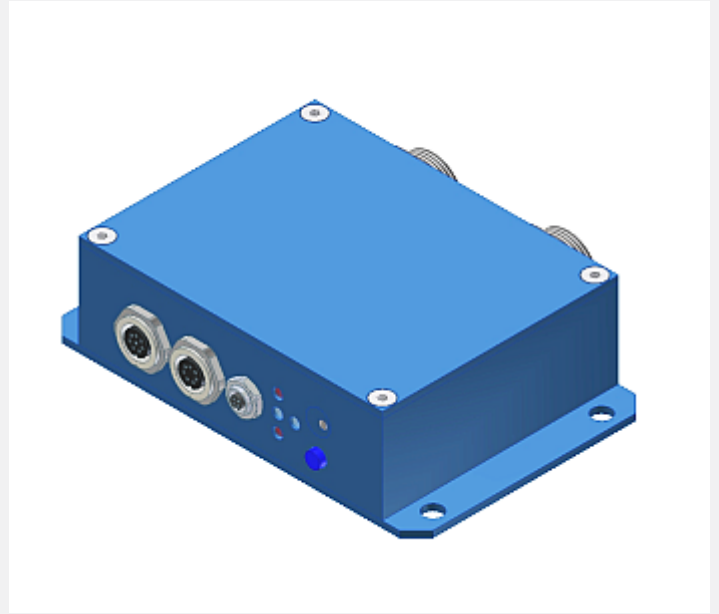


# A-LAS Series

## ▶ A-LAS-CON1-FIO A-LAS-CON1-FIO-4/20

- For control of max. two optical fibers (transmitted light or reflected light)
- 100%-check of objects (tolerance band check)
- Object positioning and thickness control (in  $\mu\text{m}$  range)
- High trigger accuracy (in  $\mu\text{m}$  range)
- High switching frequency (25 kHz)
- Setting of trigger threshold and tolerance band via Windows® software
- Output polarity can be switched via software
- Dirt accumulation compensation
- External teach push-button and potentiometer for tolerance setting
- 2 digital inputs, 3 digital outputs
- 1 analog output (voltage 0 ... +10V or current 4 ... 20mA)
- Switching state indication by means of 4 LEDs (1x grn, 2x red, 1x yel)



### Design

**Product name:**

**A-LAS-CON1-FIO**  
**A-LAS-CON1-FIO-4/20**  
incl. Windows® software  
A-LAS-CON1-Scope

**4/20:**  
Analog output  
4...20mA

8-pole fem. connector  
Binder Series 712  
(connection to PLC)

Connecting cable:  
cab-las8/SPS or  
cab-las8/SPS-w

7-pole fem. connector  
Binder Series 712  
(Data Slave/Master)  
*not necessary for single system!*

Connecting cable:  
cab-las7-male

4-pole fem. connector  
Binder Series 707  
(RS232 interface)

Connecting cable:  
cab-las4/PC or  
cab-4/USB or  
cab-4/ETH-500

LED display:  
red/green/  
red/yellow  
(cf. page 6)

TEACH- or  
RESET button  
(input IN1)

Potentiometer for  
tolerance setting

Adapter for  
optical fiber  
(„sensor 1“)

Connection of an optical  
fiber of FIO Series

Adapter for  
optical fiber  
(„sensor 2“)

Connection of an optical  
fiber of FIO Series

Sturdy aluminium housing,  
anodized in blue

Mounting holes

**Accessories:** (p. 9-14)

- Fiber optics
- Attachment optics
- Fiber optics mounting



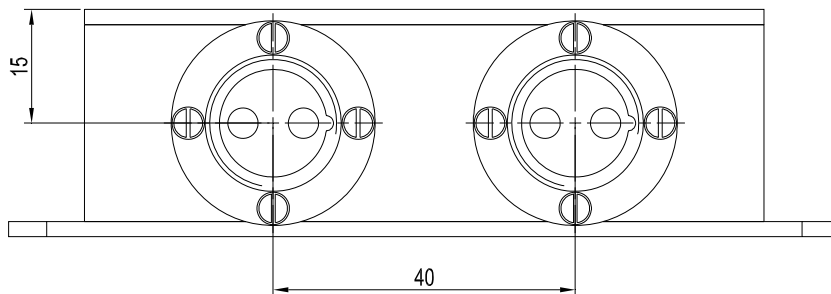
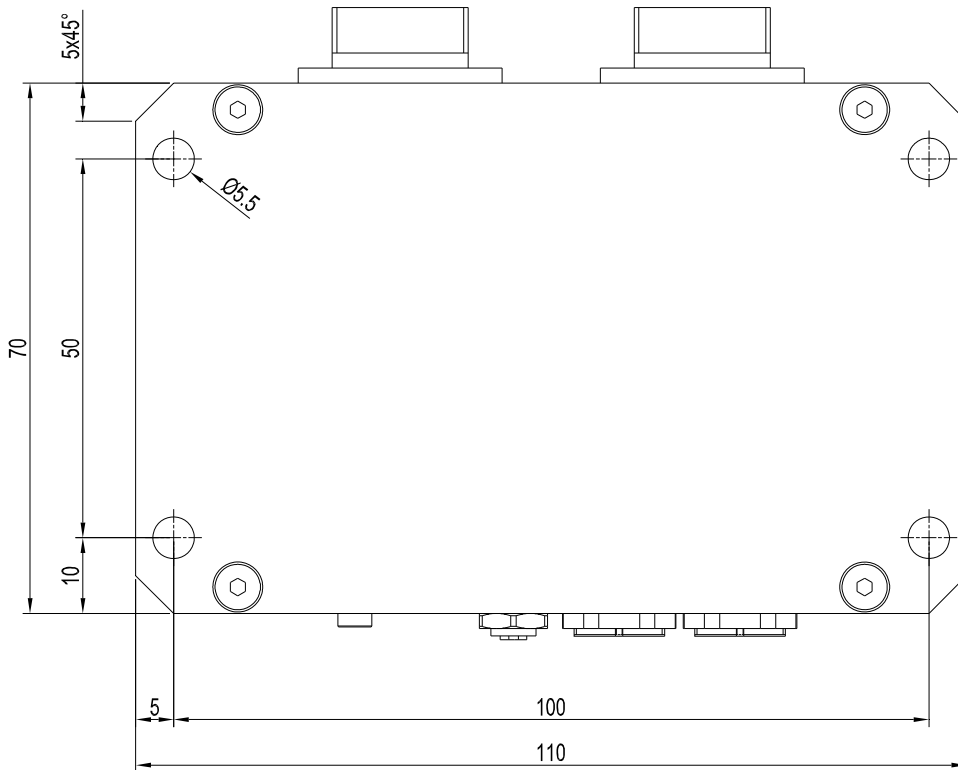
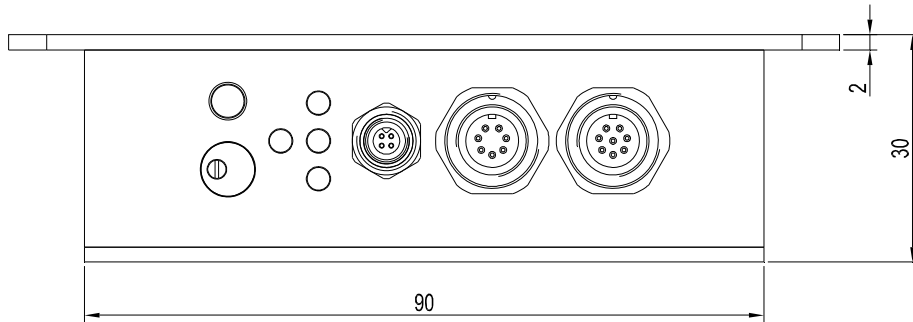


**Technical Data**

Model	A-LAS-CON1-FIO	A-LAS-CON1-FIO-4/20
Voltage supply	+24VDC $\pm$ 10%, reversed polarity protected, short-circuit protected	
Current consumption	< 250 mA	
Min. detectable object	< 10 $\mu$ m (depends on cross-section of the fiber optics used)	
Resolution	0,1% (100% = active cross-section of th fiber optics)	
Operating temperature range	-20°C ... +55°C	
Storage temperature range	-20°C ... +85°C	
Enclosure rating	IP54	
Digital inputs (2x)	IN0: EXT TRIGGER IN1: TEACH/RESET input voltage +Ub/0V, with protective circuit	
Digital outputs (3x)	OUT0, OUT1, OUT2: pnp bright-switching/npn dark-switching or pnp dark-switching/npn bright-switching, adjustable under Windows®, 100 mA, short-circuit proof	
Analog output (1x)	voltage 0 ... +10V	current 4 ... 20mA
Bandwidth analog signal	typ. 10 kHz (-3dB)	
Sensitivity setting	adjustable by means of potentiometer TOL or under Windows® on PC	
Housing material	aluminum, anodized in blue	
Housing dimensions	LxWxH approx. 110 mm x 70 mm x 30 mm	
Type of connector	8-pole circular fem. connector type Binder series 712 (PLC/Power) 4-pole circular fem. connector type Binder series 707 (PC/RS232) 2x fiber optics adaptor (for connection of fiber optics to "Sensor 1" or "Sensor 2") 7-pole circular fem. connector type Binder series 712 (data Master/Slave)	
Connecting cables	to PC: cab-las4/PC or cab-las4/PC-w or cab-4/USB or cab-4/ETH to PLC: cab-las8/SPS or cab-las8/SPS-w in case of Master/Slave operation: cab-las7-male	
Teach button	Teach button at the housing for norm value setting	
LED display	LED red (+) : status tolerance output OUT1 LED green : status tolerance output OUT2 LED red (-) : status Ttlerance output OUT0 LED yellow: voltage supply / visualization of teach process (multifunctional LED)	
EMC test acc. to	DIN EN 60947-5-2	
Scan frequency	max. 25 kHz	
Max. switching current	100 mA, short-circuit proof	
Interface	RS232, parametrisierbar unter Windows®	



Dimensions



All dimensions in mm



**Connector Assignment**

**Connection A-LAS-CON1-FIO to PLC:**  
8-pole fem. connector Binder Series 712

Pin:	(Wire color):	Assignment:
1	(white)	GND (0V)
2	(brown)	+Ub (+24VDC ± 10%)
3	(green)	IN0 (Input 0V/+Ub)
4	(yellow)	IN1 (Input 0V/+Ub)
5	(grey)	OUT0 (Output 0V/+Ub)
6	(pink)	OUT1 (Output 0V/+Ub)
7	(blue)	OUT2 (Output 0V/+Ub)
8	(red)	ANA (voltage 0 ... +10V)

in case of type 4/20: ANA I<sub>OUT</sub> (4 ... 20mA)

Connecting cable:  
cab-las8/SPS-(length) or  
cab-las8/SPS-w-(length) (angle type 90°)  
(Standard length 2m, available up to length 25m)

**Connection A-LAS-CON1-FIO to PC:**  
4-pole fem. connector Binder Series 707

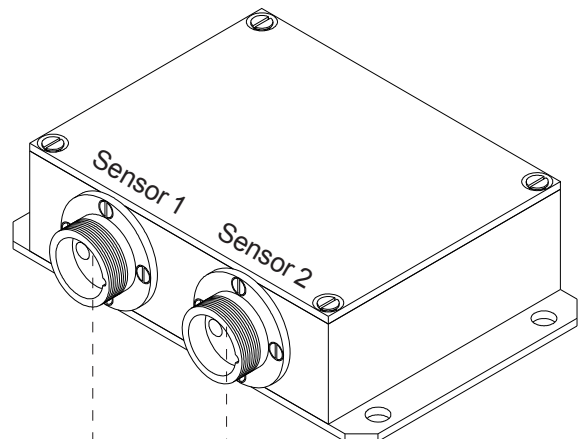
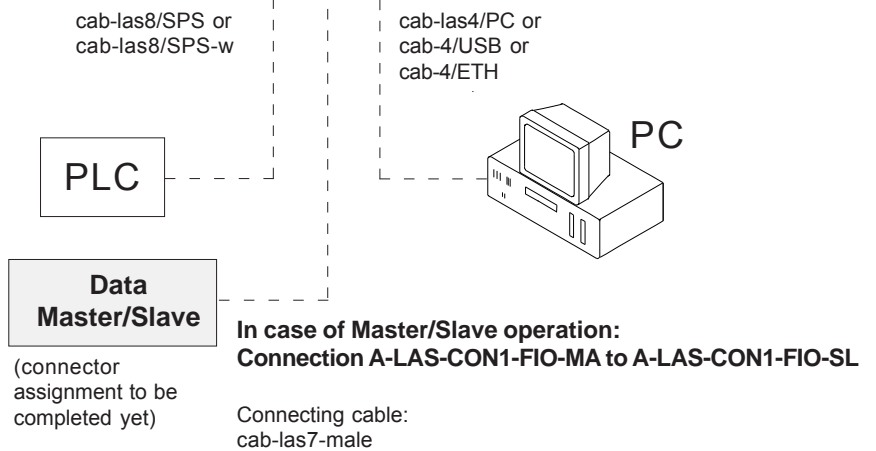
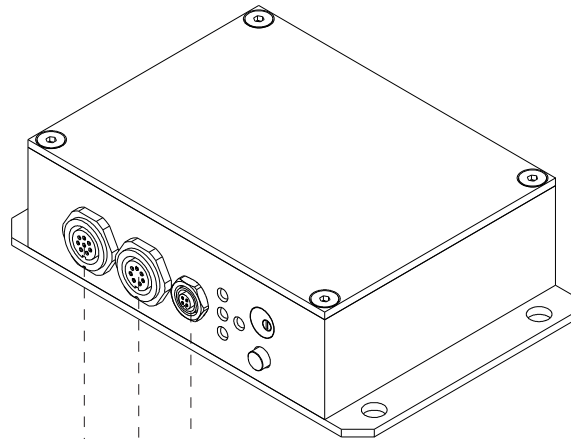
Pin:	Assignment:
1	+24VDC (+Ub, OUT)
2	GND (0V)
3	Rx0
4	Tx0

**Connection via RS232 interface at the PC:**  
Connecting cable:  
cab-las4/PC-(length)  
cab-las4/PC-w-(length) (angle type 90°)  
(standard length 2m)

**alternative:**  
**Connection via USB interface at the PC:**  
Connecting cable (incl. driver software):  
cab-4/USB-(length)  
cab-4/USB-w-(length) (angle type 90°)  
(standard length 2m)

**alternative:**  
**Connection to local network via Ethernet bus:**  
Adapter (incl. software „SensorFinder“):  
cab-4/ETH-500  
(standard length 0.5m)  
Optional: External CAT5 cable, e.g.  
cab-eth/M12D-RJ45-flx-(length)

**Suitable optical fibers:**  
**Please cf. data sheet “FIO Series“**  
(please order optical fibers separately)



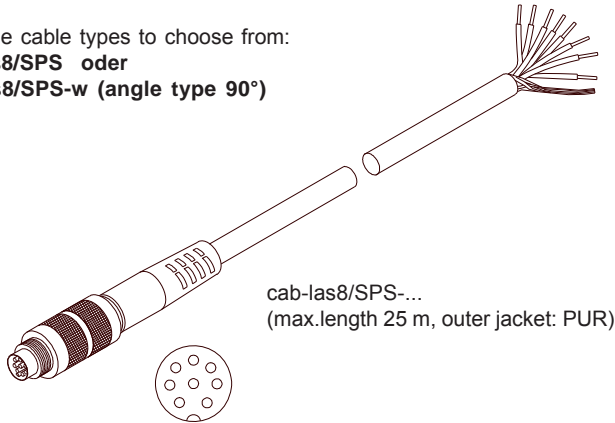
Connection A-LAS-CON1-FIO to optical fiber at „sensor 1“

Connection A-LAS-CON1-FIO to optical fiber at „sensor 2“

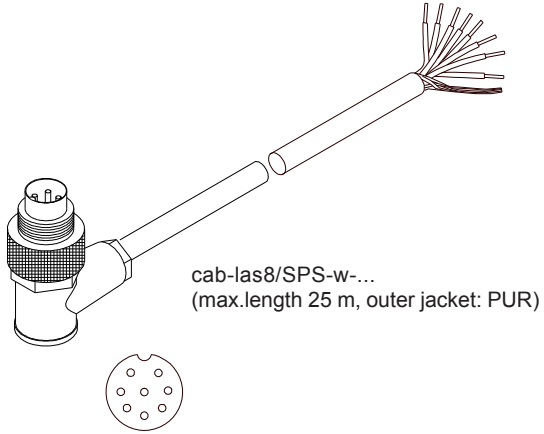
Connecting Cables

Connection A-LAS-CON1-FIO to PLC:

Available cable types to choose from:  
**cab-las8/SPS** oder  
**cab-las8/SPS-w** (angle type 90°)



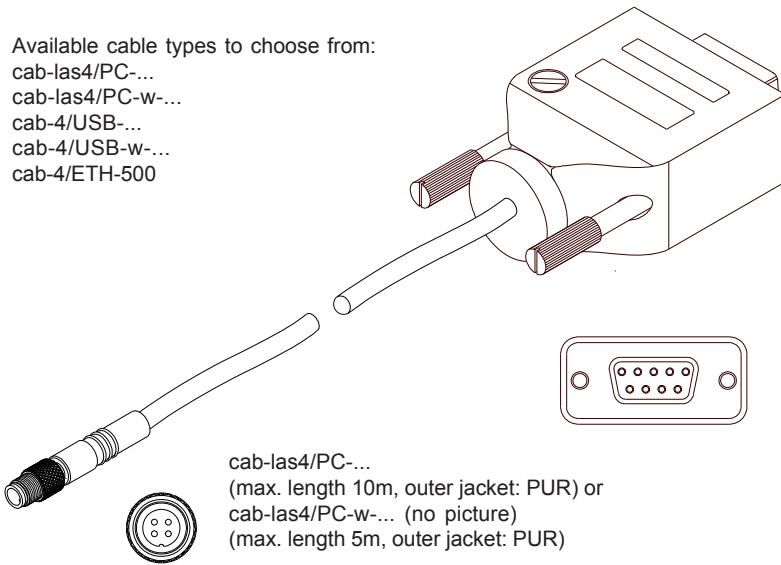
cab-las8/SPS-...  
 (max.length 25 m, outer jacket: PUR)



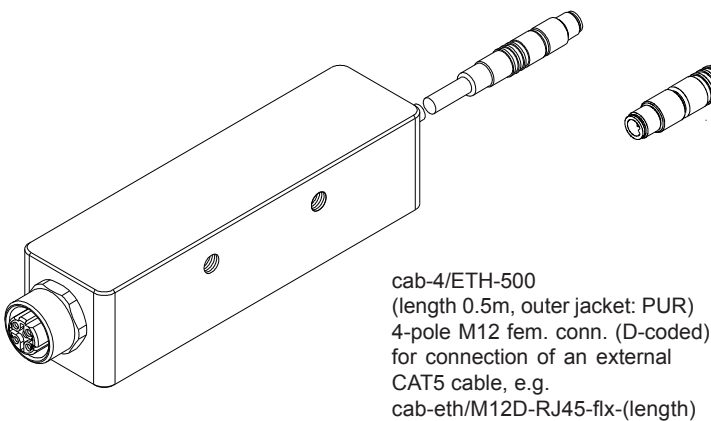
cab-las8/SPS-w-...  
 (max.length 25 m, outer jacket: PUR)

Connection A-LAS-CON1-FIO to PC:

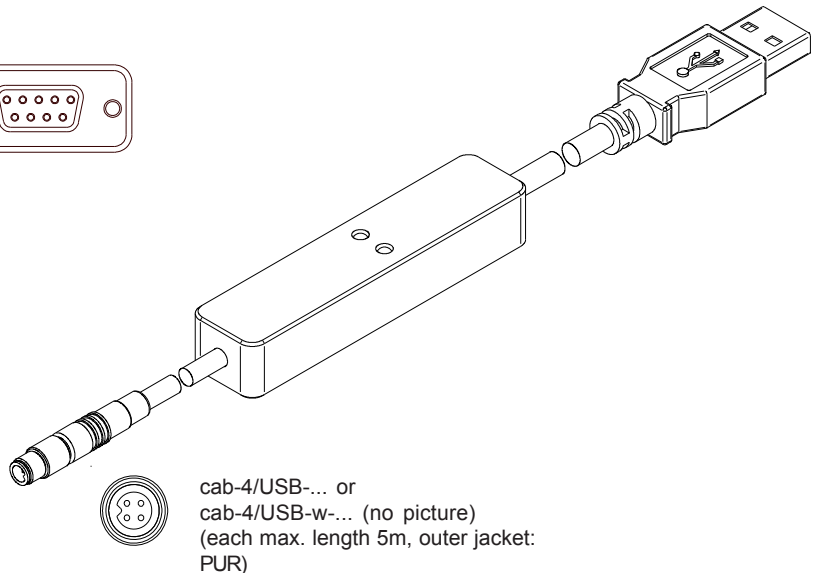
Available cable types to choose from:  
 cab-las4/PC-...  
 cab-las4/PC-w-...  
 cab-4/USB-...  
 cab-4/USB-w-...  
 cab-4/ETH-500



cab-las4/PC-...  
 (max. length 10m, outer jacket: PUR) or  
 cab-las4/PC-w-... (no picture)  
 (max. length 5m, outer jacket: PUR)



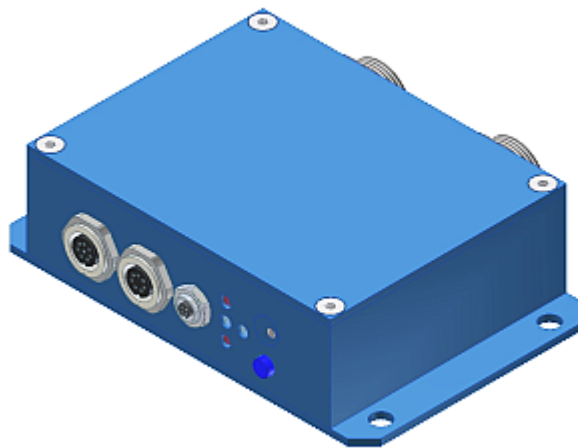
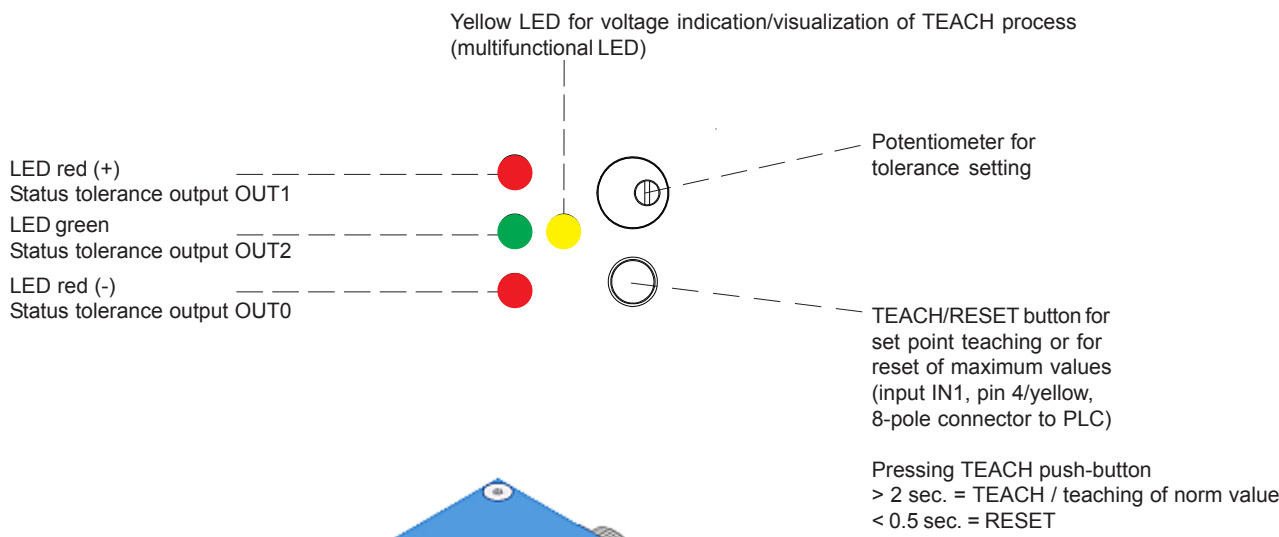
cab-4/ETH-500  
 (length 0.5m, outer jacket: PUR)  
 4-pole M12 fem. conn. (D-coded)  
 for connection of an external  
 CAT5 cable, e.g.  
 cab-eth/M12D-RJ45-flx-(length)



cab-4/USB-... or  
 cab-4/USB-w-... (no picture)  
 (each max. length 5m, outer jacket:  
 PUR)



LED Display





## Funktionsprinzip

### A-LAS-CON1-FIO (or A-LAS-CON1-FIO-4/20):

The A-LAS-CON1-FIO control unit contains transmitter and receiver electronics within the control unit, and provides two connections for optical fibres.

The A-LAS-CON1-FIO control unit is used to perform a 100% inspection of objects by way of tolerance-band monitoring. A high-speed 2-channel 12-bit analog/digital converter allows reading and processing of the analog values from the optical fibres at a speed of up to max. 25 kHz. With the control unit the laser power can be variably adjusted for the measurement channel.

By way of the two optical fibre adaptors one optical fibre of the LWL series can each be directly connected at the A-LAS-CON1-FIO control unit.

The analog output signals of the two optical fibers (referred to as „channels“) are read and digitised by the control unit at a rate of up to 25000 times per second. The digital values are then internally processed and evaluated according to user-defined settings. The two optical fibers (channel A and B) are interpreted independently of each other. An additional virtual channel allows the forming of mathematic combinations of the two real channels. The signals are evaluated by way of a tolerance band that is separately defined for each channel and can be freely set within the measuring range.

For configuration purposes the A-LAS-CON1-FIO control unit features an RS232 interface through which the settings of the control unit can be accessed with the "A-LAS-CON1-Scope" PC software. A separate data line allows the connection of an expansion module or of another A-LAS-CON1-FIO control unit.

Through an 8-pole female connector the A-LAS-CON1-FIO control units is supplied with a supply voltage of nominal 24V. The states of the individual channels can be output via three short-circuit-proof, freely configurable digital outputs (OUT0, OUT1, OUT2). At the housing of the A-LAS-CON1-FIO the output state is visualised by way of 4 LEDs.

Two digital inputs (IN0, IN1) provide a trigger function for controlling measurement value scanning and/or a teach function for setting new tolerance band values. Through a high-speed analog output (0...+10V or 4...20mA) the measurement values can be output as analog values. A TEACH/RESET button at the housing of the A-LAS-CON1-FIO control unit allows access to one of the two digital inputs. A potentiometer for configuring the tolerance bands also is provided.

#### From analog sensor to digital value

- A-LAS sensors generate an analog voltage value that depends on the shadowing of the laser beam arriving at the A-LAS receiver.
- The A-LAS-CON1 control unit in fixed time intervals converts this analog value into a digital value.
- The digital value either is absolutely scaled (RAW VALUE) or relatively scaled (NORM VALUE).
- The normalisation process requires that the A-LAS sensor becomes "free" in regular intervals.

#### From digital value to measuring value

- The RAW or NORM VALUES first are filtered (MAX, MIN, or DIRECT) and are output when the trigger condition is fulfilled.
- Trigger conditions: Continuous, status-controlled, or edge-controlled.
- Trigger sources: External, digital input signals, the measuring channel, the alternative channel
- The third ("EVAL") channel results from the mathematic combination of channel A and channel B.

#### From measuring value to digital/analog output

- Each of the three channels has its own tolerance band, channel A and B have a trigger threshold.
- Each of the three digital outputs can output every state of any channel or the combination of the states of several channels as a digital value.
- The analog output provides one of the three measuring values or one of two RAW VALUES as an analog voltage.



Parameterisation

**Windows® software A-LAS-CON1-Scope:**

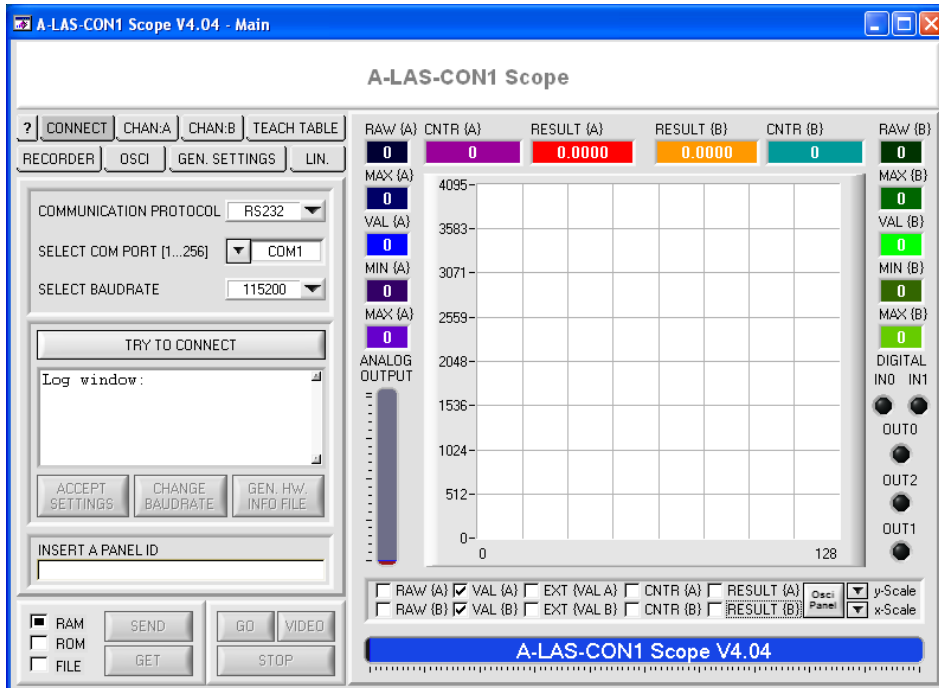
The A-LAS-CON1-Scope software is used for parameterising the A-LAS-CON1-FIO control unit for optical fibers of FIO Series. The measured values provided by the optical fiber can be visualised with the PC software, which means that the software among others can be used for adjustment purposes and for setting suitable tolerance limits for the inspection of the measuring object.

Data exchange between the PC user interface and the optical fiber system is effected through a standard RS232 interface. For this purpose the A-LAS-CON1-FIO control unit is connected to the PC with the serial interface cable cab-las-4/PC (or with the USB cable cab-las4/USB or Ethernet adaptor cab-4/ETH-500).

When parameterisation is finished, the setting values can be permanently saved in an EEPROM memory of the A-LAS-CON1-FIO control unit. The sensor system then continues to operate in "STAND-ALONE" mode without a PC.

When the A-LAS-CON1-Scope software is started, the following Windows® user interface will be displayed:

For detailed description of parameter setting please cf. software user manual.







Fiber Optics

Field of use:

Optical fibers offer solutions for difficult tasks in optoelectronics. They can be used universally and allow flexible applications.

Advantages:

- Highest quality
- Selection from different fiber types
- Thermal stability
- Great variety of available standard sensor heads
- Special designs
- Various attachment optics available



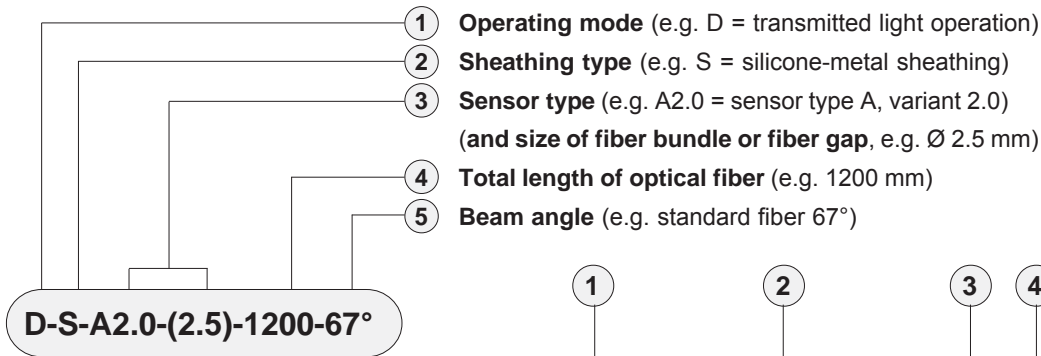
Characteristics:

Light-conducting glass fibers are optical components that allow the transmission of light through any curved path based on the principle of total reflection.

The individual fiber is composed of high-break core glass and low-break cladding glass. The light beams entering the core glass within the critical angle are guided through the fiber by way of reflection at the core/cladding contact surfaces (step index fiber).

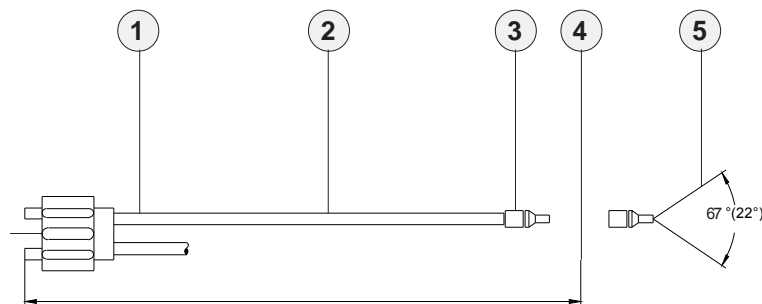
The highly flexible optical fibers are made of bundled individual glass fibers. The ends are each glued into a sensor head and a connector. The faces are optically polished. For protection against mechanical, chemical, or thermal destruction the optical fibers are provided with a corresponding protective sheath.

Order Code:



Order code for optical fiber

(For detailed description of the various types of fiber optics, please cf. catalog „FIO Series“)



Dimensions of adapter

Attachment optics (e.g. focus lens, reflex optics, prismn optics)

Fiber optics for reflex light operation

Fiber optics for transmitted light operation

Mounting hints

cf. catalog FIO Series

cf. catalog FIO Series

cf. catalog FIO Series

cf. catalog FIO Series

cf. catalog FIO Series





Optical Frontends

Overview: Optical frontends for fiber optics



KL-1  
(A2.0)



KL-2  
(A2.0)



KL-3 (A2.0)  
KL-4 (A1.1)  
KL-5 (R1.1)  
KL-8 (R2.1)  
KL-9 (A3.0)



KL-90 (2x)  
(D-A2.0)



KL-D-2.5  
(D-A2.0)



KL-D-6  
(D-A2.0)



KL-D-14  
(D-A2.0)



KL-D-17  
(D-A2.0)



KL-D-20  
(D-A2.0)



KL-D-28  
(D-A2.0)



KL-D-40  
(D-A2.0)



KL-M8-A1.1



KL-M12-A1.1  
KL-M12-A2.0  
KL-M12-A3.0  
KL-M12-R1.1



KL-M12-XL-A1.1  
KL-M12-XL-A2.0  
KL-M12-XL-R1.1



KL-M18-A1.1  
KL-M18-A2.0  
KL-M18-A3.0  
KL-M18-R1.1  
KL-M18-R2.1



KL-M18-XL-A1.1  
KL-M18-XL-A2.0  
KL-M18-XL-A3.0  
KL-M18-XL-R1.1  
KL-M18-XL-R2.1



KL-M34-A1.1  
KL-M34-A2.0  
KL-M34-A3.0  
KL-M34-R1.1  
KL-M34-R2.1



KL-M34-XL-A1.1  
KL-M34-XL-A2.0  
KL-M34-XL-A3.0  
KL-M34-XL-R1.1  
KL-M34-XL-R2.1



KL-M34/62-A1.1  
KL-M34/62-A2.0  
KL-M34/62-A3.0  
KL-M34/62-R1.1  
KL-M34/62-R2.1



**Optical Frontends**

**Optical frontends for reflected light or transmitted light fiber optics:**

Part number:	Suitable for fiber optics type: (R, T = reflected light, D= transmitted light)	Characteristics:
KL-1 (2 pcs. necessary)	D-S-A2.0-(2.5)-...-67° or 22°	Transmitter/receiver distance typ. 50 mm ... 200 mm
KL-2	R-S-A2.0-(2.5)-...-67° or 22°	Transmitter/receiver distance max. 300 mm, beam divergency ± 7,5°
KL-2 (2 pcs. necessary)	D-S-A2.0-(2.5)-...-67° or 22°	Transmitter/receiver distance max. 300 mm, beam divergency ± 7,5°
KL-3	R-S-A2.0-(2.5)-...-67° or 22°	Working distance typ. 10 mm ... 20 mm
KL-3/30	R/D-S-A2.0-(2.5)-1200-67° <i>Special version*</i>	Working distance typ. 30 mm
KL-4	R-S-A1.1-(0.6)-...-67° or 22°	Working distance typ. 10 mm ... 15 mm
KL-4	R-S-A1.1-(1.1)-...-67° or 22°	Working distance typ. 10 mm ... 15 mm
KL-4	R-S-A1.1-(1.5)-...-67° or 22°	Working distance typ. 10 mm ... 15 mm
KL-5	R-S-R1.1-(3x0.5)-...-67° or 22°	Working distance typ. 8 mm ... 20 mm
KL-8	R-S-R2.1-(6x1)-...-67° or 22°	Working distance typ. 8 mm ... 25 mm
KL-8-N	R-S-R2.1-(6x1)-...-67° or 22°	Working distance typ. 8 mm ... 25 mm <i>with guide slot (adjustment aid)</i>
KL-9	R-S-A3.0-(3.0)-...-67° or 22°	Working distance typ. 8 mm ... 25 mm
KL-90 (2 pcs. necessary)	D-S-A2.0-(2.5)-...-67° or 22°	Working distance typ. 20 mm ... 100 mm - <i>prismatic optics</i>
KL-D-2.5	D-S-A2.0-(2.5)-...-67°	Working distance typ. 100 mm ... 500 mm
KL-D-6	D-S-A2.0-(2.5)-...-67°	Working distance typ. 100 mm ... 230 mm
KL-D-14	D-S-A2.0-(2.5)-...-67°	Working distance typ. 60 mm ... 120 mm
KL-D-14-T400	D-S-A2.0-(2.5)-1200-67°-T400	Working distance typ. 60 mm ... 120 mm <i>thermally stable up to 400°C</i>
KL-D-17	D-S-A2.0-(2.5)-...-67°	Working distance typ. 30 mm ... 80 mm
KL-D-20	D-S-A2.0-(2.5)-...-67°	Working distance typ. 10 mm ... 50 mm
KL-D-28	D-S-A2.0-(2.5)-...-67°	Working distance typ. 20 mm ... 50 mm
KL-D-30	D-S-A2.0-(2.5)-...-67°	Working distance typ. 20 mm ... 30 mm
KL-D-40	D-S-A2.0-(2.5)-...-67°	Working distance typ. 15 mm ... 25 mm
KL-M8-A1.1	R-S-A1.1-(1.5)-...-67°	Working distance typ. 8 mm ... 20 mm
KL-M12-A1.1	R-S-A1.1-(1.5)-...-67°	Working distance typ. 8 mm ... 40 mm
KL-M12-A2.0	R-S-A2.0-(2.5)-...-67°	Working distance typ. 8 mm ... 40 mm
KL-M12-A3.0	R-S-A3.0-(3.0)-...-67°	Working distance typ. 8 mm ... 40 mm
KL-M12-R1.1	R-S-R1.1-(3x0.5)-...-67° <i>Special version*</i>	Working distance typ. 8 mm ... 40 mm
KL-M12-XL-A1.1	R-S-A1.1-(1.5)-...-67°	Working distance typ. 20 mm ... 100 mm
KL-M12-XL-A2.0	R-S-A2.0-(2.5)-...-67°	Working distance typ. 20 mm ... 100 mm
KL-M12-XL-R1.1	R-S-R1.1-(3x0.5)-...-67°	Working distance typ. 20 mm ... 100 mm
KL-M12-XL-30°/30-A2.0	D-S-A2.0-30°/30-A2.0	Working distance typ. 20 mm ... 100 mm
KL-M18-A1.1	R-S-A1.1-(1.5)-...-67°	Working distance typ. 20 mm ... 60 mm
KL-M18-A2.0	R-S-A2.0-(2.5)-...-67°	Working distance typ. 20 mm ... 60 mm
KL-M18-A3.0	R-S-A3.0-(3.0)-...-67°	Working distance typ. 20 mm ... 60 mm
KL-M18-M5.0	T-S-M5.0-(5.0)-...-67° <i>Special version*</i>	Working distance typ. 20 mm ... 60 mm
KL-M18-M6.0	T-S-M6.0-(6.0)-...-67° <i>Special version*</i>	Working distance typ. 20 mm ... 60 mm
KL-M18-M8.0	T-S-M8.0-(8.0)-...-67° <i>Special version*</i>	Working distance typ. 20 mm ... 60 mm
KL-M18-R1.1	R-S-R1.1-(3x0.5)-...-67°	Working distance typ. 20 mm ... 60 mm
KL-M18-R2.1	R-S-R2.1-(6x1)-...-67°	Working distance typ. 20 mm ... 60 mm

\*Special version:

Version is different to the standard version (e.g. no standard fiber adapter) and therefore is suitable only for certain sensors or applications



## Optical Frontends

## Optical frontends for reflected light or transmitted light fiber optics:

Part number:	Suitable for fiber optics type: (R, T = reflected light, D= transmitted light)	Characteristics:
KL-M18-XL-A1.1	R-S-A1.1-(1.5)-...-67°	Working distance typ. 10 mm ... 200 mm
KL-M18-XL-A2.0	R-S-A2.0-(2.5)-...-67°	Working distance typ. 10 mm ... 200 mm
KL-M18-XL-A3.0	R-S-A3.0-(3.0)-...-67°	Working distance typ. 10 mm ... 200 mm
KL-M18-XL-M5.0	T-S-M5.0-(5.0)-...-67° <i>Special version*</i>	Working distance typ. 10 mm ... 200 mm
KL-M18-XL-M6.0	T-S-M6.0-(6.0)-...-67° <i>Special version*</i>	Working distance typ. 10 mm ... 200 mm
KL-M18-XL-M8.0	T-S-M8.0-(8.0)-...-67° <i>Special version*</i>	Working distance typ. 10 mm ... 200 mm
KL-M18-XL-R1.1	R-S-R1.1-(3x0.5)-...-67°	Working distance typ. 10 mm ... 200 mm
KL-M18-XL-R2.1	R-S-R2.1-(6x1)-...-67°	Working distance typ. 10 mm ... 200 mm
KL-M34-A1.1	R-S-A1.1-(1.5)-...-67°	Working distance typ. 100 mm ... 250 mm
KL-M34-A2.0	R-S-A2.0-(2.5)-...-67°	Working distance typ. 100 mm ... 250 mm
KL-M34-A3.0	R-S-A3.0-(3.0)-...-67°	Working distance typ. 100 mm ... 250 mm
KL-M34-M5.0	T-S-M5.0-(5.0)-...-67° <i>Special version*</i>	Working distance typ. 100 mm ... 250 mm
KL-M34-M6.0	T-S-M6.0-(6.0)-...-67° <i>Special version*</i>	Working distance typ. 100 mm ... 250 mm
KL-M34-M8.0	T-S-M8.0-(8.0)-...-67° <i>Special version*</i>	Working distance typ. 100 mm ... 250 mm
KL-M34-R1.1	R-S-R1.1-(3x0.5)-...-67°	Working distance typ. 100 mm ... 250 mm
KL-M34-R2.1	R-S-R2.1-(6x1)-...-67°	Working distance typ. 100 mm ... 250 mm
KL-M34-XL-A1.1	R-S-A1.1-(1.5)-...-67°	Working distance typ. 50 mm ... 400 mm
KL-M34-XL-A2.0	R-S-A2.0-(2.5)-...-67°	Working distance typ. 50 mm ... 400 mm
KL-M34-XL-A3.0	R-S-A3.0-(3.0)-...-67°	Working distance typ. 50 mm ... 400 mm
KL-M34-XL-M5.0	T-S-M5.0-(5.0)-...-67° <i>Special version*</i>	Working distance typ. 50 mm ... 400 mm
KL-M34-XL-M6.0	T-S-M6.0-(6.0)-...-67° <i>Special version*</i>	Working distance typ. 50 mm ... 400 mm
KL-M34-XL-M8.0	T-S-M8.0-(8.0)-...-67° <i>Special version*</i>	Working distance typ. 50 mm ... 400 mm
KL-M34-XL-R1.1	R-S-R1.1-(3x0.5)-...-67°	Working distance typ. 50 mm ... 400 mm
KL-M34-XL-R2.1	R-S-R2.1-(6x1)-...-67°	Working distance typ. 50 mm ... 400 mm
KL-M34/62-A1.1	R-S-A1.1-(1.5)-...-67°	Working distance typ. 80 mm ... 200 mm
KL-M34/62-A2.0	R-S-A2.0-(2.5)-...-67°	Working distance typ. 80 mm ... 200 mm
KL-M34/62-A3.0	R-S-A3.0-(3.0)-...-67°	Working distance typ. 80 mm ... 200 mm
KL-M34/62-R1.1	R-S-R1.1-(3x0.5)-...-67°	Working distance typ. 80 mm ... 200 mm
KL-M34/62-R2.1	R-S-R2.1-(6x1)-...-67°	Working distance typ. 80 mm ... 200 mm

\*Special version:

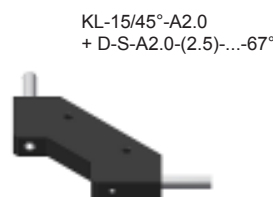
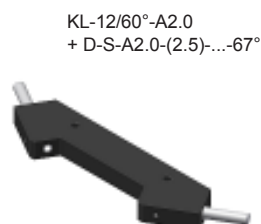
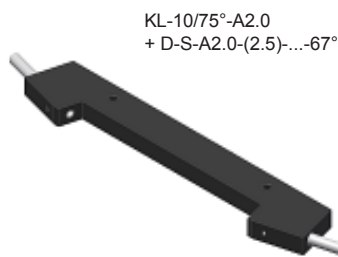
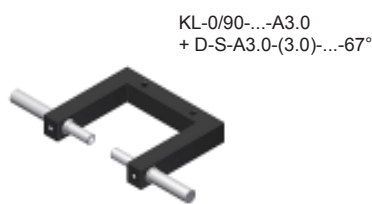
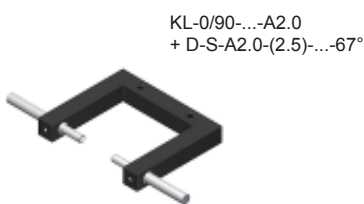
Version is different to the standard version (e.g. no standard fiber adapter) and therefore is suitable only for certain sensors or applications



Fiber Optics Fixtures

Mounting brackets (fixtures) for transmitted light fiber optics with sensor head type „A2.0“, „A3.0“, or „R2.1“:

Part number:	Suitable for fiber optics type: (D= transmitted light)	Characteristics:
KL-0/90°-22-A2.0	D-S-A2.0-(2.5)-...-67°	Transmitter/receiver distance 22 mm, fork width/depth: 50/50 mm
KL-0/90°-60-A2.0	D-S-A2.0-(2.5)-...-67°	Transmitter/receiver distance 22 mm, fork width/depth: 60/50 mm
KL-0/90°-100-A2.0	D-S-A2.0-(2.5)-...-67°	Transmitter/receiver distance 100 mm, fork width/depth: 100/50 mm
KL-0/90°-16-A3.0	D-S-A3.0-(3.0)-...-67°	Transmitter/receiver distance 16 mm, fork width/depth: 50/50 mm
KL-0/90°-60-A3.0	D-S-A3.0-(3.0)-...-67°	Transmitter/receiver distance 60 mm, fork width/depth: 94/50 mm
KL-0/90°-100-A3.0	D-S-A3.0-(3.0)-...-67°	Transmitter/receiver distance 100 mm, fork width/depth: 100/50 mm
KL-5/85°-A2.0	D-S-A2.0-(2.5)-...-67°	Angle of incidence 85° to the vertical in a distance of 5 mm to the object, gloss control of extremely rough surfaces
KL-5/85°-A3.0	D-S-A3.0-(3.0)-...-67°	Angle of incidence 85° to the vertical in a distance of 5 mm to the object, gloss control of extremely rough surfaces
KL-10/75°-A2.0	D-S-A2.0-(2.5)-...-67°	Angle of incidence 75° to the vertical in a distance of 10 mm to the object, gloss control of rough surfaces
KL-10/75°-A3.0	D-S-A3.0-(3.0)-...-67°	Angle of incidence 75° to the vertical in a distance of 10 mm to the object, gloss control of rough surfaces
KL-12/60°-A2.0	D-S-A2.0-(2.5)-...-67°	Angle of incidence 60° to the vertical in a distance of 12 mm to the object, gloss control of matt to light glossy surfaces
KL-12/60°-A3.0	D-S-A3.0-(3.0)-...-67°	Angle of incidence 60° to the vertical in a distance of 12 mm to the object, gloss control of matt to light glossy surfaces
KL-12/60°-R2.1	D-S-R2.1-(6x1)-...-67°	Angle of incidence 60° to the vertical in a distance of 12 mm to the object, gloss control of matt to light glossy surfaces
KL-15/45°-A2.0	D-S-A2.0-(2.5)-...-67°	Angle of incidence 45° to the vertical in a distance of 15 mm to the object, gloss control of matt to glossy surfaces
KL-15/45°-A3.0	D-S-A3.0-(3.0)-...-67°	Angle of incidence 45° to the vertical in a distance of 15 mm to the object, gloss control of matt to glossy surfaces
KL-20/20°-A2.0	D-S-A2.0-(2.5)-...-67°	Angle of incidence 20° to the vertical in a distance of 20 mm to the object, gloss control of very glossy surfaces
KL-20/20°-A3.0	D-S-A3.0-(3.0)-...-67°	Angle of incidence 20° to the vertical in a distance of 20 mm to the object, gloss control of very glossy surfaces





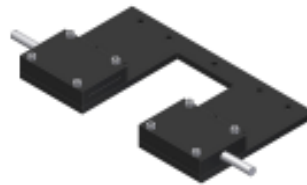
Fiber Optics Fixtures

Mounting brackets (fixtures) for transmitted light fiber optics with sensor head type „Q....“ (cross-section converter):

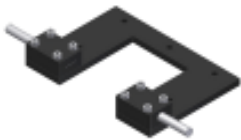
Part number:	Suitable for fiber optics type: (D= transmitted light)	Characteristics:
KL-50/50-5	D-S-Q1-(5x0.5)-...-67°	Width of measuring range: 5 mm, transmitter/receiver distance: 50 mm, distance beginning of measurement range (inner side) to inner edge of housing: 50 mm
KL-50/50-10	D-S-Q2-(10x0.3)-...-67°	Width of measuring range: 10 mm, transmitter/receiver distance: 50 mm, distance beginning of measurement range (inner side) to inner edge of housing: 50 mm
KL-50/50-18	D-S-Q3-(18x0.3)-...-67°	Width of measuring range: 18 mm, transmitter/receiver distance: 50 mm, distance beginning of measurement range (inner side) to inner edge of housing: 50 mm
KL-50/50-28	D-S-Q4-(28x0.2)-...-67°	Width of measuring range: 28 mm, transmitter/receiver distance: 50 mm, distance beginning of measurement range (inner side) to inner edge of housing: 50 mm
KL-50/50-38	D-S-Q5-(38x0.15)-...-67°	Width of measuring range: 38 mm, transmitter/receiver distance: 50 mm, distance beginning of measurement range (inner side) to inner edge of housing: 50 mm
KL-50/50-48	D-S-Q6-(48x0.15)-...-67°	Width of measuring range: 48 mm, transmitter/receiver distance: 50 mm, distance beginning of measurement range (inner side) to inner edge of housing: 50 mm



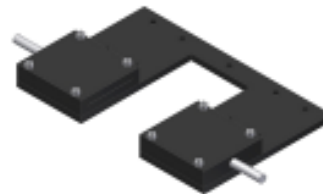
KL-50/50-5  
+ D-S-Q1-(5x0.5)-...-67°



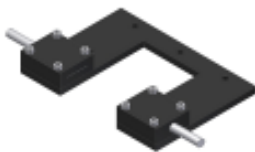
KL-50/50-28  
+ D-S-Q4-(28x0.2)-...-67°



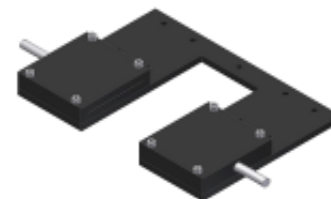
KL-50/50-10  
+ D-S-Q2-(10x0.3)-...-67°



KL-50/50-38  
+ D-S-Q5-(38x0.15)-...-67°



KL-50/50-18  
+ D-S-Q3-(18x0.3)-...-67°



KL-50/50-48  
+ D-S-Q6-(48x0.15)-...-67°