

Operating Instructions

SS2-00VA000R4

Safety Analysis Module for Safety Through-Beam Sensor



EN



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1 General

1.1 Information Concerning these Instructions

- These instructions make it possible to use the product safely and efficiently.
- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- Local accident prevention regulations and national work safety regulations must be complied with as well.
- The product is subject to further technical development, and thus the information contained in these operating instructions may also be subject to change. The current version can be found at www.wenglor.com in the product's separate download area.



INFORMATION

The operating instructions must be read carefully before using the product and must be kept on hand for later reference.

1.2 Explanation of Symbols

- Safety precautions and warnings are emphasized by means of symbols and signal words.
- Safe use of the product is only possible if these safety precautions and warnings are adhered to.

The safety precautions and warnings are laid out in accordance with the following principle:

SIGNAL WORD

Type and source of danger!

Possible consequences in the event that the hazard is disregarded.

→ Measures for averting the hazard.

The meanings of the signal words, as well as the scope of the associated hazards, are listed below:



DANGER

This signal word indicates a hazard with a high degree of risk which, if not avoided, results in death or severe injury.



WARNING

This signal word indicates a hazard with a medium degree of risk which, if not avoided, may result in death or severe injury.



CAUTION

This signal word indicates a hazard with a low degree of risk which, if not avoided, may result in minor or moderate injury.



NOTICE

This signal word draws attention to a potentially hazardous situation which, if not avoided, may result in property damage.



INFORMATION

Information draws attention to useful tips and suggestions, as well as information on efficient, error-free use.

1.3 Limitation of Liability

- The product has been developed in consideration of the current state-of-the-art technology, as well as applicable standards and guidelines. Subject to change without notice.
- A valid declaration of conformity can be accessed at www.wenglor.com in the product's separate download area.
- wenglor sensoric elektronische Geräte GmbH (hereinafter referred to as "wenglor") excludes all liability in the event of:
 - Non-compliance with the instructions
 - Use of the product for purposes other than those intended.
 - Use by untrained personnel.
 - Use of unapproved spare parts.
 - Unapproved modification of products.
- These operating instructions do not include any guarantees from wenglor with regard to the described procedures or specific product characteristics.
- wenglor assumes no liability for printing errors or other inaccuracies contained in these operating instructions unless wenglor was verifiably aware of such errors at the point in time at which the operating instructions were prepared.

1.4 Copyrights

- The contents of these instructions are protected by copyright law.
- All rights are reserved by wenglor.
- Commercial reproduction or any other commercial use of the provided content and information, in particular graphics and images, is not permitted without previous written consent from wenglor.

2 For Your Safety

2.1 Use for Intended Purpose

The safety analysis module for safety through-beam sensors is part of a design-approved, contactless safety device (ESPE) in accordance with EN 61496-1. It's a type 2 safety device in per EN 61496-1. The TÜV-certified analysis module can be used with suitable through-beam sensors up to performance level c in accordance with EN ISO 13849-1.

This Product Can Be Used in the Following Industry Sectors:

- Special-purpose mechanical engineering
- Heavy mechanical engineering
- Logistics
- Automotive industry
- Food industry
- Packaging industry
- Pharmaceuticals industry
- Plastics industry
- Woodworking industry
- Consumer goods industry
- Paper industry
- Electronics industry
- Glass industry
- Steel industry
- Aviation industry
- Chemicals industry
- Alternative energies
- Raw materials extraction

2.2 Use for Other than the Intended Purpose

- The product is not suitable for use in potentially explosive atmospheres.
- The product may be used only with accessories supplied or approved by wenglor, or in combination with approved products. A list of approved accessories and combination products can be found at www.wenglor.com on the product detail page.



DANGER

Risk of personal injury or property damage in case of use for other than the intended purpose!

Use for other than the intended purpose may lead to hazardous situations.

→ Observe instructions regarding use for intended purpose.

2.3 Personnel Qualifications

- Suitable technical training is a prerequisite.
- In-house electronics training is required.
- Trained personnel who use the product must have (permanent) access to the operating instructions.



DANGER

Risk of personal injury or property damage in case of incorrect initial start-up and maintenance!

Personal injury and damage to equipment may occur.

→ Adequate training and qualification of personnel

2.4 Modification of Products



DANGER

Risk of personal injury or property damage if the product is modified!

Personal injury and damage to equipment may occur. Noncompliance may result in loss of the CE and/or UKCA mark and voiding of the warranty.

→ Modification of the product is not permitted

2.5 General Safety Precautions



INFORMATION

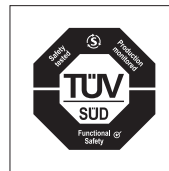
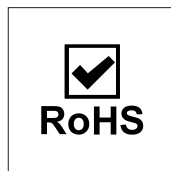
These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.

In the event of possible changes, the current version of the operating instructions can be found at www.wenglor.com in the product's separate download area.

Read the operating instructions carefully before using the product.

Protect the sensor against contamination and mechanical influences.

2.6 Approvals and protection classes



3 Technical Data

3.1 General data



NOTICE

The safety analysis module is suitable for safety applications with the SL2-00Nx000H2 or S1Nx002 safety through-beam sensors. The power level according to EN ISO 13849-1 may only be determined in conjunction with the SL2-00Nx000H2 or S1Nx002 safety through-beam sensors.

Technical data	
Safety category (EN ISO 13849-1)	2
Performance level (EN ISO 13849-1)	PL c
Safety integrity level (EN 61508)	SIL 1
PFHD	$3.16 \times E-7$ 1/h Probabilities of failure of the safety analysis module when using up to 4 pairs of safety through-beam sensors.
Mission time TM (EN ISO 13849-1)	20 years (or less if MTTFd < 20 years)

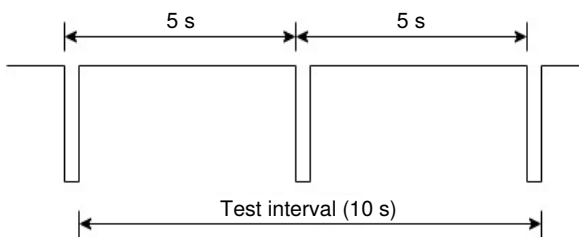
Load	B10d	Switching interval	MTTFd
2 A at 230 V AC	400.000	30 s	25,16
		1 min	47,01
		1 h	322,56
		24 h	355,69
0.5 A at 24 V DC	200.000	30 s	13,04
		1 min	25,16
		1 h	293,41
		24 h	353,27

Technical data	
Supply voltage	24 V DC $\pm$ 20 % PELV (EN 60204-1)
Power consumption	< 3 W
Safety outputs	2, normally open contacts (2 A; 250 V)
Fuse protection	max. 4 A, slow-blow
Response time	< 80 ms (incl. safety through-beam sensors)
Switching current signal control	< 100 mA, PNP output
Voltage drop signal control	< 3 V, PNP output
Contactor monitoring input	Forcibly guided NC contacts (20 mA; 24 V DC)
Maximum switching time	300 ms
Minimum test time test input	40 ms
Function types	Restart interlock or safety operating mode
LED indicators	Supply voltage - Channel status - Error
Connectable safety through-beam sensors	1-4 (with 1 static PNP safety output)
Mounting	Top hat rail 35 mm according to EN 60715
Connection type	Screw terminals (pluggable)

Technical data	
Clampable wire cross-section	0.14...2.5 mm ²
Degree of protection	IP20
Temperature range	-30...55 °C
Storage temperature	-30...70 °C
Weighting	150 g

Performance features

- Protective device in accordance with EN 61496-1, type 2
- TÜV certification
- Simple handling
- potential-free safety relay outputs (normally open contacts)
- optional restart interlock/safety operating mode (automatic restart)
- Monitoring of external safety relays
- connection option for up to 4 pairs of safety through-beam sensors
- One PNP output for indicator of the system status
- Periodic self-test of the connected safety through-beam sensors
- The safety analysis module sends test pulses to terminals 9 (S1 test) or 10 (S2 test) cyclically every 5 seconds. A periodic test consists of 2 test pulses. The resulting test interval is therefore 10 seconds.



General instructions for use

The use of electro-sensitive protective equipment (ESPE) is governed by official regulations. National and international regulations apply to the safe use of ESPE, in particular

- EN standards
- the accident prevention regulations

The safety through-beam sensors may only be used as access guarding in accordance with EN ISO 13855. Use as finger and hand protection is not permitted. If it is possible for persons to remain in the danger zone, a restart interlock must be used. Confirmation must come from outside the danger zone.

ESPE may only be used on power-driven work equipment whose control can be influenced electrically in such a way that a dangerous movement can be interrupted immediately in any phase. Before use, a risk analysis must be carried out in accordance with EN ISO 12100 to determine whether the use of a protective device with performance level c in accordance with EN ISO 13849-1 is permissible.

If other light beams are present in an application (e.g. use of infrared controls, radiation from welding processes, strong fluorescent lamps, stroboscope lights), additional measures may be necessary to ensure that the ESPE does not fail dangerously.

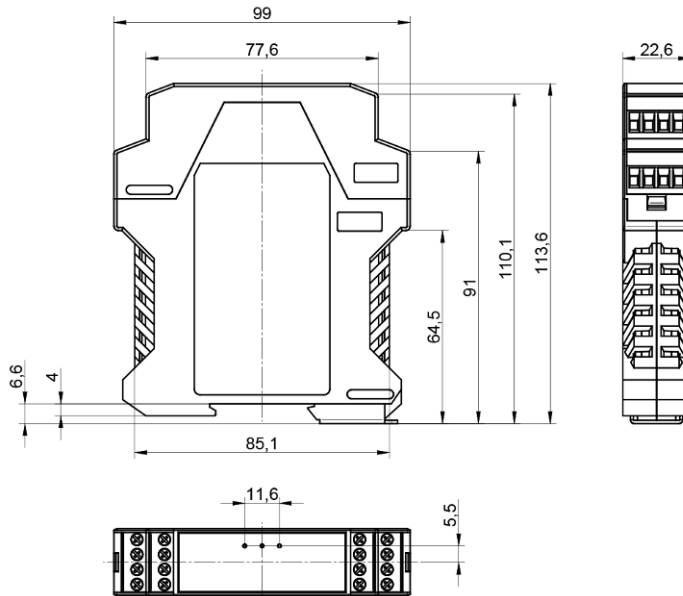


NOTICE

Strong fluorescent lamps must not be aimed directly at the lens of the receiver. Otherwise the receiver may fail dangerously.

Before the initial start-up of electro-sensitive protective equipment, a test must be carried out by an expert. The test must cover the proper interaction of the electro-sensitive protective equipment with the control system of the power-driven work equipment and the installation in accordance with these safety rules.

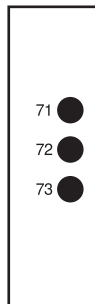
3.2 Housing Dimensions



Dimensions in mm (1 mm = 0,03937 Inch)

3.3 Control panel

S8



71 = Channel 1
72 = Channel 2/Error Indicator
73 = OSSD/Diagnosis

3.4 Complementary Products

wenglor offers you the right connection and mounting technology as well as other accessories for your product. You can find this at www.wenglor.com on the product details page at the bottom.

3.5 Scope of delivery

- Safety analysis module

4 Installation and Electrical Connection

4.1 Assembly

- Protect the product from contamination during installation.
- The relevant electrical and mechanical regulations, standards and safety rules must be observed.
- Protect the product from mechanical impact.
- Ensure that the product is mounted mechanically secure.
- Torques must be observed (see chapter Technical data [► 9]).



NOTICE

The operating instructions of the safety through-beam sensors SL2-00Nx000H2 and S1Nx002 must also be observed.

The barriers must be installed so that access to the hazardous area is only possible through the beam of light from the barriers. It must not be possible to reach around from the side, over or under. If necessary, this must be ensured by additional mechanical protection. The mounting height and the distance to the hazardous movement are regulated in EN ISO 13855 and are explained below.

Safety clearance

Calculation of the safety clearance is based on the EN ISO 13855 standard. However, if any special directives and standards apply to the respective machine, these must be taken into consideration as well.

$$S = K \times T + C$$

S = safety clearance [mm]

K = approach speed = 1600 [mm/s]

T = total response time (t1 + t2) [s]

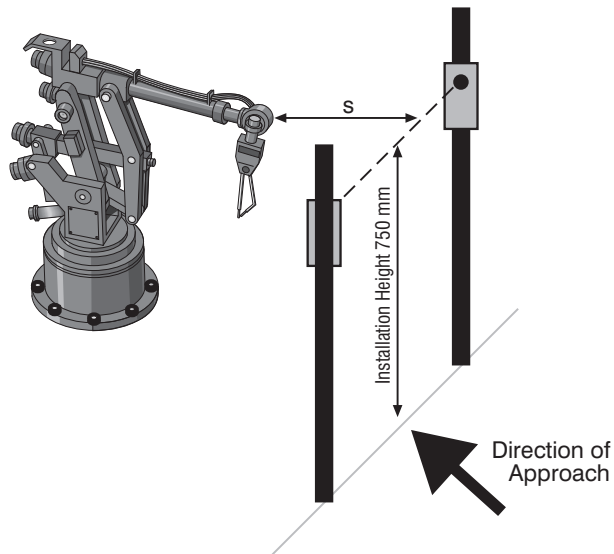
t1 = response time safety through-beam sensor [s] + response time safety analysis module [s]

t2 = machine over-travel time [s]

C = margin [mm], depending on the number of safety through-beam sensors (see table below)

Number of safety through-beam sensors	1	2	3	4
Height above reference level [mm]	750	400 900	300 700 1100	300 600 900 1200
Margin C [mm]	1200	850	850	850

Perpendicular approach to the safety field

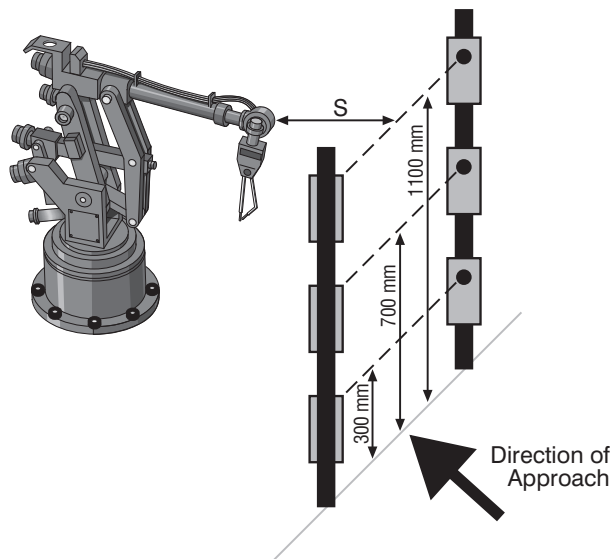


A minimum installation height of 750 mm from the reference level is required for the use of a safety through-beam sensor.

C = margin for interruption of the danger zone before the safety device is tripped (never < 0) = 1200 mm

K = 1600 mm/s

$S = K \times (t_1 + t_2) + C(1200 \text{ mm})$



If several safety through-beam sensors are used, the table in the section Safety distance applies.

C = margin for interruption of the danger zone before the safety device is tripped

(never < 0) = 850 mm

K = 1600 mm/s

$S = K \times (t_1 + t_2) + C(850 \text{ mm})$

Parallel approach to the safety field



NOTICE

If this safety concept is used, the height of the safety field (H) may not be any greater than 1000 mm. If H is greater than 300 mm (or 200 mm for non-industrial applications, e.g. if children are present), there is a risk of inadvertent, undetected access from underneath the safety field. This must be taken into consideration during risk analysis.

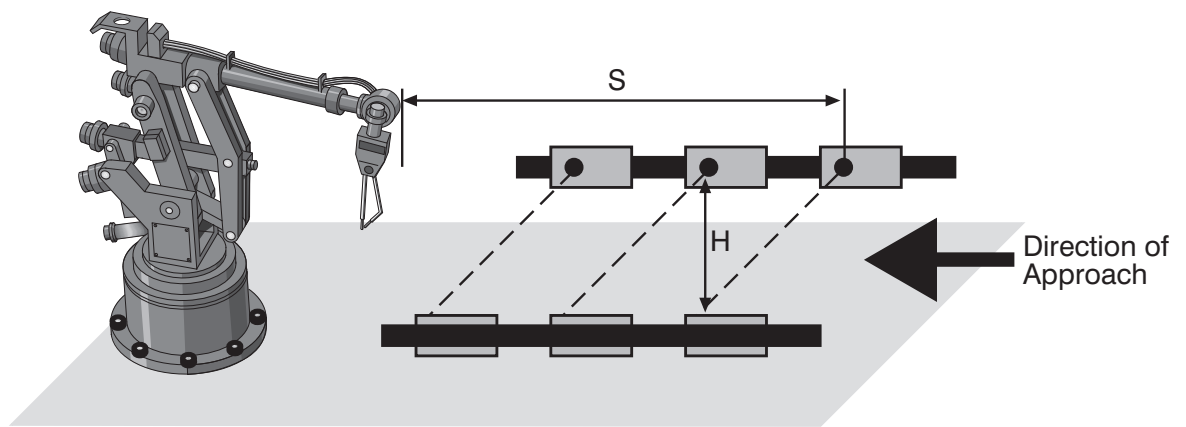
H = height of the safety field above the reference level

C = margin for interruption of the danger zone before the safety device is tripped

(never < 850) = $1200 \text{ mm} - 0.4 \times H$

K = 1600 mm/s

$S = K \times (t_1 + t_2) + C (1200 \text{ mm} - 0.4 \times H)$

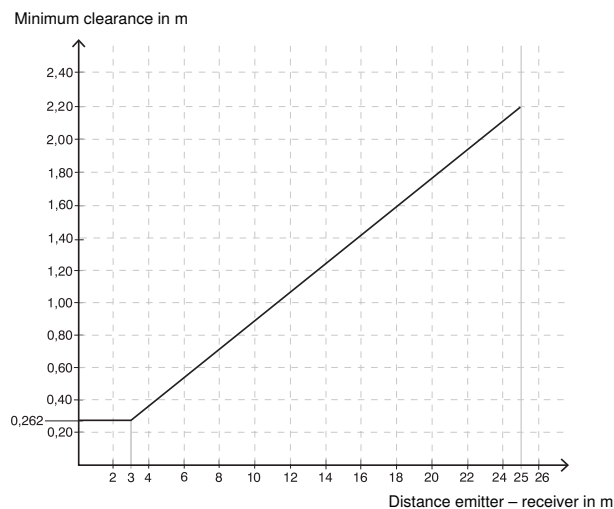


S = minimum safety clearance

Minimum Clearance to Reflective Surfaces

In order to prevent bleed-over reflection, a minimum clearance between reflective objects and the optical axis must be maintained.

Minimum clearance = $\tan 5^\circ \times (\text{clearance between emitter and receiver})$



Avoidance of mutual interference

To prevent mutual influence of the safety through-beam sensors:

- Only one emitter (receiver) may be within the aperture angle of the receiver (emitter).
- The sensor pairs must be aligned anti-parallel for multi-beam safeguarding.



NOTICE

Risk of property damage in case of improper installation!

The product may be damaged!

→ Comply with installation instructions.



CAUTION

Risk of personal injury or property damage during installation!

Personal injury and damage to the product may occur.

→ Ensure a safe installation environment.

4.2 Connection and integration into the machine

4.2.1 General information



INFORMATION

The safety analysis module must be integrated into the system in such a way that at least protection class IP54 is achieved (e.g. switch cabinet installation).

After the mechanical installation of the safety through-beam sensors, the safety analysis module is integrated into the machine control system.

The OSSD outputs must be integrated into the machine's safety circuit in such a way that safety category 2 is continued. The safety regulations of the respective machine or for integration into the machine control system must be observed.

If several safety analysis modules are installed next to each other, a minimum distance of 2 cm must be maintained between the modules to prevent overheating.



INFORMATION

The safety analysis module must be supplied with a supply voltage of 24 V DC $\pm 20\%$.

The external power supply must comply with EN 60204-1.

During installation, particular care must be taken to ensure that terminals 7 and 8 are not short-circuited.

Additional measures against electrostatic discharge should be taken during installation, troubleshooting and adjustment.

It is recommended that the connecting cables are fitted with wire end ferrules before installing the safety through-beam sensors.

4.2.2 Notes on the connecting cables

- Cables with a cross-section greater than 1 mm² must be used for connections between the safety through-beam sensor and the safety analysis module with a length of more than 50 m.
- The supply to the safety analysis module should be kept separate from other electrical power devices (electric motors, inverters, frequency variators) or other sources of interference.
- The connecting cables between the safety analysis module and the safety through-beam sensors, the connection with the test command transmitter and with the feedback contacts connected to terminal 11 must be routed separately from power cables.

4.2.3 Terminal assignment and LED indicator

Drawing	Terminal	Designation	Input/output
	1	24 V DC	-
	2	0 V	-
	3	PE (earthing)	-
	4	Confirmation input	E
	5	Restart interlock	E
	6	Test input	E
	7	S1 NC contact	E
	8	S2 NC contact	E
	9	S1 Test	A
	10	S2 Test	A
	11	Contactor monitoring	E
	12	Signal control	A
	13	OSSD B Contact 1	A
	14	OSSD B contact 2	A
	15	OSSD A Contact 1	A
	16	OSSD A Contact 2	A

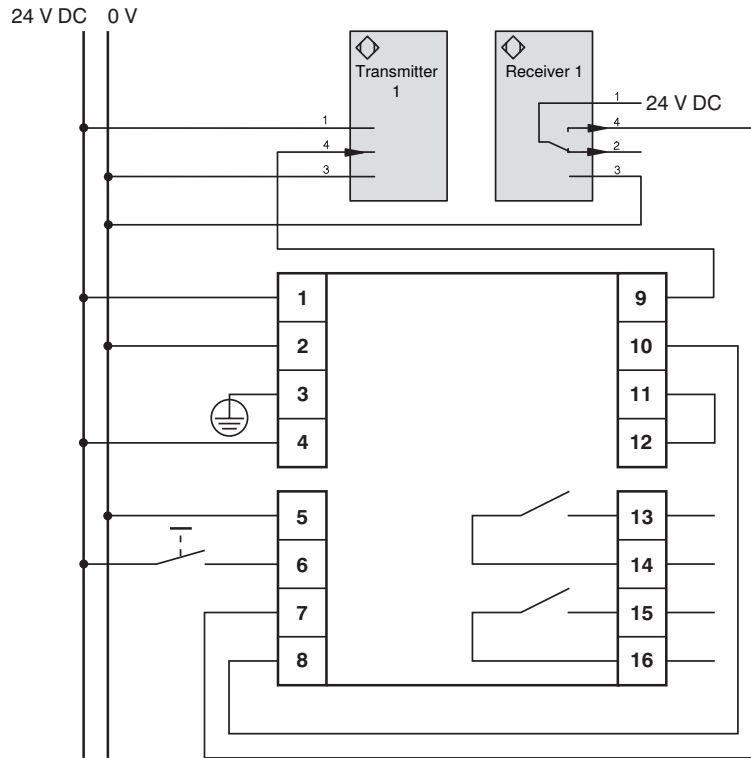
LED	Color	Status LED	Operation
CH1	green	On	Channel 1 free
		Off	Channel 1 busy
CH2 Failure	Green, red	Red	Fault detected*
		Green	Channel 2 free
		Off	Channel 2 busy or missing
OSSD DIAG	Green, Red, Yellow	Red	Output relay open
		Red flashing	The number of pulses shows the type of error (only if CH2/Failure is on) *
		Green	Output relay closed
		Yellow	Channels free - relay open (only with restart interlock)

*see Diagnostic information [► 27].

4.2.4 Connecting the safety through-beam sensors

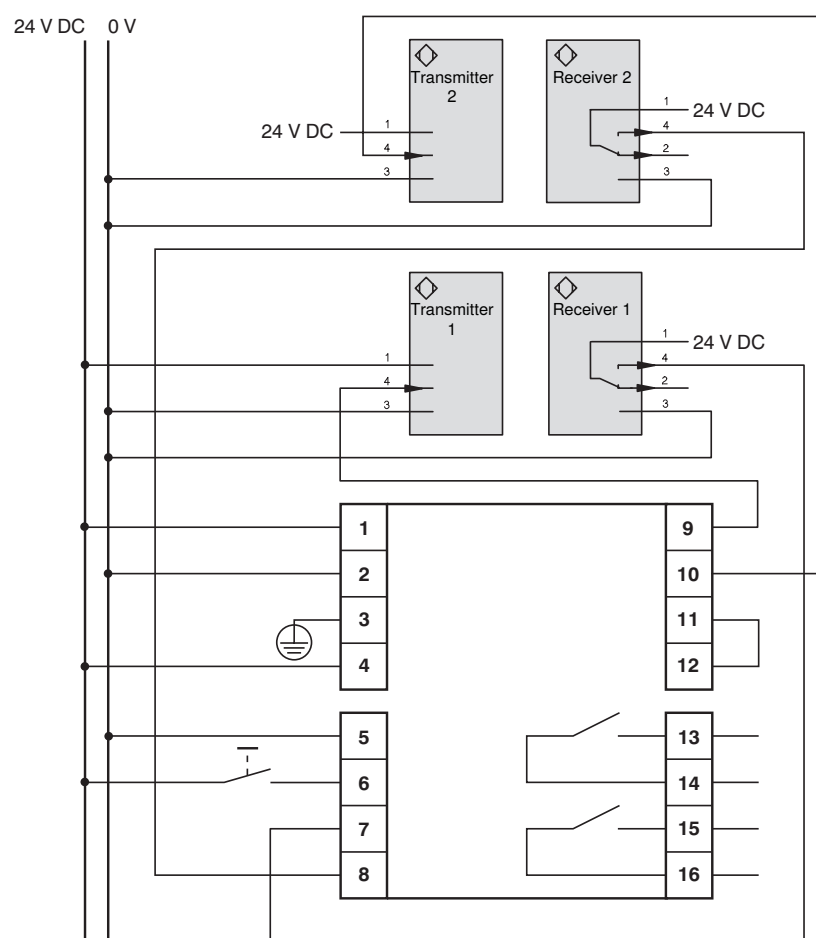
The following connection diagrams show the connection of the safety through-beam sensors to the safety analysis module with the safety operating mode setting, without contactor monitoring.

Connection of a safety through-beam sensor



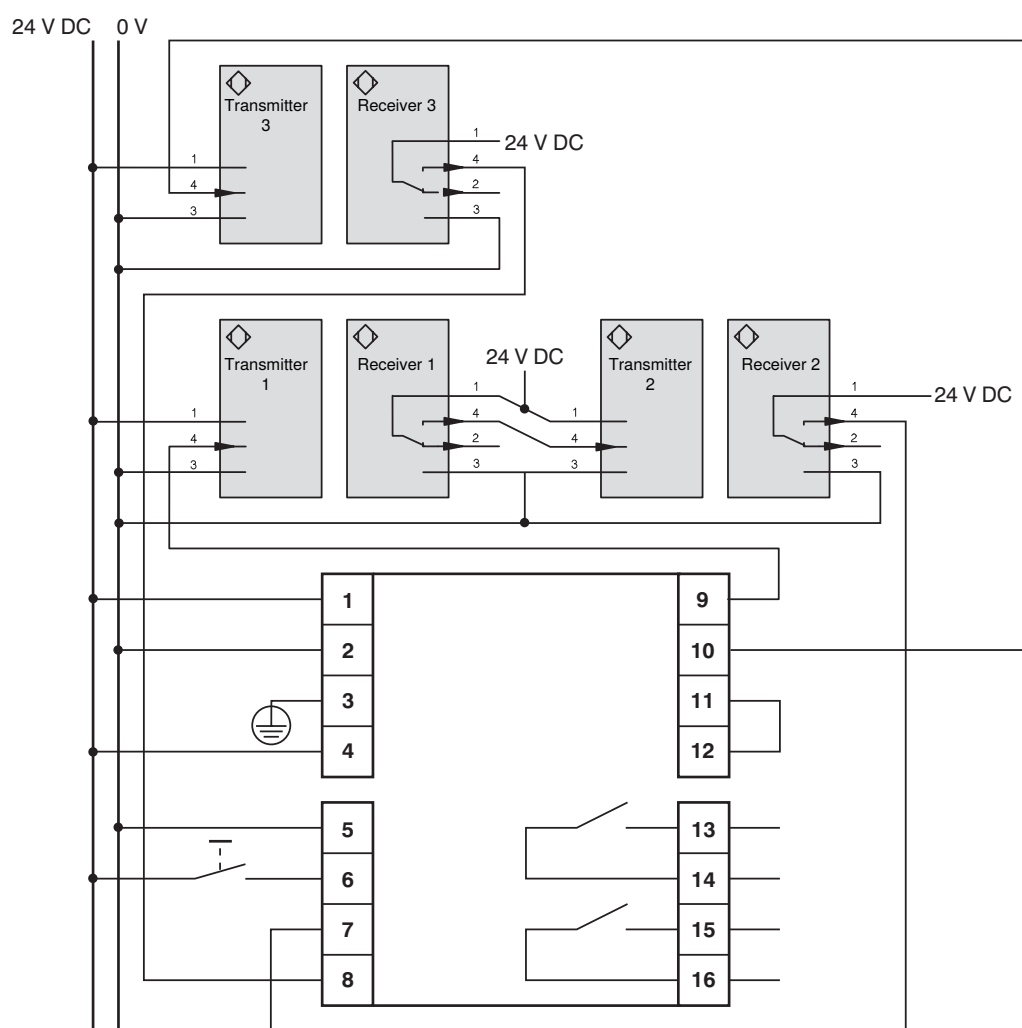
Drawing	Terminal	Designation	Input/output
	1	24 V DC	-
	2	0 V	-
	3	PE (earthing)	-
1 2 3 4	4	Confirmation input	E
5 6 7 8	5	Restart interlock	E
	6	Test input	E
	7	S1 NC contact	E
	8	S2 NC contact	E
	9	S1 Test	A
	10	S2 Test	A
	11	Contactor monitoring	E
	12	Signal control	A
	13	OSSD B Contact 1	A
	14	OSSD B contact 2	A
	15	OSSD A Contact 1	A
	16	OSSD A Contact 2	A

Connection of two safety through-beam sensors



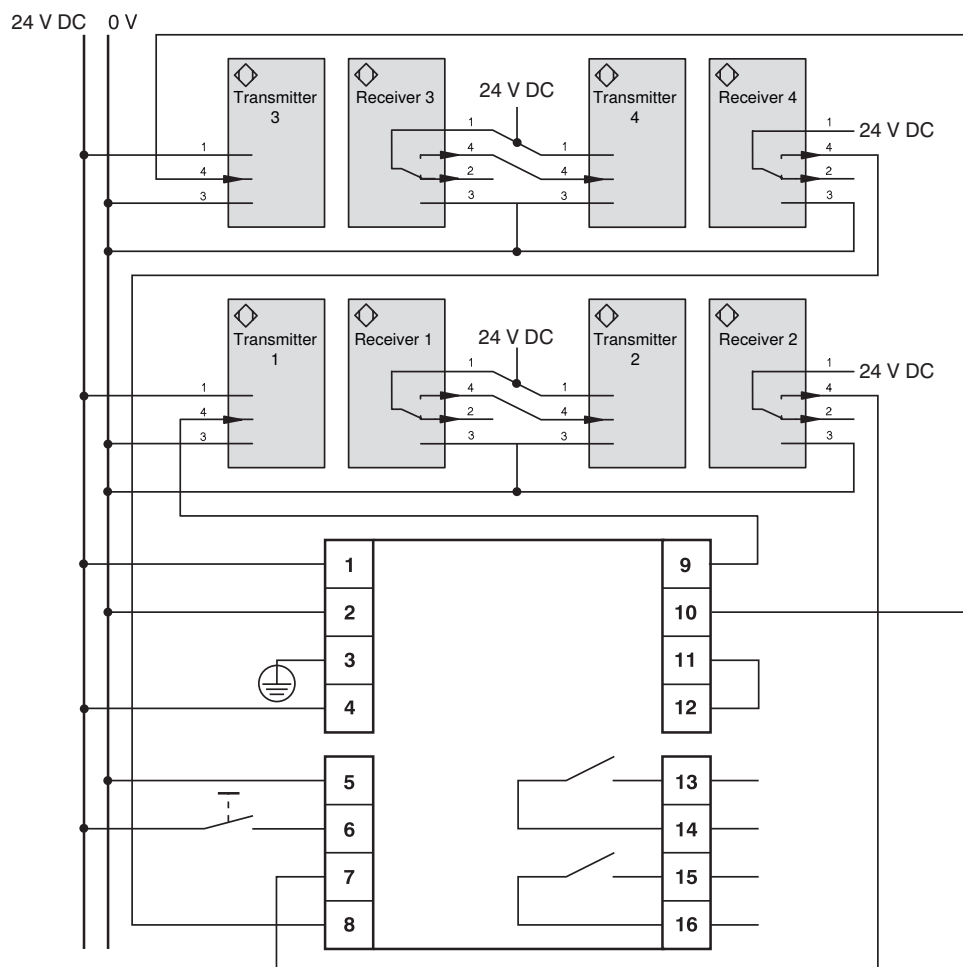
Drawing	Terminal	Designation	Input/output
	1	24 V DC	-
	2	0 V	-
	3	PE (earthing)	-
	4	Confirmation input	E
	5	Restart interlock	E
	6	Test input	E
	7	S1 NC contact	E
	8	S2 NC contact	E
	9	S1 Test	A
	10	S2 Test	A
	11	Contactor monitoring	E
	12	Signal control	A
	13	OSSD B Contact 1	A
	14	OSSD B contact 2	A
	15	OSSD A Contact 1	A
	16	OSSD A Contact 2	A

Connection of three safety through-beam sensors



Drawing	Terminal	Designation	Input/output
	1	24 V DC	-
	2	0 V	-
	3	PE (earthing)	-
1 2 4	4	Confirmation input	E
5 6 7 8	5	Restart interlock	E
	6	Test input	E
	7	S1 NC contact	E
	8	S2 NC contact	E
	9	S1 Test	A
	10	S2 Test	A
	11	Contactor monitoring	E
	12	Signal control	A
	13	OSSD B Contact 1	A
	14	OSSD B contact 2	A
	15	OSSD A Contact 1	A
	16	OSSD A Contact 2	A

Connection of four safety through-beam sensors



Drawing	Terminal	Designation	Input/output
	1	24 V DC	-
	2	0 V	-
	3	PE (earthing)	-
	4	Confirmation input	E
	5	Restart interlock	E
	6	Test input	E
	7	S1 NC contact	E
	8	S2 NC contact	E
	9	S1 Test	A
	10	S2 Test	A
	11	Contactor monitoring	E
	12	Signal control	A
	13	OSSD B Contact 1	A
	14	OSSD B contact 2	A
	15	OSSD A Contact 1	A
	16	OSSD A Contact 2	A

5 Inputs

5.1 Test input

The self-test of the safety analysis module is triggered by applying 24 V DC to the test input (terminal 6). If the safety outputs of the safety analysis module are switched on, the safety analysis module signals the test process by switching off the transmitters of the connected safety through-beam sensors, thus simulating an intrusion into the protected area. The operator can then check the effectiveness of the switch-off. Switching off takes place as long as the input carries 24 V DC.

The externally triggered test is insignificant for the test of the safety analysis module, as the safety analysis module is self-testing.

The minimum length of the test pulse is 40 ms. The frequency of the tests depends on the risk analysis (safety regulations).

5.2 Confirmation input

The safety analysis module can be set up with either restart interlock or safety operating mode.

The use of the restart interlock (start/restart interlock activated) is required if the safety device secures a passage to a hazardous area and it is possible for a person to remain in the hazardous area after passing through the passage without being detected.

Choice of function

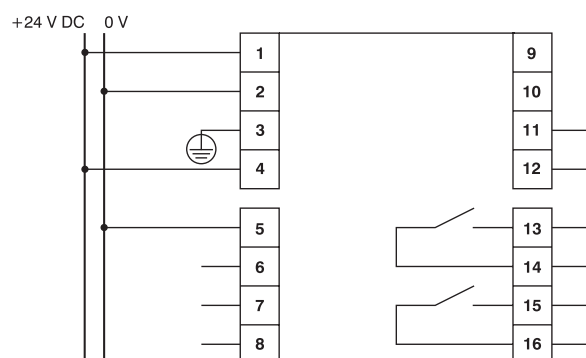
The following table shows the configuration of the operating modes.

Terminal 4	Terminal 5	Type of function
24 V DC	0 V open	Safety operating mode
0 V open	24 V DC	Restart interlock
0 V open	0 V open	Impermissible conditions
24 V DC	24 V DC	

5.3 Safety operating mode

In this function mode, the outputs of the safety analysis module follow the status of the safety through-beam sensor:

- if the safety field is free (outputs of the safety through-beam sensor active), the relay outputs are active
- if the safety field is interrupted (outputs of the safety through-beam sensor inactive), the relay outputs are deactivated



Drawing	Terminal	Designation	Input/output
	1	24 V DC	-
	2	0 V	-
	3	PE (earthing)	-
	4	Confirmation input	E
	5	Restart interlock	E
	6	Test input	E
	7	S1 NC contact	E
	8	S2 NC contact	E
	9	S1 Test	A
	10	S2 Test	A
	11	Contactor monitoring	E
	12	Signal control	A
	13	OSSD B Contact 1	A
	14	OSSD B contact 2	A
	15	OSSD A Contact 1	A
	16	OSSD A Contact 2	A

5.4 Restart interlock

In this function mode, the outputs of the safety analysis module are only activated under the condition that the safety field is free and the module has received the signal from a button or by a corresponding command, e.g. from a PLC on the confirmation input (terminal 4). After an intrusion into the protected area, the relay outputs are deactivated and can only be reactivated by following the procedure just described.

The confirmation signal is given by a pulse from 0 V to 24 V to 0 V DC at the confirmation input.



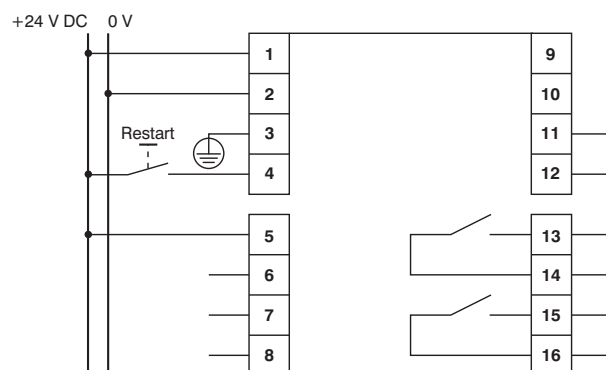
INFORMATION

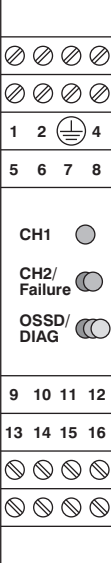
The pulse duration must be 100 ms to 5 s. A current of max. 10 mA flows.

For manual confirmation, an external normally open button can generate the confirmation input signal.

The switch-on delay of the system results from the sum of the switch-on delay times of the safety analysis module (150 ms) and the external auxiliary switching elements K1/K2 that may be used.

The confirmation must come from outside the protected area, from where the protected area and the entire working zone concerned are clearly visible. The button for the confirmation input must not be accessible from inside the protected area.



Drawing	Terminal	Designation	Input/output
	1	24 V DC	-
	2	0 V	-
	3	PE (earthing)	-
	4	Confirmation input	E
	5	Restart interlock	E
	6	Test input	E
	7	S1 NC contact	E
	8	S2 NC contact	E
	9	S1 Test	A
	10	S2 Test	A
	11	Contactor monitoring	E
	12	Signal control	A
	13	OSSD B Contact 1	A
	14	OSSD B contact 2	A
	15	OSSD A Contact 1	A
	16	OSSD A Contact 2	A

5.5 Contactor monitoring

Contactor monitoring is used to monitor whether the external contactors or auxiliary switching elements are switching correctly. External contactors may only be connected if they have positively driven NC contacts. The contactors are monitored statically and dynamically for the timing behavior of the contacts. The switchover time must not exceed 300 ms. 24 V DC is fed back to the input via a free NC contact of the external contactor.

Input for contactor monitoring

If the external relays or auxiliary switching elements K1 and K2 with forcibly guided contacts are used, 24 V DC must be connected in series to the contactor monitoring input (terminal 11) via the control contacts K1-1 and K2-1 (NC, block B in the figure). The correct switching of K1 and K2 is checked with a delay of 300 ms after the actual command.

If no external auxiliary switching elements K1 and K2 are used, terminals 11 (contactor monitoring) and 12 (signal monitoring) must be connected together.

- The control contacts K1-1 and K2-1 (terminal 11, block B) must be able to switch a current of 20 mA and a voltage of 24 V DC.
- To extend the service life of the internal relays A and B, suitable suppression devices should be used, which are connected to the coil ends of L1 and L2 (block A).
- The external contactors L1 and L2 must be supplied with a suitable voltage (SV).

5 – Inputs | SS2-00VA000R4 – Safety Analysis Module for Safety Through-Beam Sensor

6 Outputs

6.1 Safety outputs

The safety analysis module uses two safety relays with forcibly guided contacts (relay - OSSD) as the output circuit.

To prevent damage or premature ageing, each output contact must be protected with a slow-blow 4 A fuse. The loads must comply with the technical data (see chapter 12).

6.2 Signal control

The signal control output indicates the switching status of the safety relay in the safety analysis module:

- if the relay outputs are open, the output is open.
- if the relay outputs are closed, 24 V DC is present at the output.

The output is intended to control an optical indicator lamp. Alternatively, a PLC can also be connected to process the signal. The output is realized as a PNP output.

7 Functions and operation

7.1 One channel occupied

LED			Meaning
CH1 Green	CH2/Failure red/green	OSSD/DIAG red/green/yellow	
On	red	red	Power-on test
Off	Off	Red	Channel busy, outputs off
On	Off	Yellow	Channel free, outputs off Unit waiting for restart
On	Off	Green	Channel free, outputs on
Indicates the status of the channel	Off	Yellow: Flashing (twice per second)	System test running

7.2 Two channels occupied

LED			Meaning
CH1 Green	CH2/Failure red/green	OSSD/DIAG red/green/yellow	
On	red	red	Power-on test
Off	Off	Red	Channel busy, outputs off
Off	Green	Red	
On	Off	Red	
On	Green On	Yellow	Channel free, outputs off Unit waiting for restart
On	Green	Green	Channel free, outputs on
Indicates the status of channel 1	Indicates the status of channel 2	Yellow: Flashing (twice per second)	System test running

8 Diagnostic information

If errors occur when using the safety analysis module, the safety output switches off and the CH2/Failure indicator flashes red. Troubleshooting is carried out using the following diagnostic table.

If an error occurs permanently, our specialist personnel must be consulted. If necessary, the safety analysis module must be sent in. Self-repairs are not possible.

LED			Meaning → Measure
CH1 green	CH2/Failure red/green	OSSD/DIAG red/green/yellow	
Off	Red	 (2 pulses red)	Internal fault → Please contact support
Off	Red	 (3 pulses red)	Fault in the internal relays → Please contact support
Off	Red	 (4 pulses red)	Fault in the external contactor → Check the wiring
Off	Red	 (5 pulses red)	Incorrect initial configuration → Check connection of the safety through-beam sensors, start inhibit configuration, contactor monitoring
Off	Red	 (6 pulses red)	Configuration changed without restart. → Switch unit off and on
Off	Red	 (7 pulses red)	Possible overload or incorrect connection of the signal control → Check the wiring of the signal control



WARNING

No operation if error behavior is unclear

The machine must be taken out of operation if the fault cannot be clearly assigned or safely rectified.

9 Initial commissioning checklist

This checklist is an aid for initial commissioning. It does not replace the inspection prior to initial commissioning or the regular inspections by competent persons.

1. standards and guidelines, selection of ESPE		
Have the safety regulations been based on the directives/standards applicable to the machine?	Yes	No
Are the applied directives and standards listed in the declaration of conformity?	Yes	No
Does the protective device comply with the required safety level?	Yes	No
2. safety distance		
Has the safety distance been calculated according to the valid formulas for safe-guarding danger points, taking into account the resolution, response time of the ESPE, response time of any safety interface used and the stopping time of the machine?	Yes	No
Has the stopping time of the machine been measured, specified, documented (on the machine and/or in the machine documents) and adjusted in accordance with the installation of the ESPE?	Yes	No
Is the safety distance between the danger point and the safety field maintained?	Yes	No
3. access to the danger zone		
Is access to the danger zone only possible through the safety field of the ESPE?	Yes	No
Is an unprotected stay in the danger zone safely excluded (e.g. by mechanical protection against stepping behind, cascading) and are the measures taken protected against manipulation?	Yes	No
Are additional mechanical protective measures in place to prevent reaching under, over and around and protected against manipulation?	Yes	No
4. assembly		
Are the components of the ESPE properly fastened and secured against loosening or shifting/twisting after adjustment?	Yes	No
Is the external condition of the ESPE and its accessories in perfect condition?	Yes	No
Is the command device for resetting the ESPE correctly installed outside the danger zone and effective?	Yes	No
5. integration into the machine		
Are the safety outputs (OSSD) integrated into the downstream machine control system in accordance with the required control category and does the integration match the circuit diagrams?	Yes	No
Are the switching elements controlled by the ESPE (e.g. contactors, valves) monitored?	Yes	No
6. functionality		
Is the ESPE effective during the entire hazardous movement of the machine?	Yes	No
Is an initiated hazardous state stopped when the ESPE is switched off or switched on, or when the operation or function types are switched or when switching to another protective device?	Yes	No
Are the specified protective functions effective for each configuration?	Yes	No
Has the protective function been checked in accordance with the test instructions in the operating instructions?	Yes	No

10 Inspection Instructions

The inspections described below serve to confirm compliance with specified safety requirements set forth in national/international regulations, in particular the safety requirements included in the machinery directive and the directive concerning safety and health requirements for the use of work equipment. The inspections also serve to detect influences which effect the device's protective action, as well as any other unusual ambient influences.

Inspection Prior to Initial Start-Up

Inspection of ESPE in accordance with local ordinances.

- Inspection for correct attachment of the safety device, correct electrical connection to the controller and effectiveness in all of the machine's operating modes.
- The same inspection requirements apply if the machine in question has been shut down for a lengthy period of time and after significant modifications or repairs, if these might influence safety in any way.
- Observe regulations regarding the training of operating personnel by qualified persons before operators begin work. The company which operates the machine is responsible for training.
- Check the protection function (see section of the same name).

Regular Inspection (at least Annually)

Regular testing must be completed in accordance with local ordinances. They serve the purpose of detecting changes to (e.g. over-travel time) or manipulation of the machine and the safety devices.

- Regular inspections must be conducted by a person who has been authorized and engaged to do so by the company which operates the machine. The frequency (e.g. daily, at shift changes, etc.) must be determined based on the risk assessment for the application.
- The effectiveness of the ESPE must be tested with supply power to the ESPE switched on, and supply power to the hazardous motion of the machine switched off.
- Check the protection function (see section of the same name).

Checking the Protection Function

The protection function of the ESPE must be tested by reaching into the light beam with a test rod (diameter 30 mm).

The test rod must be moved through the light beam. Each beam must be tested individually. As long as the light beam is interrupted, it must not be possible to initiate any dangerous movement.

If any impairment of the device's safety function is detected during regular testing or during operation, all work at the respective machine must be immediately stopped!

11 Maintenance Instructions



NOTICE

This wenglor product is maintenance-free.

Cleaning and inspection of the plug connections at regular intervals are advisable.

Do not clean the product with solvents or cleaning agents that could damage the product.

The product must be protected against contamination during initial start-up.

12 Proper Disposal

wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.

13 Declarations of Conformity

Declarations of conformity can be found on our website at www.wenglor.com in the product's separate download area.

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