



# Safety Sensor Eden AS-i

## Machine safety - Jokab Safety products

Power and productivity  
for a better world™



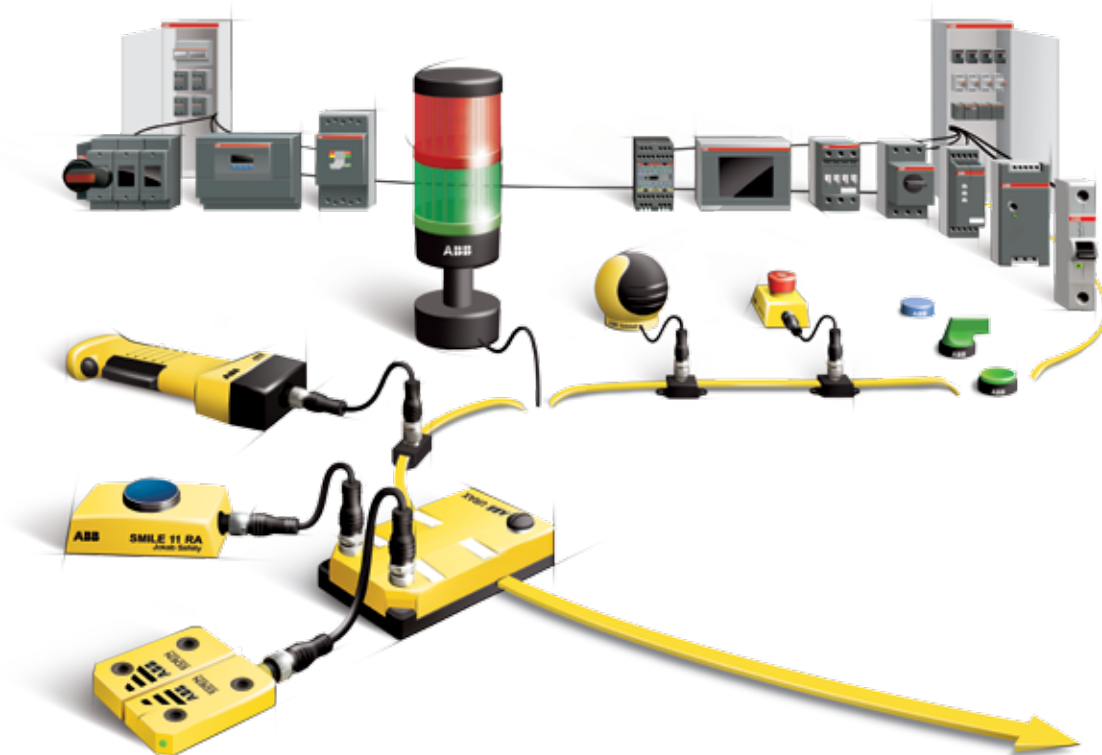
# We develop products and solutions for machine safety

The fact that the leading power and automation technology company, ABB, and a leader in machine safety, Jokab Safety, are joining forces means a lot more than just a new organisational chart. ABB has made a huge footprint in the industry - from power supply to the control of each individual motor - and has been delivering reliable solutions for decades that boost productivity in the industry. The acquisition of Jokab Safety now means that the last building block is in place. We can now offer our customers tailored, turnkey solutions where machine safety is an integral and value-enhancing component.

Since its inception in 1988, Jokab Safety has been adhering to the business concept of developing innovative products and solutions for machine safety. The company has supplied everything from individual safety components to fully installed protection systems for entire production lines, and works on a daily basis with the practical application of safety requirements in combination with production requirements. Jokab Safety is also represented on a variety of international

standards committees concerned with the safety of machinery, which means that we have added this very valuable experience and knowledge to our offering. Similarly, ABB has always been a pioneer and a representative for its business areas and a powerful voice in professional organisations and committees. All in all, this creates an enormous bank of knowledge and experience that we look forward to sharing with our customers.

Productivity and safety are not contradictory terms. On the contrary, safety solutions that are properly executed and adapted from the beginning will increase productivity. A partner that can deliver integrated and well thought out turnkey solutions enables a production-friendly safety environment. By building up and upgrading safety solutions in existing environments in a smart way, the mode of production will not need to be adapted to meet the requirements that safety sets. Instead, this allows a system that is manufacturing-friendly and that takes into account the business and its productivity objectives.



# Non-contact safety sensor – with integrated AS-i node Eden AS-i



## A non-contact safety sensor for the highest safety level

Eden AS-i is a non-contact safety sensor for use on interlocked gates, hatches etc. Eden AS-i consists of two complementary parts called Adam and Eva. The sensor is only activated if the gate or hatch is closed e.g. when Adam and Eva are within sensing distance. Eden AS-i is constantly communicating between the two parts and any failure will directly lead to a stop signal.

## A non-contact safety sensor for AS-i

Eden AS-i has an integrated AS-i node and is connected via an M12 connection directly to the AS-i cable.

Eden AS-i has a protective encapsulation that enables Eden AS-i to be used in harsh environments. Each Eden AS-i is individually coded which makes it secure against manipulation.

The advantages of safety within AS-i is that it is very easy to install since connection of the safety devices is just to the buss cable. The function of the safety devices is determined by the software program in the safety monitor/master. Each safety device (node) has its own address and a unique safety code.

It is simple to add, move and disconnect safety devices on the AS-i cable as well as to extend the AS-i cable. Traditional safety systems require new cable running from the electrical cabinet for each new protection. Connection with Eden AS-i is simple as all units are connected to the same cable.

## Approvals:

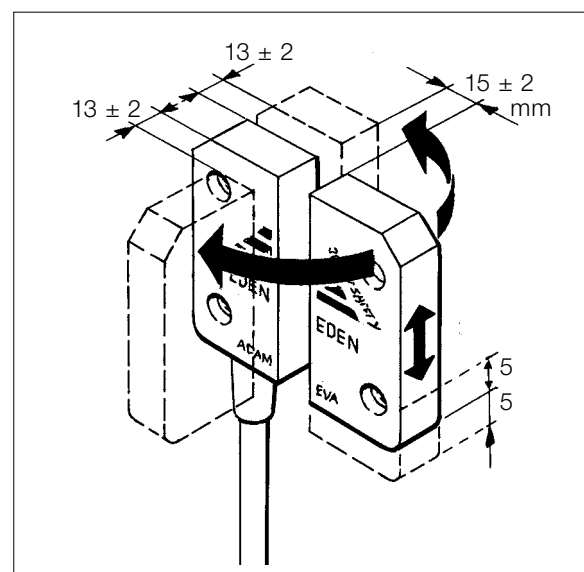
TÜV Nord CE

## Application:

Doors and hatches  
Position control  
Sector detection  
Slot detection

## Features:

Cat. 4/PL e according to EN ISO 13849-1 with a safety Master/Monitor  
Non contact detection 0-15 mm +/- 2 mm  
Versatile mounting, 360 degrees  
Protection class IP69K  
The signal passes through wood and plastic (not metal)  
Status information LED on the sensor  
Small hysteresis (1-2 mm)



Flexible mounting and the ability to operate at long distances.

### Eden AS-i to detect position

Adam and Eva can be used to ensure that a safe position is kept/reached. The safety sensor has contact if they are within 15 mm from each other.

### Eden AS-i is used for sector detection

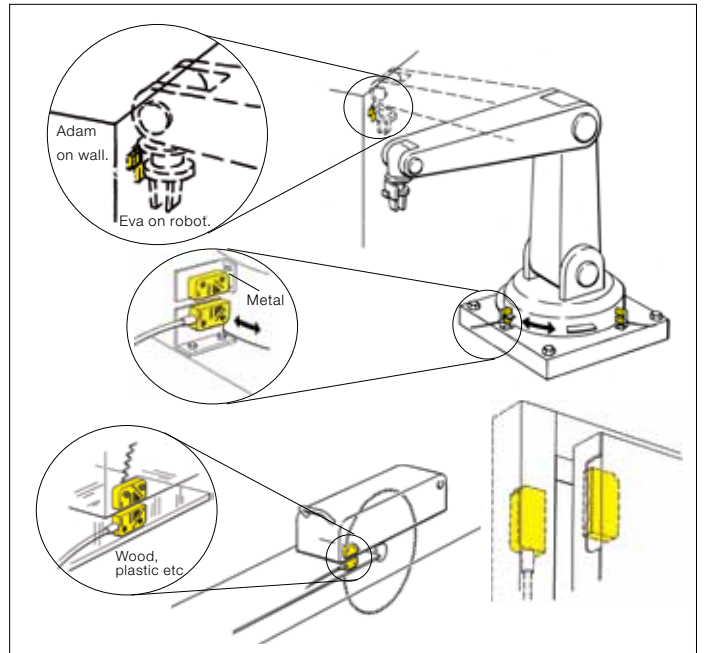
Additional Eden sensor(s) can be mounted on a machine to detect working place.

### Eden AS-i can communicate through wood and plastic

Wood, plastic and other non-metallic materials between Adam and Eva let the communication signal pass.

### Eden AS-i can be hidden in doors and hatches

Because of the small size, Eden can easily be hidden in frames or guards.



### Installation and maintenance for Eden AS-i

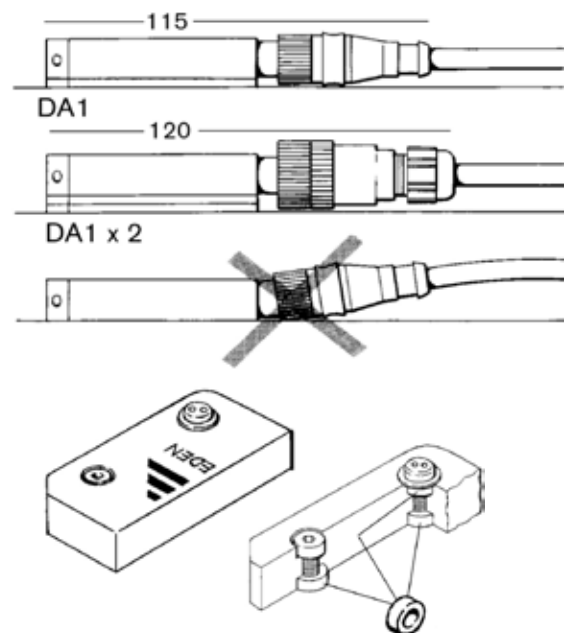
Eva can be turned in a number of different ways relative Adam. Depending on the cable connector used to connect Eden AS-i, different protection plates can be necessary in order to avoid damage to Adam. The protection plates (DA1) supplied with Adam M12-models connector are recommended for this, see figure below. Also, the mounting spacers supplied must be used in order to physically protect Eden AS-i from damage.

- Mounting with one protection plate (DA1) for Adam M12 using prewired moulded M12 connector
- Mounting with two protection plates (DA1) for Adam M12 using self assemble M12 connector.
- Wrong mounting without protection plate may cause permanent damage to sensor.

Sensing distance between Adam and Eva: 0-15 mm +/- 2 mm  
Minimum distance between two Eden AS-i pairs: 100 mm

### LED indication

The LED indication can be set to function automatically, but it can also be manually controlled through data bit settings with Pluto (our AS-i Safety Controller) or other AS-i Master.



The DA2 mounting spacer must be used in order to physically protect Eden AS-i from damage.

# Connection to the AS-i bus

## AS-i makes safety simple

Connection is simple as all units are connected to the same yellow AS-i cable/bus. This thereby minimises the risk of faulty connection. Each safety node has its own address and a unique safety code.

Eden AS-i has a built-in AS-i safety node and is supplied with 30 VDC from the AS-i bus.

Connection to the AS-i bus is through a flat cable connector to M12, making it possible to quickly and easily connect Eden AS-i to the AS-i cable.

Our Pluto is the most flexible AS-i Safety Controller on the market. Pluto can be used as Safety Master, Monitor or I/O and can control and monitor the safety of a machine at the same time.



### Manual LED indication

LED	Setting (hex)	Setting (binary)	Description
LED on Adam	1	0,0,0,1	LED lights red
	3	0,0,1,0	LED lights green
	All other	All other	LED OFF

### Automatic LED indication

LED	Indication	Description
LED on Adam	Green	Eva within sensing distance of Adam
	Green and/or Red (fast flash) or both lights at the same time	Eva within ~2 mm of maximum sensing distance
	Red	Eva not within sensing distance of Adam

### LED indication (independent of manual or automatic control)

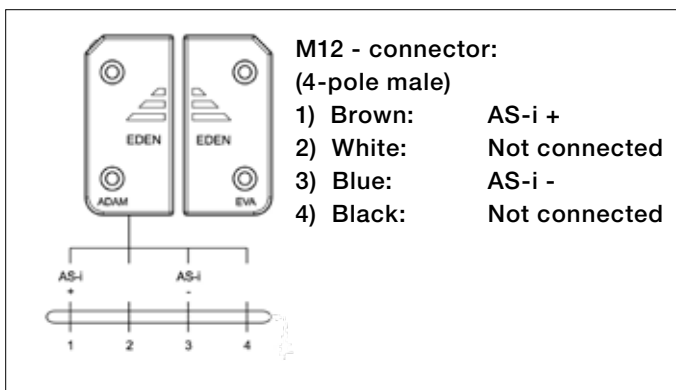
LED	Indication	Description
LED on Adam	Green-Red (flash)	No contact with AS-i master
	Red (flash)	Internal fault. Power cycle, replace if still present

### AS-i LED and Fault LED in combination

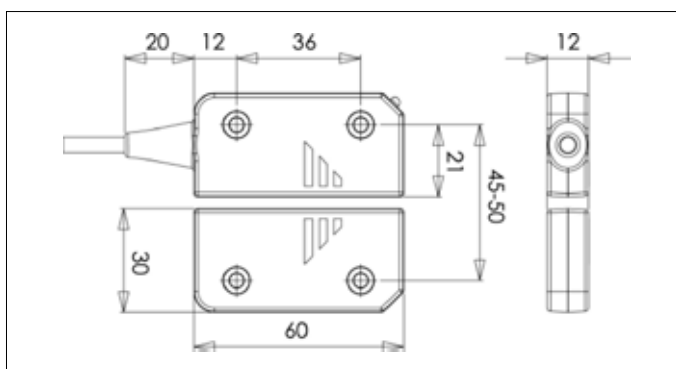
AS-i (green)	Fault (red)	Description
OFF	OFF	AS-i power missing
ON	OFF	Normal operation
ON	ON	No data exchange with master
Flash	ON	No data exchange because address = 0

## Technical data – Eden AS-i

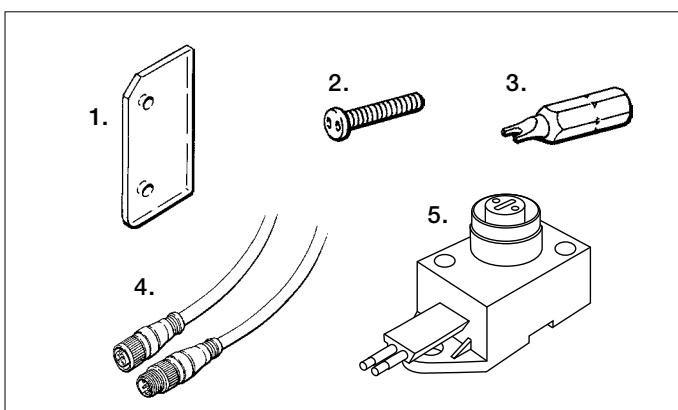
Supplier	ABB AB Jokab Safety, Sweden
Article number/Ordering data	
Adam AS-i with 4 DA2	2TLA020051R6000
Eva AS-i (5-pole M12-connector)	2TLA020051R8000
AS-i data:	
AS-i profile	S-7.B.E
Slaveaddress at delivery	0
Addressing via	M12-connector
Response time over AS-i bus	10 ms
Safety data - annual usage	
PFH <sub>D</sub>	
Proof test interval (life)	20 years
Power supply, Operating voltages	30 VDC, AS-i bus. Tolerance 26.5-31.6 VDC
Switching distance (target to target)	15 +/- 2 mm
Total current consumption	65 mA
Assured release distance (Sar)	45 mm
Assured operating distance (Sao)	7.5 mm
Enclosure protection	IP69K
Cable type	M12-connector 4-pole male (only pin-1 and pin-3 used)
Ambient temperature	Storage: -40...+85°C Operation: -25...+55°C
Weight	~150 g
Material	Housing: Polybutylene terephthalate (PBT) Moulding: Epoxy
Colour	Yellow, black text
Mounting bolts	SM4
EN ISO13849-1	Up to PL e, cat 4
EN62061	Up to SIL3
IEC/EN 61508-1...7	SIL3, PFH <sub>D</sub> : 9.11x 10 <sup>-10</sup>
Approved standards	European Machinery Directive 2006/42/EG EN ISO 12100-1:2003+A1:2009, EN ISO 12100-2:2003+A1:2009, EN 954-1:1996/EN ISO 13849-1:2008, EN 62061:2005, EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007, EN 60947-5-1:2003+A1:2009, EN 1088+A2:2008



Eden AS-i electrical connections



Dimensions



### Accessories:

1. Protection plate DA1: 2TLA020053R0000
2. Safety screws, SM4 x 20: 2TLA020053R4200
3. Safety screwdriver bit SBITS: 2TLA020053R5000.

### Accessories for connection to the AS-i bus

4. M12-C112 1 m cable, 5-pole, 0.34 mm<sup>2</sup>, M12 female + male: 2TLA020056R2000,
- M12-C312 3 m cable, 5-pole, 0.34 mm<sup>2</sup>, M12 female + male: 2TLA020056R2100

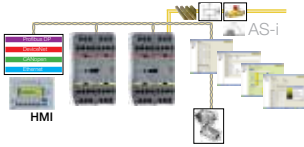
5. AS-i T-connector with M12, Flat cable connector to M12: 2TLA020073R0000

# Product family Jokab Safety



## Training & Advice

Practical application of standards and regulations, along with CE-labelling.



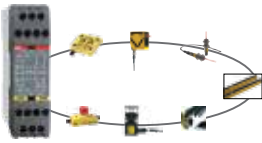
## Pluto Safety PLC

A unique All-Master safety PLC for dynamic and static safety circuits.



## Pluto AS-i

Programmable safety system AS-i where all units are connected to the same bus cable and the function of the unit is determined in the PLC program.



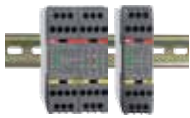
## Vital safety controller

Dynamic safety circuit for multiple protection according to the highest safety category.



## Tina adapter units

Transformation of static signals to dynamic safety signals, etc.



## Safety relays

The market's most flexible safety relays for different protection purposes and categories.



## Stopping time & machinery diagnosis

Used for stopping time measurement, annual maintenance and for trouble - shooting machinery.



## Light curtain/light beam/scanner

Complete range of light beams, light curtains and scanners.



## Sensors/switches/locks

Dynamic non-contact sensors, safety switches, magnetic switches and locks.



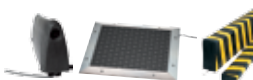
## Control devices

Ergonomic three-position control units two-hand control units and foot pedals.



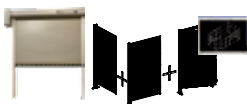
## Emergency stop devices

Emergency stop devices for dynamic and static safety circuits.



## Contact strips/Bumpers/Safety mats

Sensitive edges, bumpers and safety mats.



## Fencing systems/SafeCAD/Roller doors

A stable and flexible fencing system that is easy to install.

# Contact us

## **ABB AB**

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