

Application Note

How to achieve PL d with single safety light beam series 46C-K4 and a Safety PLC

Which devices can be used?

Transmitter	Receiver	Connection	Range	Red light	Infrared light
SLS46C-40.K48	SLE46C-40.K4/4P	2m Cable	0,25m – 40m	x	
SLS46C-40.K48-M12	SLE46C-40.K4/4P-M12	4-pin M12	0,25m – 40m	x	
SLS46C-70.K48	SLE46C-70.K4/4P	2m Cable	5m – 70m	x	
SLS46C-70.K48-M12	SLE46C-70.K4/4P-M12	4-pin M12	5m – 70m	x	
SLS46CI-40.K48	SLE46CI-40.K4/4P	2m Cable	0,25m – 40m		x
SLS46CI-40.K48-M12	SLE46CI-40.K4/4P-M12	4-pin M12	0,25m – 40m		x
SLS46CI-70.K48	SLE46CI-70.K4/4P	2m Cable	5m – 70m		x
SLS46CI-70.K48-M12	SLE46CI-70.K4/4P-M12	4-pin M12	5m – 70m		x

Which safety PLC's can be used?

The test rate of PLC must be at least 100 times higher than the expected interruptions according EN 13849-1

For example:

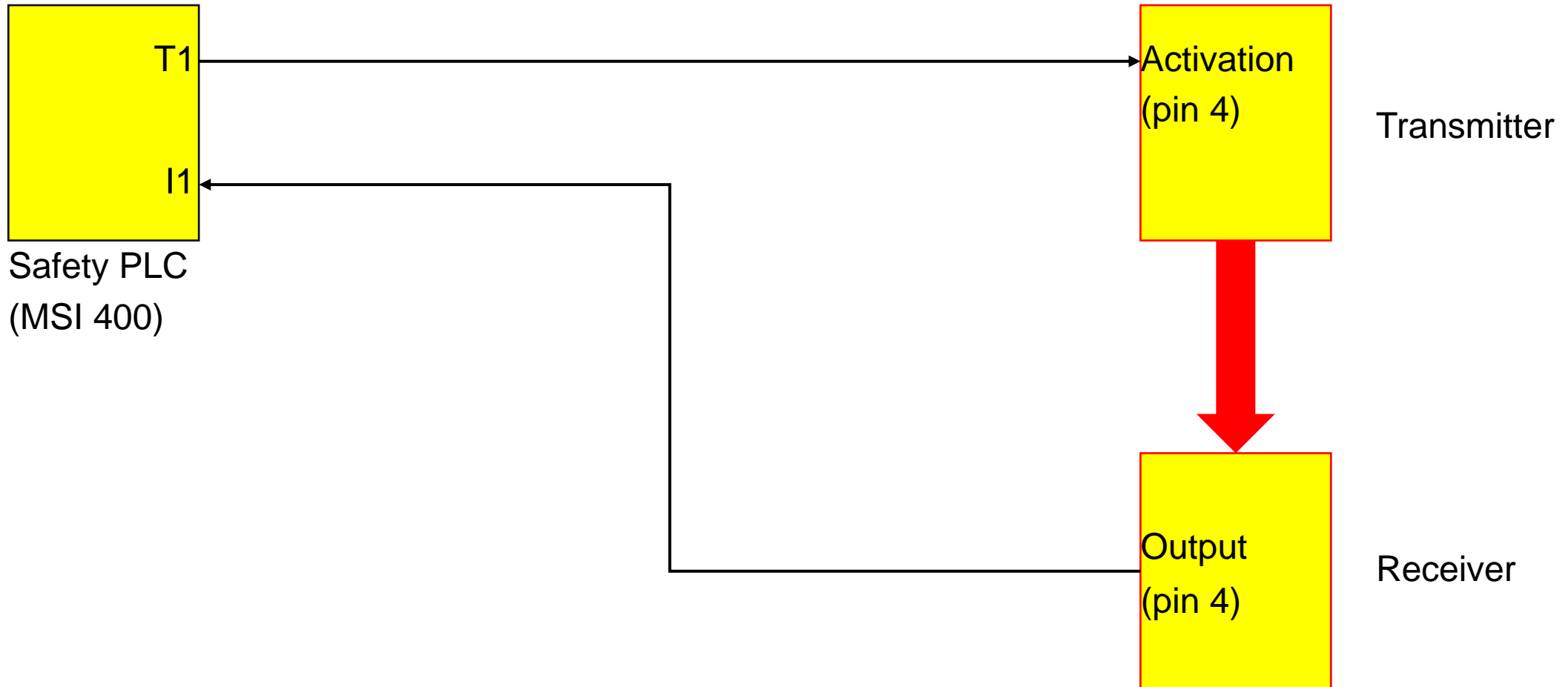
When the safety light barrier will be interrupted every minute, the test period must be at least 600ms.

Please note, that the transmitter and receiver have an activation time!

⇒ Test pulse gap must be higher than 5 ms.

Applicable Safety PLC's:

Company	Device
Leuze	MSI 400 series
Siemens	S7 – 300F series
	S7 – 1200F series
	S7 – 1500F series



How we achieve Performance Level d?

The system is a category 2 system (EN ISO 13849-1)

MTTF SLS46C – XX : 900 years

=> PFH: $2,3E-07 / h$

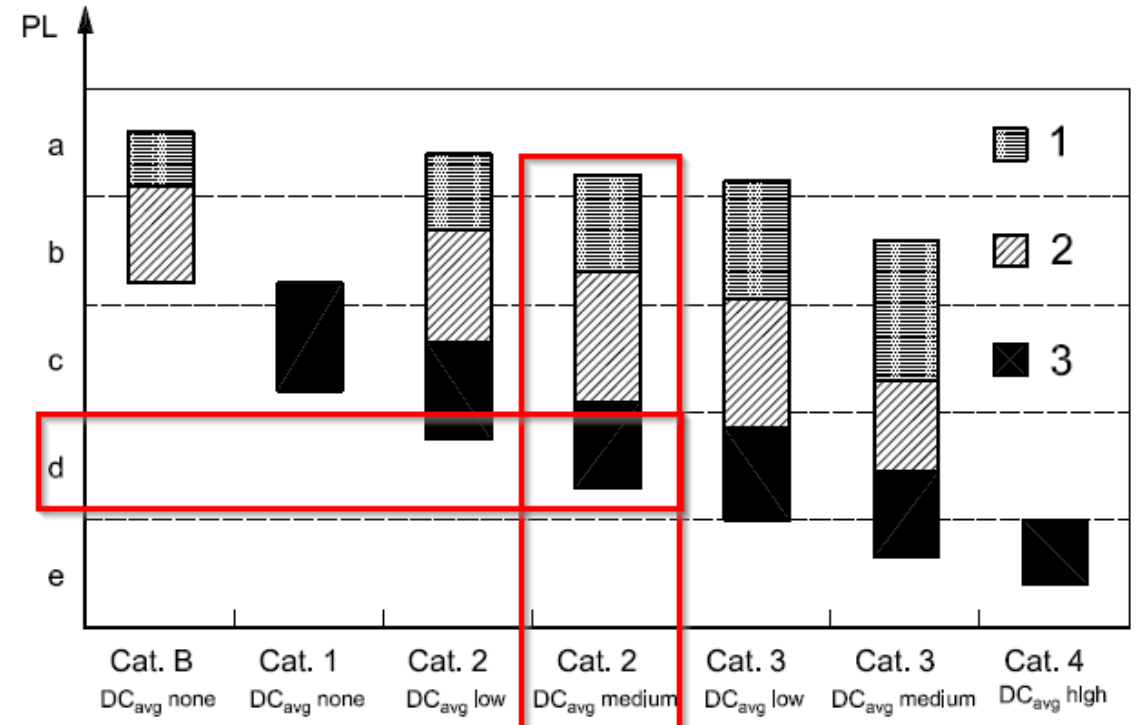
PFH MSI400 series: $4,3E-09$

PFH SLS46C + PFH MSI400 = $2,3E-07 / h$

PFH for PLd = $PFH < 1E-06 / h$

PFH SLS46C + MSI400 < PFH for PLd

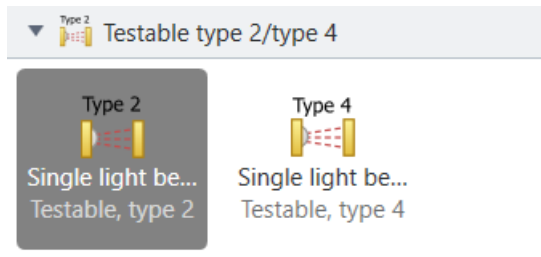
$2,3E-07 / h < 1E-06 / h$



Steps you have to do in MSI.Designer (MSI400 series)

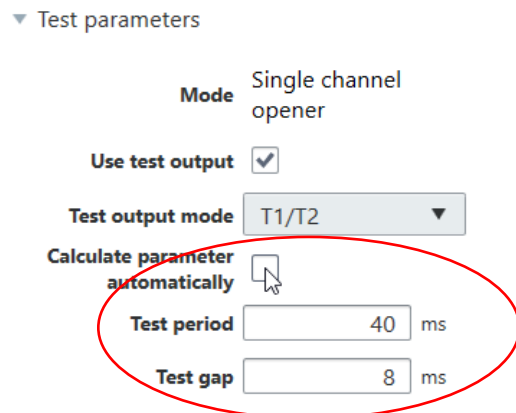
For 1 single beam device:

1. Use the functionblock „testable type 2“



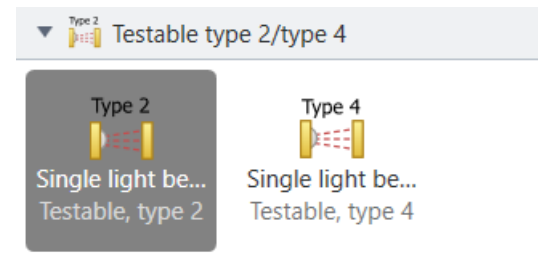
2. Uncheck calculate parameter

3. Change test gap parameter to 8 ms and test period at least to 40 ms.



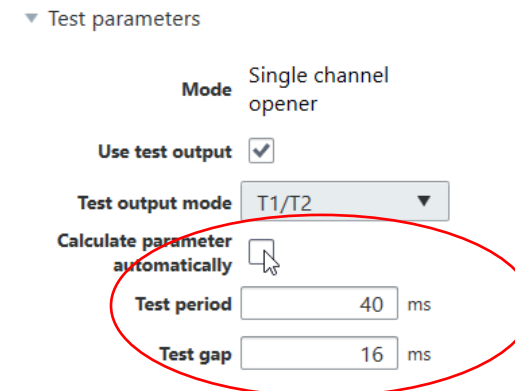
For up to 3 single beam devices:

1. Use the functional block „testable type 2“



2. Uncheck calculate parameter

3. Change test gap parameter to at least 16 ms and test period at least to 40 ms.



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