



SG-BWS-T4 SERIES

Safety control unit

QUICK GUIDE

SAFETY INFORMATION



The following points must be observed for a correct and safe use of the safety light curtains of the SG-BWS-T4 series:

The stopping system of the machine must be electrically controlled. This control system must be able to stop the dangerous movement of the machine within the total machine stopping time T as per par. 3.4 of the complete manual inside the CD and during all working cycle phases.

The safety system should be installed and connected by a qualified technician in compliance with the instructions specified in this manual and industry rules.

The photocells must be securely installed in a particular position so that access to the dangerous zone is not possible without the interruption of the beams (see 3.3 “General information on sensors positioning” of the complete manual inside the CD).

The personnel operating in the dangerous area must be well trained and must have adequate knowledge of all the operating procedures of the safety control unit.

The START and TEST buttons must be located outside the protected area because the operator must check the protected area during all Test and Reset operations.

Please carefully read the instructions for the correct functioning before powering the SG-BWS-T4.

Precautions to be observed for the choice and installation of the device



Make sure that the protection level assured by the SG-BWS-T4 device (Type 4) is compatible with the real danger level of the machine to be controlled, according to EN 954-1 and EN 13849-1.

- The OSSD outputs of the ESPE must be used as machine stopping devices and not as command devices. The machine must have its own START command.
- The dimension of the smallest object to be detected must be larger than the resolution level of the installed safety sensors.

- The ESPE must be installed in a room complying with the technical characteristics indicated in section 9 “Technical data” of the complete manual inside the CD.
- Do not install the sensors close to strong and/or flashing light sources or close to similar devices.
- Strong electromagnetic disturbance might negatively affect device operation. Should this be the case contact Datalogic Automation Technical Service.
- The operating distance of the safety sensors can be reduced in presence of smog, fog or airborne dust.
- A sudden change in environment temperature, with very low minimum peaks, can generate a small condensation layer on the sensors lenses and so jeopardise functioning.
- Pay special care when positioning the safety photocells so to offer effective protection. The safety sensors should be installed in such a way that the dangerous area can only be entered after detecting the sensitive area. Photocells position is fixed by normative and must respect measures in Tab. 4 of the complete manual inside the CD.



*The failure to respect the safety distance reduces or cancels ESPE the protection function.
For more detailed information about calculation of safety distance, please refer to the complete manual contained in the CD supplied.*

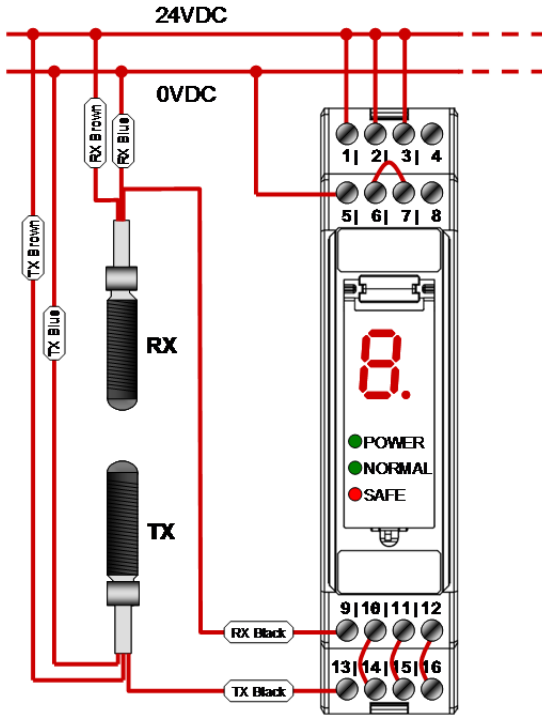
CONNECTIONS



SIGNAL	CONTACT	CONNECTION
VDC	1	24 Vdc ext.
START/TEST/RESET	2	- NC contact toward 24VDC
EDM ENABLE	3	- 24VDC → EDM DISABLED - NOT CONNECTED → EDM ENABLED
EDM	4	- NC contact of external relay toward 24VDC (with EDM enabled) - NOT CONNECTED (with EDM disabled)
0 V	5	0 Vdc ext.
MAN/AUTO	6	- OSSD1 (7) → AUTOMATIC RESET - OSSD2 (8) → MANUAL RESET
OSSD1	7	External relay coil 1 (positive)
OSSD2	8	External relay coil 2 (positive)
RX1	9	PNP output of receiver photocell 1 (black)
RX2	10	PNP output of receiver photocell 2 (black)
RX3	11	PNP output of receiver photocell 3 (black)
RX4	12	PNP output of receiver photocell 4 (black)
TX1	13	TEST of emitter photocell 1 (black)
TX2	14	TEST of emitter photocell 2 (black)
TX3	15	TEST of emitter photocell 3 (black)
TX4	16	TEST of emitter photocell 4 (black)

Minimum connection (1 photocell, no EDM, automatic RESTART)

The control unit terminals layout and the minimum connection to check system operation are shown below. The photocells power (blue and brown wires) must be connected to the same power supply of SG-BWS-T4.

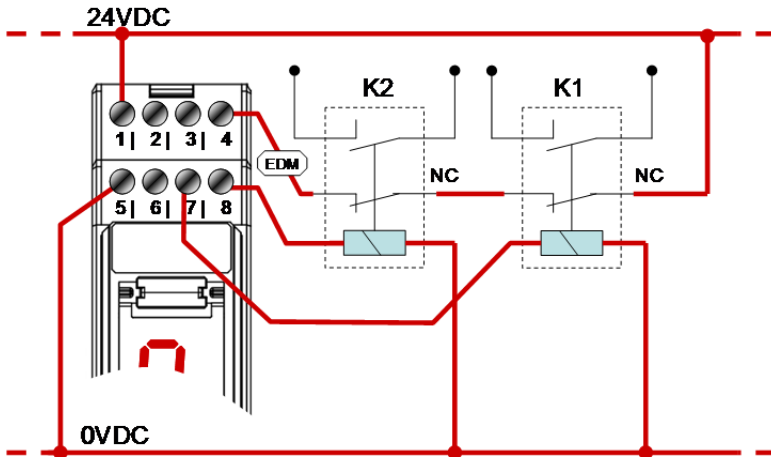


SIGNAL	CONTACT	CONNECTION
VDC	1	24 Vdc ext.
START/TEST/RESET	2	24 Vdc ext.
EDM ENABLE	3	24 Vdc ext.
OV	5	0 Vdc ext.
MAN/AUTO	6	OSSD1 (7)
RX1	9	PNP output of receiver photocell 1 (black)
RX2	10	TX2 (14)
RX3	11	TX3 (15)
RX4	12	TX4 (16)
TX1	13	TEST of emitter photocell 1 (black)

External relays connection for machine control

For SG-BWS-T4 to work as a safety device an external MPCE (Machine Primary Control Equipment) must be connected that controls main machine power supply.

Next figure shows the connection to 2 external safety relays that can be monitored by SG-BWS-T4 by means of the EDM connection.



ALIGNMENT SAFETY DEVICES

Once all components are in place and connected, emitters and receivers shall be mutually aligned. **In alignment mode, the OSSD safety outputs are open. The alignment mode and relevant procedure are described here below:**

- Cut off control unit power supply.
- Hold the Test push-button depressed (open Test contact).
- Power on the control unit.
- The 7-segment display shows the first device to be aligned (Photocells 1-4, light curtains 5-6)
- Align the indicated device until display will indicate the following device to be aligned or alignment completed warning (A flashing).
- When alignment is completed, cut off control unit power, release Test push-button (close the contact) and restore control unit power.
- The control unit will run the initial test routines and display a countdown, the display will then turn off and the control unit will switch to NORMAL OPERATION status (● NORMAL).

Now carry out the following inspections:

- The ESPE stays in ● SAFE mode during photocells and light curtains beam interruption using the suitable "Test Piece", along the entire protected area.
- Enabling the TEST function, the OSSD outputs should open (● SAFE and the controlled machine stops).
- The response time upon machine STOP (including response time of the ESPE and of the machine) is within the limits defined for the calculation of the safety distance (see section 3 "Installation" of the complete manual inside the CD).
- The safety distance between the dangerous areas and the safety sensors is in accordance with the instructions included in section 3 "Installation" of the complete manual inside the CD.
- Access of a person between sensors and machine dangerous parts is not possible nor is it possible for him/her to stay there.
- Access to the dangerous area of the machine from any unprotected area is not possible.

During alignment or normal operation, make sure that the photocells connected to the same or other units do not interfere with each other. Should you find interference, change their position, for instance you could set some emitter sets on the side of the other receivers. In case of interference, the control unit will lock out and display the relevant error code.

DIAGNOSTICS AND SIGNALLING








SG-BWS-T4 is equipped with a user interface featuring 3 LEDs and a 7-segment display.

LED	INDICATION
● POWER	Device is powered correctly
● NORMAL	No danger: safety outputs closed
● SAFE	Danger or fault: safety outputs open
	The 7-segment display shows detailed information on control unit current status

Normal operation signalling

INDICATION	STATUS	DESCRIPTION	TO DO
<ul style="list-style-type: none"> ● POWER ○ NORMAL ○ SAFE 	Alignment	The display shows the first device to be aligned and then the others in a sequence (1 to 4).	Align the safety devices (see 5.2)
<ul style="list-style-type: none"> ● POWER ○ NORMAL ○ SAFE 	Alignment	All connected devices are aligned	Close the Test contact (Pin 2) and restart the control unit to switch to normal operation (see 5.2)
<ul style="list-style-type: none"> ● POWER ○ NORMAL ● SAFE 	SAFE	The indicated safety device beam is interrupted. If many devices are in this status, the first one is indicated, then the others in a sequence (1 to 4).	Clear the area or check device connections
<ul style="list-style-type: none"> ● POWER ● NORMAL ○ SAFE 	NORMAL OPERATION	The device is in normal operating conditions and monitored area is safe.	
<ul style="list-style-type: none"> ● POWER ●* NORMAL ● SAFE 	Interlock	Waiting for the START command in manual reset mode	Push reset control
<ul style="list-style-type: none"> ● POWER ●/○ NORMAL ○/● SAFE 	NORMAL OPERATION/ SAFE	The decimal point indicates that the EDM function is active (see 4.7)	
<ul style="list-style-type: none"> ● POWER ○ NORMAL ● SAFE 	SAFE	TEST push-button pressed (contact 2 open)	Check TEST push-button connections (see 4.6)

Failure state signalling

INDICATION	STATUS	DESCRIPTION	TO DO
<p>○ POWER ○ NORMAL ○ SAFE</p> 	Off	Power disconnected or inner fuse blown due to overload.	Check power supply
<p>● POWER ○ NORMAL ● SAFE</p> 	FAILURE LOCKOUT	It is impossible to determine selected reset mode	Check MAN/AUTO switch connection (terminal 6, see 4.3)
<p>● POWER ○ NORMAL ● SAFE</p> 	FAILURE LOCKOUT	OSSD test routine has failed.	Check OSSD outputs connections (see 4.3). Make sure there is no short-circuit and check the features of the load downstream of the OSSD (see section 9)
<p>● POWER ○ NORMAL ● SAFE</p> 	FAILURE LOCKOUT	EDM test has failed	Check EDM connections (see 4.5) or disable EDM function (see 4.3) if you do not wish to use it.
<p>● POWER ○ NORMAL ● SAFE</p> 	FAILURE LOCKOUT	Start signal time-out tripped.	Make sure you hold the Start button depressed for less than 5s.
<p>● POWER ○ NORMAL ● SAFE</p> 	FAILURE LOCKOUT	One of microprocessor tests has failed	Disconnect power supply and reconnect it. If error persists, please contact the Technical Service.
<p>● POWER ○ NORMAL ● SAFE</p> 	FAILURE LOCKOUT	Test of indicated safety sensor has failed.	Make sure there is no interference across different photocell sets.

DECLARATION OF CONFORMITY

We DATALOGIC AUTOMATION declare under our sole responsibility that these products are conform to the 2006/42/EC and successive amendments.





WARRANTY

DATALOGIC AUTOMATION warrants its products to be free from defects. DATALOGIC AUTOMATION will repair or replace, free of charge, any product found to be defective during the warranty period of 36 months from the manufacturing date. This warranty does not cover damage or liability deriving from the improper application of Datalogic Automation products.

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