






Introduction and overview

Selection guide

The safety controllers from ABB can monitor anything from a single safety function to complete manufacturing lines.

	Pluto	Vital	Sentry
Image			
Type	Programmable safety controller	Safety controller	Safety relay
Description	A cost-effective, powerful and compact programmable safety controller for all types of safety applications.	A configurable safety controller that can monitor all safety devices on smaller machines.	Powerful and easy-to-install safety relays suitable for all common types of safety devices.
Application(s)	Monitoring of multiple safety devices and several safety functions, as well as control of machines and/or processes. Many I/Os and programmable logic.	Monitoring multiple safety devices with all the advantages of the DYNlink system.	Monitoring safety devices with one safety function, as well as expansion of safety outputs, with or without time delay.
Compatible safety devices	All types of conventional safety devices and DYNlink devices	DYNlink devices	All types of conventional safety devices
Advantages	<ul style="list-style-type: none"> - Easy-to-use while still allowing advanced programming - Free software - Easy system modification - Gateway communication with all main fieldbuses 	<ul style="list-style-type: none"> - Monitor up to 30 sensors in series maintaining Cat. 4/PL e - No programming 	<ul style="list-style-type: none"> - Easy and fast to install with push-in terminals - Universal models for all common applications - Extensive status information - Advanced timer functions - Multireset of up to 10 safety relays

Safety relay

Sentry

The Sentry safety relays are powerful and easy to use safety relays, suitable for all common types of safety applications.

The Sentry series contains basic models for simple applications and easy output expansion, as well as highly flexible models with extremely accurate timer functions.

Sentry safety relays are used in both simple and more advanced safety solutions when safety devices need to be monitored according to the requirements of functional safety standards.



Continuous operation

LEDs and display

LEDs in 3 colours allow for more status messages and simplify troubleshooting. Models with display offer preset configurations and extensive fault information.

Advanced timer functions

Timer functions with an accuracy of $\pm 1\%$ minimize unnecessary downtime.

Multi-reset

The multi-reset function enables reset of up to 10 Sentry safety relays using just one reset button.



Speed up your projects

Twice as fast to install

Push-in terminals are twice as fast compared to regular spring loaded connectors.

Handles ferruled and rigid cables

Both ferruled and rigid cables are easy to just push into the push-in terminals by hand.

No tools required for installation

No tools are required for connecting a cable in the push-in terminals. Just use the cable to push into the opening.



Easy to install

Detachable terminal blocks

Detachable terminal blocks speed up connection and replacement.

Switch for reset selection

Manual or automatic reset easily selectable by switch.

Powerful outputs

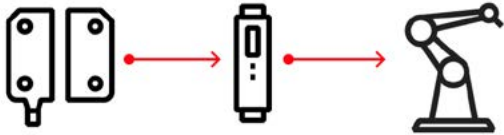
Powerful outputs allow to drive larger contactors and simplify installation by saving the use of an intermediary contactor.

Applications

Sentry

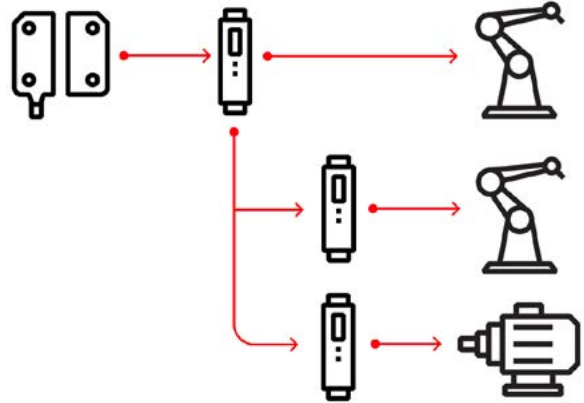
Monitoring of safety devices

Sentry safety relays make it easy to reach the required level of safety when monitoring safety devices like emergency stop buttons, door switches, light guards, etc.



Expansion of safety outputs

Sentry expansion modules are used to increase the number of safety outputs of a safety control module in order to control more machinery.



Features

Sentry

Timer functions with an accuracy of $\pm 1\%$

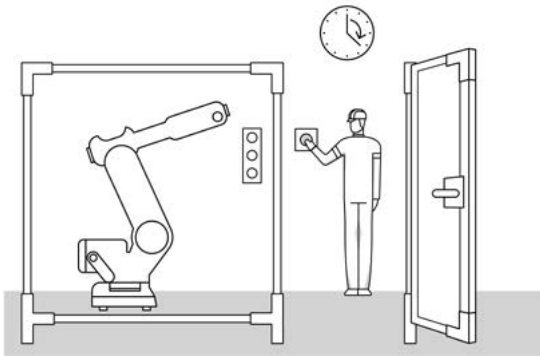
Several timer functions are available: On/Off-delay, time bypass and time reset.

On/Off-delay are used to postpone the activation/deactivation of the safety outputs with a preset time delay. This is used in e.g. Category 1 stops.

Time bypass activates the safety outputs for a maximum predefined time when the safety inputs are closed. Inching is an example of application.

Time reset activates the safety outputs for a maximum predefined time when the safety inputs are opened. Pre-reset is an example of application.

An accuracy of $\pm 1\%$ allows a very precise time to be set in order to increase safety and minimize unnecessary downtime.



Push-in terminals

All models are available with push-in terminals, enabling a fast and tool-free installation.

Multi-reset

The multi-reset function enables reset of up to 10 Sentry safety relays using just one reset light-button. This simplifies connection, minimizes cabling and unnecessary downtime. The multi-reset function is available for all +24 VDC Sentry models offering manual reset.

Light-button function

The light-button function is used for the multi-reset function, but can also be used for a standard reset button. The function of the LED in the light-button is the following:
on - at least one input is not accepted
flashing - all inputs are accepted, reset possible
off - all inputs accepted, reset performed, outputs active

Note: if an input is accepted it means that the door is closed, the light curtain is not interrupted, etc.



Configurable models with display

The models with display are configurable and the user can choose between preset configurations and a custom configuration that can be protected by password.

Faster troubleshooting with display

The display minimizes troubleshooting by giving extensive information about internal faults, I/O faults, system faults, function faults and a log of the last 10 errors.



Switch for selection of the reset function

All models can be used in automatic reset and some models allow to choose manual reset, either by switch or by configuration, which simplifies connection. In order to prevent mistakes, it is not possible to change reset function during operation by just flipping the switch.



Powerful outputs

The outputs have a switching capacity of up to 6A DC-13. This allows Sentry to drive larger contactors and saves the use of an intermediary contactor.

Delayed outputs

Some Sentry models have delayed outputs in order to e.g. give a machine time to apply breaking force before power is disconnected.

For models with 2 NO + 2 NO outputs, it is only the second pair of NO outputs that is delayed.

For models with 3 NO + 1 NC, all outputs are delayed.

Single function or universal models

Sentry **SSR** models are single function safety relays designed for a specific application such as 1 and 2 channel devices, OSSD devices or two-hand devices.

Sentry **USR** models are universal safety relays. They are capable of handling most types of applications and safety devices, i.e. 1 and 2 channel devices, OSSD-devices, two-hand devices and contact mats/bumpers/edges. This means that only one type of relay is necessary as a spare, which reduces stock and saves warehouse space.

Ordering information

Sentry



BSR10



SSR32



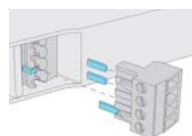
USR10



S30A



S30C



S30B

Ordering details

Expansion	Safety devices	Test/Reset	Safety relay outputs	Timer function	Feature	Power supply	Type	Order code
Expansion of safety controller outputs	1 channel 2 channels with equivalent contacts 2 channels with antivalent contacts OSSD outputs / PNP outputs Contact mats, bumpers and safety edges ^{c)} Two-hand devices Manual reset (all models have auto reset) Start/Test 3 NO + 1 NC 4 NO 2 NO + 2 delayed/delayable NO 4 NO + 1 NC Off-delay 0.5 s Off-delay 1.5 s Advanced timer functions 0 – 999 s ^{d)} Configurable with display					85-265 VAC / 120-375 VDC +24 VDC	P=push-in terminals	
a)	• b)	•	•			•	BSR10 BSR10P	2TLA010040R0000 2TLA010040R0001
a)	• b)	•	•			•	BSR11 BSR11P	2TLA010040R0200 2TLA010040R0201
a)				•		•	BSR23 ^{e)} BSR23P ^{e)}	2TLA010041R0600 2TLA010041R0601
•	• • •	•	•			•	SSR10 SSR10P	2TLA010050R0000 2TLA010050R0001
•	•	•	•			•	SSR10M SSR10MP	2TLA010050R0100 2TLA010050R0101
		•	•			•	SSR20 SSR20P	2TLA010051R0000 2TLA010051R0001
		•	•			•	SSR20M SSR20MP	2TLA010051R0100 2TLA010051R0101
	• • •	•	•	•		•	SSR32 SSR32P	2TLA010052R0400 2TLA010052R0401
	• • •	•	•		•	•	SSR42 SSR42P	2TLA010053R0400 2TLA010053R0401
•	• • •		•		• • • •	•	TSR10 TSR10P	2TLA010060R0000 2TLA010060R0001
•	• • •		•		• •	•	TSR20 TSR20P	2TLA010061R0000 2TLA010061R0001
•	•		•		• •	•	TSR20M TSR20MP	2TLA010061R0100 2TLA010061R0101
	• • • • • •	•	•		• • • •	•	USR10 USR10P	2TLA010070R0000 2TLA010070R0001
	• • • • • •	•	•		• • • •	•	USR22 USR22P	2TLA010070R0400 2TLA010070R0401

a) These models can also be used for expansion of Pluto safe transistor outputs (-24 VDC)

b) No monitoring of two-channel fault, i.e. max Category 3 without fault exclusion.

c) The safety relay detects a short-circuit, not a change in resistance.

d) Off-delay, On-delay, Time bypass or Time reset.

e) BSR23 must be monitored by another device in order to reach higher than Category 1/PL c according to EN ISO 13849-1, for example a safety relay, a safety PLC or an Orion light guard (EDM function).

Accessories

Description	Type	Order code
Screw terminal block for Sentry safety relays. One piece.	S30A	2TLA010099R0000
Push-in terminal block for Sentry safety relays. One piece.	S30C	2TLA010099R0001
Coding kit for terminal blocks. One kit for one Sentry relay.	S30B	2TLA010099R0100

Technical data

Sentry

Technical data

Approvals



Conformity

CE

2006/42/EC - Machinery

2014/30/EU - EMC

2011/65/EU - RoHS

EN ISO 12100:2010, EN ISO 13849-1:2015, EN 62061:2005+A2:2015, EN 60204-1:2006+A1:2009, EN 60664-1:2007, EN 61000-6-2:2005, EN 61000-6-4:2007, EN 61508:2010

Functional safety data

BSR10

BSR11, BSR23

SSR10, SSR10M, SSR20,
SSR20M, TSR10, TSR20,
TSR20M, USR10

SSR32, SSR42, USR22

EN/IEC 61508:2010

SIL3,
PFH_D = 3.0 x 10⁻⁹

SIL3,
PFH_D = 4.1 x 10⁻⁹

SIL3,
PFH_D = 4.9 x 10⁻⁹

SIL3,
PFH_D = 9.3 x 10⁻⁹

EN/IEC 62061:2005+A1:2013

SILCL3,
PFH_D = 3.1 x 10⁻⁹

SILCL3,
PFH_D = 4.1 x 10⁻⁹

SILCL3,
PFH_D = 4.9 x 10⁻⁹

SILCL3,
PFH_D = 3.9 x 10⁻⁹

EN ISO 13849-1:2008

PL e, Cat. 4,
PFH_D = 3.1 x 10⁻⁹

PL e, Cat. 4,
PFH_D = 4.1 x 10⁻⁹

PL e, Cat. 4,
PFH_D = 4.9 x 10⁻⁹

PL e, Cat. 4,
PFH_D = 3.9 x 10⁻⁹

Note! The relays must be cycled at least once a year.

Electrical data

Operating voltage

+24 VDC (19.2-27.6 VDC) PELV / SELV

Mains models: 85-265 VAC (50 / 60 Hz) or 120-375 VDC

Response time at deactivation

20 ms

Maximum switching capacity

DC13, DC1

Up to 6 A (except relays with 2 NO + 2 NO outputs that switch 3 A)

AC15, AC1

Up to 5 A (except relays with 2 NO + 2 NO outputs that switch 3 A)

Mechanical data

Operating temperature

BSR10, BSR11, BSR23, SSR10M, SSR20M, TSR20M

-25 °C to 55 °C

SSR10, SSR20, SSR32, SSR42, TSR10, TSR20, USR10, USR22

-25 °C to 65 °C

Humidity range

10% ... 90%

Protection class

IP20 (enclosure/electrical cabinet must have at least an IP54)

Mounting

35 mm DIN rail (DIN 50022)

Minimum space between relays in the enclosure

0 mm (except for BSR23 which needs 5 mm distance)

More information

For more information, e.g. the complete technical information, see product manuals:

<https://library.abb.com/>

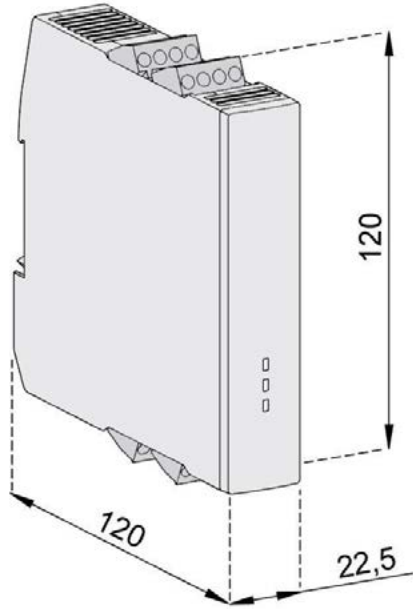
Connection diagrams

For Sentry connection diagrams please see <https://library.abb.com/>

Dimension drawing

Sentry

Dimension drawing



All dimensions in mm