

## ASi Safety Bus Interface Products

The resounding success of the AS interface (actuator-sensor interface) that operates in accordance with the master-slave principle is attributed to its complete ease of use, its ability to be specifically adapted to the simplest elements in machine and system construction as well as the host of unparalleled application advantages it offers. The AS interface has major advantages when control system must be design to conform to the Machinery Directive 2006/42/EC; effective 12/29/2009. Performance level PL<sub>e</sub> and SIL 3 are achieved effortlessly. It is not always possible to set up safety systems with safety switches connected in series while conforming to EN 13849-1. Such configurations present no problems for the AS interface which provides effective solutions up to the highest performance level.

The unshielded two-wire line that carries both data and power renders redundant parallel wiring between sensors and controller unnecessary, thus offering a considerably expanded range of functionality while reducing costs. With piercing technology corresponding field devices, i.e. up to 62 standard/31 safety devices or a mixed configuration, can be connected using the plug & play principle in any position on the yellow, two-core cable. The AS interface master, acting as an independent gateway to higher bus systems (e.g. Profibus), monitors the bus and cyclically polls the bus users.

As an open-ended standard, AS interface guarantees maximum compatibility while providing significant benefits in terms of overall cost considerations. These benefits are reflected in the substantial time and cost savings achieved for initial installation, retrofitting, converting and maintaining systems as well as significantly reducing hardware outlay.

The safety monitor makes the AS interface into a safety bus. It monitors communication between the slaves and the master. The safety monitor shuts down the up to 16 enable circuits as soon as it detects that a safety slave has switched or identifies a fault. A safety-oriented system can be built up by installing a safety monitor and corresponding slaves in an existing AS interface system.



The safety-oriented application is created using the ASIMON program and loaded into the monitor. Programming is carried out by means of simple drag and drop.

### AS interface – from under one roof

All plastic-enclosed safety switches are available in the Safety at Work configuration and other products from the switch range are constantly being equipped with this functionality. With the SHS3, BERNSTEIN offers the first safety hinge switch with AS interface capabilities on the market. Integrated AS interfaces ensure BERNSTEIN components are designed with the smallest possible dimensions. For instance, the mini limit switch Ti2 is the only switch in its class on the market with AS interface capabilities. The safety switch with interlock (SLK) is also available equipped with an AS interface. In addition to switches, gateway masters and terminal boxes, the BERNSTEIN product range also includes power supply units, safety monitors, hand-held programming units as well as an extensive assortment of accessories. The entire comprehensive spectrum makes it possible to offer complete systems solutions.

### Master with gateways to following bus systems are available:

- Profibus
- Profinet
- Ethernet
- Powerlink
- EtherCat
- CanOpen
- DeviceNet
- Modbus
- Allen-Bradley ControlLogix

## Quick-Connect Technology



Direct connection of AS interface formed cable to BERNSTEIN AS interface switch.

The combination of the AS interface cable with ribbon cable terminals and M12 connecting lines guarantees enormous time-saving potentials in installation and connection.

This principle is supported by the direct connection technology of BERNSTEIN AS interface switches. These BERNSTEIN AS interface switches are connected directly to the AS interface cable by means of integrated ribbon cable terminals.

The use of the AS interface cable together with piercing technology ensures the ribbon cable terminal can be easily reposition-ed while retaining the cable's protection class.

### Installation advantages

- Reduced installation time
- Easy installation thanks to piercing technology (in ribbon cables protected against polarity reversal)
- Safety circuits can be retrofitted and converted by simply plugging in individual slaves
- Changes to safety system can be quickly implemented by way of software
- Reduced cable requirements, consequently:
  - Small trailing cables
  - Small cable platforms
  - Easy to clean
  - Low fire load
- No terminal boxes
- No need to prepare enclosures, terminals and screw connections

### Planning advantages

- Straightforward planning – intricate wiring documents are replaced by clearly arranged bus structure diagrams
  - Safety functions quickly created by drag and drop in ASIMON
  - Printout of safety configuration from programming tool

### System advantages

- Uncomplicated interconnection of safety system in machines used in production lines
- Straight forward implementation of safety system cascading
- Faults in the safety system can be diagnosed with a laptop online
- Diagnostic facilities directly at the master and monitor for exact fault location
- System data/polling can be read out via higher-level bus system: Remote servicing
- Fewer I/Os at controller
- Takes up less space in control cabinet

### Economic advantages

- Reduced costs through:
  - Faster installation
  - Fewer circuit diagrams need to be created
  - Faster assignment
  - Fast troubleshooting
  - Extensive diagnostic facilities

User advantages through reduced:

- Machine downtimes thanks to extensive diagnosis and fast troubleshooting
- Commissioning costs
- Maintenance and servicing expenditure

### Further advantages

- Direct connection – no need for M12 connection cable and connection adapters
- Great degrees of freedom in terms of network typology
- Tough even in harsh working environments
- Modularity and perfect integration in higher-level bus systems – an AS interface master can be integrated as a normal slave in a higher-level bus system

### Technical data (for all saves, except coupling box)

Electrical data	
Voltage range	U 26.6 ... 31.6 V; via AS interface with polarity reversal protection
Power intake	I < 30 mA
AS interface specification	
	Profile S-0.B
	IO-Code: 0 x 0 ID-Code: 0 x B
	IO-Code1: 0 x F ID-Code2: 0 x E
AS interface inputs	
	Contact 1: Data bits D0/D1 = static 00 or dynamic code transfer
	Contact 2: Data bits D2/D3 = static 00 or dynamic code transfer
Parameter bits	No function
Mechanical data	
Display	LEDs for indicating status of ASI slave and bus
Contact type	2 Öffner (Slow-action contact, Zb)
Type of connection	Connector M12 male
Plug assignment 1	1: AS-i + 2: free
	3: AS-i – 4: free
Installation position	Any
Protection class	IP65 conforming to EN 60529; DIN VDE 0470 T1
Performance Level	
PL	Conforming to 13849-1 Up to e
Standards	
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1 EN 50295, EN ISO 13849-1	

Please refer to the corresponding standard product for further technical data.

## Intelligent Locking, Hinged and Rope Pull Switches

### ASi SLK

With the ASi SLK BERNSTEIN offers a switch with interlock function and integrated Safety at Work interface.

You can choose the functional principle, i.e. spring and magnet latching device.

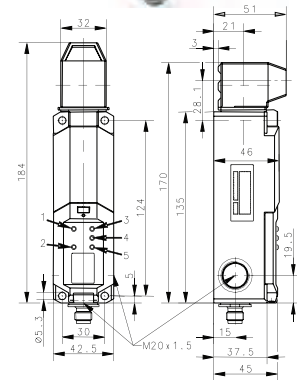
LED integrated in the switches indicate the bus status.

The inserted actuator and the status of the latching device are also indicated by LEDs.

The LEDs can also be optionally controlled via the PLC.



M12-connection	Direct connection
<b>607.3200.058</b> ASi-SLK-F-R1 (Spring Latching / Normally Locked)	- -
<b>607.3200.057</b> ASi-SLK-M-R0 (Magnetic Latching / Normally Unlocked)	- -



### ASi SHS

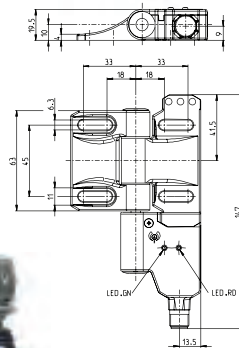
With the SHS3 BERNSTEIN offers the only safety hinge switch with AS interface Safety at Work.

As on the standard hinge, after adjustment, the user can correct the switching point with the integrated fine adjustment system.

When converting a system you can redefine the switching point with the aid of a change kit.



M12-connection	Direct connection
<b>607.3200.011</b> ASi SHS3 SA R	- -
<b>607.3200.013</b> ASi SHS3 SR R	- -



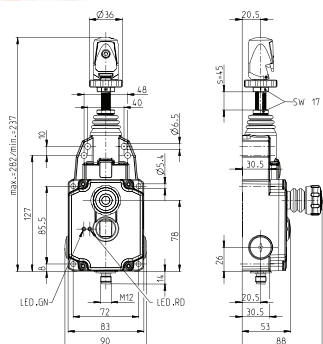
### ASi SRM

Cable span lengths of up to 37.5 meters are possible with the SRM...175 (see information under Safety Cable Pull Switches).

As in the standard range, the Q variant features the quick-connect head that drastically reduces the cable installation time.



M12-connection	Direct connection
<b>607.3200.007</b> ASi SR M-FF-175	- -
<b>607.3200.008</b> ASi SR M-FF-300	- -



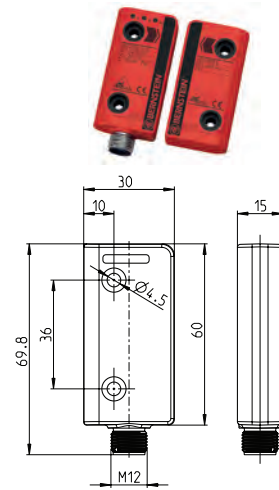
<b>607.3200.009</b> ASi SR M-LU-175	- -
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Drawing dimensions in mm

## Intelligent Non-Contact and Keyed Safety Switches

### CSMS

The BERNSTEIN CSMS is a non-contact safety sensor (transponder) with dynamically coded signal transmission for AS Interface – Safety at Work. With the unique allocation of the actuator to the safety switch, protection against tampering is already integrated in the CSMS, making it suitable for concealed installation in non-coded systems.



#### CSMS KIT

**607.3200.062**  
ASI-CSMS-SET  
(kit contains: Read head and actuator)

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#### CSMS individual components

**607.3200.060**  
ASI-CSMS-M-ST  
(Read head)

**607.3200.061**  
ASI-CSMS-S  
(Actuator)

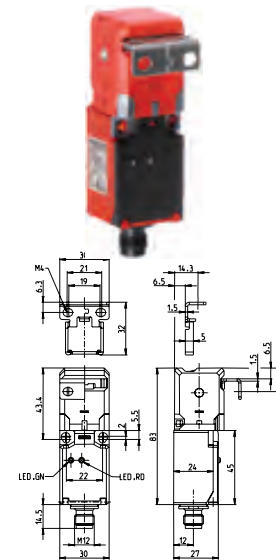
### ASI SKT

The ASI SKT with separate actuator for monitoring safety gates and guards is a Type 2 switch and is one of the smallest in its class.

The enclosure and cover are made from fiber glass-reinforced thermoplastic.

LEDs that indicate the status of the ASI slave and bus are integrated in the cover.

Protection class IP65 in accordance with IEC/EN 60529 is guaranteed.



#### M12-connection

**607.3200.006**  
ASI SKT

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#### Direct connection

**607.3200.029**  
ASI SKT D

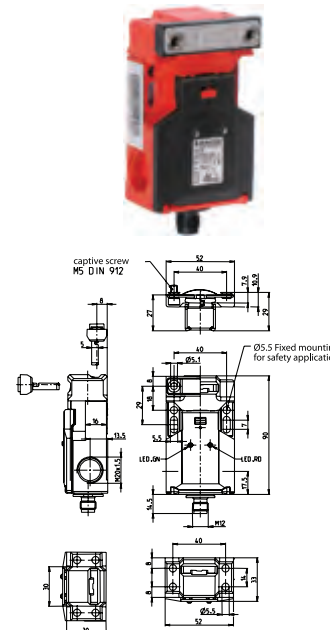
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### ASI SK

The ASI SK with separate actuator for monitoring safety gates and guards is a Type 2 switch.

The enclosure and cover are made from fiber glass-reinforced thermoplastic. LEDs that indicate the status of the ASI slave and bus are integrated in the cover. Protection class IP65 in accordance with IEC/EN 60529 is guaranteed.



#### M12-connection

**607.3205.028**  
ASI SK M

**6073205050**  
ASI SK F30 M

#### Direct connection

**607.3205.039**  
ASI SK M D

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## Intelligent Keyed Safety and Limit Switches

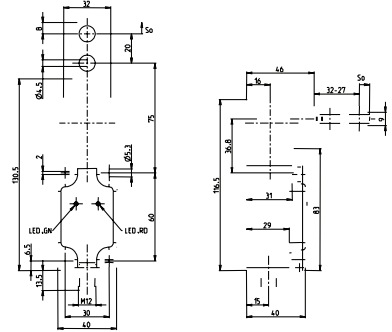
### ASI ENK

The ASI ENKK VTU with separate actuator is a very tough standard switch often used for monitoring safety gates and guards.

The enclosure and cover are made from fiber glass-reinforced thermoplastic.

LEDs that indicate the status of the ASI slave and bus are integrated in the cover.

Protection class IP65 in accordance with IEC/EN 60529 is guaranteed.

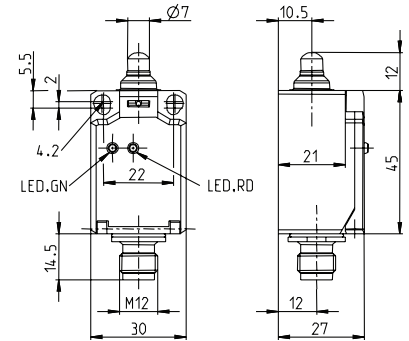


M12-connection	Direct connection
<b>607.3504.025</b> ASI ENK VTU	<b>607.3504.038</b> ASI ENK VTU D
-	-

### ASI Ti2

The Ti2 family with its extremely compact dimensions is the only ASI switch family in this class.

The captive snap-on cover contributes to the protection rating of IP65 in accordance with EN 60529, DIN VED 0470 T1.



M12-connection	Direct connection
<b>607.3401.018</b> ASI Ti2 w	<b>607.3401.033</b> ASI Ti2 W D
<b>607.3402.019</b> ASI Ti2 Riw	<b>607.3402.034</b> ASI Ti2 RIW D
<b>607.3403.020</b> ASI Ti2 Hw	<b>607.3403.035</b> ASI Ti2 HW D

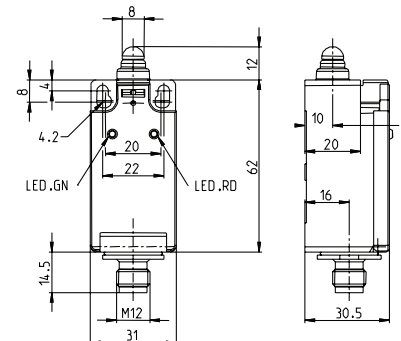
### ASI I88

The ASI I88 conforming to EN 50047 is a standard switch used in a wide range of applications.

The enclosure and cover are made from fiber glass-reinforced thermoplastic.

LEDs that indicate the status of the ASI slave and bus are integrated in the cover.

Protection class IP65 in accordance with IEC/EN 60529 is guaranteed.



M12-connection	Direct connection
<b>607.3301.015</b> ASI I88 w	<b>607.3301.030</b> ASI I88 W D
<b>607.3302.016</b> ASI I88 RiwK	<b>607.3302.031</b> ASI I88 RIWK D
<b>607.3303.017</b> ASI I88 Hw	<b>607.3303.032</b> ASI I88 HW D

Drawing dimensions in mm

## Intelligent Limit Switches and Connection Box

### ASI Bi2

The AS interface version of the ASI Bi2 switch is designed as a very compact unit with a low overall height and side connection.



**M12-connection**

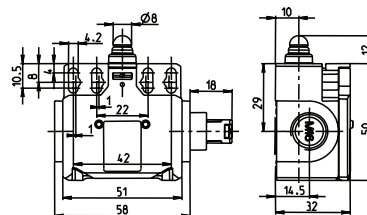
**607.3201.052**  
ASI Bi2 w

-
-

**Direct connection**

**607.3201.051**  
ASI Bi2 w D

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### ASI ENK

The ASI ENK conforming to EN 50041 is an extremely sturdy standard switch used in a wide range of applications. The enclosure and cover are made from fiber glass-reinforced thermoplastic. LEDs that indicate the status of the ASI slave and bus are integrated in the cover. Protection class IP65 in accordance with EN 60529, DIN VDE 0470 T1 is guaranteed.



**M12-connection**

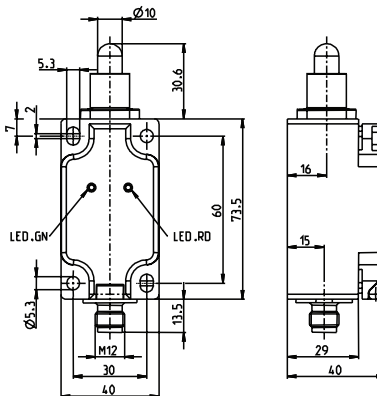
**607.3501.023**  
ASI ENK iw

<b>607.3502.024</b> ASI ENK Riw
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**Direct connection**

**607.3501.036**  
ASI ENK IW D

<b>607.3502.037</b> ASI ENK RIW D
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### ASI ANS

The standard connection box has an ASI address and integrates up to four non-safety sensors in the ASI system. The connection box is equipped with LEDs that indicate the status of the connected user.

**Connection box 6073201**

**607.3100.027**  
ASI CONNECTION BOX 4 IN

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Drawing dimensions in mm



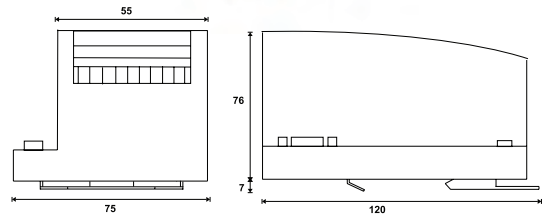
## ASi Masters and Power Supply

### ASI MST

The ASI Master is the “head” of the AS interface system. It organizes communication on the bus and makes available all data to the higher-level system via the gateway. The master shown here is equipped with a Profibus gateway. Gateways are available for following bus systems: Profinet, Ethernet, Powerlink, EtherCat, CanOpen, Devicenet, Modbus, Allen-Bradley ControlLogix

#### Master

**607.3100.001**  
ASI MST PROFIBUS

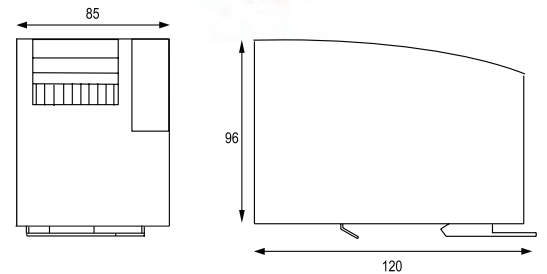


### ASI SMO

The second generation safety monitor is an emergency stop switching device that features two integrated and a further 14 external enable circuits. The second generation ASI safety monitor features a stainless steel enclosure and an LC display for showing slave addresses and error messages. The safety monitor can be used in applications up to performance level e and SIL 3. The safety application is created with the ASIMON program.

#### Safety monitor

**607.3100.004**  
ASI SMON B+W

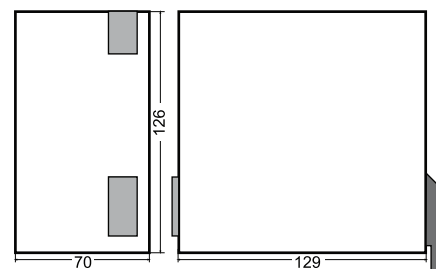


### ASI NT

The primary clocked power supply unit for AS interface supplies a 4 amp current. Besides supplying power, the power supply unit is also responsible for data decoupling with respect to the feed source and balancing the two AXI output lines with respect to machine earth.

#### Power supply unit

**607.3100.003**  
ASI NT 4A B+W



## ASi Hand Held Addressing Device and Software

### ASi HND

The ASi hand-held addressing device is a compact unit used for addressing ASi slaves (sensors, actuators and interface modules).

Electromechanical connection is made by the universal connection adapter.

ASi slaves can be addressed in accordance with ASi specifications 2.0, 2.1 and 3.0 with the ASi hand-held addressing device.

#### Hand-held addressing device

**607.3100.005**  
ASi HND PRG



### ASi PRO

The safety application of the safety monitor is created with the ASIMON software.

This program makes available a debug view for fast troubleshooting.

In addition, documentation of the safety application can be printed out.

It comes with a cable for connecting the safety monitor to a laptop.

#### Software

**607.3800.021**  
ASi PROG SW + KBL

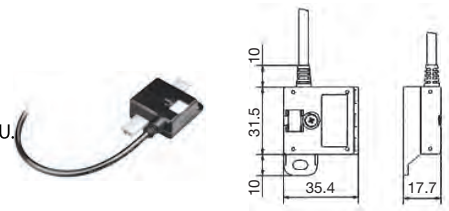


## ASi Cable and Connectors

**607.3900.040**  
ASI CABLE EPDM YELLOW



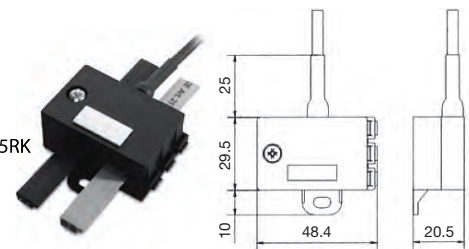
**607.3900.044**  
ASI COUPLER M. 0.3 RK U.  
M12 W



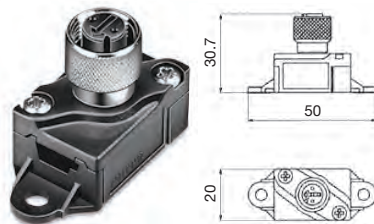
**607.3900.041**  
ASI CABLE EPDM BLACK



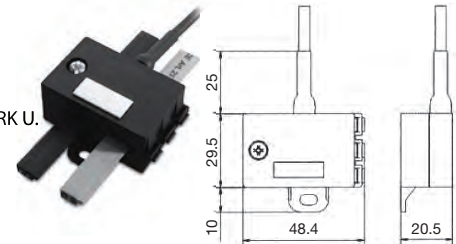
**607.3900.045**  
ASI COUPLER 2F M.0.5RK  
U.M12 G



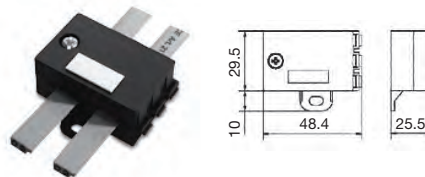
**607.3900.042**  
ASI COUPLING MODULE  
M12 SCREW



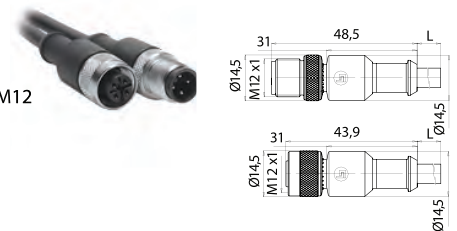
**607.3900.046**  
ASI COUPLER 2F M.0.5RK U.  
M12 W



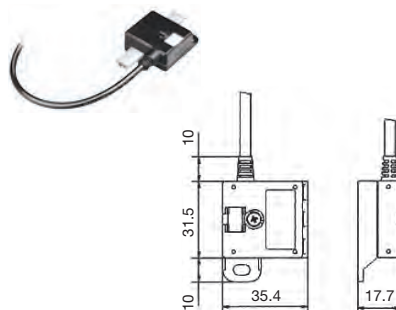
**607.3900.047**  
ASI CABLE LINK



**607.3900.048**  
ASI CONNECTING LEAD M12  
1M G/W



**607.3900.043**  
ASI COUPLER  
M. 0.3 RK U. M12 G



**607.3900.049**  
ASI CONNECTING LEAD M12  
1M G/W



Drawing dimensions in mm