The MLG-2 as a replacement product for the MLG-1 and XLG

Quick finder guide for new light grids

SICK
Sensor Intelligence.

Described product

MLG-2

Manufacturer

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Legal information

Original document

This document is an original document of SICK AG.

CE

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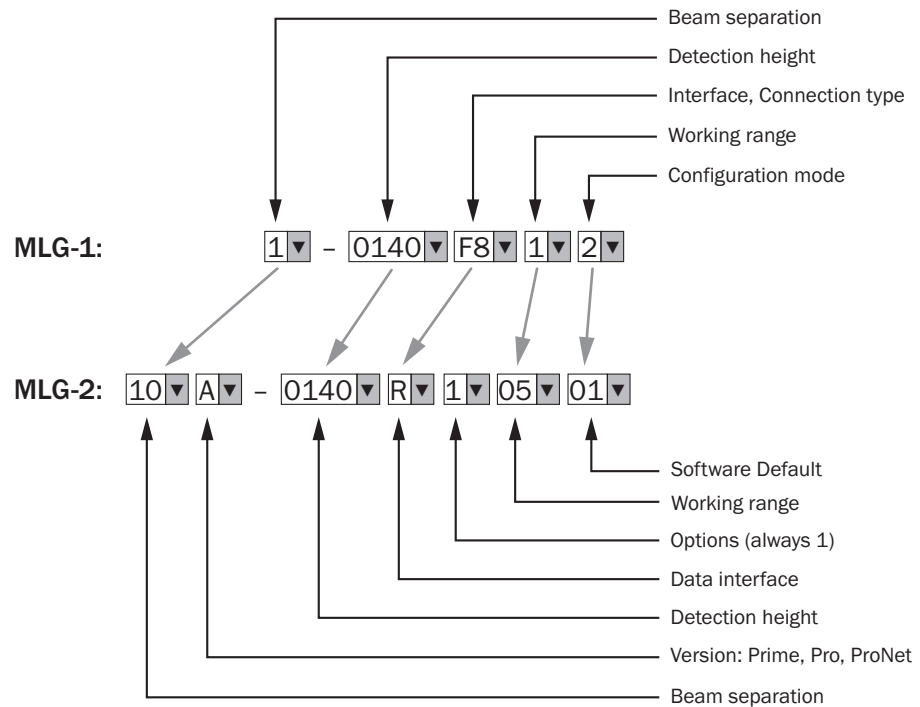
Figure 1: Comparison of the MLG-1 and MLG-2 type codes

Beam separation

Table 1: Beam separation

MLG-1	MLG-2
Beam separation Example: MLG1-xxxxxxxx	Beam separation Example: MLG10x-xxxxxxxxxx
1: 10 mm	10: 10 mm
2: 20 mm	20: 20 mm
3: 30 mm	30: 30 mm
4: 40 mm	40: 40 mm
5: 50 mm	50: 50 mm
7: 25 mm	25: 25 mm

Detection height

Table 2: Detection height

MLG-1	MLG-2
Detection height Example: MLGx-0100xxxx	Detection height Example: MLGxxx0100xxxxxx
0100: 100 mm to 3140: 3,140 mm	0100: 100 mm to 3140: 3,140 mm

Interface, connection type → version and data interface

If the interface and connection type of your MLG-1 are not listed in the table below, please contact your SICK AG sales office.

> **!** **NOTICE**
> Additional accessories may be required if you want to use your existing connecting cables with the MLG-2 (see "Overview of accessories required", page 19).

Table 3: Interface and connection type

MLG-1		MLG-2	
Interface and connection type	Description	Data interface	Result Type code
MLGx-xxxx**A8**xx	2 x AO, 1 x PNP-Out, 1 x PNP-In M12, 8-pin	B: 2 x analog + 2 x I/O	MLGxx**A**-xxxx**B**xxxxx
MLGx-xxxx**C8**xx	CANopen M12, 8-pin	C: CANopen	MLGxx**N**-xxxx**C**xxxxx
MLGx-xxxx**E2**xx	6 x NPN-Out, 2 x NPN-In Terminal compartment	U: Prepared for terminal box [1]	MLGxx**N**-xxxx**U**xxxxx [1]
MLGx-xxxx**E5**xx	1 x NPN-Out M12, 5-pin	R: 2 x Q + 2 x I/O	MLGxx**A**-xxxx**R**xxxxx
MLGx-xxxx**E8**xx	3 x NPN-Out, 1 x NPN-In M12, 8-pin	R: 2 x Q + 2 x I/O	MLGxx**A**-xxxx**R**xxxxx
MLGx-xxxx**F2**xx	6 x PNP-Out, 2 x PNP-In Terminal compartment	U: Prepared for terminal box [1]	MLGxx**N**-xxxx**U**xxxxx [1]
MLGx-xxxx**F5**xx	1 x PNP-Out M12, 5-pin	R: 2 x Q + 2 x I/O	MLGxx**A**-xxxx**R**xxxxx
MLGx-xxxx**F8**xx	3 x PNP-Out, 1 x PNP-In M12, 8-pin	R: 2 x Q + 2 x I/O	MLGxx**A**-xxxx**R**xxxxx
MLGx-xxxx**I2**xx	1 x RS-485, 4 x PNP-Out, 2 x PNP-In Terminal compartment	U: Prepared for terminal box [1]	MLGxx**N**-xxxx**U**xxxxx [1]
MLGx-xxxx**I8**xx	1 x RS-485, 1 x PNP-Out, 1 x PNP-In M12, 8-pin	I: RS-485 + 2 x I/O	MLGxx**A**-xxxx**I**xxxxx
MLGx-xxxx**N8**xx	2 x AO, 1 x NPN-Out, 1 x NPN-In M12, 8-pin	B: 2 x analog + 2 x I/O	MLGxx**A**-xxxx**B**xxxxx
MLGx-xxxx**P8**xx	PROFIBUS M12, 8-pin	P: Prepared for PROFIBUS replacement module [2]	MLGxx**N**-xxxx**P**xxx02
MLGx-xxxx**T2**xx	1 x RS-485, 4 x NPN-Out, 2 x NPN-In Terminal compartment	U: Prepared for terminal box [1]	MLGxx**N**-xxxx**U**xxxxx [1]
MLGx-xxxx**T8**xx	1 x RS-485, 1 x NPN-Out, 1 x NPN-In M12, 8-pin	I: RS-485 + 2 x I/O	MLGxx**A**-xxxx**I**xxxxx

[1] If you want to replace an MLG-1 that has a terminal compartment, you must order an additional item: the DOS-1205-G M12 female connector for the sender (part number: 6009719).

Table 4: Operating range

MLG-1	MLG-2
Operating range **Example: MLGx-xxxxxx1x**	**Operating range** **Example: MLGxxx-xxxxxx05xx**
1: 5 m, ± 3.6°	05: 5 m, ± 3.6°
2: 8.5 m, ± 3.6°	08: 8.5 m, ± 3.6°
4: 5 m, ± 5°	05: 5 m, ± 3.6°
5: 8.5 m, ± 5°	08: 8.5 m, ± 3.6°

Configuration mode → "Software Default"

The choice of variant for "Software Default" depends on the following:
- MLG-1 configuration mode
- The version required, which is determined by the interface and connection type of the MLG1 (siehe Tabelle 3, Seite 5)

Table 5: Configuration mode – "Software Default"

MLG-1		MLG-2	
Configuration mode **Example: MLGx-xxxxxxxx1**	**Connection type** **Example: MLGx-xxxxxx5xx**	**Version** **Example: MLGxxA-xxxxxxxxx**	**Software Default** **Example: MLGxxx-xxxxxxxx01**
1: Standard	5: M12, 5-pin	A: Pro	97
	5: M12, 5-pin	N: ProNet	01
	8: M12, 5-pin	A: Pro	99
2: Configuration interface	8: M12, 5-pin	A: Pro	99
3: Triple cross beam	5: M12, 5-pin	A: Pro	96
	8: M12, 5-pin	A: Pro	98
L: Triple cross beam, output Q inverted	5: M12, 8-pin	A: Pro	95

Special devices, customer-specific settings or no results at all

In the following cases, please contact your SICK AG sales office:
- Your MLG-1 is a special device: MLGx-xxxxxxxx**S**xx (example: MLGx2-1180F822**S**01)
- Your MLG-1 has customer-specific settings: MLGx-xxxxxxxx**K**xx (example: MLGx2-0580F812**K**01)
- Despite following the procedure described in this chapter, you are unable to find an appropriate MLG-2 variant to replace your MLG-1 variant.

1.2   Finding a replacement for your XLG

Table 6: Replacement for XLG-1

XLG-1			MLG-2
Type	**Part number**	**Description**	**Result** **Type code**
XLG1-0590I812	1065368	Beam separation: 10 mm, sensing range: 5 m, ± 1.8° 1 x RS-485, 1 x PNP-Out, 1 x PNP-In, M12, 8-pin, configuration interface	MLG10**A**-0590I10801

XLG-1			MLG-2
Type	Part number	Description	Result Type code
XLG2-1180I212	1048203	Beam separation 20 mm, sensing range: 5 m, ± 1.8° 1 x RS-485, 4 x PNP-Out, 2 x PNP-In, with terminal compartment, configuration interface	MLG20**N**-1180**U**10801
XLG3-1020F812	1046353	Beam separation: 30 mm, sensing range: 5 m, ± 1.8° 3 x PNP-Out, 1 x PNP-In, M12, 8-pin, configuration interface	MLG30**A**-1020**R**10801
XLG3-1470F812	1047926	Beam separation: 30 mm, sensing range: 5 m, ± 1.8° 3 x PNP-Out, 1 x PNP-In, M12, 8-pin, configuration interface	MLG30**A**-1470**R**10801
XLG5-1150T81	1064836	Beam separation: 50 mm, sensing range: 5 m, ± 1.8° 1 x RS-485, 1 x PNP-Out, 1 x PNP-In, M12, 8-pin, configuration interface	MLG50**A**-1150**I**10801
XLG5-1900I212	1048351	Beam separation: 50 mm, sensing range: 5 m, , ± 1.8° 1 x RS-485, 4 x PNP-Out, 2 x PNP-In, with terminal compartment, configuration interface	MLG50**N**-1900**U**10801

Special devices, customer-specific settings or no results at all

In the following cases, please contact your SICK AG sales office:
- Your XLG-1 is a special device: XLGx-xxxxxxxx**S**xx (example: XLG2-1020F412**S**04)
- Your XLG-1 has customer-specific settings: XLGx-xxxxxxxx**K**xxx (example: XLG5-1900I212**K**001)
- Despite following the procedure described in this chapter, you are unable to find an appropriate MLG-2 variant to replace your XLG variant.

1.3   Type code and ordering information

For a detailed illustration of the type code and for further ordering information, please refer to the relevant product information.
- MLG-1 and XLG product information: 8014655
- MLG-2 product information: 8017053

2 Advantages of the MLG-2 compared to the MLG-1

The MLG-2 offers the following advantages over the MLG-1:
- Able to detect smaller objects (high-resolution mode)
- Improved detection of transparent objects thanks to "Transparent mode"
- Improved ambient light immunity due to the smaller aperture angle
- Better able to adapt to the environment and the application thanks to a variety of operating modes
- Shorter response times and minimum presence time
- Smaller minimum distances when mounting multiple light grids
- Flexible mounting of removable fieldbus module (no blind zone)
- Removable fieldbus modules that can be ordered separately
- Control panel for easy commissioning without a PC
- IO-Link interface V.1.1
- Easy configuration with the SOPAS configuration software via an Ethernet interface
- Configuration options for multiple applications (measuring tasks)

For additional information, see the relevant operating instructions.

3   Response times

As the MLG-2 offers shorter response times, you may have to adjust the PLC configuration. Alternatively, you can also set a digital output delay for the MLG-2. See the relevant MLG-2 operating instructions.
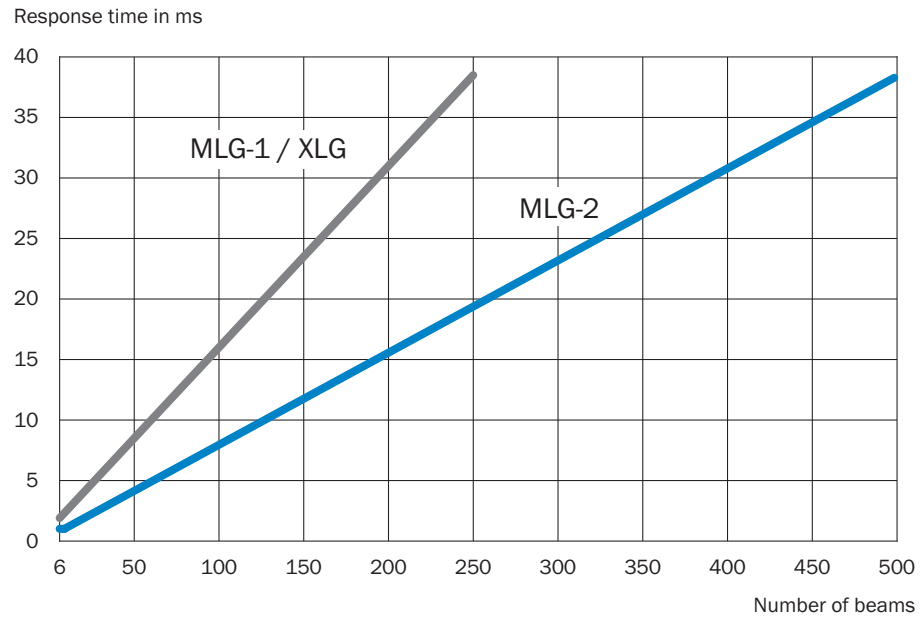
Response time in ms

Figure 2: Comparison of response times for MLG-1 / XLG and MLG-2 with parallel-beam function, MLG-2 without high-speed scan

The response time depends on the beam function and on which basic function is selected.

In the case of the cross-beam function, multiply the response time in the diagram by 2.

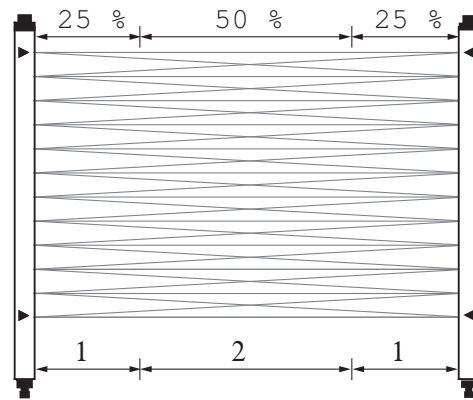# 4 Minimum detectable object (MDO) – Cross-beam function

Figure 3: Cross-beam function

① Area A
② Area B

Operating range 5 m

Table 7: Cross-beam function, operating range 5 m – Minimum detectable object (stationary object) with standard measurement accuracy

	MLG-1				MLG-2		
	± 3.6°	± 5°	MDO		± 3.6°	MDO	
Beam separation	Minimum distance		In area A	In area B	Minimum distance	In area A	In area B
10 mm	350 mm	180 mm	15 mm	> 10 mm	220 mm	14 mm	9 mm
20 mm	650 mm	320 mm	25 mm	> 15 mm	440 mm	24 mm	14 mm
25 mm	–	400 mm	30 mm	> 18 mm	550 mm	29 mm	16.5 mm
30 mm	900 mm	470 mm	35 mm	> 20 mm	660 mm	34 mm	19 mm
50 mm	1,500 mm	750 mm	55 mm	> 30 mm	1,110 mm	54 mm	29 mm

Operating range 8.5 m

Table 8: Cross-beam function, operating range 8.5 m – Minimum detectable object (stationary object) with standard measurement accuracy

	MLG-1				MLG-2		
	± 3.6°	± 5°	MDO		± 3.6°	MDO	
Beam separation	Minimum distance		In area A	In area B	Minimum distance	In area A	In area B
10 mm	350 mm	180 mm	20 mm	> 15 mm	240 mm	14 mm	9 mm
20 mm	650 mm	320 mm	30 mm	> 20 mm	480 mm	24 mm	14 mm
30 mm	900 mm	470 mm	40 mm	> 25 mm	720 mm	34 mm	19 mm
50 mm	1,500 mm	750 mm	60 mm	> 35 mm	1,200 mm	54 mm	29 mm

5 Mounting

5.1 Distance between lower edge of housing and first beam

The distance between the lower edge of the housing and the first beam is not the same on the MLG-2 as on the MLG-1.

There are three different applications, which are illustrated in chapters "Application 1", "Application 2", and "Application 3". The choice of application depends on which MLG-1 is being replaced and on the new MLG-2. The following table lists suitable MLG-2 variants as replacements for certain MLG-1 variants. For additional information, siehe Tabelle 3, Seite 5.

▶ Remember to take account of the difference between the lower edge of the housing and the first beam during planning and mounting.

- Application 1: see "Application 1", page 12
- Application 2: see "Application 2", page 13
- Application 3: see "Application 3 (PROFIBUS or CANopen)", page 14

Table 9: Applications – Replacement involving MLG-1 and MLG-2

MLG-1	MLG-2	MLG-1 and MLG-2
Type code Interface and connection type	Type code Version and data interface	Application – Comparison of first beam in relation to lower edge of housing
MLGx-xxxx**A8**xx	MLGxx**A**-xxxx**B**xxxxx	Application 1
MLGx-xxxx**C8**xx	MLGxx**N**-xxxx**C**xxxxx	Application 3
MLGx-xxxx**E2**xx	MLGxx**N**-xxxx**U**xxxxx [1]	Application 2
MLGx-xxxx**E5**xx	MLGxx**A**-xxxx**R**xxxxx	Application 1
MLGx-xxxx**E8**xx	MLGxx**A**-xxxx**R**xxxxx	Application 1
MLGx-xxxx**F2**xx	MLGxx**N**-xxxx**U**xxxxx [1]	Application 2
MLGx-xxxx**F5**xx	MLGxx**A**-xxxx**R**xxxxx	Application 1
MLGx-xxxx**F8**xx	MLGxx**A**-xxxx**R**xxxxx	Application 1
MLGx-xxxx**I2**xx	MLGxx**N**-xxxx**U**xxxxx [1]	Application 2
MLGx-xxxx**I8**xx	MLGxx**A**-xxxx**I**xxxxx	Application 3
MLGx-xxxx**N8**xx	MLGxx**A**-xxxx**B**xxxxx	Application 1
MLGx-xxxx**P8**xx	MLGxx**N**-xxxx**P**xxx02	Application 3
MLGx-xxxx**T2**xx	MLGxx**N**-xxxx**U**xxxxx	Application 2
MLGx-xxxx**T8**xx	MLGxx**A**-xxxx**I**xxxxx	Application 1

[1] Remember to order the following additional item: the DOS-1205-G M12 female connector for the sender (part number: 6009719).
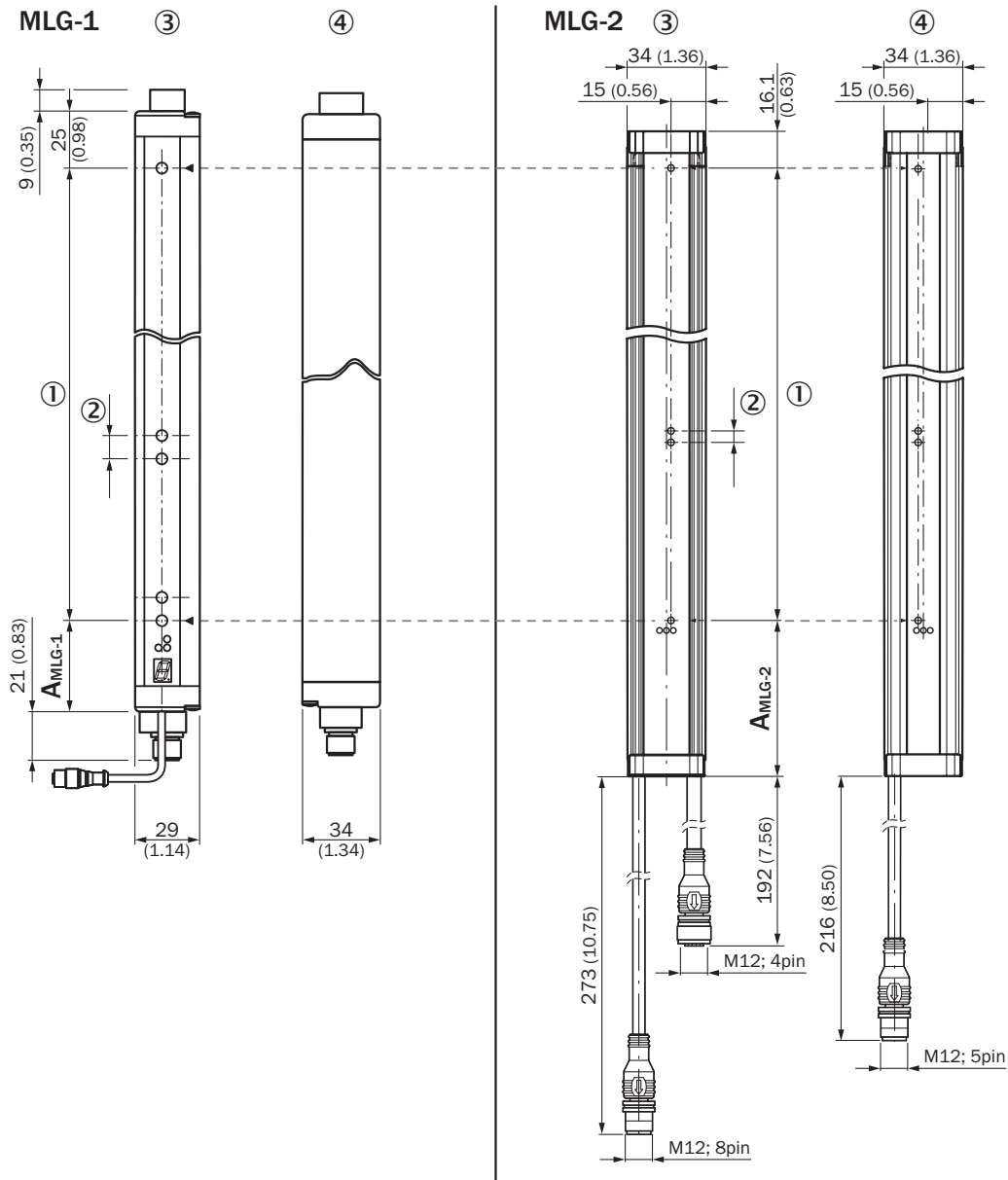
5.1.1 Application 1

Figure 4: Application 1 – Comparison of distance between first beam and lower edge of housing on MLG-1 and MLG-2

①   Detection height
②   Beam separation
③   Receiver
④   Sender
A   Distance between lower edge of housing and first beam (see table 10, page 15)

5.1.2 Application 2

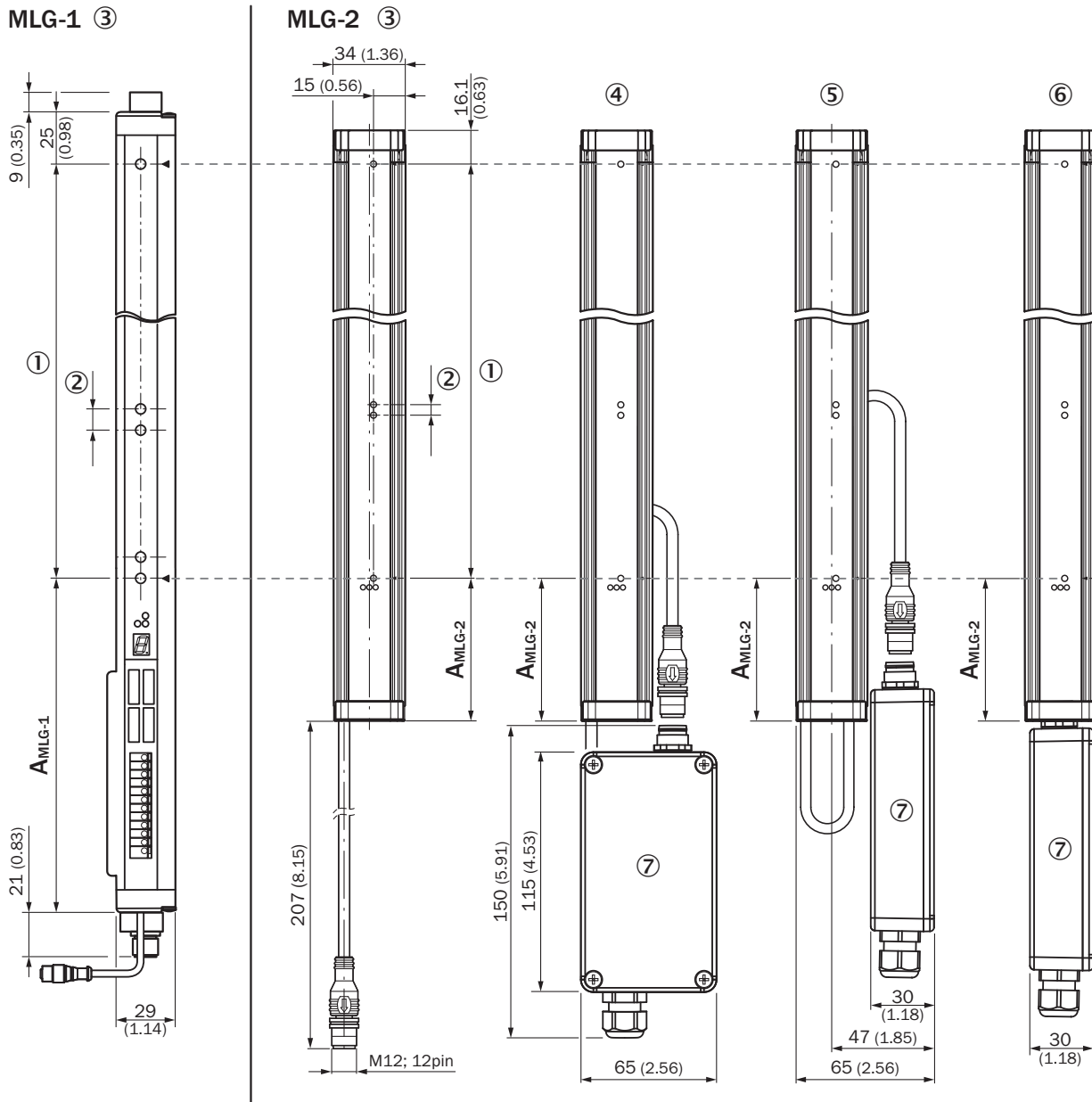Figure 5: Application 2 – Comparison of distance between first beam and lower edge of housing on MLG-1 and MLG-2

① Detection height
② Beam separation
③ Receiver
④ "Flat" installation example
⑤ "Slim" installation example
⑥ "Compact" installation example
⑦ "AFB" terminal box (for additional information, see "Connecting the "AFB" terminal box", page 20).
A Distance between lower edge of housing and first beam (see table 10, page 15)

5.1.3 Application 3 (PROFIBUS or CANopen)

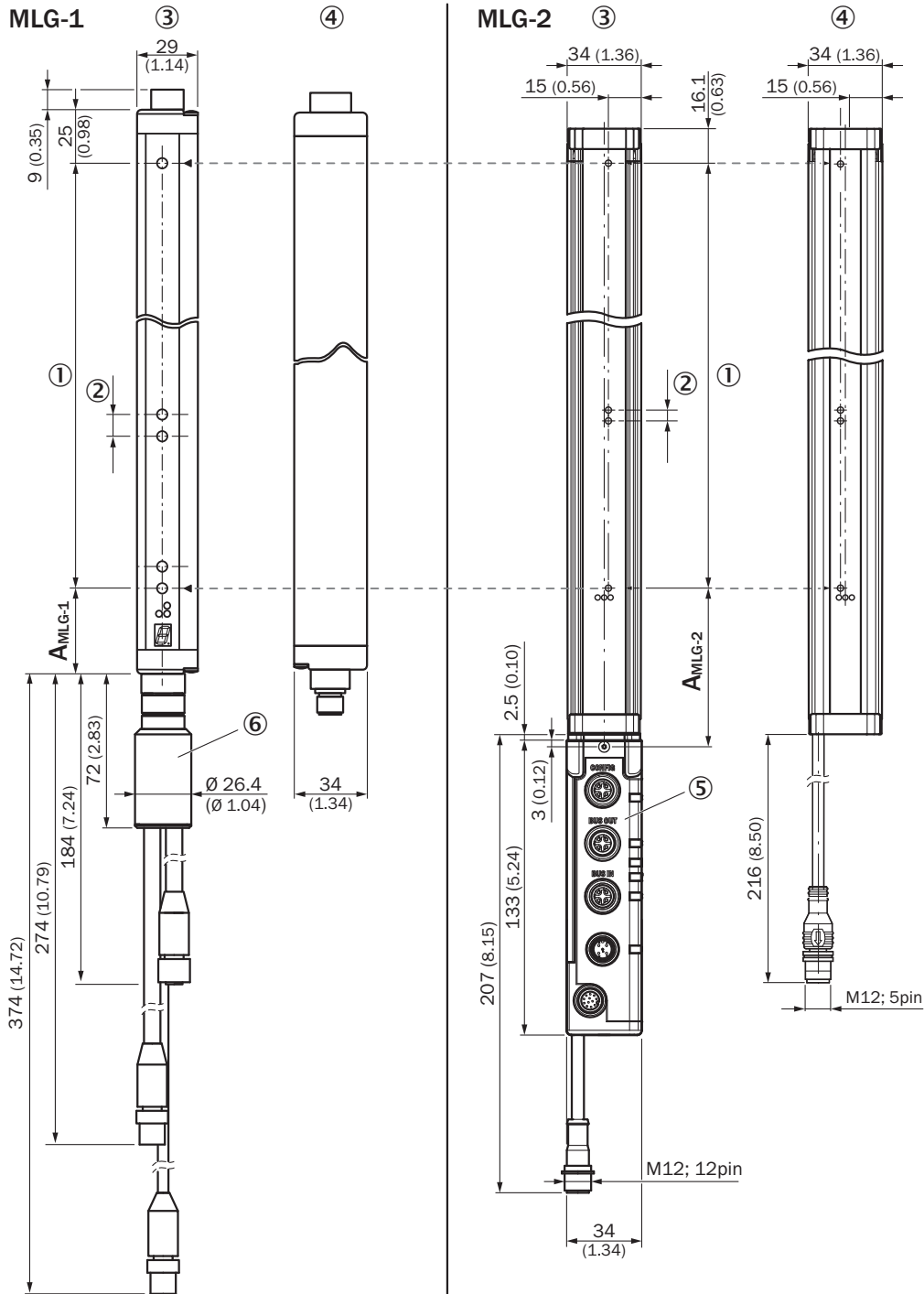*Figure 6: Application 3 – Comparison of distance between first beam and lower edge of housing on MLG-1 and MLG-2*

① Detection height
② Beam separation
③ Receiver
④ Sender
⑤ Fieldbus module; the fieldbus module can be mounted separately
⑥ CANopen adapter ADAPT-CAN-GE-MLG or PROFIBUS adapter ADAPT-PB-GE-MLG
A Distance between lower edge of housing and first beam (see table 11, page 15)

5.1.4   Distance between lower edge of housing and first beam for all applications

Applications 1 and 3

Table 10: Applications 1 and 3 – Distance between first beam and lower edge of housing

Beam separation	Dimension A_{MLG-1}	Dimension A_{MLG-2}
10 mm	40 mm	68.3 mm
20 mm	49 mm [1]	68.3 mm
	59 mm [2]	78.3 mm
25 mm	64 mm	83.3 mm
30 mm	69 mm	88.3 mm
50 mm	89 mm	108.3 mm

[1]   With an even number of beams
[2]   With an uneven number of beams

Application 2

Table 11: Application 2 – Distance between first beam and lower edge of housing

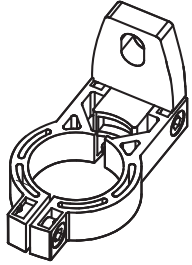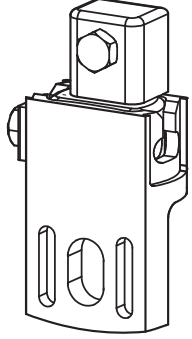| Beam separation	Dimension A_{MLG-1}	Dimension A_{MLG-2}
10 mm	160 mm	68.3 mm
20 mm	170 mm [1]	68.3 mm
	180 mm [2]	78.3 mm
25 mm	175 mm	83.3 mm
30 mm	180 mm	88.3 mm
50 mm	200 mm	108.3 mm

[1]   With an even number of beams
[2]   With an uneven number of beams

5.2   Overview of brackets

Various brackets were available for mounting the MLG-1 light grid. In the case of the brackets below, you can use the same mounting positions for the MLG-2 as for the MLG-1 by relying on the BEF-1SHABP004 mounting kit.

Please note that the MLG-1 and MLG-2 differ in terms of where the first beam is located in relation to the lower edge of the housing (see "Distance between lower edge of housing and first beam", page 11).

Table 12: Replaceable MLG-1 and XLG-1 brackets

MLG-1			MLG-2	
Designation	Part number	Description	Designation	Part number
Swivel mount bracket BEF-2SMKEAKU4	2019649		Mounting kit BEF-1SHABP004	2071021
Side bracket BEF-NUT-MLG	2023696			

Alternatively, you can mount the MLG-2 using the following brackets:
- FlexFix bracket BEF-1SHABPKU4 (part number: 2066614)
- QuickFix bracket BEF-3SHABPKU2 (part number: 2066048)

In order to use this bracket, you must adapt the mounting position accordingly.

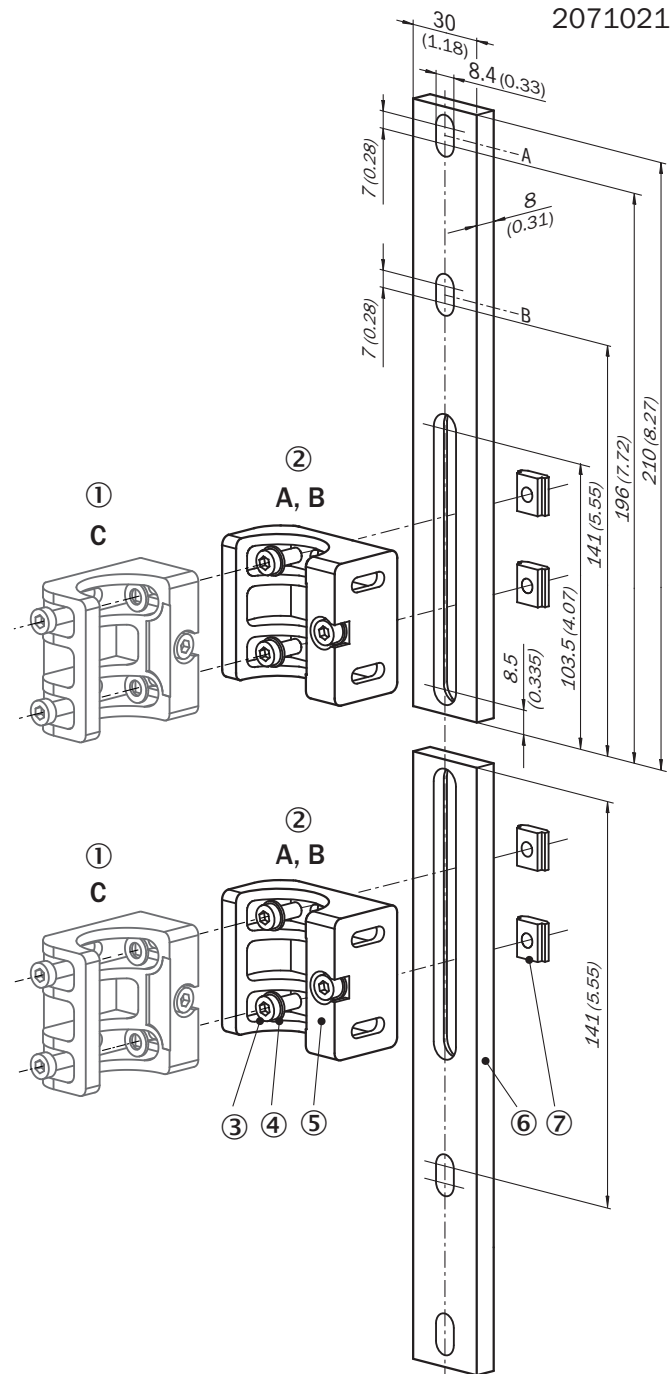### 5.2.1   Mounting the MLG-2 with the BEF-1SHABP004 mounting kit

Figure 7: Mounting kit (part number: 2071021) – Dimensions, layout, and scope of delivery

①   Method C
②   Method A or B
③   Screw (8x)
④   Washer (8x)
⑤   FlexFix bracket (4x)
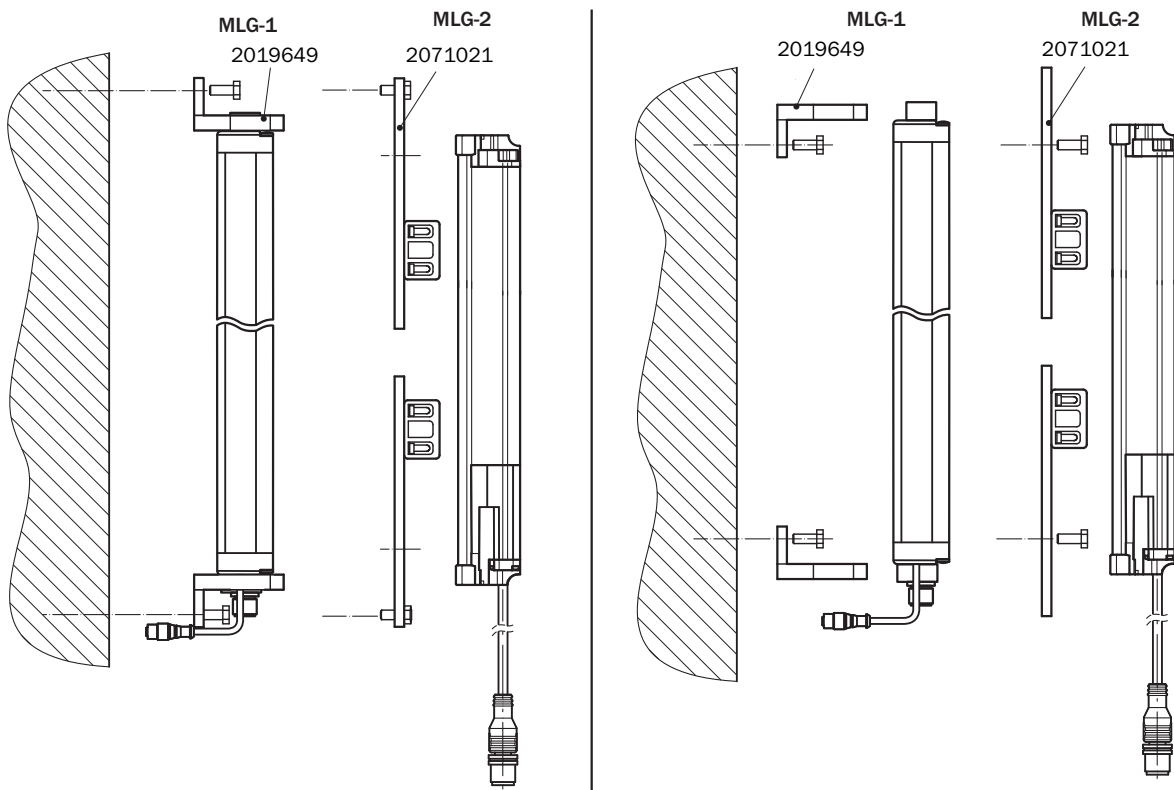⑥   Mounting plate (4x)
⑦   Sliding nut (8x)

Figure 8: Mounting the MLG-2 with mounting kit BEF-1FSHABP004 – Methods A and B, replacement for side bracket BEF-NUT-MLG
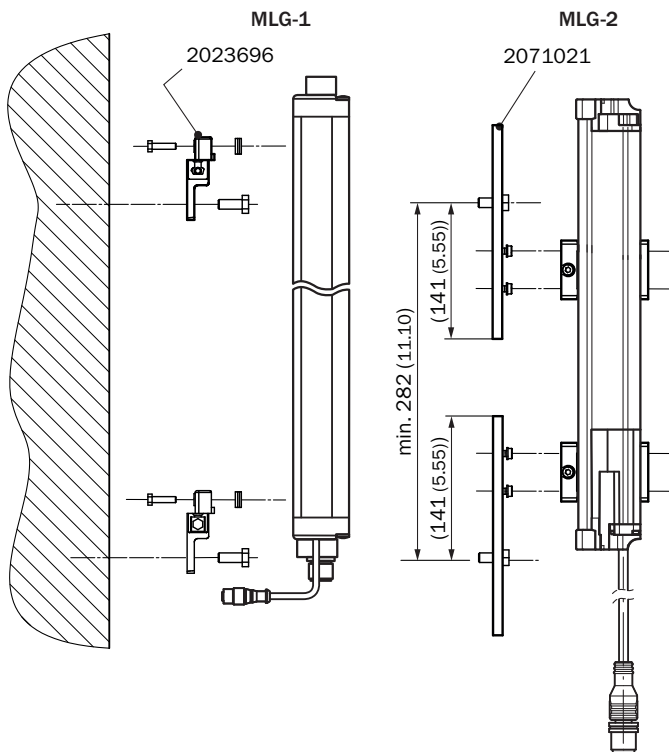

Figure 9: Mounting the MLG-2 with mounting kit BEF-1FSHABP004 – Method C, replacement for swivel mount bracket BEF-2SMKEAKU4

6 Electrical connection

6.1 Overview of accessories required

SICK offers some accessories in case you want to use your MLG-1 connecting cables for the MLG-2.

Table 13: Accessories required

MLG-1	MLG-2	Accessories required for the MLG-2	
Type code Interface and connection type	Type code Version and data interface	Sender	Receiver
MLGx-xxxx**A8**xx	MLGxx**A**-xxxx**B**xxxxx	Adapter cable Part number: 6057015	Adapter cable Part number: 6057014
MLGx-xxxx**C8**xx	MLGxx**N**-xxxx**C**xxxxx	No accessories required	No accessories required
MLGx-xxxx**E2**xx (with terminal compartment)	MLGxx**N**-xxxx**U**xxxxx	M12 female connector, 5-pin, A-coded DOS-1205-G Part number: 6009719	"AFB" terminal box Part number: 2082790 Included with delivery
MLGx-xxxx**E5**xx	MLGxx**A**-xxxx**R**xxxxx	No accessories required	Adapter cable Part number: 6057013
MLGx-xxxx**E8**xx	MLGxx**A**-xxxx**R**xxxxx	Adapter cable Part number: 6057015	Adapter cable Part number: 6057014
MLGx-xxxx**F2**xx (with terminal compartment)	MLGxx**N**-xxxx**U**xxxxx	M12 female connector, 5-pin, A-coded DOS-1205-G Part number: 6009719	"AFB" terminal box Part number: 2082790 Included with delivery
MLGx-xxxx**F5**xx	MLGxx**A**-xxxx**R**xxxxx	No accessories required	Adapter cable Part number: 6057013
MLGx-xxxx**F8**xx	MLGxx**A**-xxxx**R**xxxxx	Adapter cable Part number: 6057015	Adapter cable Part number: 6057014
MLGx-xxxx**I2**xx (with terminal compartment)	MLGxx**N**-xxxx**U**xxxxx	M12 female connector, 5-pin, A-coded DOS-1205-G Part number: 6009719	"AFB" terminal box Part number: 2082790 Included with delivery
MLGx-xxxx**I8**xx	MLGxx**A**-xxxx**I**xxxxx	Adapter cable Part number: 6057015	Adapter cable Part number: 6057014
MLGx-xxxx**N8**xx	MLGxx**A**-xxxx**B**xxxxx	Adapter cable Part number: 6057015	Adapter cable Part number: 6057014
MLGx-xxxx**P8**xx (PROFIBUS)	MLGxx**N**-xxxx**P**xxx02	No accessories required	PROFIBUS replacement module FBM-P22 Part number: 2092618 Included with delivery
MLGx-xxxx**T2**xx	MLGxx**N**-xxxx**U**xxxxx	M12 female connector, 5-pin, A-coded DOS-1205-G Part number: 6009719	"AFB" terminal box Part number: 2082790 Included with delivery
MLGx-xxxx**T8**xx	MLGxx**A**-xxxx**I**xxxxx	Adapter cable Part number: 6057015	Adapter cable Part number: 6057014

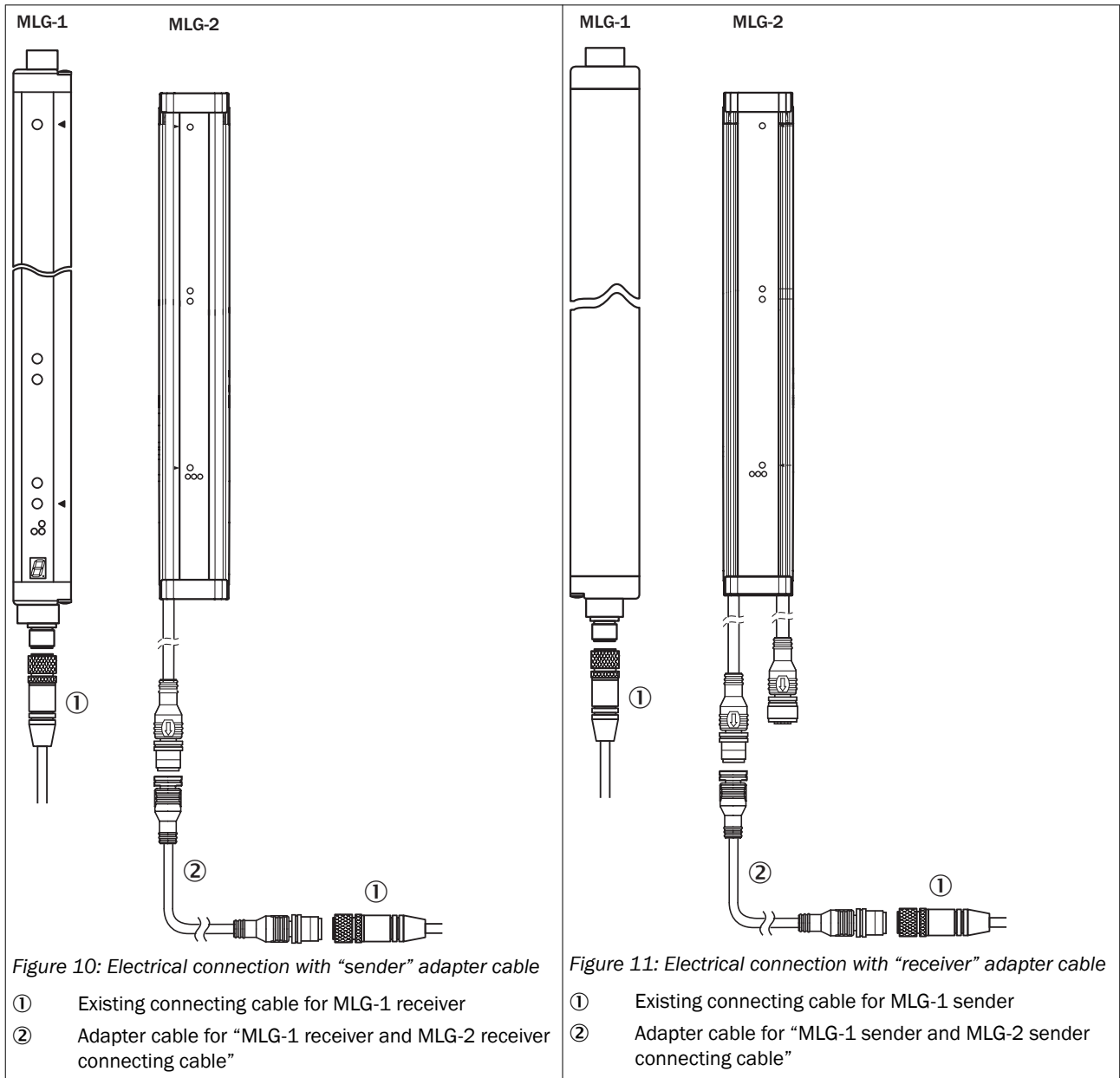Please note that the accessories are always required with the following variants:
- MLG-1 variants with a terminal compartment: accessory required = "AFB" terminal box
- MLG-1 featuring PROFIBUS: accessory required = PROFIBUS replacement module FBM-P22

6.2 Adapter cables

Various adapter cables are available to facilitate the replacement of certain MLG variants (see "Overview of accessories required", page 19).

To carry out the replacement process, proceed as follows:

1. Connect the adapter cable between the connecting cable of the MLG-1 sender and the MLG-2 sender.
2. Connect the adapter cable between the connecting cable of the MLG-1 receiver and the MLG-2 receiver.

Figure 10: Electrical connection with "sender" adapter cable

① Existing connecting cable for MLG-1 receiver
② Adapter cable for "MLG-1 receiver and MLG-2 receiver connecting cable"

Figure 11: Electrical connection with "receiver" adapter cable

① Existing connecting cable for MLG-1 sender
② Adapter cable for "MLG-1 sender and MLG-2 sender connecting cable"

6.3 Connecting the "AFB" terminal box

In order to replace the receiver for MLG variants that have a terminal compartment, you must connect the "AFB" terminal box (part number 2082790) to the MLG-2 receiver (see "Overview of accessories required", page 19 and see "Application 2", page 13).

To carry out the replacement process, proceed as follows:

1. Unplug the connecting cable from the MLG-1 receiver. Remember to make a note of the wire colors and terminal numbers of the MLG-1.
2. Plug the connecting cable into the "AFB" terminal box as shown below (see figure 12, page 21).
   - Please note that the wiring is dependent on the MLG variant.
   - To make the wiring process easier, you can remove the terminal strips.
3. Connect the "AFB" terminal box to the 12-pin connecting cable (M12 male connector) of the MLG-2.
4. To configure the MLG-2, you will need a PC that has SOPAS ET installed. Connect this PC to the RJ45 female connector on the terminal box via an Ethernet cable (part number 6026084).
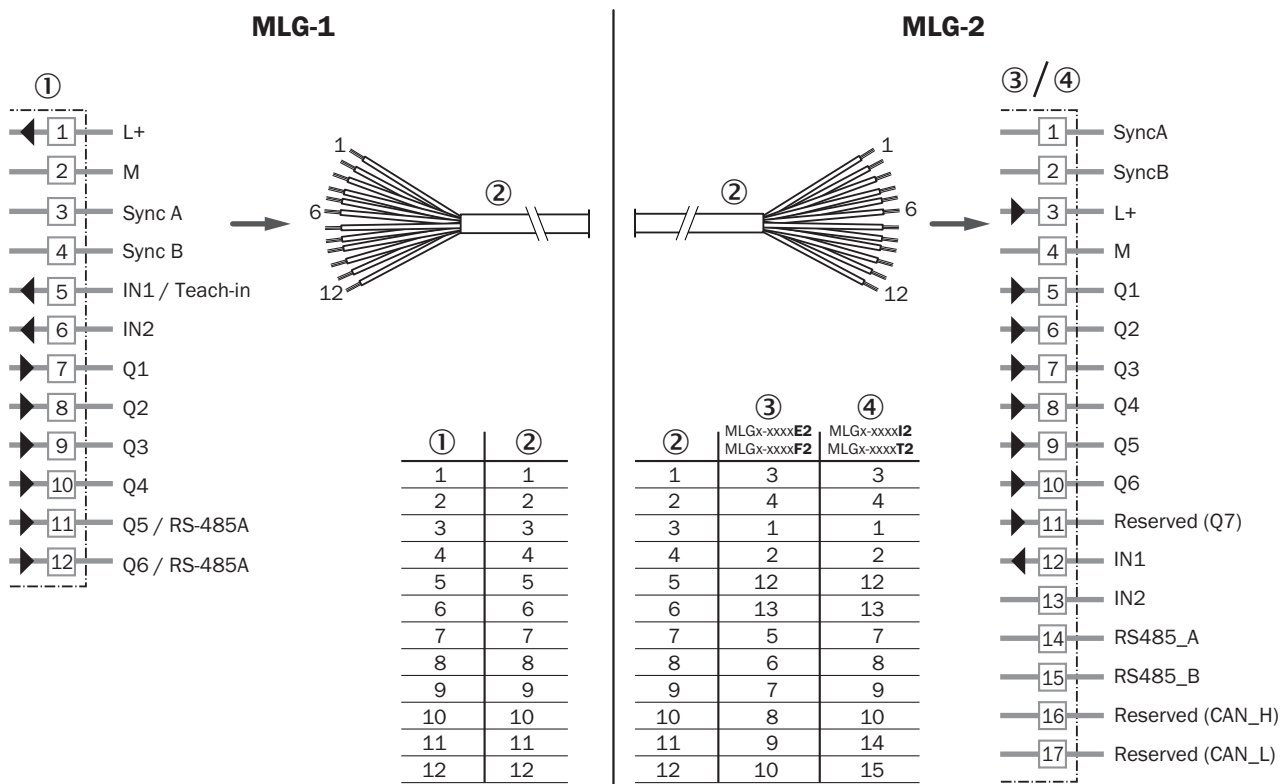
MLG-1

①	
1	L+
2	M
3	Sync A
4	Sync B
5	IN1 / Teach-in
6	IN2
7	Q1
8	Q2
9	Q3
10	Q4
11	Q5 / RS-485A
12	Q6 / RS-485A

MLG-2

③ / ④	
1	SyncA
2	SyncB
3	L+
4	M
5	Q1
6	Q2
7	Q3
8	Q4
9	Q5
10	Q6
11	Reserved (Q7)
12	IN1
13	IN2
14	RS485_A
15	RS485_B
16	Reserved (CAN_H)
17	Reserved (CAN_L)

①	②
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12

②	③ MLGx-xxxx**E2** MLGx-xxxx**F2**	④ MLGx-xxxx**I2** MLGx-xxxx**T2**
1	3	3
2	4	4
3	1	1
4	2	2
5	12	12
6	13	13
7	5	7
8	6	8
9	7	9
10	8	10
11	9	14
12	10	15

Figure 12: MLG-1, replacing a receiver that has a terminal compartment

①　　Terminal compartment on MLG-1 receiver
②　　Connecting cable for MLG-1 receiver
③　　Connection to the "AFB" terminal box for variants MLGx-xxxxE2 and MLGx-xxxxF2
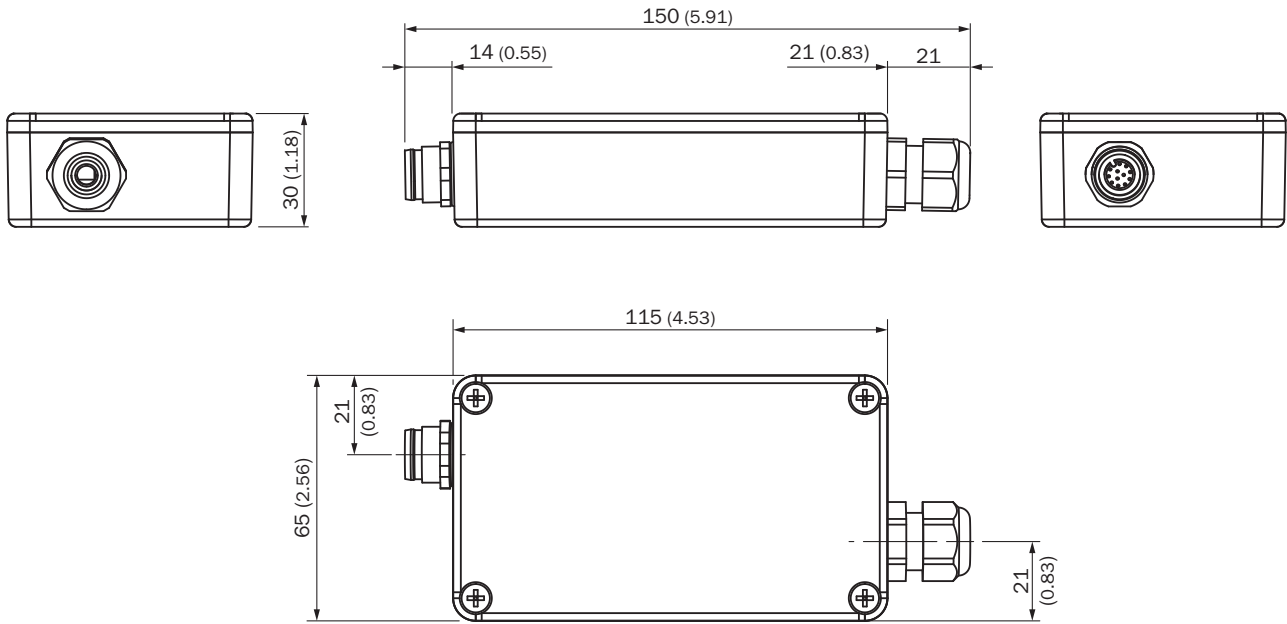④　　Connection to the "AFB" terminal box for variants MLGx-xxxxI2 and MLGx-xxxxT2

Figure 13: Dimensions of the "AFB" terminal box (part number 2082790)

The terminal box has 17 terminals.

Table 14: Terminals in the terminal box

1	SyncA
2	SyncB
3	L+
4	M
5	Q1
6	Q2
7	Q3
8	Q4
9	Q5
10	Q6
11	Reserved (Q7 for special applications)
12	IN1
13	IN2
14	RS485_A
15	RS485_B
16	Reserved (CAN_H for special applications)
17	Reserved (CAN_L for special applications)

6.4 Connecting the M12 female connector

In the case of MLG variants that feature a terminal compartment, a 5-pin, M12 female connector is available to enable replacement of the sender (see "Overview of accessories required", page 19).

To carry out the replacement process, proceed as follows:

1. Unplug the connecting cable from the MLG-1 sender. Remember to make a note of the wire colors and terminal numbers of the MLG-1.
2. Connect the connecting cable to the 5-pin M12 female connector as follows:
    - Terminal 1 wire of MLG-1 → pin 1 of M12 female connector
    - Terminal 2 wire of MLG-1 → pin 3 of M12 female connector
    - Terminal 3 wire of MLG-1 → pin 2 of M12 female connector
    - Terminal 4 wire of MLG-1 → pin 5 of M12 female connector
    - Terminal 5 wire of MLG-1 → pin 4 of M12 female connector
3. Using the connecting cable, connect the M12 female connector to the M12 male connector of the MLG-2.
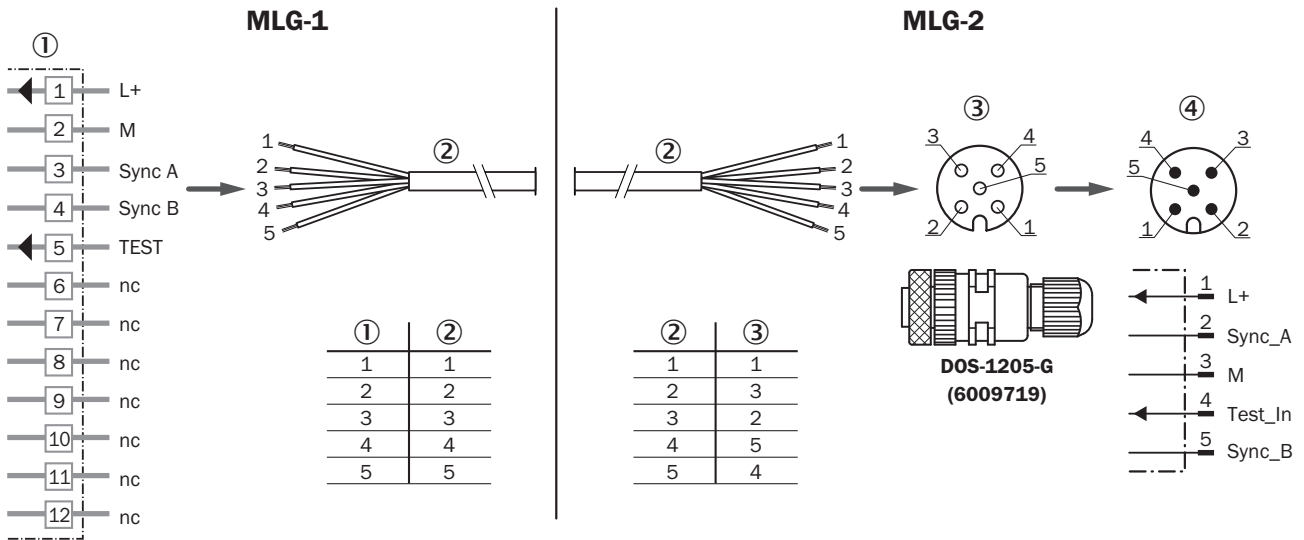
Figure 14: MLG-1, replacing a sender that has a terminal compartment

①   Terminal compartment on MLG-1 sender
②   Connecting cable for MLG-1 sender
③   M12 female connector, 5-pin, A-coded, e.g., DOS-1205-G (part number 6009719); to be ordered separately
④   M12 male connector, 5-pin, A-coded on MLG-2 sender

7 Configuration

This chapter is only relevant if you are replacing MLG-1 devices that have been configured using the MLG-1 configuration program called "MLGsetup".

7.1 Transferring the parameter settings from the MLG-1 to the MLG-2

To transfer the MLG-1 settings to the MLG-2, you must complete the following steps:

1. Save the MLG-1 settings in the "MLGsetup" configuration program as an "MLG System Information" file (see "Setting the parameters for the MLG-2 in SOPAS ET", page 24).
2. Take the parameters from the "MLG System Information" file and set them manually for the MLG-2 in the SOPAS ET configuration program (see "Saving the MLG-1 parameter settings", page 24).

7.2 Saving the MLG-1 parameter settings

The MLG-1 Programmable and XLG Programmable were configured via the "MLGsetup" configuration program.

To configure the MLG-2, you need to use SOPAS ET instead.

Saving the parameter settings

1. Start MLGsetup.
2. Download the parameter settings from the MLG-1. You have the following options:
   - Select the "Download" menu. Menu path: MLG > Download
   - Select the "Load configuration data from MLG" button.

3. Print the parameter settings (MLG System Information).
   - Select the printer. Menu path: File > Page layout
   - Print the settings. Menu path: File > Print
   - The "MLG System Information" file contains the settings from the "Configuration parameter" window (menu path: Handle > Parameters) as well as additional information. The information in the "MLG System Information" file does not appear in the same order as the tabs of the "Configuration parameter" window.
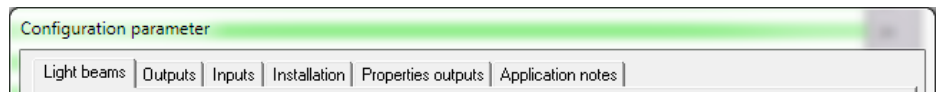
4. Quit MLGsetup.
✓ The relevant data for the MLG-1 is now contained in the "MLG System Information" file.

7.3 Setting the parameters for the MLG-2 in SOPAS ET

To make the settings for the MLG-2 in SOPAS ET, proceed as follows:

1. Take the printout of the "MLG System Information" file.
2. Make the settings step by step in SOPAS ET by referring to the "MLG System Information" file.

How the "MLG System Information" is structured

The "MLG System Information" file is divided into the following sections:
- Application notes
- Hardware
- Installation: see ""Installation" section", page 26.
- Configuration > Outputs: see ""Configuration – Outputs" section", page 27
- Configuration > Light beams: see ""Configuration – Light beams" section", page 32
- Configuration > Inputs: see ""Configuration – Inputs" section", page 33
- Configuration > Data interface: see ""Configuration – Data interface" section", page 35

The "Application notes" and "Hardware" sections are not relevant for the purpose of configuring the MLG-2.

7.3.1 MLGsetup and SOPAS ET user interfaces
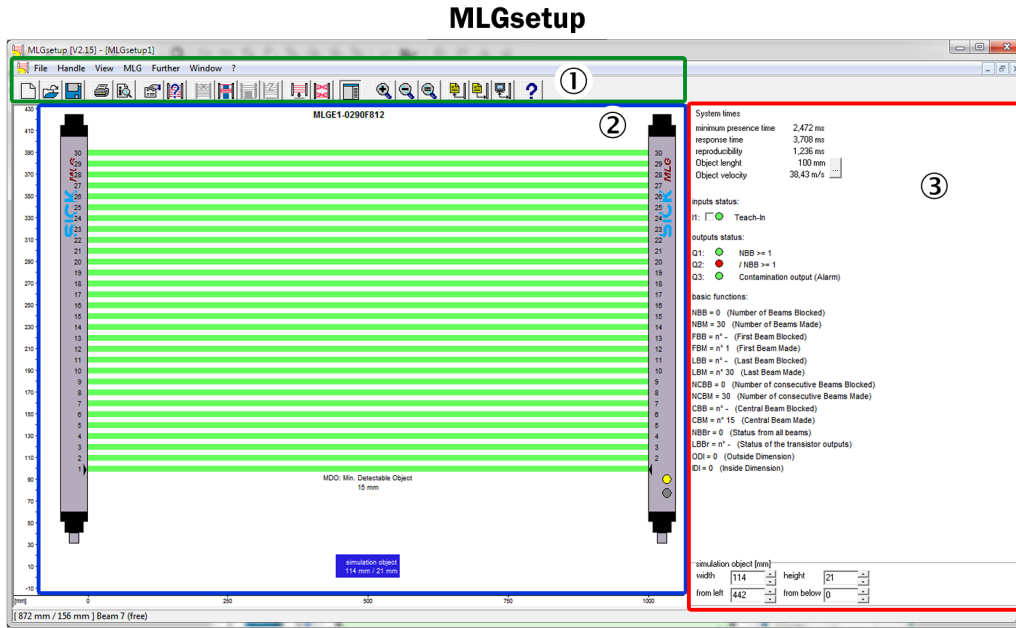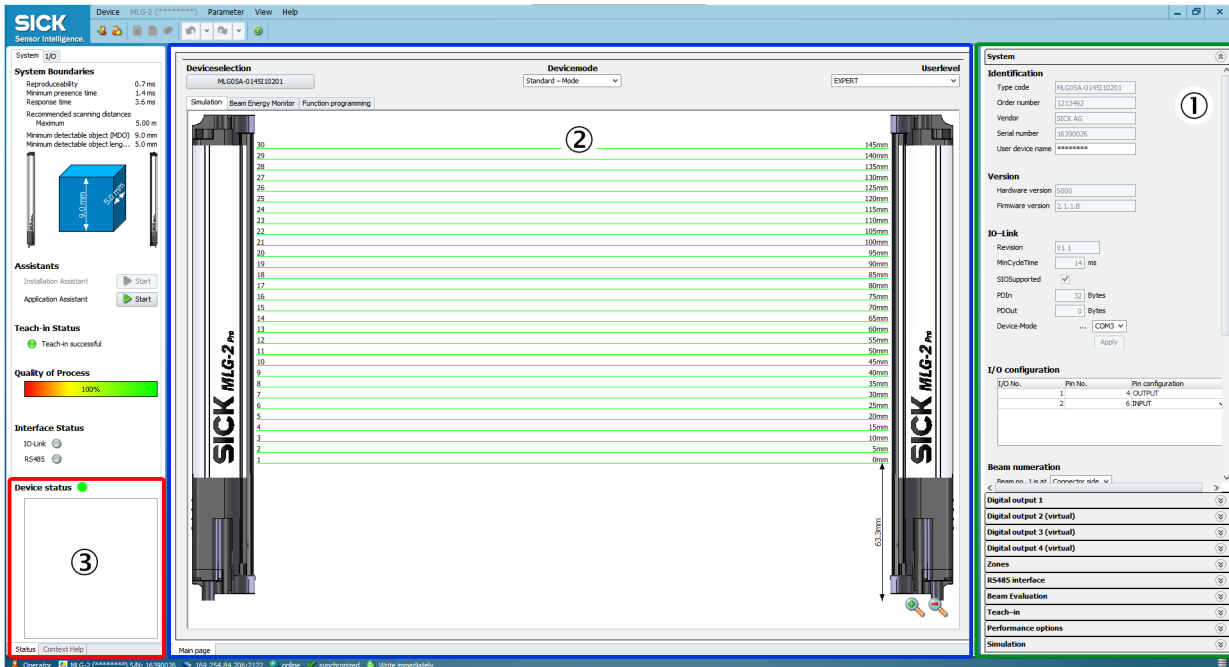
MLGsetup

SOPAS ET

Figure 15: MLGsetup and SOPAS ET user interfaces

①   Configuration window, marked in green

②   Light beam window, marked in blue

③   Status window, marked in red

7.3.2 "Installation" section

The "Installation" section of the "MLG System Information" file corresponds to the "Installation" tab in MLGsetup (see figure 17, page 27).
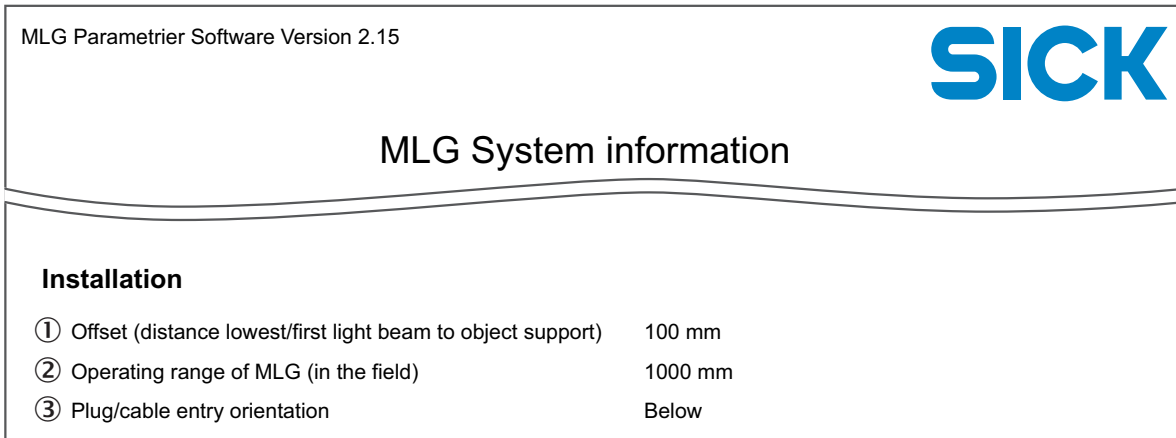
MLG Parametrier Software Version 2.15

SICK

MLG System information

Installation

① Offset (distance lowest/first light beam to object support)   100 mm

② Operating range of MLG (in the field)   1000 mm

③ Plug/cable entry orientation   Below

Figure 16: MLG-1 "MLG System Information" file, "Installation" section (example)

① Offset does not need to be set in SOPAS

② Operating range does not need to be set in SOPAS

③ Orientation: This should be set via the SOPAS ET installation wizard when setting up the MLG-2. Alternatively, it can be set directly in SOPAS ET by selecting the "System" menu followed by the "Beam numbering" area.
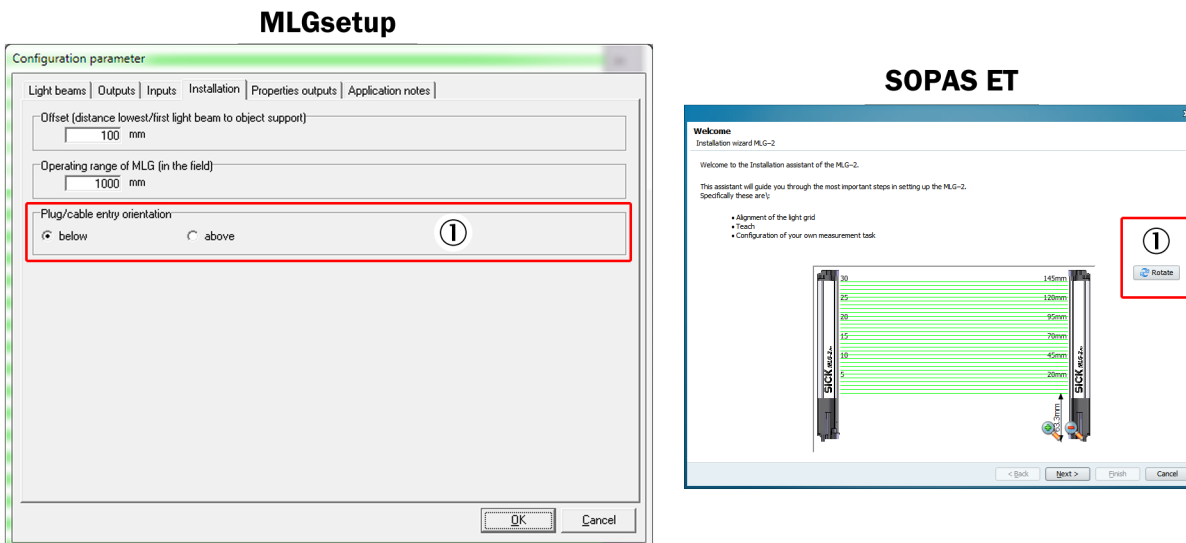
MLGsetup

SOPAS ET

Figure 17: "Installation" in MLGsetup and SOPAS ET

① Configuring the position of the light grid

7.3.3   "Configuration – Outputs" section

The "Outputs" section in the "MLG System Information" file corresponds to the following tabs in MLGsetup:

- "Outputs" tab: see figure 19, page 29
- "Analog outputs" tab: see figure 21, page 31
- "Properties outputs" tab: see figure 22, page 32
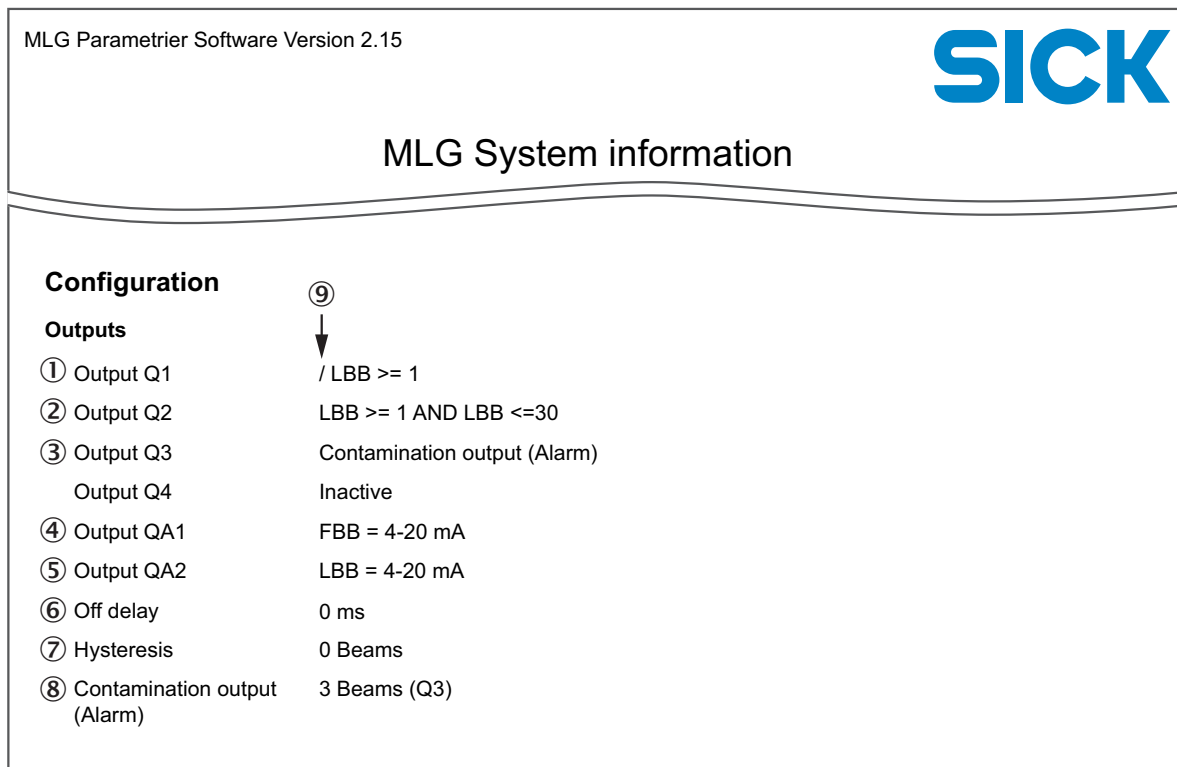- "Light beams" tab: see figure 24, page 33

MLG Parametrier Software Version 2.15

SICK

MLG System information

Configuration

⑨

Outputs

①	Output Q1	/ LBB >= 1
②	Output Q2	LBB >= 1 AND LBB <=30
③	Output Q3	Contamination output (Alarm)
	Output Q4	Inactive
④	Output QA1	FBB = 4-20 mA
⑤	Output QA2	LBB = 4-20 mA
⑥	Off delay	0 ms
⑦	Hysteresis	0 Beams
⑧	Contamination output (Alarm)	3 Beams (Q3)

Figure 18: MLG-1 – "MLG System Information" file, "Outputs" section (example)

①	Output Q1 (see figure 19, page 29)
②	Output Q2
③	Output Q3, configured via "Contamination output (Alarm)" function (see figure 19, page 29)
④	Analog output QA1 (see figure 21, page 31)
⑤	Analog output QA2 (see figure 21, page 31)
⑥	Off delay (see figure 22, page 32)
⑦	Hysteresis cannot be set in SOPAS ET
⑧	The number of beams as of which the contamination signaling alarm is active (see figure 24, page 33)
⑨	"/" is used to identify an inverted output

Configuring the outputs
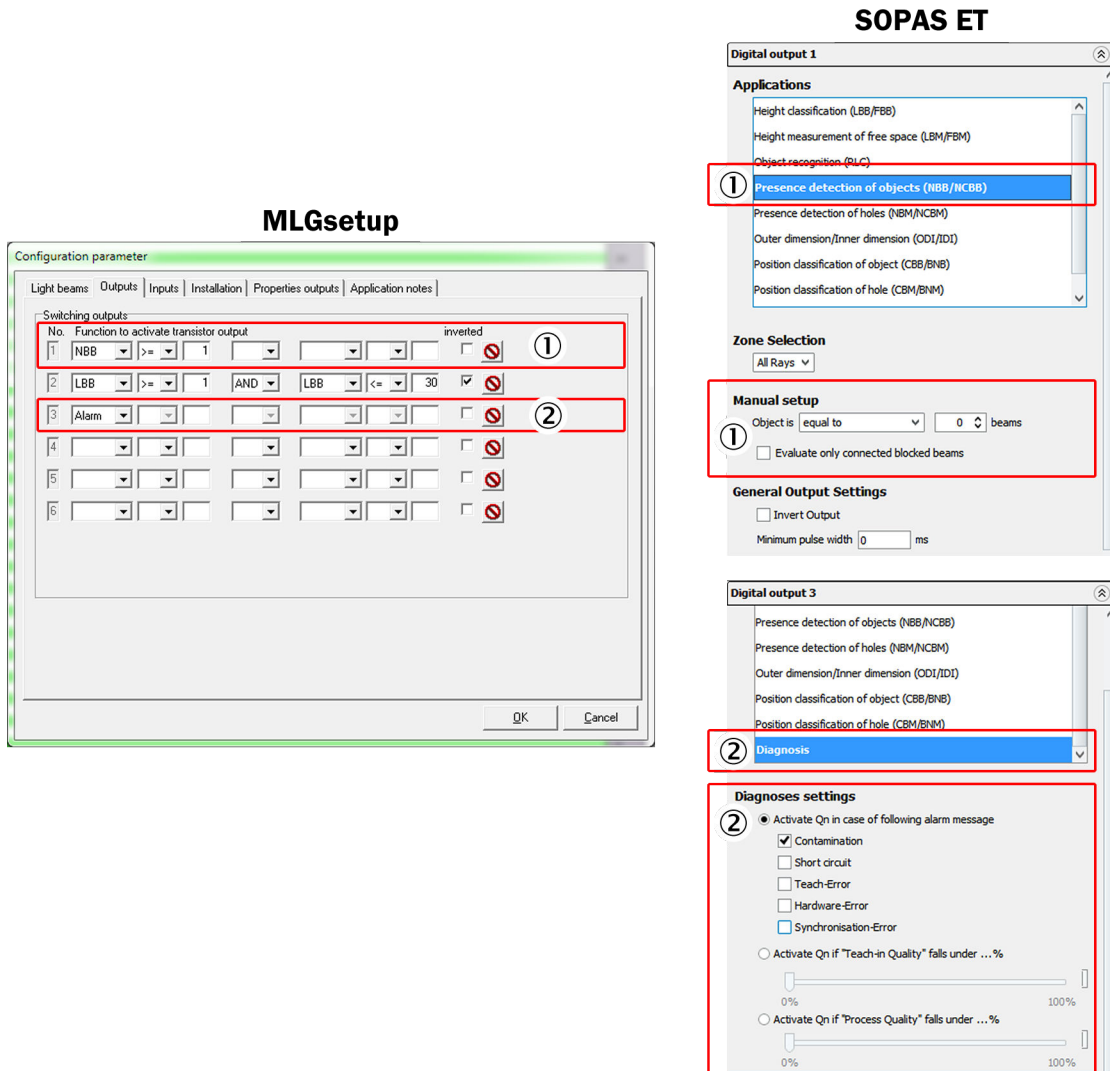
Figure 19: Outputs in MLGsetup and SOPAS ET

①   Configuring the output function (in this case: the "NBB" function)
②   Configuring the output for the contamination alarm

Configuring output Q1 (example)

On the MLG-1, output Q1 may (for example) be configured with function "LBB >= 1". To configure this function in SOPAS ET, proceed as follows:

1. In SOPAS ET, go to the right-hand window and select (for example) the "Digital output 1" menu.
2. Configure function "LBB >= 1" as follows:
   - In the "Applications" area, select the "Height classification (LBB/FBB)" application.
   - In the "Manual setup" area, select the "Measure height starting from first beam (LBB)" option.
   - In the "Object is" area, select the "bigger or equal than" option and the number "1".
3. In the "General Output Settings" area, activate the "Invert Output" option. In the "MLG System Information" file, an inverted output is identified by the symbol "/".

Configuring output Q2 (example)

On the MLG-1, output Q2 may (for example) be configured with function
"LBB >= 1 AND LBB <= 30". To configure this function in SOPAS ET, proceed as follows:

1. In SOPAS ET, go to the right-hand window and select (for example) the "Digital output 2" menu.
2. Configure function "LBB >= 1 AND LBB <= 30" as follows:
   - In SOPAS ET, go to the middle window and select the "Function programming" tab.
   - Select the "Expert" user level.
   - In the "Beam function variables" area, select beam function variables BFVar1 and BFVar2.
   - Go to the "Logic functions" area for the LogVar1 logic function variable and logically link the BFVar1 and BFVar2 beam function variables.
   - In the "Digital outputs/Virtual outputs" area, assign the LogVar1 logic function variable to output Q2. Please note that if you use the "Function programming" tab to configure a user-defined application, you will not be able to make any further settings in the "Output" menu.

Figure 20: SOPAS ET – Function programming; used here (for example) to configure output Q2 with function "LBB >= 1 AND LBB <= 30"

Configuring output Q3 – Contamination output (Alarm) (example)

1. In SOPAS ET, go to the right-hand window and select (for example) the "Digital output 3" menu.
2. In the "Applications" area, select the "Diagnostics" application.
3. In the "Configuration" area, activate the "Contamination" option.
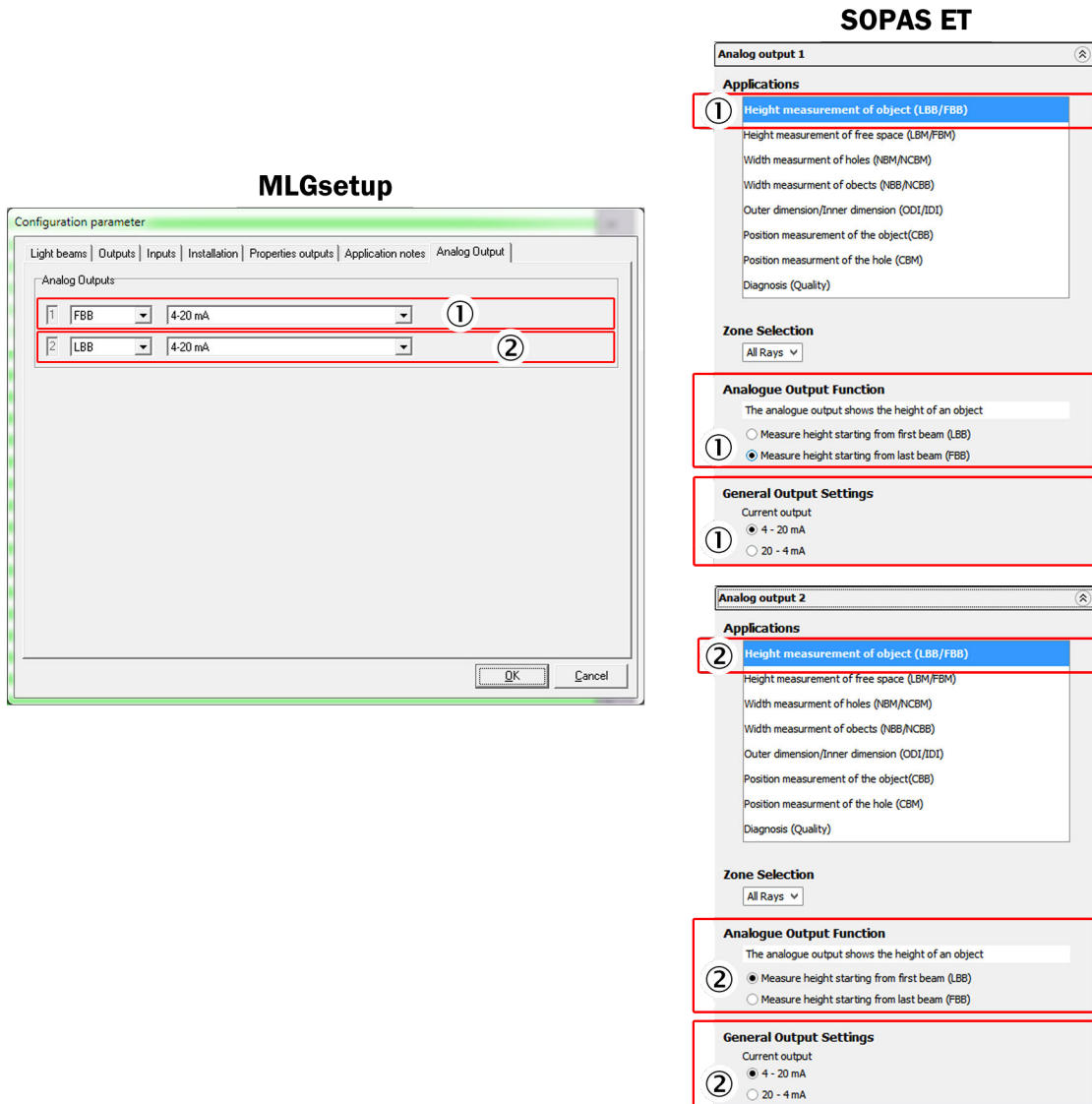
Configuring the analog output

Figure 21: Analog outputs in MLGsetup and SOPAS ET

①   Configuring the analog output function (in this case: the "FBB" function)
②   Configuring the analog output function (in this case: the "LBB" function)

Configuring analog output QA1 (example)

On the MLG-1, analog output QA1 may (for example) be configured with function "FBB = 4-20 mA". To configure this function in SOPAS ET, proceed as follows:

1.   In SOPAS ET, go to the right-hand window and select (for example) the "Analog output 1" menu.
2.   Configure function "FBB = 4-20 mA" as follows:
     ▪   In the "Applications" area, select the "Object height measurement (LBB/FBB)" application.
     ▪   In the "Analog function" area, select the "Measure height starting from first beam (LBB)" option.
     ▪   In the "General Output Settings" area, select the "4-20 mA" option.

Configuring the off delay
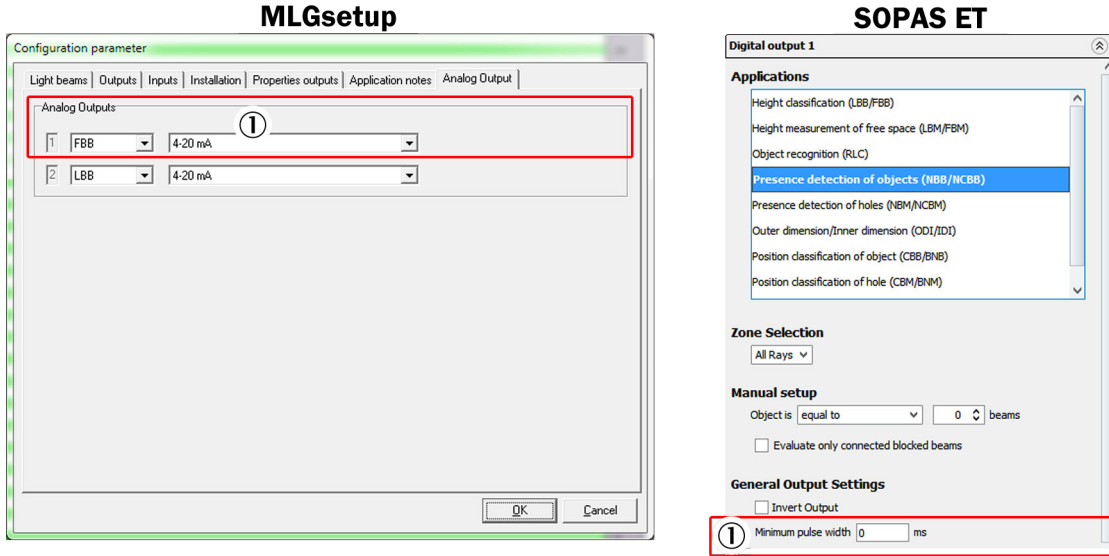
Figure 22: Output properties in MLGsetup and SOPAS ET

① Configuring the off delay/minimum pulse width

1. In SOPAS ET, select the output to which the off delay is to apply, e.g., the "Digital output 1" menu for Q1.
2. In the "General Output Settings" area, specify the off delay for the "Minimum pulse width" parameter.

7.3.4 "Configuration – Light beams" section

The "Light beams" section in the "MLG System Information" file corresponds to the "Light beams" tab in MLGsetup (see figure 24, page 33).
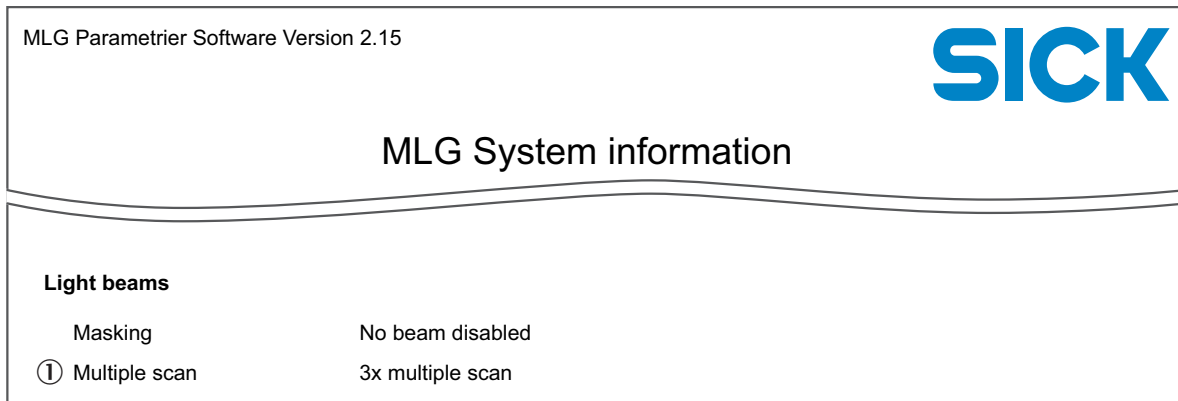
Figure 23: MLG-1 – "MLG System Information" file, "Light beams" section (example)

① Cross-beam function activated
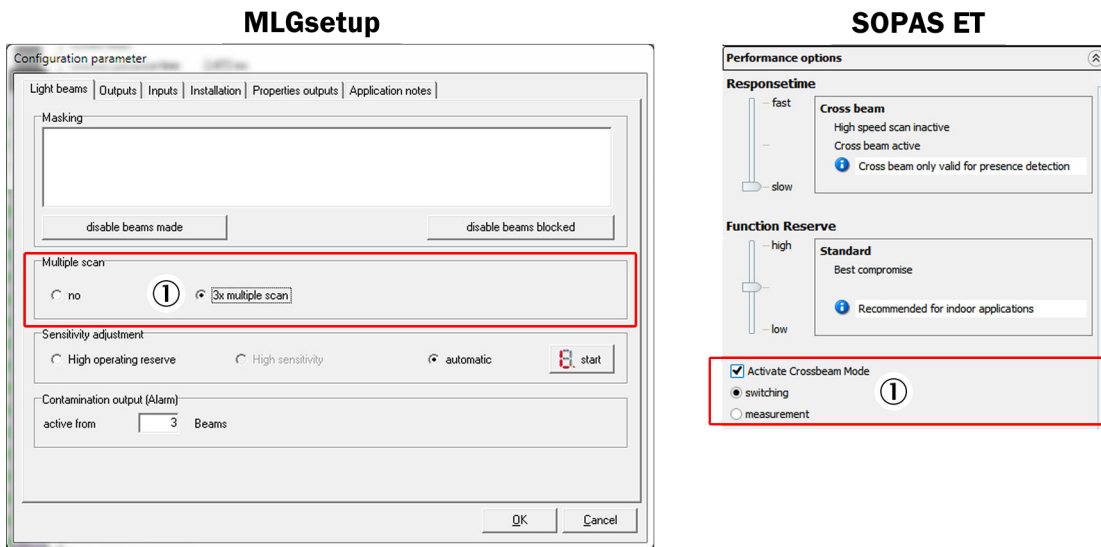
MLGsetup   **SOPAS ET**

Figure 24: Light beams in MLGsetup and SOPAS ET

①   Activating the cross-beam function

Activating the cross-beam function

1. In SOPAS ET, go to the middle window and select the "Expert" option in the "User level" area.
2. In SOPAS ET, go to the right-hand window and select the "Performance options" menu.
3. In the "Object size/Detection type" area, select the "Activate cross beam mode" option.

7.3.5   "Configuration – Inputs" section

The "Inputs" section in the "MLG System Information" file corresponds to the "Inputs" tab in MLGsetup (see figure 26, page 34)
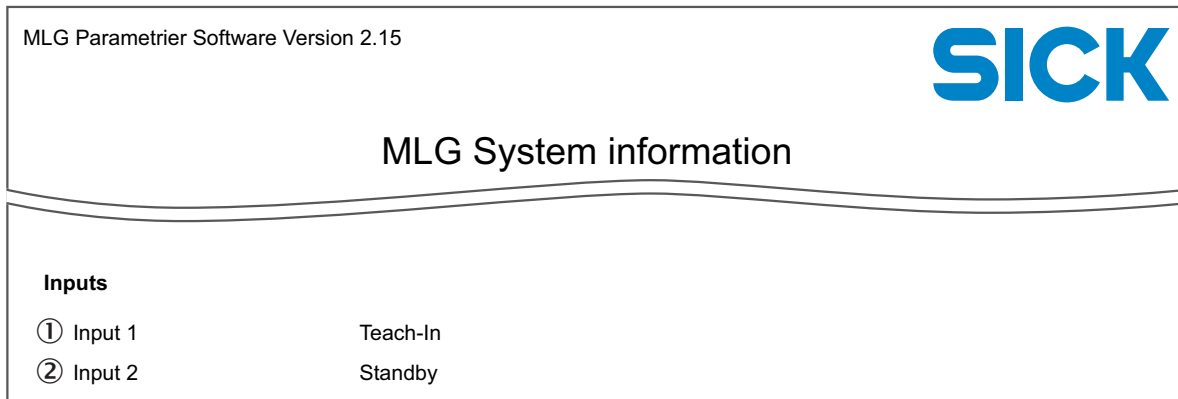
Figure 25: MLG-1 – "MLG System Information" file, "Inputs" section (example)

①   "Teach-in" input function
②   "Standby" input function

8020351.ZLW3/2017-05-03 | SICK
Subject to change without notice
TECHNICAL INFORMATION | The MLG-2 as a replacement product for the MLG-1 and XLG   **33**
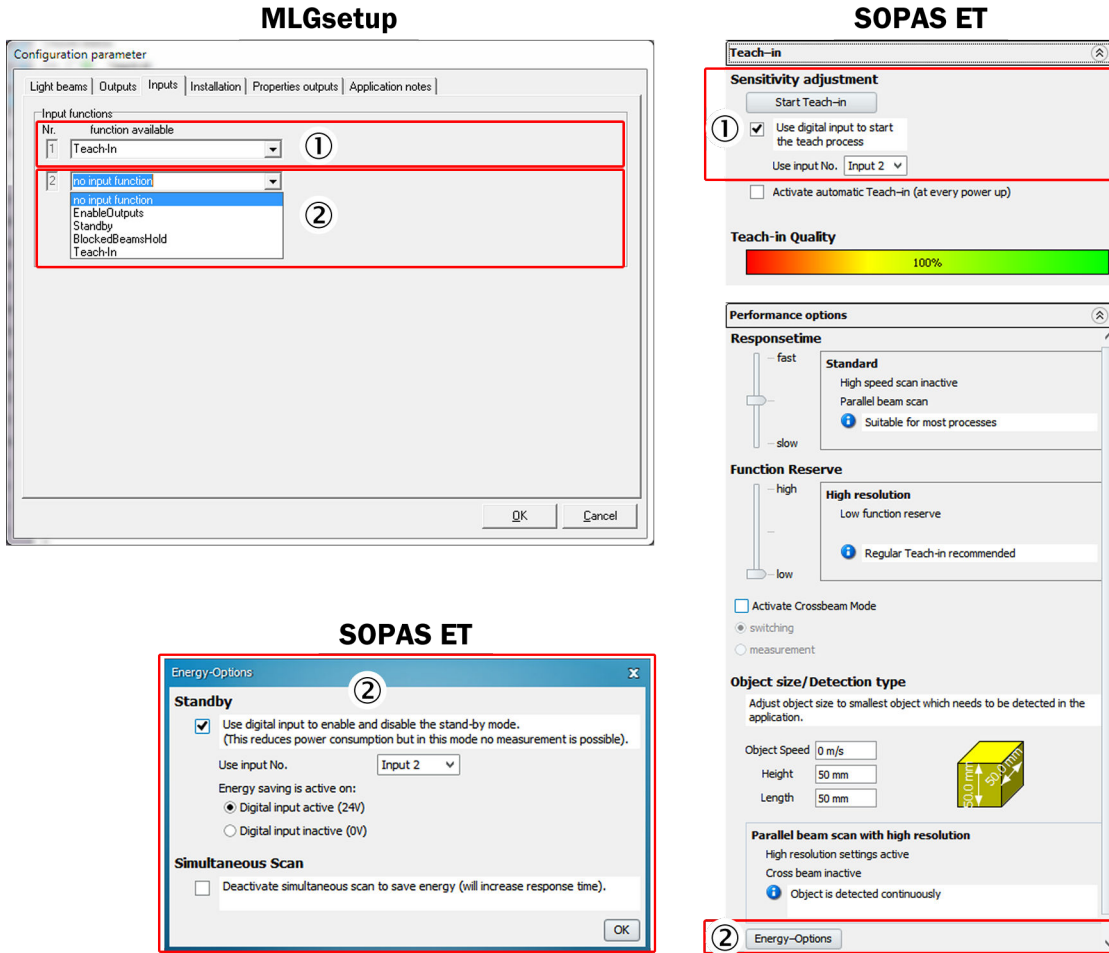
Configuring the inputs

Figure 26: Inputs in MLGsetup and SOPAS ET

① Configuring the "Teach-in" input function

② Configuring the "Standby" input function

Configuring the "Teach-in" input function

1. In SOPAS ET, go to the middle window and select the "Expert" option in the "User level" area.
2. In SOPAS ET, go to the right-hand window and select the "Teach-in" menu.
3. In the "Sensitivity adjustment" area, activate the "Use digital input to start the teach process" option.
4. In the "Use output No." field, assign the input for triggering the teach-in process.

Configuring the "Standby" input function

1. In SOPAS ET, go to the middle window and select the "Expert" option in the "User level" area.
2. In SOPAS ET, go to the right-hand window and select the "Performance options" menu.
3. In the "Object size/Detection type" area, click the "Energy-Options" button.
4. In the "Energy-Options" window, activate the "Standby mode" option.
5. In the "Use output No." field, assign the input for triggering Standby mode.

7.3.6 "Configuration – Data interface" section

The "Data interface" section in the "MLG System Information" file corresponds to the "Data interface" tab in MLGsetup (see figure 28, page 35).

Figure 27: MLG-1 "MLG System Information" file, "Data interface" section (example)

Figure 28: Data interface in MLGsetup and SOPAS ET

8 IPG protective pipes

In cases where an MLG-1 is installed in an IPG protective pipe, you must also order a new IPG protective pipe when switching over to the MLG-2. For details of how to mount IPG protective pipes, see the "IPG2 protective pipe for MLG-2 light grid" mounting instructions (part number 8018943). The distance between the lower edge of the IPG protective pipe housing and the first beam is not the same on the MLG-2 as on the MLG-1. Even if the detection height is kept exactly the same, the total length of the IPG protective pipe has to be longer for the MLG-2 than for the MLG-1.

▶ Remember to take account of this difference during planning and mounting.
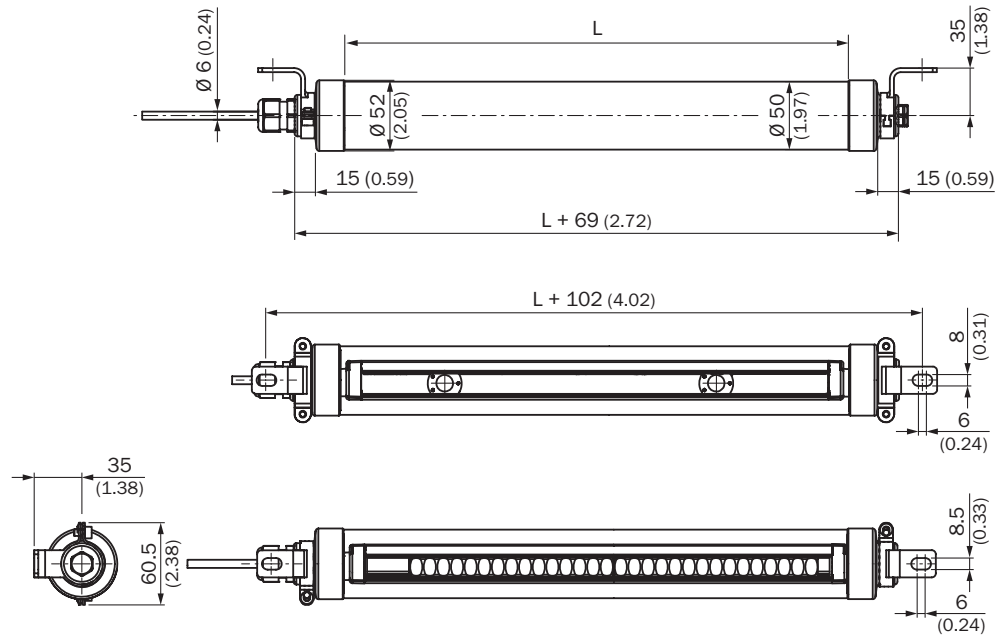
IPG for MLG-1

Figure 29: MLG-1 with IPG protective pipe
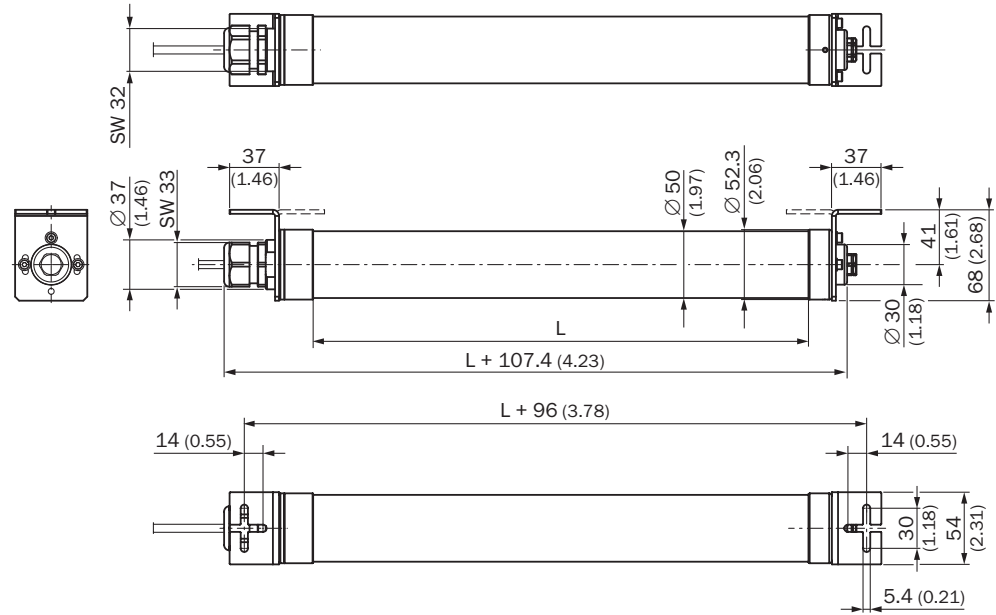
L Protective pipe

IPG2 for MLG-2

Figure 30: MLG-2 with IPG2 protective pipe

L   Protective pipe length

Table 15: Comparison of IPG protective pipe for MLG-1 and IPG2 protective pipe for MLG-2, aluminum

MLG-1		MLG-2			MLG-2 and MLG-1
Detection height	IPG type (part number)	Detection height	IPG2 type	IPG2 part number	Protective pipe length (L)
100 ... 140 mm	IPG67-02205111	140 ... 145 mm	IPG2-0220A5P167	2083870	220 mm
250 ... 290 mm	IPG67-03705111	250 ... 295 mm	IPG2-0370A5P167	2083871	370 mm
400 ... 440 mm	IPG67-05205111	400 ... 445 mm	IPG2-0520A5P167	2082909	520 mm
550 ... 590 mm	IPG67-06705111	550 ... 595 mm	IPG2-0670A5P167	2083872	670 mm
850 ... 890 mm	IPG67-09705111	850 ... 895 mm	IPG2-0970A5P167	2083873	970 mm
1,000 ... 1,040 mm	IPG67-11205111	1,000 ... 1,045 mm	IPG2-1120A5P167	2083874	1,120 mm
1,300 ... 1,340 mm	IPG67-14205111	1,300 ... 1,345 mm	IPG2-1420A5P167	2083875	1,420 mm
1,450 ... 1,490 mm	IPG67-15705111	1,450 ... 1,495 mm	IPG2-1570A5P167	2083878	1,570 mm
1,600 ... 1,640 mm	IPG67-17205111	1,600 ... 1,645 mm	IPG2-1720A5P167	2083879	1,720 mm
2,200 ... 2,240 mm	IPG67-23205111	2,200 ... 2,245 mm	IPG2-2320A5P167	2082189	2,320 mm

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