



PSEN op4F/H A-Series

Safety light curtain

GETTING STARTED

1003068-EN-01

SAFETY GUIDELINES



To ensure correct and safe use of the safety light curtains of the PSEN op4F/H-A-series, the following instructions have to be observed.

- The system intended to stop the machine must be electrically controllable.
- The safety system at the machine must be able to stop any hazardous machine movement
 - within the entire stopping time of the machine T,
 - in accordance with the details in chapter 1.2.3 of the operating manual (see CD provided),
 - and in each phase of the processing cycle.
- The safety light curtains may only be installed and connected by qualified personnel. It is essential to follow the instructions provided in the relevant sections of the manuals provided (see Chapters 2, 3, 4 and 5) and to comply with the applicable directives.
- The safety light curtain must be installed securely so that access the danger zone is not possible without interrupting the light axes (see chapter 2 and 3 of the operating manual).
- Only qualified personnel with appropriate knowledge of all the operating procedures of the safety light curtain should be permitted to work within the danger zone.
- The operating elements for the TEST, RESET/RESTART and OVERRIDE functions have to be arranged outside the protected field, so that the operator can control the corresponding area at any time.
- Instructions provided for correct operation must be strictly followed before switching on the light curtain.

Precautionary measures when selecting and installing



Ensure that the safety level guaranteed by the light curtain is compatible with the actual hazard of the machine to be monitored, in accordance with the standards EN 954-1 and EN 13849-1.

- The outputs (OSSD) of the light curtain have to be connected as safety inputs and not in the normal control circuit. The machine must have a separate START control.
- The resolution of the light curtain has to be less that the objects to be detected.
- The light curtain must be installed in an environment that complies with the technical properties stated in Chapter 10 "Technical data" of the operating manual (see CD provided).
- Avoid installing the device, particularly the receiver on the front, close to particularly intense and/or flashing light sources.
- Strong electromagnetic interference could adversely affect the correct operation of the light curtain. Consider this carefully, seeking the advice of Pilz's technical customer services.
- Smoke, mist or dust in the air in the working environment can reduce the operating range of the light curtain considerably.
- Sudden, large-scale temperature variations with very low peak values can generate a slight layer of condensation on the light curtain's lens, adversely affecting its function.
- Reflective surfaces close to the beams emitted from the protective device (whether from above, below or from the side) can cause passive reflections that adversely affect the operation of the light curtain.
- The protective device must be positioned at a distance that exceeds the minimum safety distance S or that corresponds to it, which guarantees that the operator cannot reach the danger zone until the hazardous machine movement of the object has come to a standstill by triggering the light curtain.

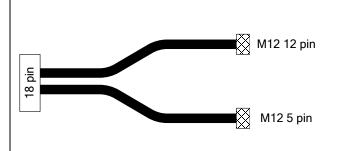


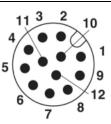
When the safety distance is not maintained, the safety function of the light curtain could be adversely affected or cancelled. A detailed description of the safety distance calculation is to be found in the complete operating manual (see CD provided).

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Connector - pigtail cable

PSEN opt Advanced RX Muting





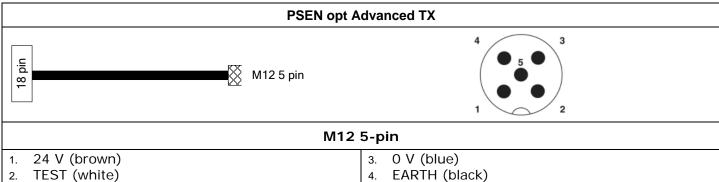


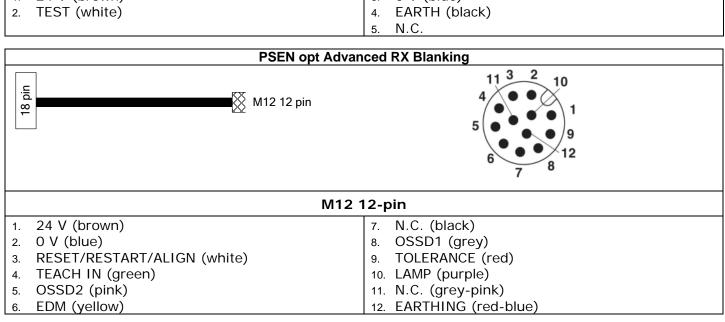
M12 connector, 12-pin:

- 1. 24 V (brown)
- 2. 0 V (blue)
- 3. RESET/RESTART/ALIGN (white)
- 4. OVERRIDE1 (green)
- 5. OSSD2 (pink)
- 6. EDM (yellow)
- 7. MUTING ACTIVATION (black)
- 8. OSSD1 (grey)
- 9. OVERRIDE2 (red)
- 10. MUTING LAMP (purple)
- 11. OVERRIDE STATUS (grey-pink)
- 12. EARTHING (red-blue)

M12 connector, 5-pin:

- 1. 24 V (brown)
- 2. MUTING2 (white)
- 3. 0 V (blue)
- 4. MUTING1 (black)
- 5. N.C. (grey)





ALIGNMENT

The transmitter and receiver must be aligned to ensure the light curtain operates correctly. Good alignment prevents instability due to dust deposits or vibration.

Make a check after you have installed the mechanical and electrical components correctly, and check the results in accordance with the following tables. To start the alignment mode of the light curtain, the RESET/RESTART/ALIGN input has to be activated while the light curtain is activated, until the red OSSD LED starts flashing.

The alignment is perfect when the light axes emitted by the first and the last transmitter correspond to the light axes at the relevant elements of the receiver.

The first beam (beside the connector) and the last beam are used for optical synchronisation (SYNC).

RX	TX	Information	Configuration LED RX	Alignment status	OSSD status - normal operation
		No sync, check SYNC1		NO	OFF
		SYNC1 aligned		NO	OFF
		SYNC2 aligned		NO	OFF
	←	One or several intermediate beams are not aligned	•	NO	OFF
		All light axes are aligned		LOW	ON
	→	All light axes are aligned			ON
	SYNC 1	All light axes are aligned			ON
		All light axes are aligned	•	EXCELLENT	ON

- A Hold the receiver in a stable position and align the transmitter until the yellow **SYNC1** LED goes out. This state confirms that the first synchronisation beam has been aligned.
- B Rotate the transmitter around the axis of the lower lens until the yellow SYNC2 LED goes out.
- **C** For precision adjustment, alternately make minor movements of the transmitter and receiver to achieve the optimum quality ().
- **D** Fix both units. Check that the LEVEL of the receiver does not decrease in quality, and that the light axes are not interrupted. Then check that all LEDs on the LEVEL LED go out, even if only one beam is interrupted.
 - For checking, use the cylindrical test object PSEN op Testpiece F 14mm or PSEN op Testpiece F 30mm that corresponds to the diameter of the configured resolution (see chapter 2.2.5 "Inspections following a first-time installation" of the operating manual).
- **E** Switch off the light curtain pair and then switch it back on in normal operating mode.
 - The degree of alignment is always indicated on displays even during normal operation of the light curtain (see chapter 8.1 of the operating manual).
 - Once the light curtain has been aligned and fastened appropriately, the LED display proves useful for checking the alignment and displaying any change in the ambient conditions (e.g. dust).

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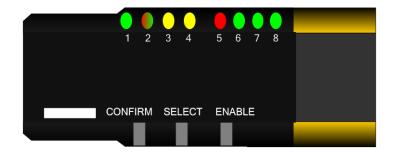
SETTING OF BASIC CONFIGURATION (BCM)



The light curtain can switch to the basic configuration mode during normal operation. After configuration and when the button "CONFIRM" is pressed, the light curtain starts up in normal operating mode in the new configuration. Particular attention is required during administration and use of the basic configuration.



The muting timeout "infinite" does not meet the requirements of the standard IEC 61496-1. For this reason, any possible hazards must be taken into account and the appropriate preventive measures have to be taken before selecting the option "infinite".



- To open the mode of basic configuration press the CONFIRM button and hold it down.
 The system runs through a test cycle. During this test cycle, ALL LEDs must light up in sequence from 1 to 8. The current configuration is then displayed.
- 2 Use the **SELECT** function to choose the function that is to be set. The LED for the selected function will flash.
- 3 Now configure the selected function by pressing the **ENABLE** button (LED lights/goes out).
- **4** Repeat steps 2 and 3 until the required configuration is displayed.
- 5 Press the **CONFIRM** button and keep it held down to save the new configuration.

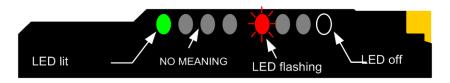
List of RX functions in muting mode (LED3 lights up yellow)			
Function	LED No.	Setting (Standard setting in bold)	Status of LED 1 2 3 4 5 6 7 8
Coding	2	Code 1 Code 2	000000
		No code	••••
Selection of muting/blanking	3	Muting Blanking	0000000
EDM	4	Activated Deactivated	
Restart mode	5	Auto Manual	0000000
Muting direction	6	T (bidirectional) L (one-directional)	
Muting Timeout	7	10 min Infinite	
Override sensor	8	Level Edge	

Function list in blanking mode (LED3 OFF)			
Function	LED No.	Setting (Default in bold)	Status of LED 1 2 3 4 5 6 7 8
Coding	2	Code 1	••••
		Code 2	••••
		No code	••••
Selection of muting/blanking	3	Muting	••••
		Blanking	••••
EDM	4	Activated	••••
		Deactivated	••••
Restart mode	5	Auto	••••
		Manual	••••
Selection of floating blanking	6-7	Floating blanking disabled	
		Floating blanking 1 beam	
		Floating blanking 2 beams	
		Red. resolution 4 beams	••••
Selection of fixed blanking	8	1 fixed blanking zone	••••
		2 fixed blanking zones	••••

List of TX functions			
Function Setting (Default in hold)		Status of LED	
	No.	3 ()	1 2 3 4 5 6 7 8
Coding	2	Code 1	••••
		Code 2	••••
		No code	••••
Selection of operating range	3	Long	••••
		Reduced	••••

DIAGNOSTIC FUNCTION

The operator can check the operating conditions of the safety light curtains via the 8 LEDs that are aligned at the RX and the TX unit. The image below displays all the display modes of the LEDs: **OFF**, **LIT**, **FLASHING**, **NO MEANING** (can be switched on or off according to the selected operating mode)



RX UNIT				
Operating mode light curtain	Information	ACM OSSD PWR	Recommended procedure	
	Interlock Free beams.		The operator can start up the light curtain in normal operating mode again by activating the RESTART	
Normal operating mode	Interlock Beams interrupted.		The operator has to remove any objects from the protected field before he can activate the RESTART	
	OSSD switched on			
	OSSD switched off CODE1	•••••		

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RX UNIT					
Operating mode light curtain	Information	ACM PWR	Recommended procedure		
	OSSD switched off CODE2				
	OSSD switched off No CODE	•••• 0000			
Normal operating mode	EDM active	••••			
	ACM active				
	ACM is currently being used		Configuration process running via PC, follow software instructions		
	Error at OSSD	000	Activate the RESET. If the error should persist, please contact Pilz customer services.		
	Error microprocessor/s.		Activate the RESET. If the error should persist, please contact Pilz customer services.		
	Error optical system	0000	Activate the RESET. If the error should persist, please contact Pilz customer services.		
	EDM error		Check EDM feedback loop and EDM configuration. Activate the RESET.		
	Restart error		Check RESTART connection. Activate the RESET.		
Error	Communication error		Check the cascading connection and check that the terminator cap is installed correctly. Activate the RESET.		
	BCM configuration error		Perform basic configuration again. If the error should persist, please contact Pilz customer services.		
	ACM configuration error	••*	Perform advanced configuration again. If the error should persist, please contact Pilz customer services.		
	General error - cannot be reset		Switch light curtain on/off. The indicated error code does not correspond to the above error with lit LED.		
Light curtain switched off	Supply error	0000 0000	Check the power supply connection. If the error should persist, please contact Pilz customer services.		

	RX UNIT				
Operating mode light curtain	Information	ACM EDM PWR	Recommended procedure		
	F	RX UNIT (BLANKING ONLY)			
	Blanking invalid (OSSD off)		Blanking zones not observed. Reconfigure blanking (teach in if BCM)		
Normal operation	Blanking valid (OSSD on)	•			
	Tolerance BCM active		Check the efficient resolution for the light curtain and the intended activation of the tolerance function.		
		RX UNIT (MUTING ONLY)			
	Muting active		When OSSD is switched off without designated active muting, check the configuration of the partial muting.		
	Override active				
Normal operation	Override call status		Activate the override button to force OSSDs to light.		
	Override time error	• * •• * 000	Check the override activation sequence. Check the override connector.		
	Lamp error				

TX UNIT					
Operating mode light curtain	Information	CODE — CODE — SR SR	Procedure		
	During operation				
	TEST		In the event of unwanted tests, check the connection of the test input.		
	Beams reduced range				
Normal operation	Beams long range				
	No code	•••• 0000			
	Code 1	••••••000			
	Code 2				
Error	Error microprocessor/s.		Activate the RESET. If the error should persist, please contact Pilz customer services.		
EIIOI	Optical system error		Activate the RESET. If the error should persist, please contact Pilz customer services.		

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	TX UNIT				
Operating mode light curtain	Information	PWR	Procedure		
	BCM configuration error		Perform basic configuration again. If the error should persist, please contact Pilz customer services.		
Error	Communication error		Check the cascading connection and check that the terminator cap is installed correctly. Activate the RESET.		
	General error - cannot be reset		Switch light curtain on/off. The indicated error code corresponds to the above error with lit LED.		

DOWNLOAD PSENopt Configurator		
URL	www.pilz.com/Downloads	
Search term	PSENopt Configurator	

Pilz GmbH & Co. KG Felix-Wankel-Straße 2, 73760 Ostfildern, Germany Tel: +49 711 3409-0 - Fax: +49 711 3409-133 www.pilz.com e-mail:pilz.gmbh@pilz.de

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