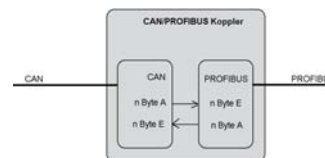
There is a galvanic isolation between CAN and PROFIBUS.

A seven digit display can be used for commissioning and diagnosis.

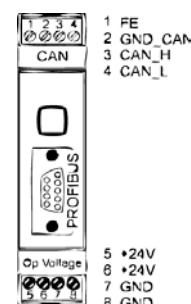
As long as one of both slaves does not exchange data the other slave reads on each input a 0 as default.

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

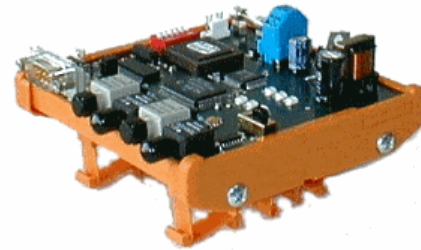


#### Terminal assignment:



## 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	

AS-i Master/Gateways/  
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## Overview AS-i Safety

Housing	Module	Art. No.	Characteristics	P.
	<b>AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing</b>	BWU2001	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	223
		BWU2002	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
	<b>AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing</b>	BWU2202	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface	223
		BWU2602	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface, safe cross communication	
	<b>AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing</b>	BWU2003	1 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	223
		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	
	<b>AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing</b>	BWU2188	1 AS-i Master, 16 release circuits, power supply decoupling unit, 2 independent output switching elements, RS 232 diagnostics interface	
		BWU2206	1 AS-i Master, 16 release circuits, power supply decoupling unit, 2 independent output switching elements, Ethernet diagnostics interface	223
	<b>AS-i 3.0 PROFINET Gateway with integrated Safety Monitor in one housing</b>	BWU2330	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	229
		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 Master/Gateways/ Links/Scanner		<b>AS-i 3.0 EtherNet/IP+Modbus TCP Gateway with integrated Safety Monitor in one housing</b>	BWU2317	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	233
			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 Slaves		<b>AS-i 3.0 EtherCAT Gateway with integrated Safety Monitor in one housing</b>	BWU2281	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	237
			BWU2338	1 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
AS-i Accessories/ Diagnostics/Development		<b>AS-i 3.0 sercos Gateway with integrated Safety Monitor</b>	BWU2588	1 AS-i 3.0 Master, 1 AS-i Safety Monitor in Stainless Steel for 2 AS-i networks, 32 release circuits, 2 x RJ-45: 100MBaud, sercos III Ethernet interface, Ethernet diagnosis interface	240
Other Fieldbuses/ Master Simulators		<b>AS-i 3.0 Gateway PROFIsafe via PROFIBUS</b>	BWU2479	1 AS-i Master, PROFIsafe for 1 AS-i network, RS 232 diagnostics interface	242
			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 Safety		<b>AS-i 3.0 Gateway PROFIsafe via PROFINET</b>	BWU2421	2 AS-i Master, PROFIsafe for 2 AS-i networks, 4 independent output switching elements, RS 232 diagnostics interface	242
			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	

Price Lists

Housing	Module	Art. No.	Characteristics	P.
	<b>AS-i Safety Monitor in stainless steel, generation II</b>	BWU2205	AS-i Safety Monitor in Stainless Steel, Generation II, 16 release circuits, 2 independent output switching elements, Ethernet diagnostics interface	249
	<b>AS-i Safety Monitor in stainless steel, generation II</b>	BWU2000	16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	249
		BWU2186	16 release circuits, 2 independent output switching elements, RS 232 diagnostics interface	
	<b>Safety Basic Monitor</b>	BWU2441	AS-i Master disengageable, 8 release circuits, 8 / 4 safe inputs and 2 (4) electronical safe outputs, USB interface	252
		BWU2567	successor for AS-i consortial Safety Monitor, compatible replacement	
		BWU2569	enhanced	
	<b>Safety Basis Monitor Starter Kit</b>	BWU2512		254
	<b>Safe contact expander</b>	BWU2539	2 independent channels	255
		BWU2548	1 independent channel	
	<b>AS-i Safety Monitor</b>	BW1764	advanced monitor, 1 release circuit, 40 ms	258
		BW1765	advanced monitor, 2 release circuits, 40 ms	
	<b>AS-i Speed Monitor</b> 2 independent axis, chip card	BWU2427	for sinus/cosine Rotary Encoder	263
		BWU2595	for HTL-Rotary Encoder or sensors	
	<b>Speed Monitor head unit and Speed Monitor sinus/cosine for 2 axis</b>	BW2538	prewired complet set, parameterization of the speed via USB, monitoring up to 40 axis with expansion modules possible	265

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Diagnostics/Development

Other Fieldbuses/  
Master Simulators

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AS-i Master/Gateways/  
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AS-i Slaves

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AS-i Safety

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Housing	Module	Art. No.	Characteristics	P.
	Connecting cable for Speed Monitor	BW2476	connector-ferrule	266
		BW2477	connector-ferrule	
		BW2494	plug-plug	
	Adapter for Speed Monitor	BW2497	AMP Mini-I/O connector for e.g. Elau MC-4	267
		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) electrical safety outputs	268
		BWU2236	AS-i Safety Relay In-/Output Modul, with diagnostic slave, 1 EDM- and 2 / 1 safety inputs	270
	AS-i Safety Output Module	BWU2045	relay output module with diagnostic slave and 1 EDM input	274
		BWU2173	output module with diagnostic slave, 1 EDM input, 3I and 2O	278
	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	282
		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	BWU2631	4 / 2 safety inputs für for floating contacts for for optoelectronic protective devices, protection category IP67, AS-i connection via M12	
		BWU1939	2 / 1 safety inputs (2 channels) for floating contacts, protection category IP20	285
		BWU2577	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP20	
		BWU2661	Safety mat with 1,2k or 8,2k monitoring resistor, IP20	



Housing	Module	Art. No.	Characteristics	P.
	<b>Emergency stop- and push button modules</b>	BW2529	AS-i Safety stop button module, lighted (red/green), 288 IP54, M12	
		BW2585	AS-i Safety stop button module, unlighted, IP54, M12	
		BW2527	Emergency stop button with plug-in-shoe connection	
		BW2528	AS-i light button module, 2 buttons each 2-colored lighted (red/green), IP54, M12	
	<b>AS-i Safety OEM Slave</b>	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	
	<b>AS-i OEM Slave</b>	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	
	<b>AS-i Substructure Module in IP67</b>	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	
	<b>Safety software for configuration, diagnosis and programming</b>	BW2071	with serial cable for AS-i Master/Monitor in stainless steel	297
		BW2501	for Safety Monitors and AS-i Masters	
	<b>Programming software ASIMON</b>	BW2145	with serial cable for AS-i Master/Monitor in stainless steel	299
		BW1770	with cable BW1771 and BW1772 only for use with the Safety Monitors BW1764 and BW1765	

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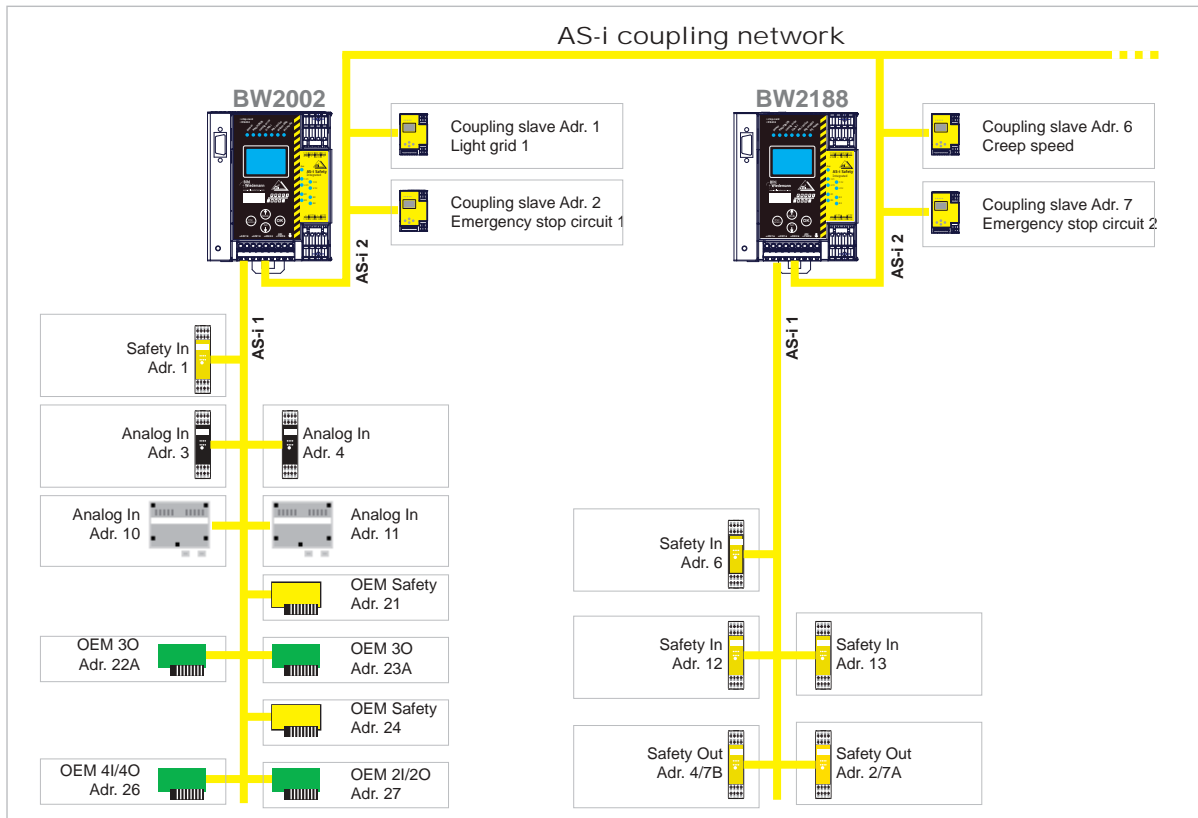
AS-i Safety

Price Lists

Housing	Module	Art. No.	Characteristics	P.
	AS-i Chipcard	BW2222	memory capacity 128 kbyte	300
		BW2079	memory capacity 32 kbyte	
	Serial cable	BW1575	for AS-i Masters and AS-i Monitors in stainless steel	299
	USB connector cable	BW2530	for Safety Basic Monitor	299
	Interface cable	BW1771	for connection of the Safety Monitor to a PC	299
	Interface cable	BW1772	for connection of 2 Safety Monitors	299

**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 program for 2 Safety at Work networks
- Up to 31 Safety at Work networks can be easily linked together
- 16 release circuits enable fast, reliable and highly simplified and differentiated system response
- Expanded programming allows up to 256 functions without increasing the response time
- Linked networks can be started together
- Safe Safety at Work outputs allow switching – even at great distances from the Monitor – without additional wiring
- The use of memory cards greatly simplifies both program changing when units are replaced and programming of the Monitor using ASIMON software
- 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

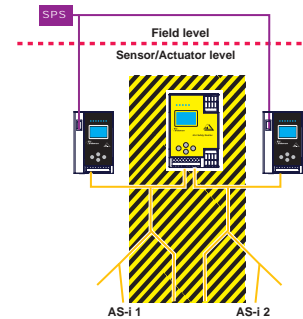
## Configuration example: Safe networking of up to 21 Safety at Work networks

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

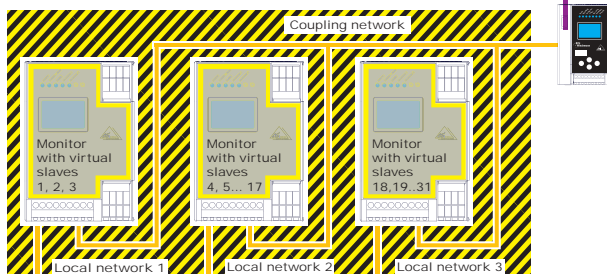
Two equal-priority Safety at Work networks are monitored by just one Multimonitor:

- 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

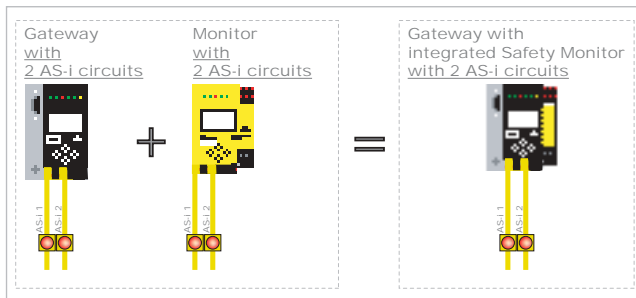
Multiple local Safety at Work networks are each monitored by 1 Multimonitor which is at the same time a node in a higher-level coupling network. There it is on one hand a Monitor, while on the other hand it internally emulates virtual slaves, through which it exchanges its own release circuits with those 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.



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 with integrated Safety Monitor

Housing	Module	Art. No.	Characteristics	P.
	<b>AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing</b>	BWU2001	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	223
		BWU2002	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	
	<b>AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing</b>	BWU2202	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface	223
		BWU2602	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, Ethernet diagnostics interface, safe cross communication	
	<b>AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing</b>	BWU2003	1 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	223
		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	
	<b>AS-i 3.0 PROFIBUS Gateway with integrated Safety Monitor in one housing</b>	BWU2188	1 AS-i Master, 16 release circuits, power supply decoupling unit, 2 independent output switching elements, RS 232 diagnostics interface	
		BWU2206	1 AS-i Master, 16 release circuits, power supply decoupling unit, 2 independent output switching elements, Ethernet diagnostics interface	223
	<b>AS-i 3.0 PROFINET Gateway with integrated Safety Monitor in one housing</b>	BWU2330	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	229
		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

# AS-i Safety with integrated Safety Monitor




THE AS-INTERFACE MASTERS


AS-i Master/Gateways/  
Links/Scanner

Housing	Module	Art. No.	Characteristics	P.
	<b>AS-i 3.0 EtherNet/IP+Modbus TCP Gateway with integrated Safety Monitor in one housing</b>	BWU2317	2 AS-i Master, 16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	233
		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 Slaves

	<b>AS-i 3.0 EtherCAT Gateway with integrated Safety Monitor in one housing</b>	BWU2281	2 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	237
		BWU2338	1 AS-i Master, 16 release circuits, power supply decoupling unit, 4 independent output switching elements, RS 232 diagnostics interface	


AS-i Accessories/  
Diagnostics/Development

	<b>AS-i 3.0 sercos Gateway with integrated Safety Monitor</b>	BWU2588	1 AS-i 3.0 Master, 1 AS-i Safety Monitor in Stainless Steel for 2 AS-i networks, 32 release circuits, 2 x RJ-45: 100MBaud, sercos III Ethernet interface, Ethernet diagnosis interface	240
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Other Fieldbuses/  
Master Simulators

	<b>AS-i 3.0 Gateway PROFIsafe via PROFIBUS</b>	BWU2479	1 AS-i Master, PROFIsafe for 1 AS-i network, RS 232 diagnostics interface	242
		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 Safety

	<b>AS-i 3.0 Gateway PROFIsafe via PROFINET</b>	BWU2421	2 AS-i Master, PROFIsafe for 2 AS-i networks, 4 independent output switching elements, RS 232 diagnostics interface	242
		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	

Price Lists

# 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



<b>Article no.</b>	<b>BWU2001 / BWU2002 / BWU2003 / BWU2004 / BWU2187 / BWU2188 / BWU2202 / BWU2204 / BWU2206 / BWU2602</b>
<b>Interface</b>	
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
<b>AS-i</b>	
AS-i cycle time	150 µs · (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
<b>Safety monitor</b>	
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
<b>Display</b>	
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

<b>Article no.</b>	<b>BWU2001 / BWU2002 / BWU2003 / BWU2004 / BWU2187 / BWU2188 / BWU2202 / BWU2204 / BWU2206 / BWU2602</b>
<b>UL-specifications (UL508)</b>	
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 <sub>us</sub>	the devices <ul style="list-style-type: none"> <li>• BWU2001</li> <li>• BWU2002</li> <li>• BWU2003</li> <li>• BWU2004</li> <li>• BWU2187</li> <li>• BWU2188</li> <li>• BWU2202</li> <li>• BWU2204</li> <li>• BWU2206</li> <li>• BWU2602</li> </ul> <p>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.</p>
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
<b>Environment</b>	
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

<b>Article No.</b>	<b>BWU2001 / BWU2002 / BWU2003 / BWU2004 / BWU2202 / BWU2204 / BWU2602</b>	<b>BWU2187 / BWU2188 / BWU2206</b>
<b>Safety monitor</b>		
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	relay outputs (output circuits 1 and 2), each 2 current paths 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	
<b>Display</b>		
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

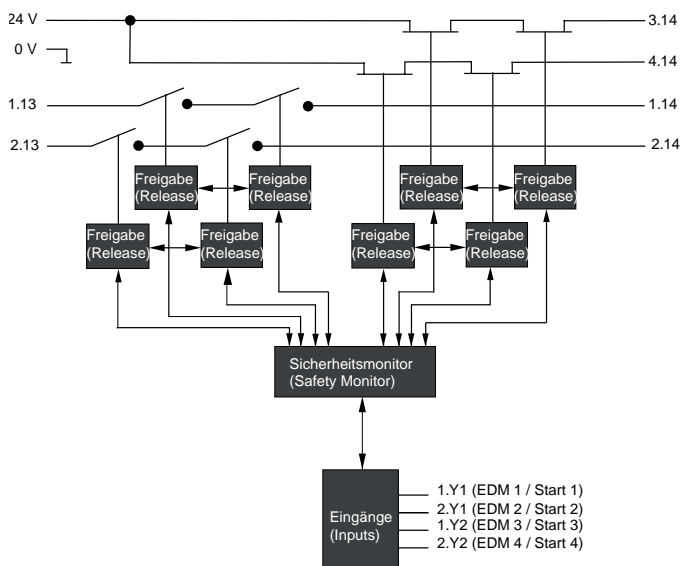
Article No.	Diagnostics interface	AS-i Safety outputs are supported	Number of AS-i circuits Safety Monitor	Max. number of release circuits	Number of release circuits in device	Configuration blocks	Number of AS-i masters
BWU2001	serial	yes	2	16	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 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	-	-	•

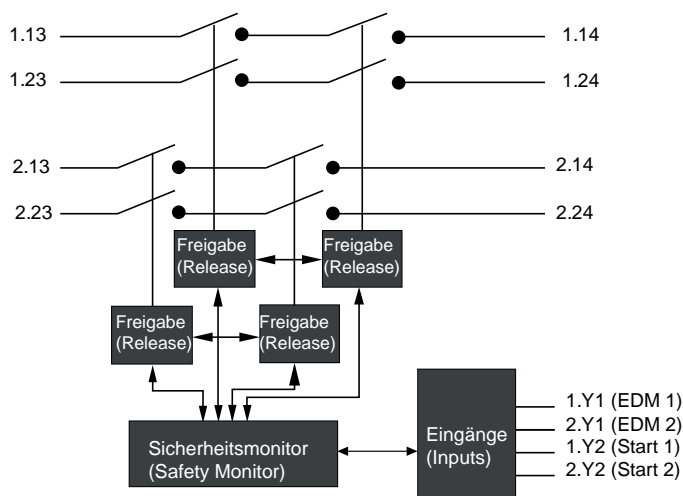
# AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

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



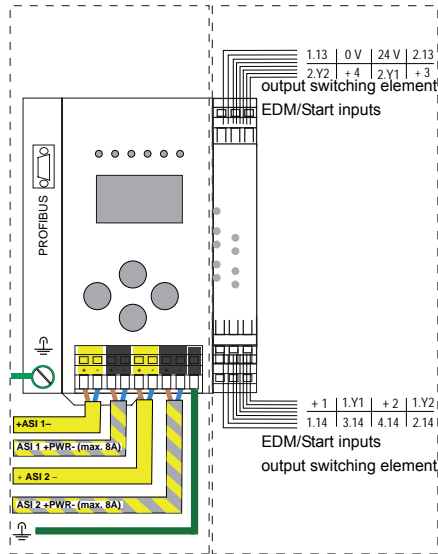
Safety Monitor block diagram BWU2187, BWU2188, BWU2206



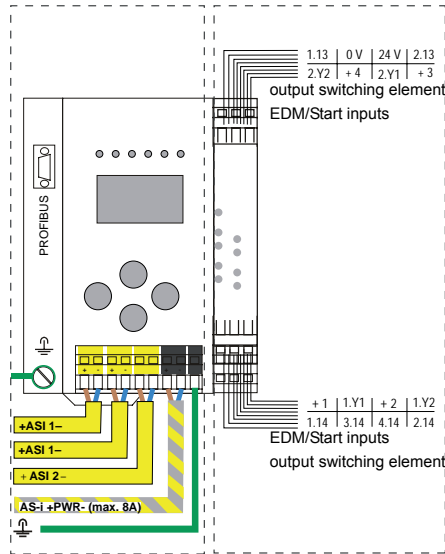
# AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

## Connections: Gateway + Safety Monitor

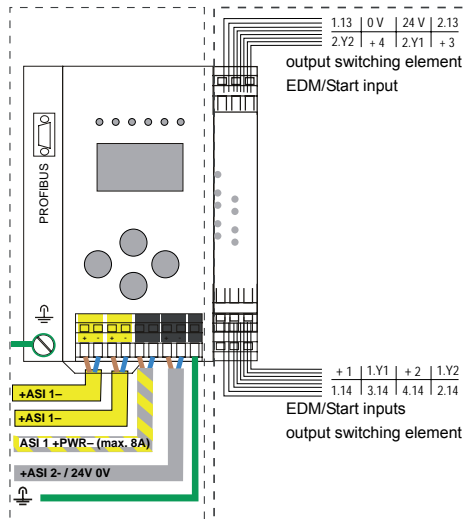
**BWU2001**



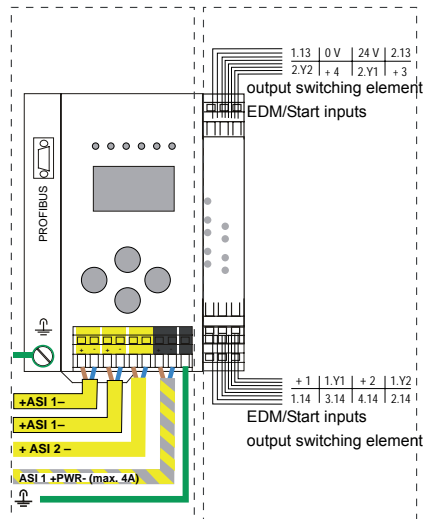
**BWU2002, BWU2202, BWU2602**



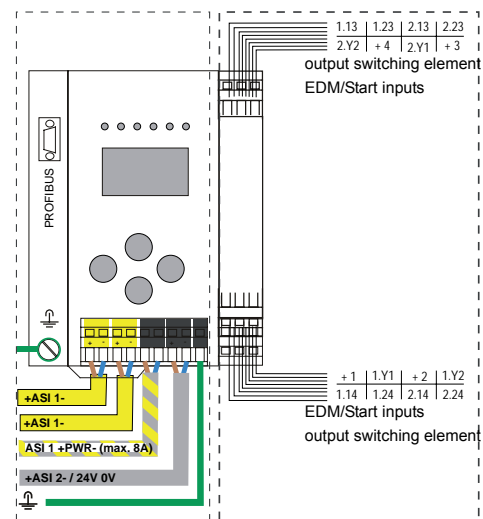
**BWU2003**



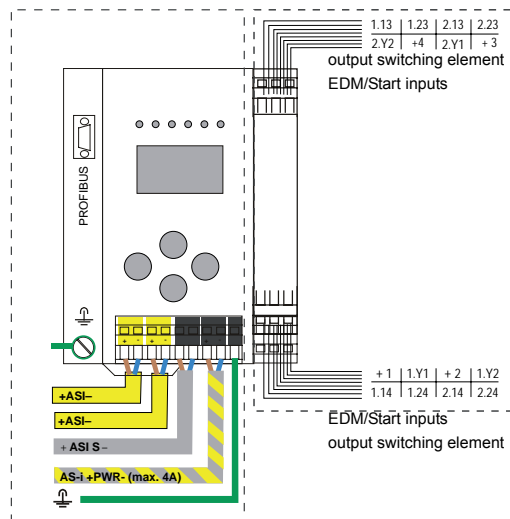
**BWU2004, BWU2204**



**BWU2187**



**BWU2188, BWU2206**



AS-i-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 PROFIBUS Gateways with integrated Safety Monitor

## Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 255)
- 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 202)
- AS-i Power Supply 4A (art. nr. BW1649) / AS-i Power Supply 8A (art. nr. BW1997), see page 174

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 / BWU2642
<b>Interfaces</b>	
PROFINET interface	RJ-45
Conformance Class	B
Baud rates	10/100 MBaud
<b>AS-i</b>	
AS-i cycle time	150 µs * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
<b>Safety Monitor</b>	
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
<b>Display</b>	
LCD	indication of slave addresses and error messages in plaintext
LED power	power on
LED PROFINET	PROFINET master recognized
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

# AS-i 3.0 PROFINET 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

<b>Article Nr.</b>	<b>BWU2237 / BWU2307 / BWU2330 / BWU2642</b>
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
<b>UL-specifications (UL508)</b>	
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 • BWU2642  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
<b>Ambiente</b>	
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	$\geq 500V$
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
<b>BWU2237</b>	RS 232 + 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 Masters with integrated power supply decoupling
<b>BWU2307</b>	RS 232 + 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
<b>BWU2330</b>	RS 232 + 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 Masters
<b>BWU2642</b>	RS 232 + Ethernet*	yes	2	32	4 release circuits SIL 3, cat. 4 in device; 2 x relays, 2 x fast electronic safe outputs	256 devices + safe cross communication via PROFINET	2 AS-i Masters with integrated power supply decoupling

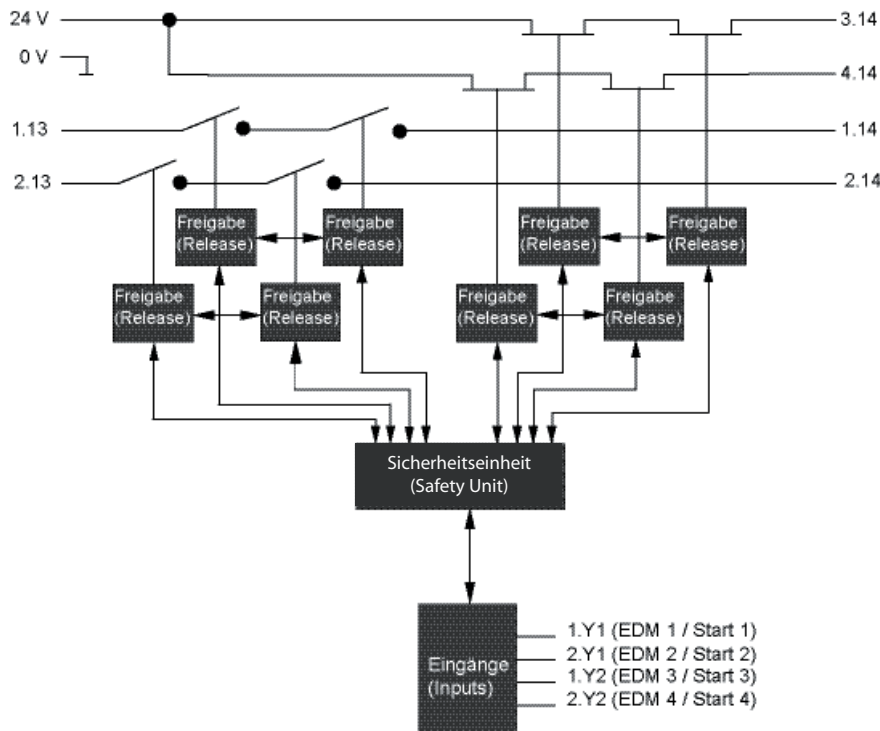
\* ASIMON, AS-i Control Tools via RS-232 and Ethernet (RJ-45 PROFINET-interface)

# AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

Operating current			
Article No.	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. 250mA (PELV Spannung)	master power supply, approx 300mA out of AS-i network
BWU2237	-	•	-
BWU2307	-	-	•
BWU2330	•	-	-
BWU2642	-	•	-

Full functional range of PROFINET gateways			
Article No.	BWU1912	BWU2238	BWU2239
BWU2237	-	•	-
BWU2307	•	-	-
BWU2330	-	-	•
BWU2642	-	•	-

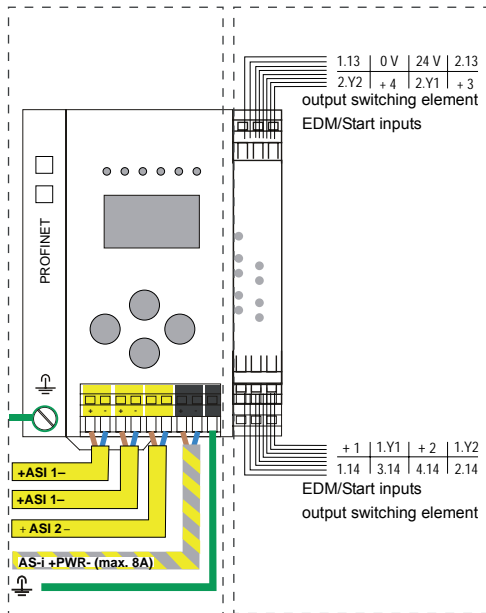
Safety Monitor block diagram



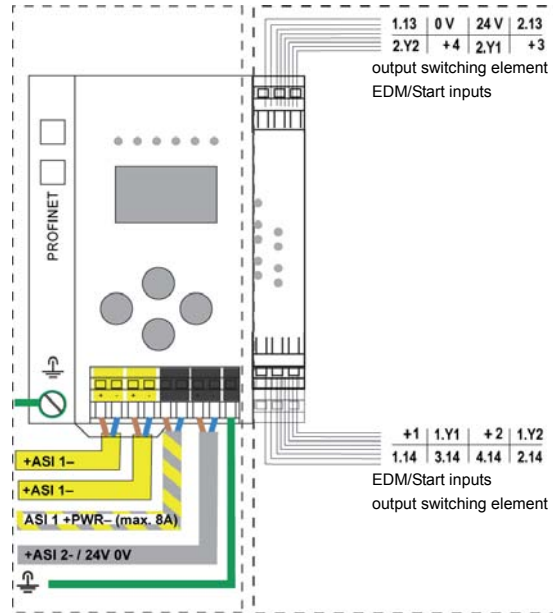
# AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

## Connections: Gateway + Safety Monitor

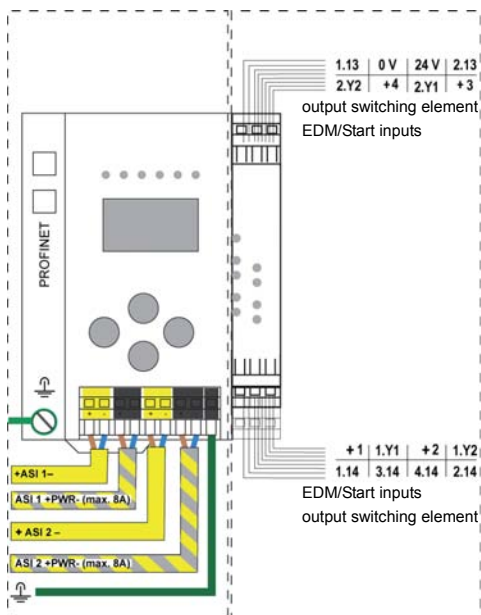
**BWU2237, BWU2642**



**BWU2307**



**BWU2330**



## Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 255)
- 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 174

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 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



<b>Article no.</b>	<b>BWU2267 / BWU2273 / BWU2317</b>
<b>Interfaces</b>	
Ethernet interfaces	RJ-45: 10/100 MBaud EtherNet + Modbus TCP according to IEEE 802.3, switch integrated
Baudraten	10/100 MBaud
<b>AS-i cycle time</b>	
AS-i cycle time	150 µs · (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
<b>Safety monitor</b>	
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
<b>Display</b>	
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

AS-i Master/Gateways/  
Links/Scanner

<b>Article no.</b>	<b>BWU2267 / BWU2273 / BWU2317</b>
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

AS-i Slaves

<b>UL-specifications (UL508)</b>	
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.
cTUV <sub>us</sub>	the devices <ul style="list-style-type: none"> <li>• BWU2267</li> <li>• BWU2273</li> <li>• BWU2317</li> </ul> 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 Accessories/  
Diagnostics/Development

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
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Other Fieldbuses/  
Master Simulators

<b>Environment</b>	
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

AS-i Safety

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
<b>BWU2267</b>	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
<b>BWU2273</b>	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
<b>BWU2317</b>	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

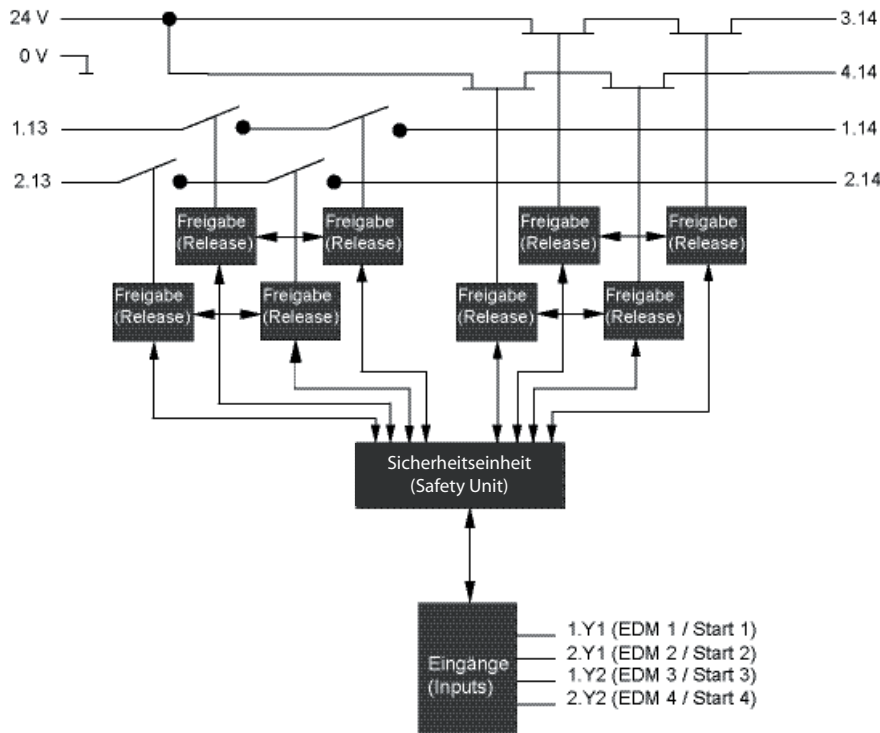
Price Lists

# 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	–	•	–

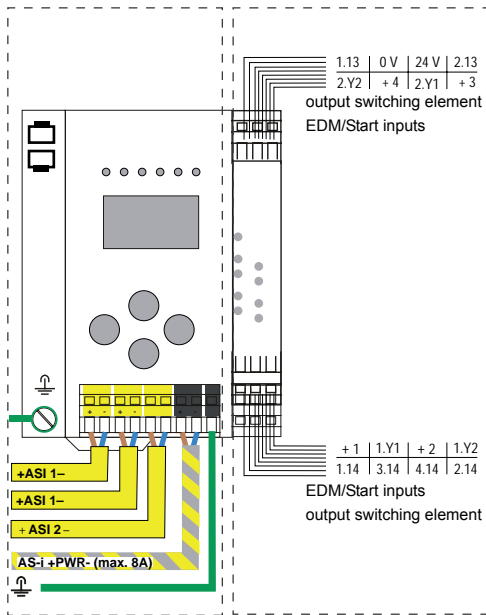
## Safety Monitor block diagrams



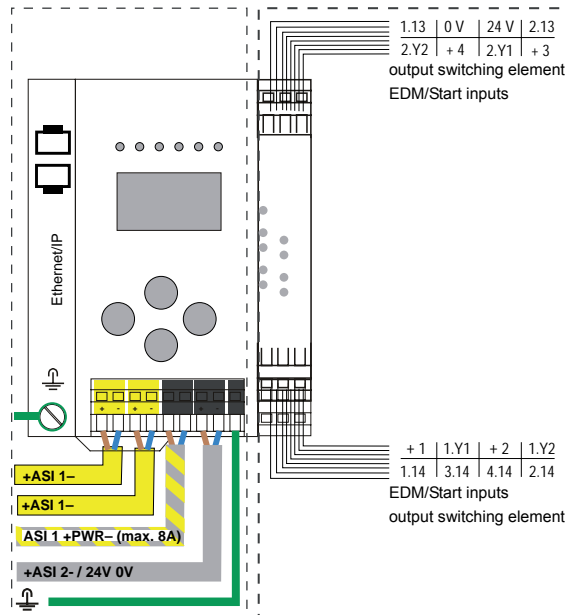
# AS-i 3.0 EtherNet/IP + Modbus TCP Gateways with integrated Safety Monitor

## Connections: Gateway + Safety Monitor

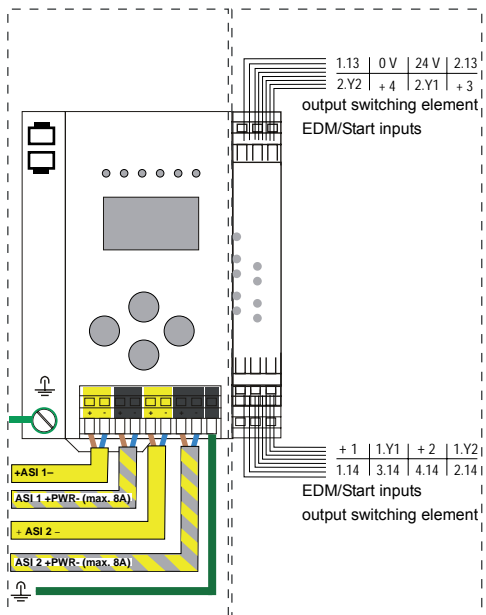
**BWU2267**



**BWU2273**



**BWU2317**



## Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 255)
- 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 174

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 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
<b>Interfaces</b>	
Interface EtherCAT	RJ-45
Baud rate	10/100 MBaud
<b>AS-i</b>	
Cycle time	150 µs * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
<b>Safety monitor</b>	
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
<b>Display</b>	
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 o.k.
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 off: open LED on: closed

# AS-i 3.0 EtherCAT Gateways with integrated Safety Monitor

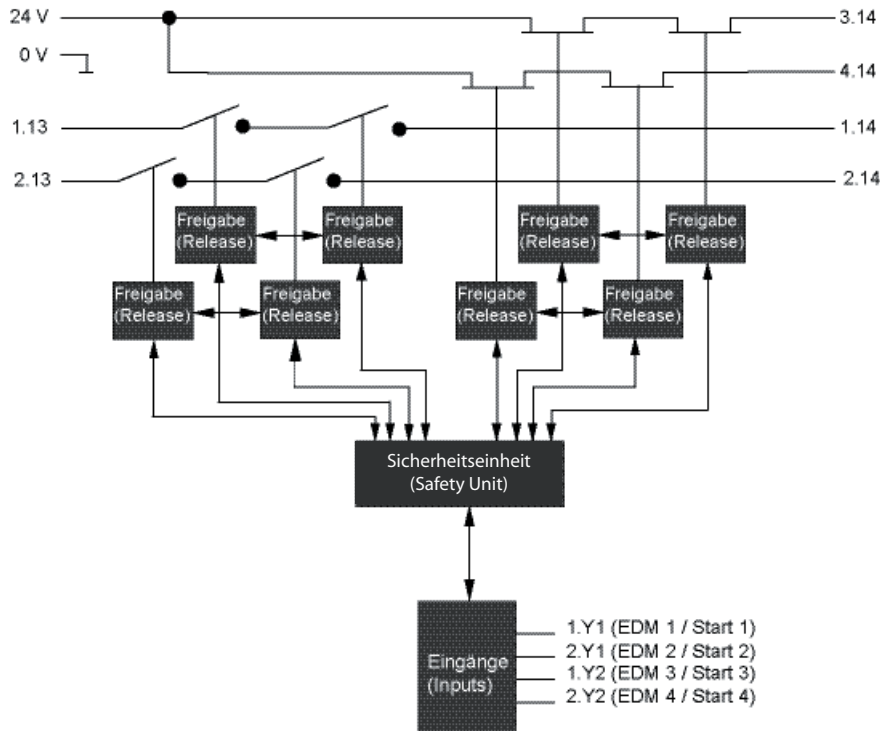
<b>Article no.</b>	<b>BWU2281 / BWU2338</b>
4 x LED output circuit	state of outputs: LED off: open LED on: closed
<b>UL-specifications (UL508)</b>	
External protection	an isolated source with a secondary open circuit voltage of $\leq 30V_{DC}$ with a 3A maximum over current protection. Over current protection 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 <sub>US</sub>	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
<b>Environment</b>	
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	$\geq 500V$
Dimensions (W / H / D in mm)	100 / 120 / 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
<b>BWU2281</b>	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
<b>BWU2338</b>	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

Operating current		
Article No.	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
<b>BWU2281</b>	–	•
<b>BWU2338</b>	•	–

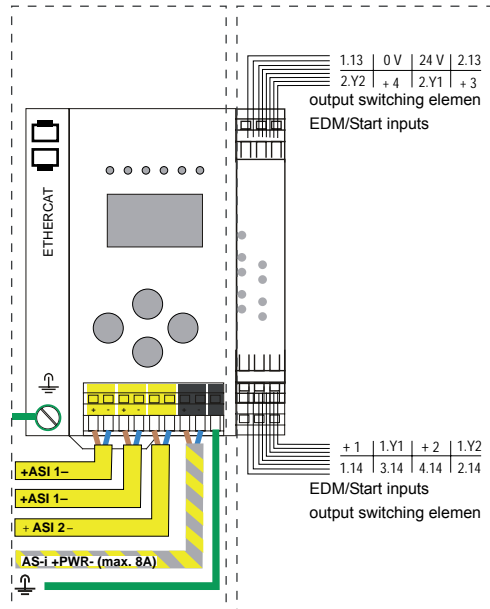
# AS-i 3.0 EtherCAT Gateways with integrated Safety Monitor

## Safety Monitor block diagrams

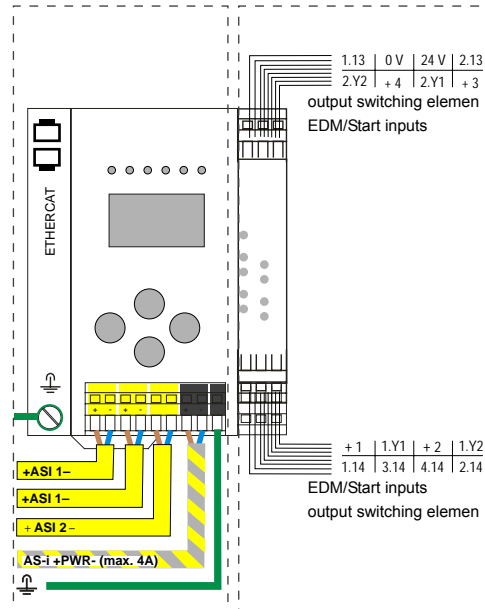


## Connections: Gateway + Safety Monitor

### BWU2281



### BWU2338



## Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 255)
- 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 174

# AS-i 3.0 sercos Gateway with integrated Safety Monitor



## 1 AS-i 3.0 Master, sercos Gateway

- Version "1 gateway + 1 power supply + 1 Safety Monitor for 2 AS-i networks"
- Full functional range of Bihl+Wiedemann Safety Monitor BWU2204!
- Compatible with the wide range of Bihl+Wiedemann power supplies
- integrated switch

## 1 AS-i Safety Monitor in Stainless Steel for 2 AS-i networks

- just 1 program!  
Monitor processes safety slaves on two AS-i networks  
Coupling between the two networks superfluous

## 32 release circuits

- 4 release circuits SIL 3, Cat 4 in the device  
2 x relays + 2 x sets of fast electronic safe outputs

## Safe AS-i outputs are supported on both AS-i networks

- 32 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

## Chip card for storage of configuration data



<b>Article no.</b>	<b>BWU2588</b>
<b>Interface</b>	
Ethernet interface	2 x RJ-45: 100MBaud, 2-port-switch, sercos III
Diagnosis interface	Ethernet
<b>AS-i</b>	
Cycle time	150ms * (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
Operating current	master power supply, approx 300mA out of AS-i network
<b>Safety Monitor</b>	
Release circuits	32
Start delay	< 10 s
Turn-off time	< 40 ms
Card slot	chip card for storage of configuration data
<b>Input</b>	
4 x EDM/Start	EDM: inputs to monitor external devices Start: Start inputs switching current statical 4 mA at 24 V, dynamic 30 mA at 24 V (T=100 µs)
<b>Output</b>	
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



# AS-i 3.0 sercos Gateway with integrated Safety Monitor

<b>Article no.</b>	<b>BWU2588</b>
<b>Display</b>	
LCD	menu, indication of slave addresses and error messages in plaintext
LED power	voltage ON
LED sercos	sercos network active
LED config error	configuration error
LED U AS-i	AS-i voltage o.k.
LED AS-i active	AS-i normal operation
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 off: open LED on: closed
4 x LED output circuits	state of output circuits: LED off: open LED on: closed
<b>Environment</b>	
Housing	Stainless Steel
Operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Protection category IEC 60 529	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Voltage of insulation	≥ 500V
Dimensions (W / H / D in mm)	100 / 120 / 96
Weight	800 g

# 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



<b>Article no.</b>	<b>BWU2214 / BWU2215 / BWU2383 / BWU2421 / BWU2479 / BWU2598 / BWU2615 / BWU2647</b>
<b>AS-i</b>	
Cycle time	150 µs + (number of slaves + 2)
Operating voltage	AS-i voltage 30V DC
<b>Display</b>	
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
<b>UL-specifications (UL508)</b>	
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 <ul style="list-style-type: none"> <li>• BWU2214</li> <li>• BWU2215</li> <li>• BWU2383</li> <li>• BWU2421</li> <li>• BWU2479</li> <li>• BWU2598</li> <li>• BWU2615</li> <li>• BWU2647</li> </ul> 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

<b>Article no.</b>	<b>BWU2214 / BWU2215 / BWU2383 / BWU2421 / BWU2479 / BWU2598 / BWU2615 / BWU2647</b>
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
<b>Environment</b>	
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

<b>Article no.</b>	<b>BWU2479</b>	<b>BWU2214 / BWU2215</b>	<b>BWU2598 / BWU2615</b>	<b>BWU2383 / BWU2421 / BWU2647</b>
<b>Interface</b>				
<b>PROFIBUS</b>				
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			–
<b>PROFINET</b>				
PROFINET interface	–			RJ-45
Conformance Class	–			B
Baud rates	–			10/100MBaud
<b>Safety monitor</b>				
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 2 and 3) max. contact load: 0,5A DC-13 at 30V		
<b>Display</b>				
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		
<b>Environment</b>				
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

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

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

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	–	–	●

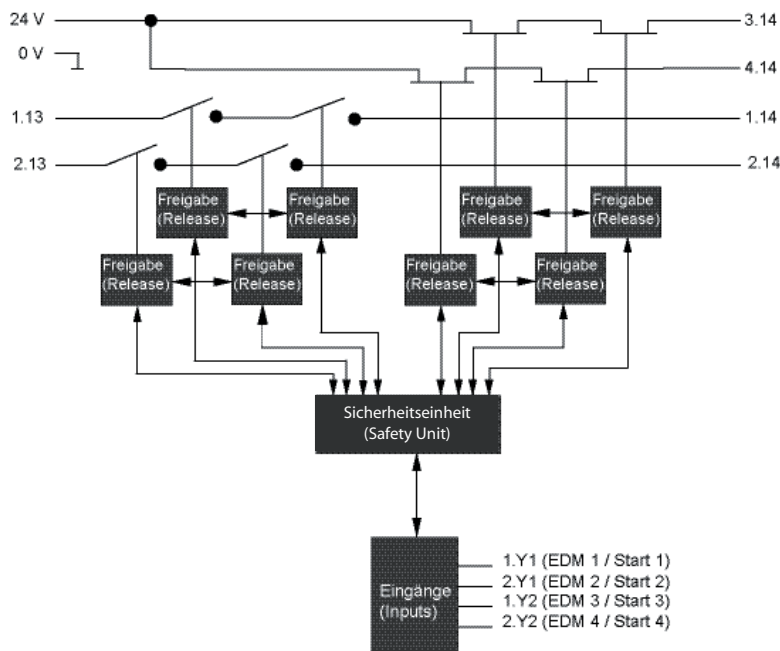
AS-i Safety

Price Lists

# AS-i 3.0 Gateways, PROFIsafe via PROFINET or PROFIBUS

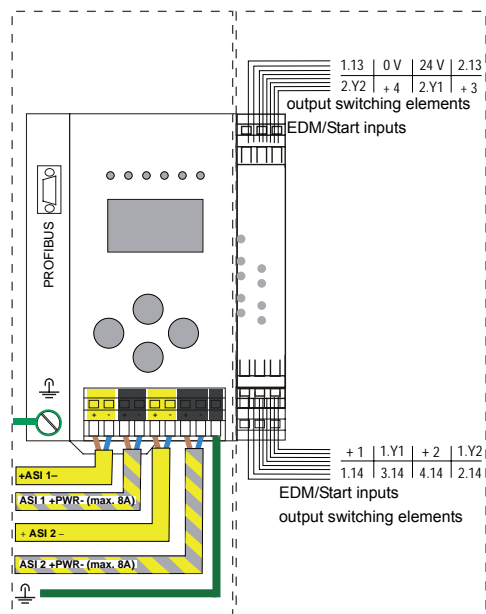
Article no.	Functional range of the PROFIBUS Gateway					
	BWU1567	BWU1568	BWU1569	BWU1891	BWU2238	BWU2239
BWU2214	-	•	-	-	-	-
BWU2215	-	-	•	-	•	-
BWU2383	-	-	-	-	•	-
BWU2647	-	-	-	-	•	-
BWU2421	-	-	-	-	-	•
BWU2598	-	-	-	•	-	-
BWU2615	-	-	-	-	•	-

Safety Monitor block diagram BWU2214, BWU2215, BWU2383, BWU2421, BWU2598, BWU2615, BWU2647:

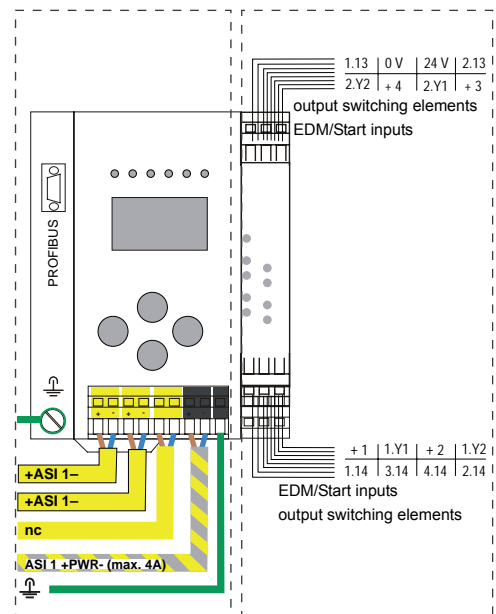


Connections: Gateway + Safety Monitor:

BWU2214, BWU2421

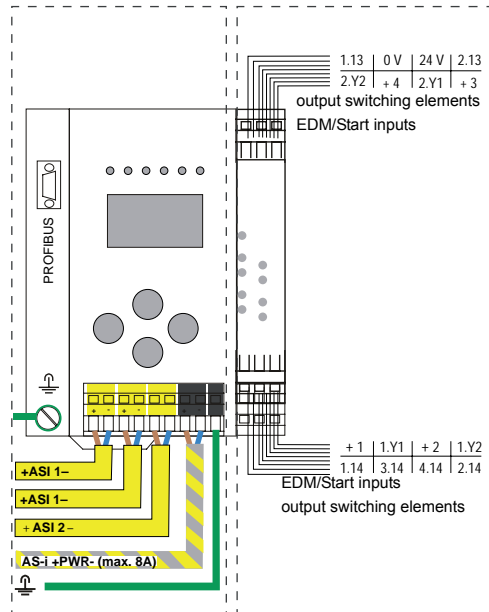


BWU2598

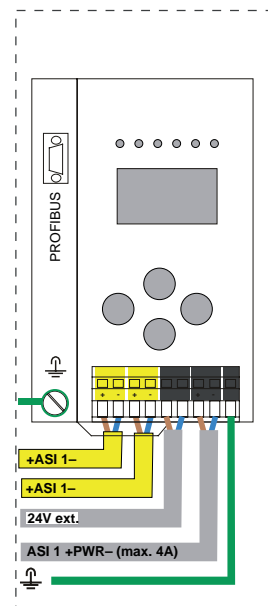


# AS-i 3.0 Gateways, PROFIsafe via PROFINET or PROFIBUS

**BWU2215, BWU2383, BWU2615, BWU2647**



**BWU2479**



## Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 255)
- 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 174)

For devices with PROFIBUS interface:

- Serial PROFIBUS Master (art. no. BW1258, see page 203)
- PROFIBUS-DP Master simulator (art. no. BW1257, see page 202)

## Overview AS-i Safety Monitor

Housing	Module	Art. No.	Characteristics	P.
	<b>AS-i Safety Monitor in stainless steel, generation II</b>	BWU2205	16 release circuits, 2 independent output switching elements, Ethernet diagnostics interface	249
	<b>AS-i Safety Monitor in stainless steel, generation II</b>	BWU2000	16 release circuits, 4 independent output switching elements, RS 232 diagnostics interface	249
		BWU2186	16 release circuits, 2 independent output switching elements, RS 232 diagnostics interface	249
	<b>Safety Basic Monitor</b>	BWU2441	AS-i Master disengageable, 8 release circuits, 8 / 4 safe inputs and 2 (4) electrical safe outputs, USB interface	252
		BWU2567	successor for AS-i consortial Safety Monitor, compatible replacement	
		BWU2569	enhanced	
	<b>Safety Basic Monitor Starter Kit</b>	BW2512		254
	<b>Safe contact expander</b>	BWU2539	2 independent channels	255
		BWU2548	1 independent channel	
	<b>AS-i Safety Monitor</b>	BW1764	advanced monitor, 1 release circuit, 40 ms	258
		BW1765	advanced monitor, 2 release circuits, 40 ms	

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

## 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.

<b>Article no.</b>	<b>BWU2000 / BWU2186 / BWU2205</b>
<b>Safety Monitor, advanced Monitor, generation II</b>	
Number release circuits	16
Start delay	< 10 s
Max. turn-off time	< 40 ms
Card slot	chip card for storage of configuration data
<b>Input</b>	
Number	4 inputs to use as EDM or start inputs switching current statical 4mA at 24V, dynamic 30mA at 24V (T=100 µs)
<b>Display</b>	
LCD	indication of slave addresses and error messages in plaintext
LED power	voltage ON
LED ready	LED on: start-up/restart-disable active LED flashing: external test necessary



# AS-i Safety Monitors in Stainless Steel

<b>Article no.</b>	<b>BWU2000 / BWU2186 / BWU2205</b>
<b>Electrical data</b>	
Operating current	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)
<b>UL-specifications (UL508)</b>	
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 <sub>us</sub>	the devices <ul style="list-style-type: none"> <li>• BWU2000</li> <li>• BWU2186</li> <li>• BWU2205</li> </ul> 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
<b>Environment</b>	
Housing	stainless steel
Ambient operating temperature	0°C ... +55°C
Storage temperature	-25°C ... +85°C
Protection category IEC 60 529	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61 131-2
Voltage of insulation	> 500V
Dimensions (L / W / H in mm)	85 / 120 / 96
Weight	800 g

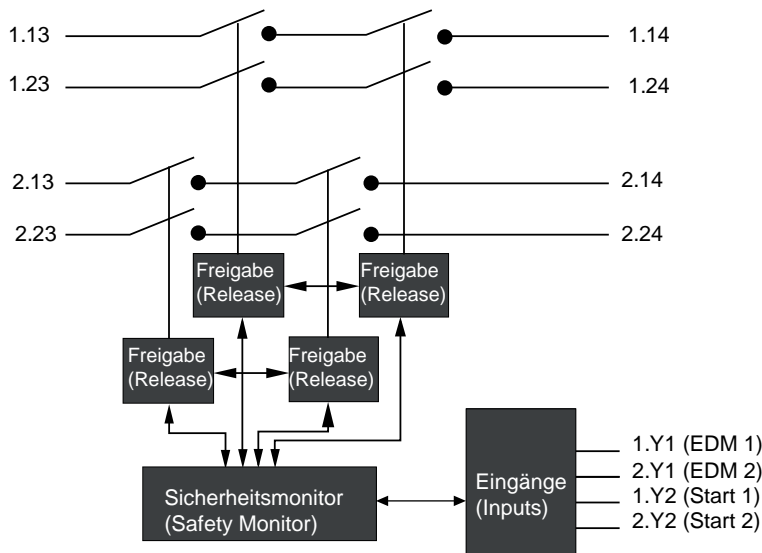
Article no.	BWU2000	BWU2186	BWU2205
<b>Interfaces</b>			
Diagnostics interface	RS 232		Ethernet, RJ-45
Baud rates	19,2 kBaud, no parity, 1 start bit, 1 stop bit, 8 data bits		-
<b>Safety Monitor</b>			
Number of release circuits in device	4	2	
<b>Output</b>			
Number	2 output circuits, each with 1 relay output switching element (output circuits 1 and 2) max. contact load: 3A AC-15 at 30V, 3A DC-13 at 30V	2 output circuits, each with 2 relay output switching element 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	-	
<b>Display</b>			
LED U AS-i / fault	-	LED green: no AS-i communication error and no RC in „red flashing“ LED red: communication error on AS-i network LED „red flashing“: at least 1 FGK in state „red flashing“	
2 LEDs channel 1 / channel 2	-	state of contacts of the safety outputs (OSSD) are: LED off: open LED on: closed LED flashing: delay time is running at stop category 1	
LED U AS-i 1 / U AS-i 2	AS-i 1 / AS-i 2 sufficiently voltage supplied	-	
LED fault	LED red: communication error on AS-i network LED flashing: at least 1 RC in state „red flashing“	-	

# AS-i Safety Monitors in Stainless Steel

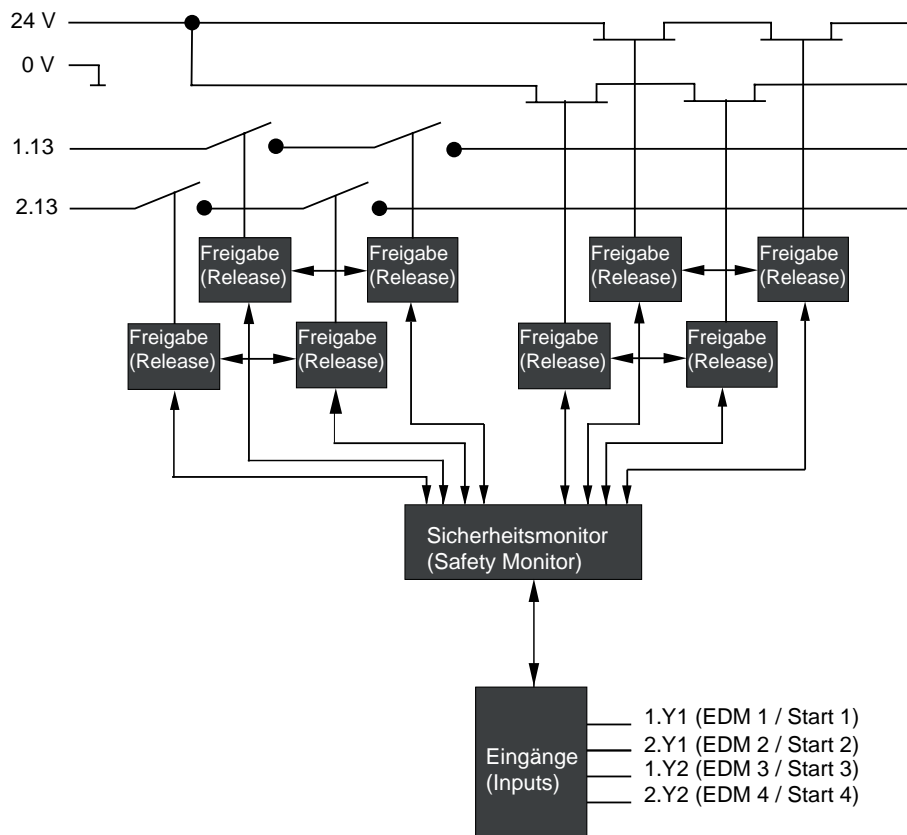
Article no.	BWU2000	BWU2186	BWU2205
LED AUX	auxiliary power		–
4 x LED EDM/Start	state of inputs: LED off: open LED on: closed		–
4 x LED output circuits	state of output circuits: LED off: open LED on: closed		–

Article No.	Diagnostics interface	AS-i Safety outputs are supported	Number of AS-i circuits Safety Monitor	Max. number of release circuits	Configuration blocks
BWU2000	serial	yes	2	16	256 devices
BWU2186	serial	yes	2	16	256 devices
BWU2205	Ethernet	yes	2	16	256 devices

## Safety Monitor block diagram BWU2186, BWU2205

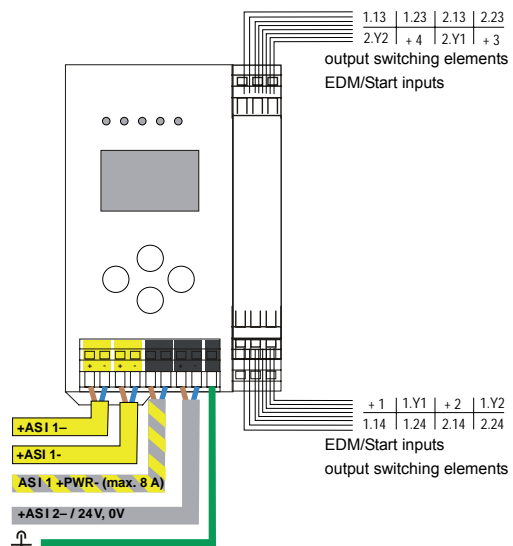


## Safety Monitor block diagram BWU2000

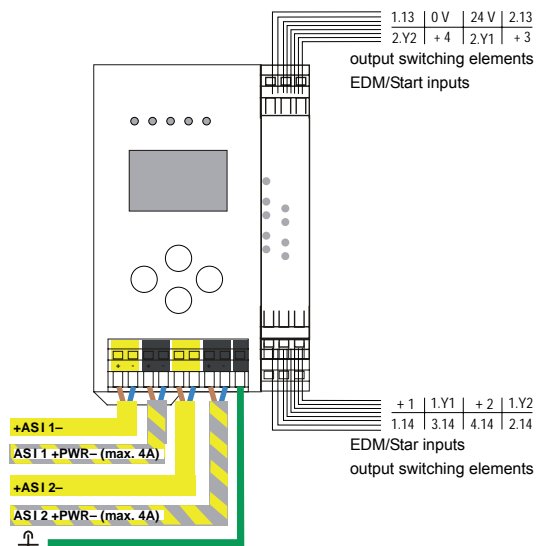


## Connections: Safety Monitor

### BWU2186, BWU2205



### BWU2000



## Accessories:

- Safe contact expander, 2 independent channels (art. no. BWU2539, see page 255)
- AS-i Power Supply 4A (art. nr. BW1649) / AS-i Power Supply 8A (art. nr. BW1997), see page 174

### 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

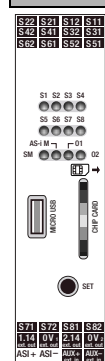


<b>Article no.</b>	<b>BWU2441 / BWU2567 / BWU2569</b>
<b>Connection</b>	
Connection	COMBICON clamp
<b>Safety Monitor</b>	
Respond delay	< 40ms
<b>AS-i Master</b>	
AS-i Master	integrated
<b>Interface</b>	
Interface	USB, chip card slot
<b>AS-i</b>	
AS-i voltage	18 ... 31,6V
Max. AS-i current consumption	200 mA
<b>AUX</b>	
AUX voltage	20 ... 30V (PELV)
Max. AUX current consumption	4A max.
<b>Input</b>	
Supply voltage inputs	of AUX (24V auxiliary power)
Network connection between the safe input terminals	max. resistance 150Ω
<b>Output</b>	
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
<b>Display</b>	
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

<b>Article no.</b>	<b>BWU2441 / BWU2567 / BWU2569</b>
1 button	service
<b>Environment</b>	
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

<b>Article no.</b>	<b>BWU2441</b>	<b>BWU2567</b>	<b>BWU2569</b>
<b>AS-i Safety Monitor</b>			
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 monitors of local inputs	no	yes	
<b>Electrical data</b>			
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 <sub>ext.out</sub>	semiconductor output 1
2.14 <sub>ext.out</sub>	semiconductor output 2
0 V <sub>ext.out</sub>	mass connection for semiconductor output
AS-i+, AS-i-	connection to the AS-i Bus
	Micro USB
AUX+ <sub>ext.in</sub> , AUX- <sub>ext.in</sub>	power supply input

**Accessories:**

- Software ASIMON 3 G2 and AS-i Control Tools (art. no. BW2501, see page 297)
- AS-i Safety 4I/2O Module, 8 / 4 safety inputs and 2 (4) electronical safety outputs in IP20 (art. no. BWU2314, see page 268) as supplementary module
- AS-i Speed Monitor (art. no. BWU2427, see page 263) as supplementary module
- USB cable for Safety Basic Monitor (art. no. BW2530, see page 299)

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

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Price Lists

# Safety Basic Monitor Starter Kit

## 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](http://www.bihl-wiedemann.de).

# Safe contact expander

## Safe contact expander

1 or 2 independent channels

4 contact sets per channel



BWU2539

BWU2548

<b>Article no.</b>	<b>BWU2539 / BWU2548</b>
<b>General data</b>	
Type of device	safe contacts, instantaneous
Number of contact sets per channel	4
<b>Input</b>	
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
<b>Output</b>	
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 <sup>1</sup>
<b>Contact load EDM (1.51, 1.52 and 2.51, 2.52)</b>	
Switching current	max. 20mA
<b>Contact load contact set (1.13, 1.14, 1.23, 1.24 and 2.13, 2.14, 2.23, 2.24)</b>	
Switching voltage AC	10 ... 230V
Switching voltage DC	10 ... 230V
Insulation to input	double insulation
Switching current	5mA... 3A
<b>Contact load contact set (1.33, 1.34, 1.43, 1.44 and 2.33, 2.34, 2.43, 2.44)</b>	
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 <sup>3</sup> cycles) AC 15: 230V/3A (ca. 80 x 10 <sup>3</sup> cycles) DC 1: 24V/3A (ca. 500 x 10 <sup>3</sup> cycles) DC 13: 24V/3A/0,1 Hz (ca. 50 x 10 <sup>3</sup> cycles)
B <sub>10d</sub> (AC15)	1,96 x 10 <sup>6</sup> cycles
B <sub>10d</sub> (DC13)	780 x 10 <sup>3</sup> cycles
<b>LED displays</b>	
LED 1 (CH 1)	safe input 1
LED 3 (EDM 1)	EDM channel 1
<b>Environment</b>	
Overvoltage category	III
Degree of pollution	2
Ambient temperature	-20°C ... 50°C (-4°F ... 122°F)

<b>Article no.</b>	<b>BWU2539 / BWU2548</b>
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:

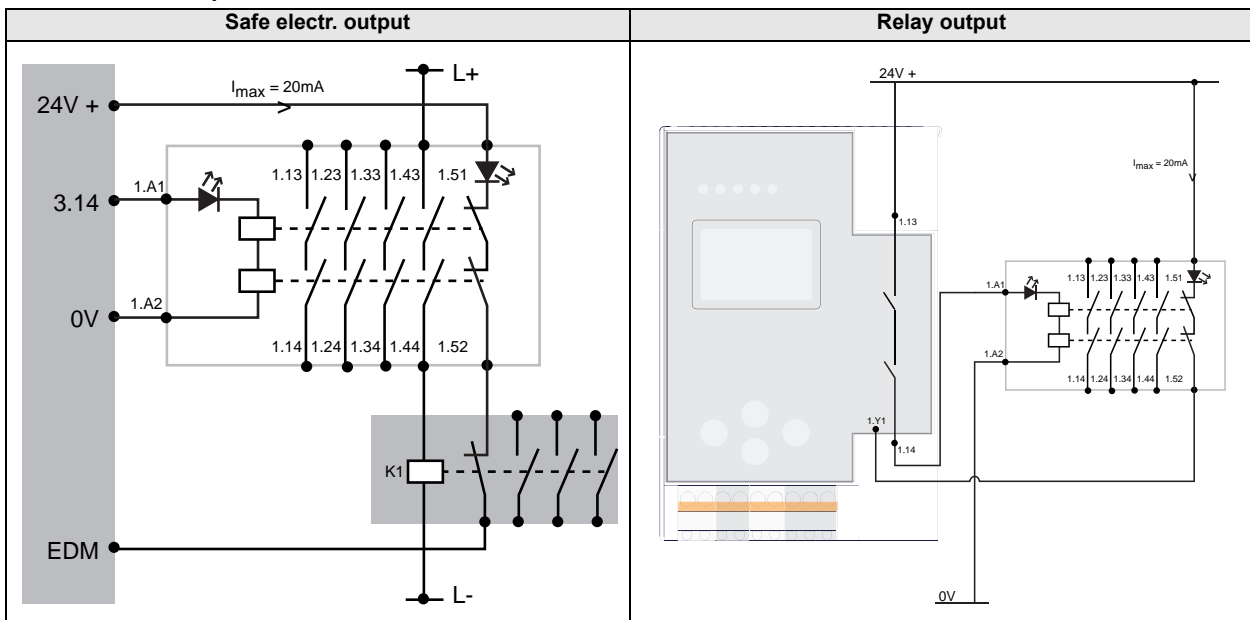
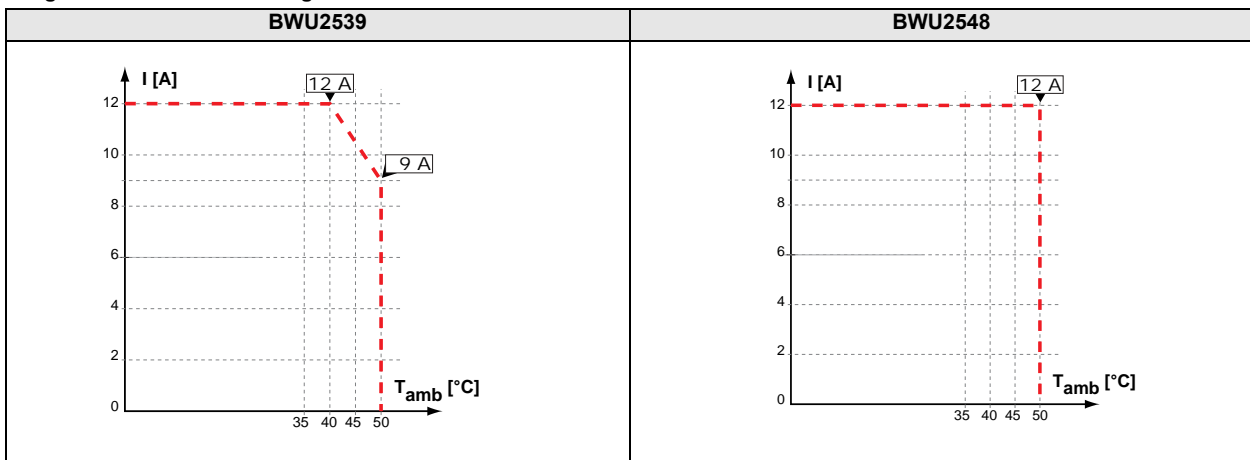


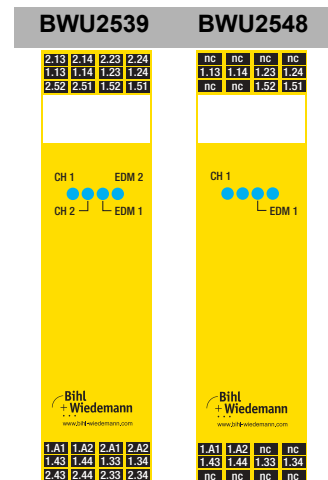
Diagram: Total current through all the contact sets of a channel:





# 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-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
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AS-i Safety

Price Lists

## 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.

<b>Article no.</b>	<b>BW1764 / BW1765</b>
<b>Connection</b>	
Connections	screw terminals
<b>General data</b>	
Start delay	< 10 s
Respond delay	< 40 ms
Safety Monitor	advanced monitor
<b>Electrical data</b>	
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)
<b>Display</b>	
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
<b>Environment</b>	
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

AS-i Master/Gateways/  
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AS-i Slaves

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AS-i Safety

Price Lists







# AS-i Safety Monitor

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:

- Programming 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)

## Overview AS-i Safety Slaves

Housing	Module	Art. No.	Characteristics	P.
	<b>AS-i Speed Monitor</b> 2 independent axis, chip card	BWU2427	for sinus/cosine Rotary Encoder	263
		BWU2595	for HTL-Rotary Encoder or sensors	
	<b>Speed Monitor head unit and Speed Monitor sinus/cosine for 2 axis</b>	BW2538	prewired complet set, parameterization of the speed via USB, monitoring up to 40 axis with expansion modules possible	265
	<b>Connecting cable for Speed Monitor</b>	BW2476	connector-ferrule	266
		BW2477	connector-ferrule	
		BW2494	plug-plug	
	<b>Adapter for Speed Monitor</b>	BW2497	AMP Mini-I/O connector for e.g. Elau MC-4	267
		BW2499	AMP Mini-I/O connector for e.g. B+R Acopos Sin Cos Interface	
	<b>AS-i Safety In-/Output Module</b>	BWU2314	8 / 4 safety inputs and 2 (4) electronical safety outputs	268
		BWU2236	relay output module with diagnostic slave, 1 EDM- and 2 / 1 safety inputs	270
	<b>AS-i Safety Output Module</b>	BWU2045	relay output module with diagnostic slave and 1 EDM input	274
		BWU2173	output module with diagnostic slave, 1 EDM input, 3I and 2O	278

Housing	Module	Art. No.	Characteristics	P.
	<b>AS-i Safety Input Module (M12)</b>	BWU2270	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP67, AS-i connection via profile cable	282
		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	
		BWU2631	4 / 2 safety inputs für for floating contacts for for optoelectronic protective devices, protection category IP67, AS-i connection via M12	
	<b>AS-i Safety Input Module</b>	BWU1939	2 / 1 safety inputs (2 channels) for floating contacts, protection category IP20	285
		BWU2577	2 / 1 safety inputs (2 channels) for optoelectronic protective devices, protection category IP20	
		BWU2661	Safety mat with 1,2k or 8,2k monitoring resistor, IP20	
	<b>Emergency stop- and push button modules</b>	BW2529	AS-i Safety stop button module, lighted (red/green), IP54, M12	288
		BW2585	AS-i Safety stop button module, unlighted, IP54, M12	
		BW2527	Emergency stop button with plug-in-shoe connection	
		BW2528	AS-i light button module, 2 buttons each 2-colored lighted (red/green), IP54, M12	
	<b>AS-i Safety OEM Slave</b>	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	
	<b>AS-i OEM Slave</b>	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-Master/Gateways/  
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AS-i Slaves

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Other Fieldbuses/  
Master Simulators

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# AS-i Safety Slaves

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

**AS-i Speed Monitor for sinus/cosine Rotary Encoder and  
AS-i Speed Monitor for HTL-Rotary Encoder or sensors**

Supplied out of AS-i and external 24V

Chip card



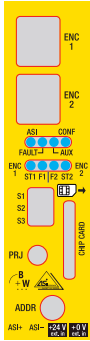
The Speed Monitor controls the speed of maximum two axis and gives a sure signal to the AS-i Bus, when the speed is below a preset threshold.

<b>Article no.</b>	<b>BWU2427 / BWU2595</b>	
<b>Connection</b>		
Connection	4-fold COMBICON clamp and 2 AMP Mini-IO plug connections	
<b>AS-i</b>		
Profile	safe input slaves: S-0.B.E., ID1=F diagnostic slaves: S-7.A.5., ID1=7 (default)	
Voltage	18 - 31,6V	
Max. current consumption	150mA	
<b>AUX</b>		
Voltage	18 - 30V	
<b>Input</b>		
Number	2 x encoder	
<b>Display</b>		
LED 1 ASI (green)	AS-i voltage present	
LED 2 FLT (red)	offline	
LED 3 AUX (green)	24V DC AUX present	
LED 4 CONF (yellow)	OFF = Normal mode	
LED 5 ST1 (yellow)	state encoder 1 (ENC 1)	
LED 6 F1 (yellow)	safety, low frequency or zero-speed axis 1	
LED 7 F2 (yellow)	safety, low frequency or zero-speed axis 2	
LED 8 ST2 (yellow)	state encoder 2 (ENC 2)	
<b>Environment</b>		
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	
Protection class DIN 60 529	housing IP20 (only suitable for use in electrical operating rooms / control cabinets with IP54 minimum protection rating)	
Tolerable loading referring to humidity	according to EN 61 131-2	
Dimensions (W / H / D in mm)	22,5 / 99,6 / 114	

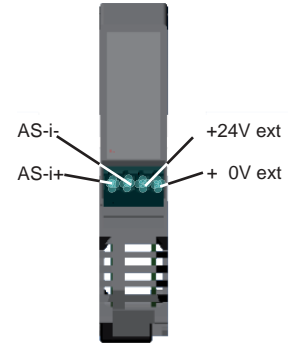
Article no.	BWU2427	BWU2595
<b>Input</b>		
Input type	sinus/cosine	HTL
Input level	-	High-level-HTL: 16V ... 28,8V
Parameterisation range for the speed limit	25Hz - 200kHz	2Hz - 200kHz
Supply of the inputs	internal 5V (100mA max.), external 5V	external 24V
<b>AUX</b>		
Max. current consumption	200mA	50mA

BWU2427 / BWU2595 Used designations on front foil:					
ENC 1	ENC 2	S1, S2, S3	CHIP CARD	PRJ	ADDR
Rotary Encoder 1	Rotary Encoder 2	Function selector switch	Chip card	Projecting button	Address socket

**Connections, switches, chip card:**



**Terminal assignment:**



**Accessories BWU2427:**

- Cable: BW2476, BW2477, BW2494
- Adapter: BW2497
- Rotary encoder simulator: BW2506

**Accessories BWU2595:**

- Cable: BW2476, BW2477, BW2494

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists



# Speed Monitor head unit and Speed Monitor sinus/cosine for 2 axis

**Speed Monitor head unit**

and

**Speed Monitor sinus/cosine for 2 axis**

**Spring-type terminals**

**Prewired**



The article BW2538 consists of the following:

- AS-i Speed Monitor (BW2427)
- Safety Basic Monitor (BW2441)

More informationen about these articles can be found at [www.bihl-wiedemann.de](http://www.bihl-wiedemann.de) or:

Bihl+Wiedemann GmbH  
Floßwörthstr. 41  
D-68199 Mannheim  
Phone: (+49) 621 / 339 96-0  
Fax: (+49) 621 / 339 22 39  
eMail: [mail@bihl-wiedemann.de](mailto:mail@bihl-wiedemann.de)  
Internet: <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

# 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**

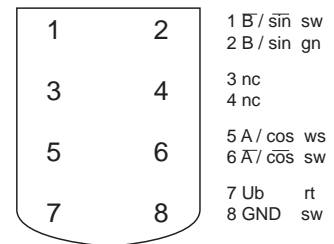
**Article no. BW2477: connection cable, 5,0 m, connector-ferrule**

**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
<b>Cable</b>			
Wire	0,2 mm <sup>2</sup> , 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
<b>Connector</b>			
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:



The pairs are always twisted

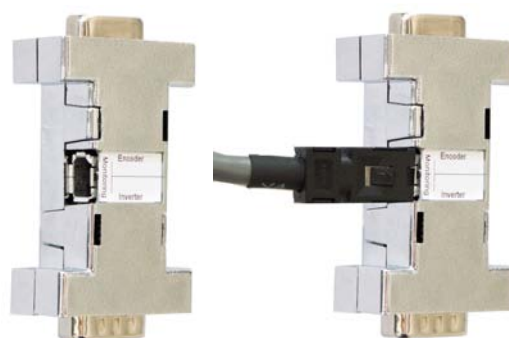
BW2476/BW2477

BW2494



30 mm  
Shield  
40 mm

## 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.
<b>BW2497</b>	Sub-D	9	9	AMP Mini-I/O connector	2	1	4	3	9	Elau MC-4
<b>BW2499</b>	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.

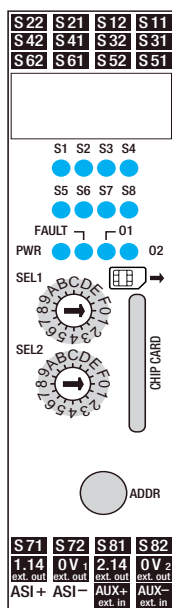
#### Diagnosis and commissioning:

- 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.

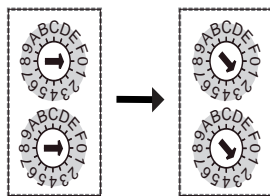
Article no.	BWU2314
Connection	COMBICON clamp
AS-i profile	safety input slaves: S-0.B.F.0 diagnostic slaves: S-7.A.5.E
AS-i voltage	22 ... 31,6 V
Max. AS-i current consumption	200 mA
AUX voltage	20 ... 30 V (PELV)
Max. AUX current consumption	4 A max.
Voltage of insulation AS-i/AUX	500 V
Inputs	8 / 4 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) electrical safety outputs in IP20

<b>Article no.</b>	<b>BWU2314</b>
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 <sub>ext.out</sub>	semiconductor output 1
2.14 <sub>ext.out</sub>	semiconductor output 2
0 V <sub>1 ext.out</sub> , 0 V <sub>2 ext.out</sub>	mass connection for semiconductor output
AS-i+, AS-i-	connection to the AS-i-Bus
ADDR	address socket
AUX+ <sub>ext.in</sub>	power supply input
AUX- <sub>ext.in</sub>	



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

**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/PLe 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

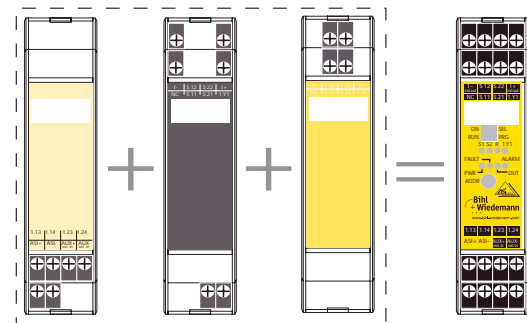
via this same safety address on a AS-i circuit. All AS-i Safety Relay Output Modules with the same safety address are controlled simultaneously.

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 <sub>hex</sub> (default), value modifiable
AS-i profile safety input	S-7.B.0
ID1 Code safety input	F <sub>hex</sub> (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 <sub>DC</sub> )
AUX <sub>ext. in</sub> voltage supply	24 V <sub>DC</sub> (± 20%)
Voltage of insulation (relay contact for AS-i resp. AUX <sub>ext. in</sub> )	≥ 6 kV
Current input out of AUX <sub>ext. in</sub>	< 30 mA
Voltage of insulation AS-i to AUX <sub>ext. in</sub>	≥ 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

<b>Article no.</b>	<b>BWU2236</b>
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	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
<b>00</b>	1: Alarm LED <i>on</i> 0: Alarm LED <i>off</i>	<b>I0</b>	Diagnostic (for definition see table "device colors")
<b>01</b>	Parameter P1=1 not used	<b>I1</b>	
	Parameter P1=0 1: output controlled by safety release 0: inhibits output on irrespective of safety release		
<b>02</b>	not used	<b>I2</b>	
<b>03</b>	inexistent	<b>I3</b>	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)

<b>Bit P1</b>	
P1=1	safety output controlled by safety release only
P1=0	safety output controlled by output O1 in addition to safety release
<b>Bit P2</b>	
P2=1	input 1.Y1 at AS-i bit I 3
P2=0	feedback for user: release <i>on</i>
<b>Bits P0, P3:</b>	
	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

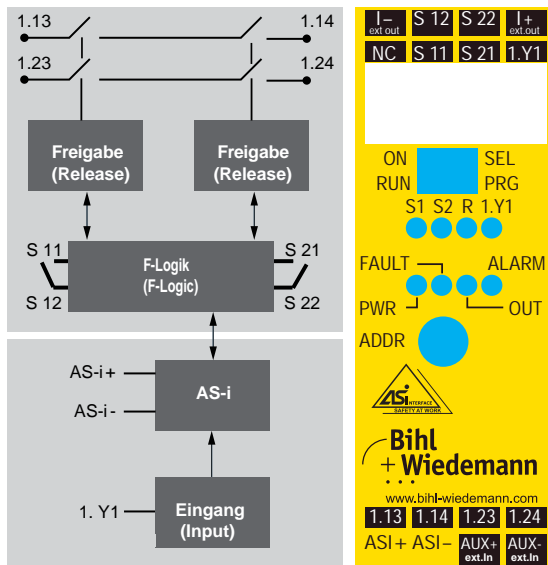
## Safety input

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 <sub>-ext.out</sub> I <sub>+ext.out</sub>	reference potential for EDM-/start input (1.Y1)
1.Y1	EDM / start input
AS-i+, AS-i-	AS-i network connection
AUX <sub>+ext.in</sub> AUX <sub>-ext.in</sub>	voltage supply for safety input (24 V <sub>DC ext.</sub> )


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

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.

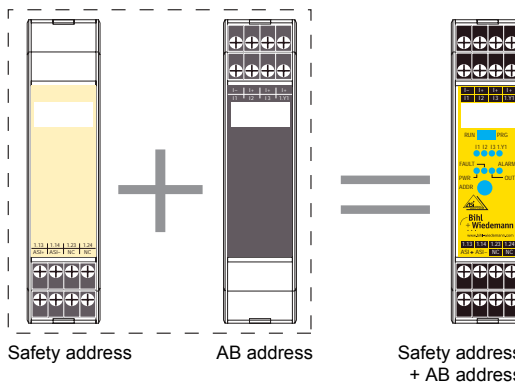
In addition to the safety single address the module also supports an AB-address e.g. used to transmit the states of the standard inputs.

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 <sub>hex</sub> (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 <sub>DC</sub> )
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 Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

# AS-i Safety Relay Output Module with Diagnostic Slave and 1 EDM input

## Diagnostic operation ID1 = 5<sub>hex</sub> (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		
O2	not used	I2	
O3	inexistent	I3	1.Y1

## 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
<b>Bits P0, P2, P3:</b>	
not used	

Release		AS-i Safety Relay Output Module, safety release from the AS-i safety monitor...	
		... not received	... received
<b>AS-i Parameter (Diagnostic Slave) changes the function of output bit O1</b>	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 (instead of diagnostic) ID1=7<sub>hex</sub>, or ID1=F<sub>hex</sub>

### 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 controlled by safety release 0: inhabits output on irrespective of safety release		
O2	not used	I2	Parameter P2=0    Parameter P2=1
		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

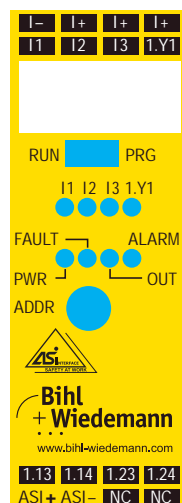
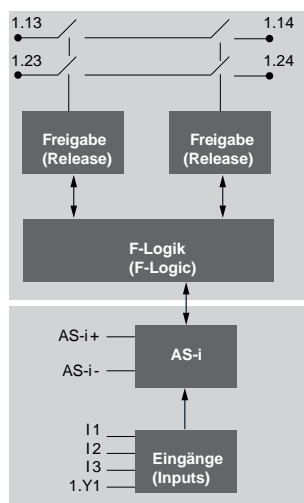
## Programming instructions

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 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

## 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 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 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

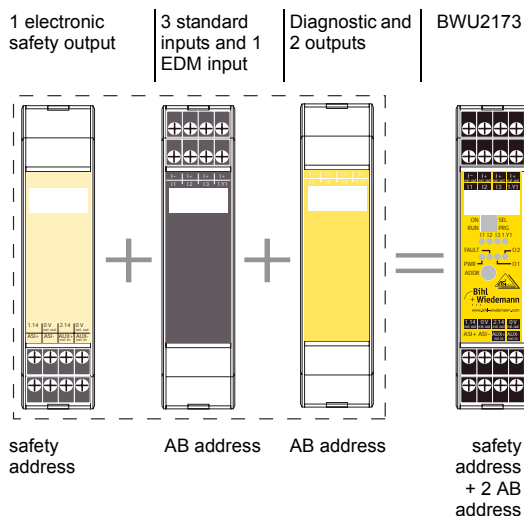
Safety Output Modules with the same safety address are controlled simultaneously.

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 <sub>DC</sub> )
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 Master/Gateways/  
Links/Scanner

AS-i Slaves

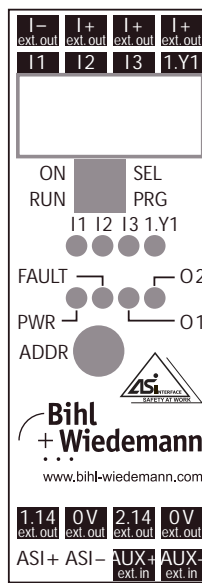
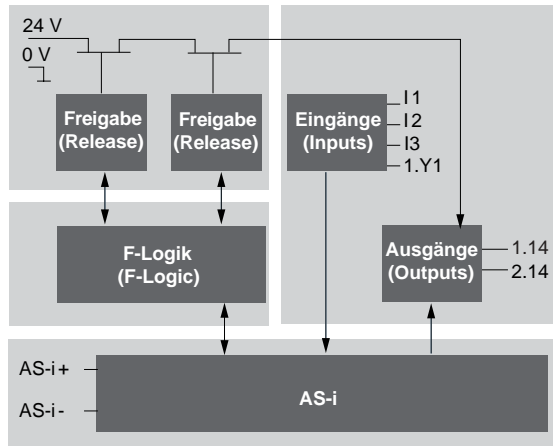
AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

# 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+ <sup>ext.in</sup>	voltage supply input
AUX- <sup>ext.in</sup>	

## 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	Parameter P1=0	I0	diagnostic (for definition see table device colors)	
	not used	1: output O 1 controlled by safety release 0: inhibits output O 1 on irrespective of safety release	I1		
O1	Parameter P1=1	Parameter P1=0	I2		
	not used	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: <i>safety release on</i> 0: feedback for user: <i>safety release off</i>
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)	
<b>Bit P1</b>	
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
<b>Bit P2</b>	
P2=1	feedback for user: release on AS-i bit I3
P2=0	input 1.Y1 at AS-i bit I3
<b>Bits P0, P3:</b>	
	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
		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
		restart inhibit, waiting for the start signal, the semiconductor output switches 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
		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 /  
BWU2631



Article no.	BWU2270 / BWU2370	BWU2284 / BWU2369	BWU2631
<b>Connection</b>			
Connection	M12		
Length of connector cable	unlimited	I/O: max. 15 m	
<b>AS-i</b>			
Profile	S-7.B.1, ID1=F	S-7.B.0, ID1=F	
Voltage	22 ... 31,6V		
Max. current consumption	60mA	80mA	
<b>AUX</b>			
Voltage	24V (20 ... 30V DC) (PELV)		–
Max. current consumption	4A max.	3A max.	–
<b>Inputs</b>			
Number	2 / 1 safety inputs (with two channels) for OSSDs or floating contacts		4 / 2 safety inputs for floating contacts
Safe input	OSSD		floating contact
Power supply	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 test pulses	0 ... 50 Hz		–
OSSD 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		–
<b>Outputs</b>			
Number	2, electronic		–
Power supply	out of AUX voltage		–
Max. output current	1A per output		–
<b>Display</b>			
2x LED (yellow)	state of input OSSD1, OSSD2	state of input S1, S2	state of input S1.1, S1.2
2x LED (yellow)	state of output Out1, Out2		state of input S2.1, S2.2
LED AUX (green)	24V DC AUX on		–
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		

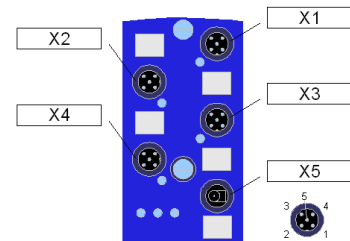
# AS-i Safety Input Module (M12), IP67

Environment			
Applied standards	<table border="0"> <tr> <td>EN ISO 13 849-1:2008/PLC 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 61 131-2 EN 954-1 Cat4</td> <td>EN ISO 13 849-1:2008/PLC 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</td> </tr> </table>	EN ISO 13 849-1:2008/PLC 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 61 131-2 EN 954-1 Cat4	EN ISO 13 849-1:2008/PLC 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
EN ISO 13 849-1:2008/PLC 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 61 131-2 EN 954-1 Cat4	EN ISO 13 849-1:2008/PLC 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
BWU2631	●	–	●	–	●	●	–	45 / 80 / 42

**BWU2270 u. BWU2284 and BWU2631:** 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)

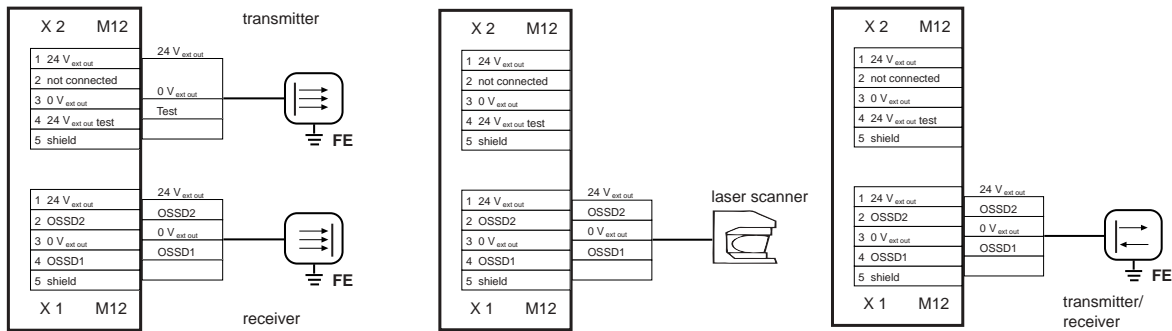
Programming	AS-i Bit setting			
	D0	D1	D2	D3
	<b>Safe input</b>			
BWU2284 / BWU2369 / BWU2631	S1	S1	S2	S2
BWU2270 / BWU2370	OSSD1	OSSD1	OSSD2	OSSD2
	<b>Output</b>			
All	Out 1	Out 2	not used	
	<b>Parameter bit</b>			
BWU2270	P0: watchdog (0 off / 1 on)			
BWU2284 / BWU2631	P0 not used			
BWU2270 / BWU2284 / BWU2631	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 <sub>ext out</sub>	OSSD2	0V <sub>ext out</sub>	OSSD1	shield	S1+	S1-	S2+	S2-	nc
X 2	24V <sub>ext out</sub>	nc	0V <sub>ext out</sub>	24V <sub>ext out</sub>	shield	S2+	S2-	nc	nc	nc
X 3	nc	Out2	0V <sub>ext out</sub>	Out1	nc	nc	Out2	0V <sub>ext out</sub>	Out1	nc
X 4	nc	nc	0V <sub>ext out</sub>	Out2	nc	nc	nc	0V <sub>ext out</sub>	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 <sub>ext in</sub>	AS-i-	+24V <sub>ext in</sub>	nc	AS-i+	0V <sub>ext in</sub>	AS-i-	+24V <sub>ext in</sub>	nc

Connections M12					
BWU2631					
Name/ Number	1	2	3	4	5
X 1	S1.1+	S1.1-	S1.2+	S1.2-	–
X 2	S1.2+	S1.2-	–	–	–
X 3	S2.1+	S2.1-	S2.2+	S2.2-	–
X 4	S2.2+	S2.2-	–	–	–
X 5	Double addressing socket (with protection cap)				

### 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 194)

# AS-i Safety Input Modules, IP20

**AS-i Safety Input Modules, IP20,  
for optoelectronic protective devices,  
floating contacts or safety mats**



BWU1939      BWU2577      BWU2661

The AS-i Safety Input Module 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 PLe (BWU1939/2577) resp. PLd (BWU2661).

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 pole protected.

Using the outputs, you can drive up to 2 indicator lights, with the power being drawn from the separated 24V.

<b>Article no.</b>	<b>BWU1939 / BWU2577 / BWU2661</b>
<b>Connection</b>	
Connection	COMBICON
Length of connector cable	I/O: max. 15 m
<b>AS-i</b>	
Voltage	22 ... 31,6V
<b>AUX</b>	
Voltage	24V (20 ... 30V DC) (PELV)
<b>Output</b>	
Number	2, electronic, short-circuit-protected
Power supply of outputs	out of AUX voltage
<b>Display</b>	
LED ASI (PWR) (green)	AS-i power supply on
LED AUX (green)	24V DC AUX on
LED OUT (yellow)	2x outputs
<b>Environment</b>	
Applied standards	EN ISO 13849-2:2008 EN 61 000-6-2, EN 61 000-6-4 EN 62 061:2005 SIL3 EN 954-1 cat 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 (W / H / D in mm)	22,5 / 99,6 / 50,5

# AS-i Safety Input Modules, IP20

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

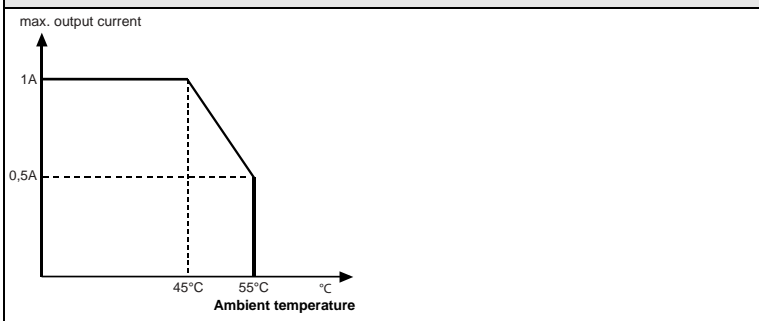
Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

Article no.	BWU1939	BWU2577	BWU2661
<b>AS-i</b>			
Profile	S-7.B.0, ID1=F	S-7.B.1, ID1=F	
Max. current input out of AS-i	< 80mA	60mA	
<b>AUX</b>			
Max. current input out of AUX	1,5A at output short-circuit	4A max.	
<b>Input</b>			
Number	2 / 1 safe inputs (2 channels) for floating contacts	2 / 1 safe inputs (2 channels) for OSSDs	safety mat with 1,2k or 8,2k monitoring resistor
Power supply of inputs	out of AS-i voltage	out of AUX voltage	
Switching threshold	10mA, R < 150Ω	V <sub>in</sub> > 11V for High-Level, input current ≥ 2,5mA at 15V	–
Power supply for external sensor	–	1,8A out of AUX voltage	–
OSSD input test pulses	–	0 ... 50 Hz	–
OSSD input test pulse width	–	U <sub>aux</sub> ≥ 21,5V= 0 ... 1 ms test pulses possible U <sub>aux</sub> ≥ 17V= 0 ... 0,8 ms test pulses possible U <sub>aux</sub> < 17V= 0 ... 0,6 ms	–
<b>Output</b>			
Max. output current	200mA per output	1A per output*	
<b>Display</b>			
LED FLT / FAULT (red)	red: communication error or address is 0 red, flashing: overload, internal supply of the in-/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	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 or sensor cable break
LED CC (red)	cross-connection of the input lines, peripheral fault	–	sensor cable break
LED IN (yellow)	2x safe inputs		1x safe input
<b>Environment</b>			
Applied standards	–	EN 61 131-2	–
	EN ISO 13849-1:2008/PLe Kat 4		–
	–	–	EN ISO 13849-1:2008/PLd Kat 3
Operating temperature	0°C ... +70°C	0°C ... +55°C	
Storage temperature	-40°C ... +70°C	-40°C ... +85°C	

### \*Derating BWU2577, BWU2661



# AS-i Safety Input Modules, IP20

Programming:	AS-i Bit-setting			
	D0	D1	D2	D3
	<b>Safe input</b>			
BWU1939	S11 / S12		S21 / S22	
BWU2577	S1		S2	
BWU2661	Sensor			
	<b>Output</b>			
BWU1939 / BWU2577 / BWU2661	O1	O2	not used	not used
	<b>Parameter bit</b>			
	P0: watchdog (0 off / 1 on), P1, P2, P3 not used			

BWU1939	BWU2577	BWU2661

Connections:		
BWU1939	BWU2577	BWU2661

## 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
<b>Connection</b>			
Connections	M12	plug-in-shoe connection 2,8 x 0,8 mm	M12
<b>AS-i</b>			
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
<b>Display</b>			
LED (green)	see table: BW2529 Options	–	D0 / D2
LED (red)	see table: BW2529 Options	–	D1 / D3
<b>Robustness</b>			
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
<b>Environment</b>			
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



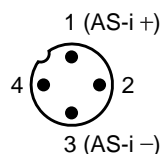
## BW2529 Options:

Operation by switch					
Parameter bit		LED display			
P1	P0	green	red	yellow	yellow flashing (1Hz)
1 <sup>1</sup>	1 <sup>1</sup>	unlocked	operated	-	no AS-i communication
0	1	operated	unlocked		

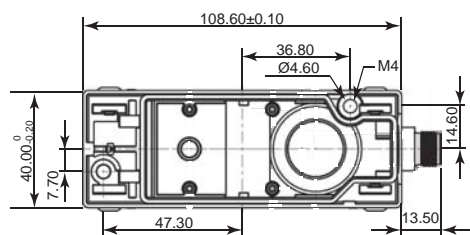
Operation via AS-i					
Parameter bit		LED Display			
P1	P0	green	red	yellow	yellow flashing (1Hz)
x	0	DO1	DO0	DO0 + DO1	no AS-i communication

<sup>1</sup> default

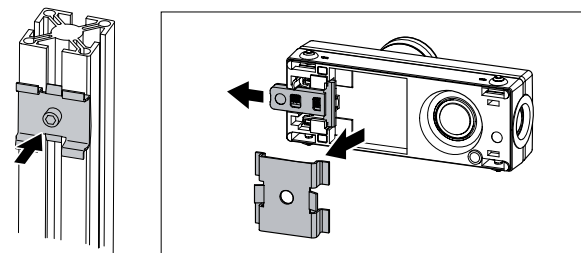
BW2528	D0	D1	D2	D3	DI0	DI1
Button above	green	red	-	-	x	-
Button below	-	-	green	red	-	x



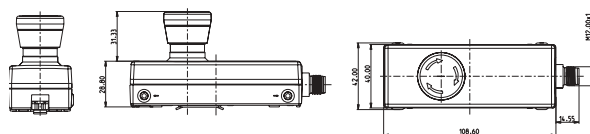
### BW2528 Drilling pattern for direct mounting via screws:



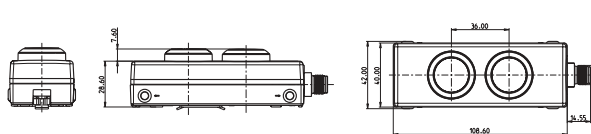
### BW2528 and BW2529 Image for rail mounting: (BW2529 Mounting only about retaining clip!)



### BW2529 Dimensions:



### BW2528 Dimensions:



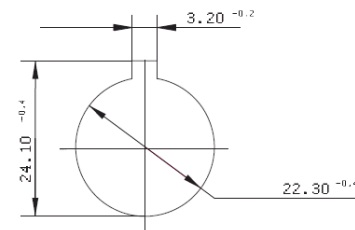
### BW2527:



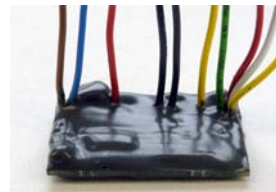
Please note mounting color marking!

### Installation openings:

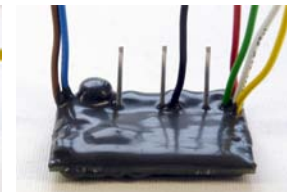
for 22,3 mm to IEC 60 947-5-1 suitable. All control elements are equipped with an twisting protection nose



## 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
<b>Connection</b>	
Length of connector cable	I/O: max. 1, 5 m
<b>AS-i</b>	
Current input out of AS-i	< 120mA
Voltage range AS-i	22 ... 31,6V
<b>Output</b>	
Outputs	2, electronic
Loading capacity of outputs	20mA per output (total ≤ 40mA) out of AS-i
<b>Input</b>	
Max. loop resistance (switch)	200Ω
<b>Display</b>	
LED red	AS-i communication error
LED green	AS-i voltage
2x LED yellow	inputs
2x LED yellow	outputs
<b>Environment</b>	
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

AS-i Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
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AS-i Safety

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Article no.	Connection		Inputs 2 safe	Inputs 2 electronic	Applied standards EN ISO 13 849-1:2008/PLe 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			
<b>Displays</b>				
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 Master/Gateways/  
Links/Scanner

AS-i Slaves

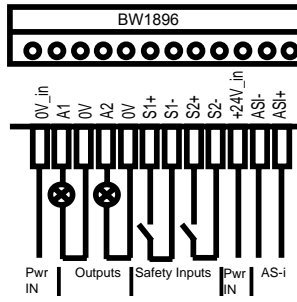
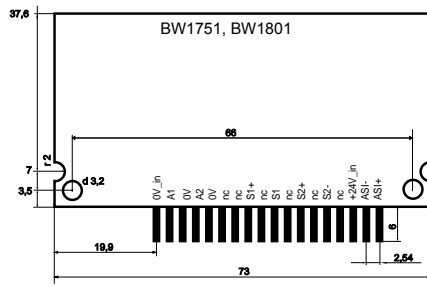
AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
Master Simulators

AS-i Safety

Price Lists

# AS-i Safety OEM Slave



AS-i-Master/Gateways/  
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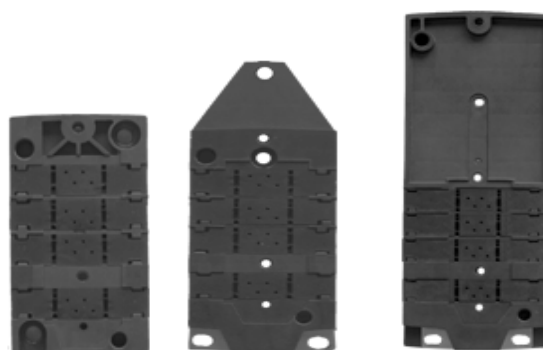
Price Lists

## 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**

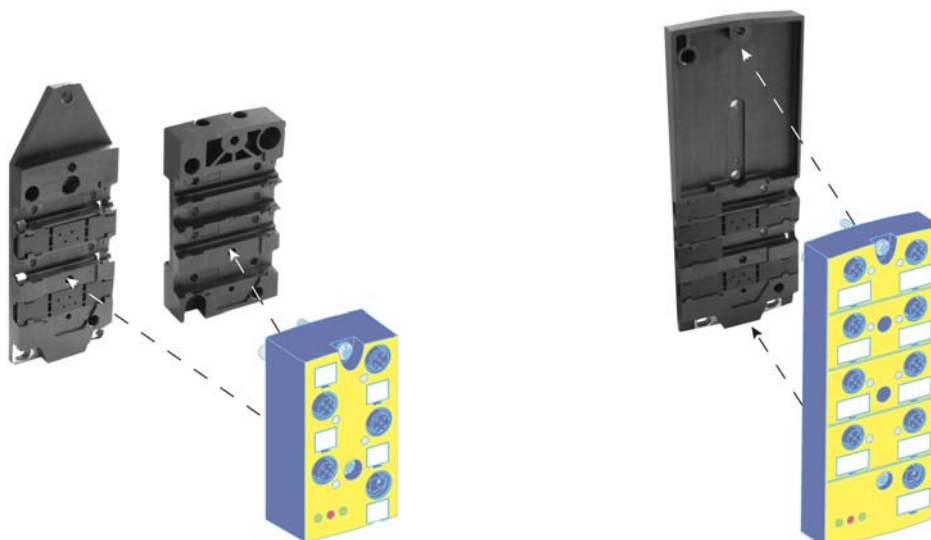
**Article no. BW2350 AS-i Substructure Module (CNOMO) for 4-channel module in 45 mm-housing**

**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

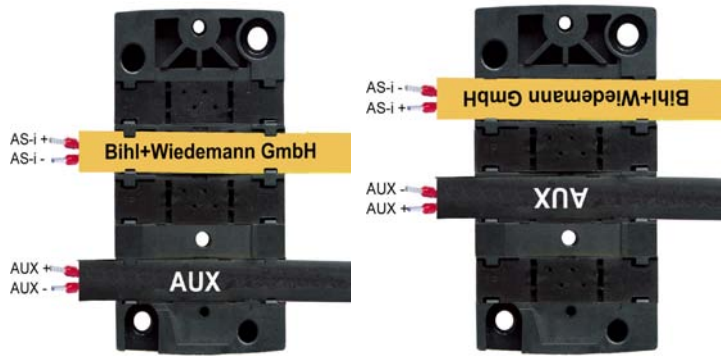
### Substructure modules and appropriate modules:



# AS-i Substructure Module in IP67

## Wiring examples:

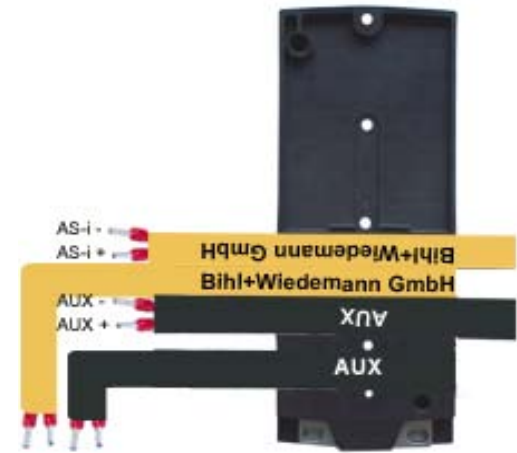
on a 4-channel module:



normal direction

turned direction

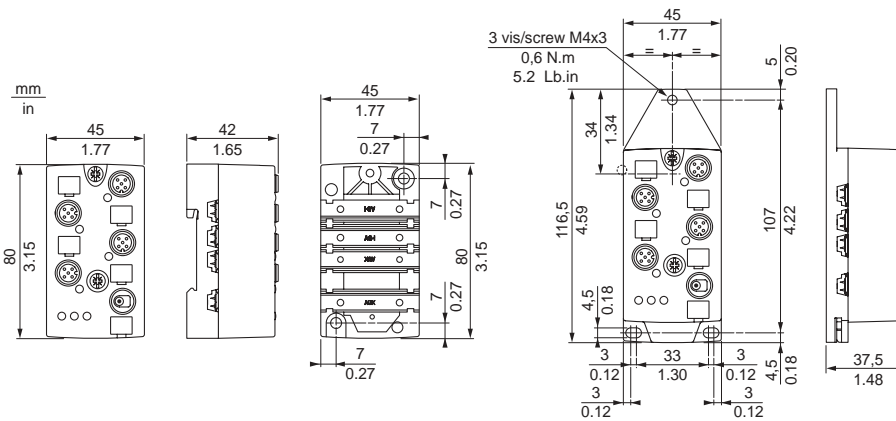
junctions on a 8-channel module:



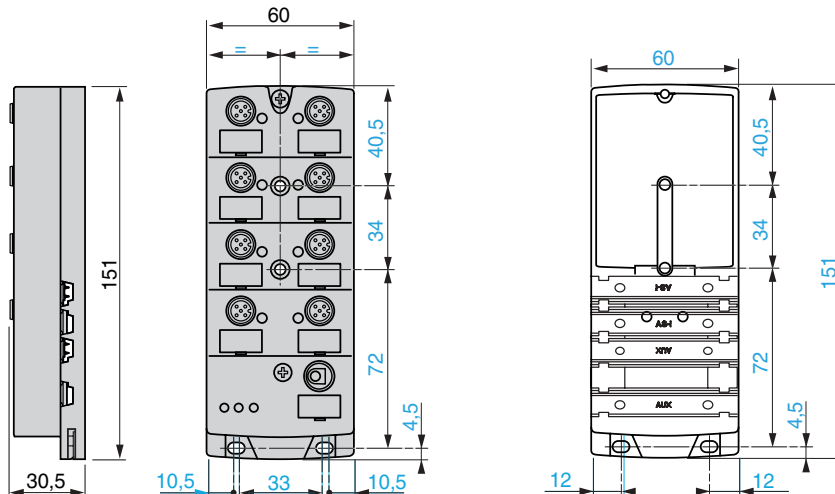
junctions

## Dimensions:



4-channel module:



8-channel module:



## Overview AS-i Safety Accessories

Housing	Module	Art. No.	Characteristics	P.
	Safety software for configuration, diagnosis and programming	BW2071	with serial cable for AS-i Master/Monitor in stainless steel	297
	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	299
	USB connector cable	BW2530	for Safety Basic Monitors	299
	Interface cable	BW1771	for connection of the Safety Monitor to a PC	299
	Interface cable	BW1772	for connection of 2 Safety Monitors	299
	AS-i Chipcard	BW2222	memory capacity 128 kbyte	300
		BW2079	memory capacity 32 kbyte	



# Safety software for configuration, diagnosis and programming

Safety software for configuration, diagnosis and programming

For Bihl + Wiedemann Safety Monitor, secure control, secure small controllers, programmable safety components, Safety Controller



Article no. BW2071, BW2501	
<b>General data</b>	
Name	ASIMON 3 G2
Field of application	configuration software for AS-Interface Safety at Work Safety Monitors
Features	creation of safe AS-i Safety at Work configurations
	configuration of coupling of Safety Monitors
	configuration of diagnostic information for further processing in higher-level control systems
	documentation of the AS-i Safety at Work system configuration
Functional description	system diagnostics and troubleshooting
	This software is used for configuring and commissioning a Safety Monitor via a Computer. Through an easy to use interface you're able to configure the Safety Monitor in conjunction with safe AS-i slaves, such as emergency stop buttons, safety switches for doors or safety light barriers within an AS-i bus system for virtually all applications for protection of hazardous areas on power-driven machinery. Also the commissioning and documentation of your safety-related application is supported by software
<b>Installation</b>	
Version	the installed version can be found via the menu item "About"
Range of functions	graphical ASIMON programming interface
	AS-i Control Tools Speed Monitor PlugIn
Installation options	ASi_safety_monitor_Software_ASIMON_3_G2_3.1.2.23
	ASi_safety_monitor_Software_ASIMON_3_G2_3.1.2.23_Service (Download and View)
<b>System requirements</b>	
Software requirements	Windows Version 2000 / XP / Vista / Windows 7
Hardware requirements	a Pentium ® - Intel ® processor or faster (or compatible models, such as AMD or Cyrix ®)
	at least 500MB of free fixed disk storage
	at least 32MB of main memory (RAM)
	a CD-ROM drive for installation from a CD-ROM
Compatibility	a mouse (recommended)
	AS-i Safety Monitor
Supported interfaces	32bit and 64bit systems
	RS232
	USB Ethernet (UDP)

AS-i-Master/Gateways/  
Links/Scanner

AS-i Slaves

AS-i Accessories/  
Diagnostics/Development

Other Fieldbuses/  
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AS-i Safety

Price Lists

# Safety software for configuration, diagnosis and programming



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AS-i Master/Gateways/  
Links/Scanner

Ordering data and accessories	
Article numbers	BW2071: ASIMON and AS-i-Control-Tools with serial cable for AS-i-Master/Monitors in Stainless Steel
	BW2501: ASIMON and AS-i-Control-Tools for Safety Monitors and AS-i Masters
Accessories / Documentation	ASIMON manual
	example programs
	quickly and easily for the first local program: quick set-up Emergency Stop Button, secure cross-communication, Speed Monitors, etc.
	BW2530: USB connector cable for Safety Basic Monitor BWU2441
	BW1575: serial cable for AS-i Masters and AS-i Monitors in Stainless Steel

AS-i Slaves

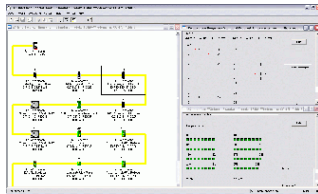
AS-i Accessories/  
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Master Simulators

AS-i Safety

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## Software AS-i Safety Monitor



<b>Article no. BW2145</b>	
Programming software ASIMON 3 G2 with serial cable for AS-i Masters/Monitors in stainless steel	
<b>Article no. BW1770</b>	
Programming software ASIMON with cable BW1771 and BW1772 only for use with the Safety Monitors BW1764 and BW1765	
<b>Note:</b> 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



<b>Article no. BW1575</b>	
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



<b>Article no. BW2530</b>	
Connection	USB type A – Micro USB
Length	2 m
Colour	black

## Interface cable for connection of the Safety Monitor to the PC



<b>Article no. BW1771</b>	
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



<b>Article no. BW1772</b>	
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: <b>BW2079</b> for all Standard and all Safety products with chip card by Bihl + Wiedemann. <b>BW2222</b> for Safety Monitors and Gateways in Stainless Steel Safety Version 4.X (for maximum 4 Safety configurations on a chip card).		

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







# Zertifikat

*Certificate*

**Registrier-Nr.**

*Registered No.*

**44 799 08 554284**

**Zeichen des Auftraggebers**  
*Customer's reference*

**Auftragsdatum**  
*Date of order*

**Aktenzeichen**  
*File reference*

**Prüfbericht Nr.**  
*Test report no.*

15.11.2007

8000554284

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 Gestaltungsleitsätze, 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  
  
Softwarestand V2008-04-25

*Description of product*

**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*

Langemarckstr. 20 • 45141 Essen • Fon +49 (0)201 825 5120 • Fax +49 (0)201 825 3209 • Email: machinery@tuev-nord.de



**THE AS-INTERFACE MASTERS**

**We are there for you.**

**Bihl+Wiedemann GmbH**

Floßwörthstraße 41, D-68199 Mannheim

Phone: +49-621-33996-0, Fax: +49-621-3392239

E-Mail: [mail@bihl-wiedemann.de](mailto:mail@bihl-wiedemann.de)

Web: [www.bihl-wiedemann.com](http://www.bihl-wiedemann.com)