ABB JOKAB SAFETY Products

Machine Safety Systems and Components Product overview

Safety relays

ABB JOKAB SAFETY **Safety Relays** offer the most flexibility of any safety relays on the market. Our universal safety relays offer various input options for use with many different safety devices and risk levels. In addition, our safety relays have detachable connector blocks for ease of installation and testing. Internally, our relays offer the highest safety level (Category 4 according to EN-954-1).

RT Series consists of universal relays that have the most common functions used in safety situations.

JSB Series consists of relays for two-hand devices dual input channel synchronization (0.5s - 1.5s) and also a small single channel relay for 12VDC.

Expansion relays are used for expanding the outputs of safety relays. Stop signals can be delayed and outputs are also provided for function indication.

Safety timers are used for time reset, time bypassing and inching.

Mechanical switches

Mkey Safety Interlock Switches are designed to provide detection for moving guards. They fit to the leading edge of sliding, hinge or lift off machine guards.

A variety of plastic, metal, stainless steel head and all stainless steel models combined with a selection of straight, angle, and flexible keys are available to meet all your interlock switch needs.

Mkey 8/9 Guard Series Locking switches provide a holding force of 2000N to keep guard doors closed until hazards have been removed. The high specification body has a high resistance to chemical and washdown solutions and the stainless steel head option provides a durable robust protection of the cam interlock.

Keys
- Flat
- Angled
- Flex

Non-contact switches

Sense Non-Contact Switches have a compact robust fitting suitable for all guard applications. With a wide 10mm-14mm sensing area, LED indication, and hygienic screw cover options they are suitable for Food Processing washdown applications.

Eden is a non-contact, non-magnetic sensor using dynamic signal transmission and offers Category 4 safety level. Eden (Adam/Eva) has bult-in diagnostics and maximum sensing distance of 15mm +/- 2mm. Up to 30 Eden can be connected together in the same circuit and be dynamically monitored by the Vital Safety Module.
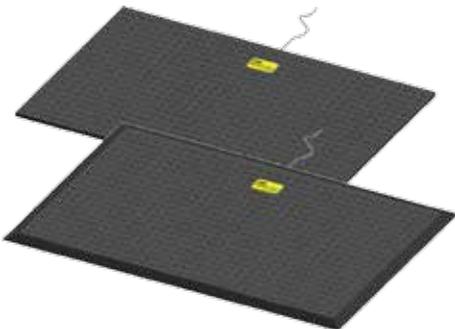
Eden E manages harsh environments — e.g. high-pressure wash-down and high and low temperatures (tested from +100°C to -70°C according to IP69K).
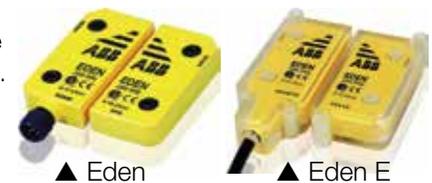
▲ Eden   ▲ Eden E

Safety mats and edges

The ABB JOKAB SAFETY contact **Safety Mat** is used for safeguarding sections in hazardous areas around machines, presses, robots and other types of active equipment.

Mats are available both with and without integrated trim. When connected to a suitable monitoring system stepping on the mat surface triggers a control signal to the stop circuit of the potentially hazardous motion. This fast contact occurs due to the area switch design on the inside of the mat.

Safety Contact **Edges** are used as protection against crushing injuries, for example, moving machine parts, and automatic doors.

Emergency stops

◀ EstrongZ

▼ Smile 11EA

ABB JOKAB SAFETY's heavy duty **EStrong Emergency Stops** provide robust emergency stop protection for exposed conveyors or machines. They feature stainless steel housing and optional 2 color LED's and button shroud versions with padlock holes for 'Lock Off' during maintenance.

ABB JOKAB SAFETY has also developed new small and robust **Smile** and **Inca** E-Stops. The size and the centered mounting holes make Smile easy to install, especially on aluminum extrusions like those used in our Quick-Guard Fencing Systems. Inca is designed for installation in a 22.5mm hole enclosure. LED indication of E-Stop status is also provided— green for OK, red for STOP and blinking if the circuit has been opened by another series connected sensor.

Inca 1A ▶

Rope pull switches

◀ Linestrong 1

Linestrong 2Z ▶

ABB JOKAB SAFETY **Line Strong** switches are designed to be mounted on machines and sections of conveyors which cannot be protected by guards. In contrast to traditional mushroom head type Emergency Stop buttons, Safety Rope Pull Switches can initiate the emergency command from any point along the installed rope length and provide robust emergency stop rope pull protection for exposed conveyors or machines.

Rope Pull Kit ▶
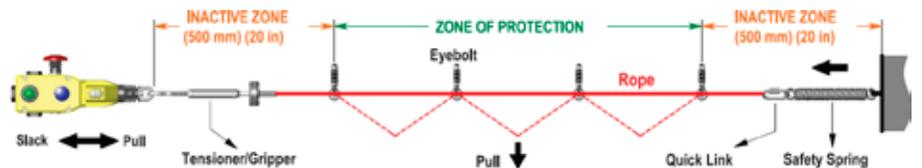
Light curtains & grids

Built-in muting, blanking and pre-reset ▼

Focus II is a light curtain or grid which has a vast range of practical applications. It is cost-effective because all functions are integrated within the basic Focus unit. As standard on all Focus II units, there are inputs for muting (partial or full), monitoring of muting-lamp, as well as manually supervised or automatic reset with pre-reset capabilities. There is also "floating blanking" on the light curtain versions. Focus II is available in 14mm, 30mm or 2 beam, 3 beam and 4 beam configurations.

Focus II units are simple to install with a minimum of brackets and connection cables.

▲ FMC/FMI modules simplify wiring

Light beams

◀ Spot 35

Spot 10 ▶

The **Spot Light Beam** consists of a separate transmitter and receiver that allows for individually selected positioning. Spot is available in two versions:
• **Spot 10** for distances up to 10m
• **Spot 35** for distances up to 35m.

Spot combined with Vital or Pluto fulfills the requirements for Category 4 according to EN-954-1 and type 4 according to EN 61496.

Six pairs of light beams can be connected in series to a Vital Controller or one pair to a single input on the Pluto Safety PLC.

The light beam system can be installed at different heights and be angled around equipment with our range of brackets and mirrors. There are also many solutions for muting of the light beam during material transport.

Two-hand control devices

◀ JSTS30 Floor Stand with JSTD25B Two-Hand Station with E-Stop

▼ JSTD1-A Safeball

Safeball™ is a unique new control approach to the design of one and two-hand control devices. The device meets the highest safety standard and, used in conjunction with the JSBR4 safety relay, meets category IIIc according to EN574 safety Category 4. A stop signal is given by the JSBR4 as soon as one or both of the buttons on a Safeball are released. A safety relay or Pluto Safety PLC will also check that all four buttons have been released and that they are activated within 0.5 seconds of each other. In addition, no top shroud protection is required.

The ergonomic design is suitable for all hand sizes and provides varied gripping possibilities.

ABB JOKAB SAFETY has also developed and included in our range of products a traditional two-hand control device, the JSTD20 with optional floor mount.

◀ JSTD25A Two-Hand Station

3-position enabling devices

◀ JSHD4

▼ 3 Position Switches

ABB JOKAB SAFETY's ergonomically designed **3-Position Enabling Device** is used for personnel safety for fault finding, testing or set up. Holding the large button on the JSHD4 device in the ergonomic mid-point position provides 'run' output signals. If the button is pressed fully down or released a 'stop' signal is given. The two JSHD2B 3-Position Enabling buttons used in the JSHD4 device are also used in programming panels of both new and existing robots.

On the front and top of the JSHD4 are buttons for auxiliary operations, e.g. start, stop, up and down. The JSHD4 is also available for EX environmental applications.

▲ JSHD4H2

Magne

▲ Magne 1A

▼ Magne 2A with built-in Eden

ABB JOKAB SAFETY has introduced a new electrical magnet, **Magne**, developed for process control safety applications when used in combination with the Eden door monitoring switch.

Included in the Magne is an information output contact which indicates that the holding force has reached the level needed. This allows the ability to supervise that the Magne is mounted correctly and that there is nothing between the magnet and the holding plate.

A range of different holding forces can be achieved by connecting voltages between 0V and 30V to the magnet. At 0V the magnetic field is completely gone and there is no residual magnetism.

Magne 1A with installation kit (JSM D21B) and Handle (JSM D2) fitted on profile ▶


Stop time analyzer

The **Smart Analyzer** can measure key safety critical parameters, as well as other machine conditions, easily and accurately. Machine stopping time is a crucial factor in the determination of required safety distances for installation of light curtains and grids, safety mats, light beams, etc. When a light curtain is 'interrupted' the machine must come to a complete stop before a person can reach the hazardous area.

Smart can determine the required safety distances for the installation of many electronics safety devices.

Graphic presentation of measurements makes it easy to analyze characteristics and movement. Smart gives stop time parameters for safety design, calculates minimum safety distance allowed, and shows how the stop distance can be optimized. Electrical reaction time and mechanical/hydraulic breaking can be identified and analyzed as well.

Fence guarding
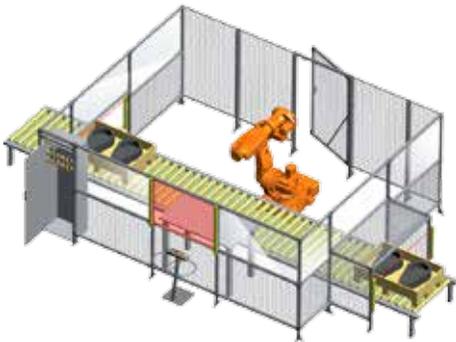
Quick-Guard® is an exclusive modular fencing system utilizing aluminum profiles, patented brackets and mesh, solid or noise reduction panels. Thanks to our patented screw-lock system, we supply all brackets pre-mounted with fixing screws and nuts.

Quick-Guard E is based upon a new patent pending 'net-lock' which easily locks the mesh against a fence post. No top or bottom horizontal members are needed. The mesh can easily be cut to different heights and it is easy to make openings where desired. All mesh edges are covered with a specially designed 'u-profile'.

Our **SafeCAD**® design program, which is based on AutoCad®, makes it simple to build custom fencing solutions.

As input, a simple sketch of the required guarding system is used. Position of doors and hatches, as well as choice of infill panels is entered. The program automatically generates 3-D assembly drawings along with component and cutting lists, shipping weight and assembly time.

Vital

Vital is the heart of a solution which makes it possible to install/connect many different types of safety devices in the same safety circuit and still achieve PL e according to EN ISO 13849-1 Safety Category 4.

The Vital module is based upon a dynamic single channel concept as opposed to conventional dual channel safety relays. Up to 30 dynamic sensors can be connected directly in the safety circuit and be supervised by only one Vital module. The Vital therefore replaces several safety relays. Safety components with output contacts can be connected to the Vital via low cost Tina adapters.

The Tina devices adapt safety sensors with mechanical contacts, such as emergency stops, switches and light grids/curtains with dual transistor outputs to the dynamic safety circuit in Vital and Pluto.

The Vital also has automatically or manually supervised reset selection, dual safety outputs, and an information output for reset indication and status information for PLCs.
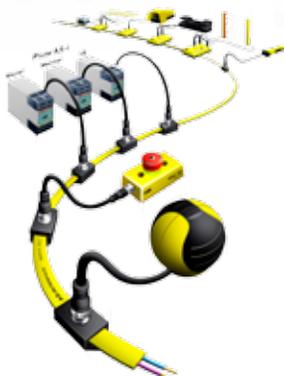
Pluto

▼ Pluto B20   ▼ Gate-D2

Pluto is an "All-Supervisor" Safety PLC concept that simplifies the design of safety systems and achieves the highest safety (Category 4) according to EN 954-1/EN ISO 13849-1 and SIL 3 according to IEC/EN 61508. The key difference between Pluto and conventional Safety PLCs is that there is no "Supervisor-Subordinate" relationship between the control units connected to the Safe Bus. All Plutos are "supervisor" units and can see each others' inputs and outputs. Using this concept, each Pluto can make decisions about its own immediate safety environment.

This concept enables simple communication and easy alterations of the safety system. With the use of a "gateway" device, information from a Pluto network can be transferred to other bus systems thereby creating even larger systems.

Pluto Manager is a freeware for fast, easy and safe programming of the PLC program for Pluto. The programming language used is ladder, which is supplemented with TÜV-approved function blocks for many common features.

AS-i

The **Pluto AS-i** system is distinguished by its special yellow profile cable. The cable connects all sensors, transducers and actuators on the network to a supervisor system. The component parts of a system can include both non-safe and safe products. This means that both operational and safety related products can be mixed in a network. The bus system drives a Supervisor-Subordinate (node) configuration where each I/O module corresponds to a common supervisor.
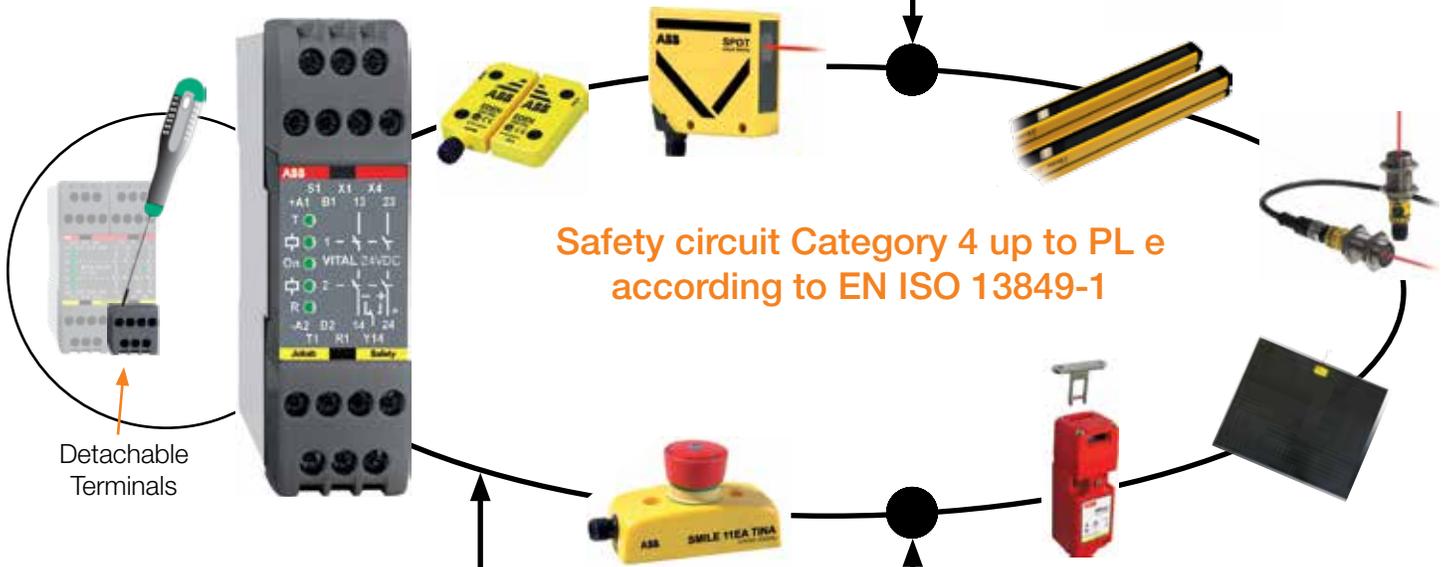
Some of our products can ordered with integrated AS-i node. These include the **Safeball AS-i, Smile AS-i and Eden AS-i**. They are connected to the network with a M12 connection directly to the yellow AS-i cable via a screw terminal which is clamped to the cable.

Our Safety Node **URAX** allows connection of safety sensors and non-safe products to the AS-i system while maintaining the highest possible level of safety.

The Non-Safe **FLEX** allows connection of non-safe devices such as light towers or keypads to the AS-i system.

Vital safety dynamic pulse technology

Vital is a safety controller with a dynamic safety circuit that can monitor up to 30 sensors, such as Eden, in accordance with the highest safety level. Vital has selectable manual or automatic resetting and dual outputs.

Active safety sensors for dynamic safety circuits

Detachable Terminals

Safety circuit Category 4 up to PL e according to EN ISO 13849-1

Dynamic safety
Dynamic "twinned" safety signal that tests a sensor, for example, 200 times per second.

0V 24V

Tina units that convert static/OSSD to dynamic signals
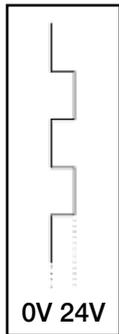
LED Indication
Each active sensor and Tina unit has LEDs that indicate OK (green), broken safety circuit (red) or flashing if the loop has been broken by another, earlier, sensor.

Sensors with static or OSSD outputs that are connected via Tina units
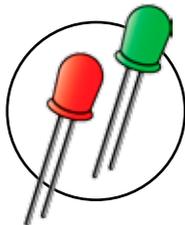
# Pluto Safety PLC (Programmable Logic Controller)

Networked Pluto

Pluto is an all-master system in which the inputs and other information are shared via the databus. Several safety sensors can be connected to one input while still achieving the highest level of safety. There are also combined inputs and outputs that can be used, for example, for lamp pushbuttons where the input and output functions are used simultaneously. Pluto has inputs for all safety devices on the market, and the Pluto Manager software selects how each input shall respond. Pluto ASi also enables you to integrate ASi safety networks with conventional safety devices while maintaining all the benefits of the Pluto system.

Pluto models with a safety bus control and monitor safety for dispersed systems—large systems, as well as small systems.

20/46 I/O

| Profibus DP |
| DeviceNet |
| CANopen |
| Profinet Ethernet/IP Modbus TCP |
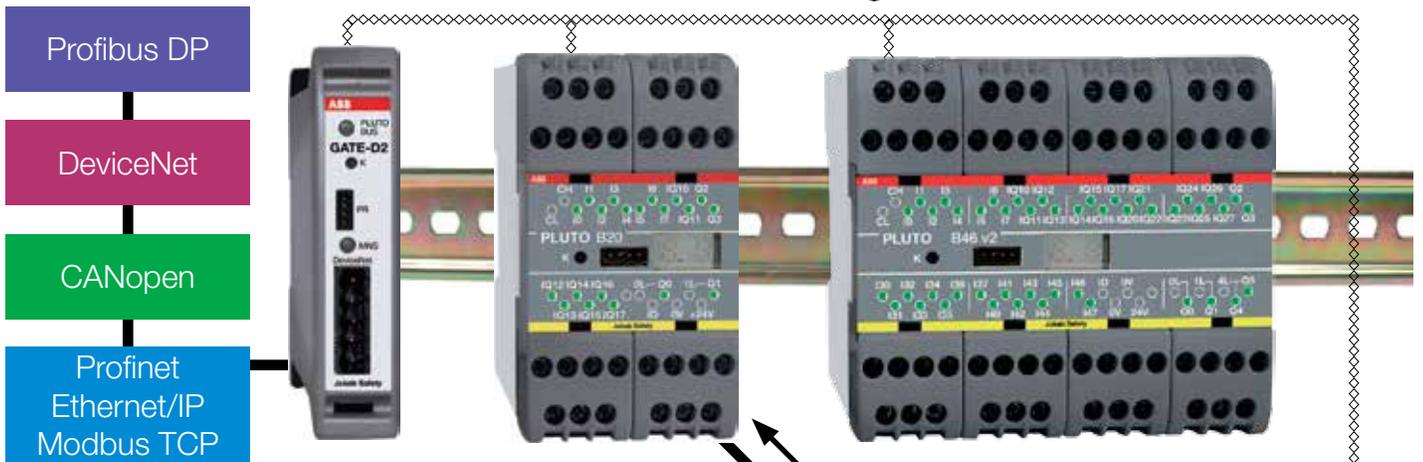
Gateway
For two-way bus communication between Pluto and other control systems.

HMI
A HMI-terminal is easy to connect to one or more Plutos through the programming port.

Safety encoders
Rotational absolute encoders can be used for safe position determination of equipment.

Pluto manager
Programming is performed using ladder or Boolean algebra with timers, auxiliary memory, registers, sequential programming and TUV-approved function blocks.

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