

# FLB Series

## ► Product Information

The sensors of FLB Series detect parts starting from a size of 0.2 mm with a switching frequency of 1 kHz. An additional analog output (0...+10V) offers application possibilities in the field of measuring technology.

With the electronic control unit FLB-CON2 an operator-friendly parameterisation on a PC under Windows® is ensured.



## Characteristics

### Operative range

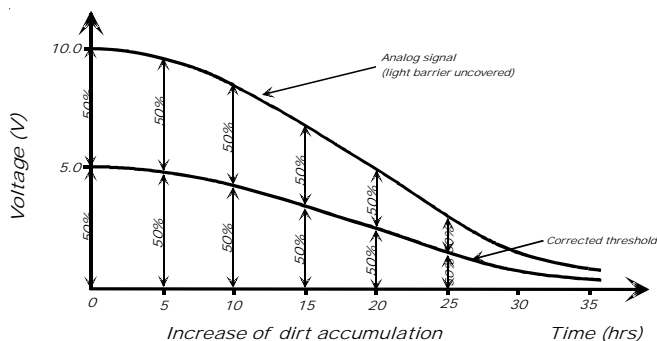
The frame light barriers of FLB Series are used for the measurement of smallest unguided parts. In addition, some types feature an analog output which, among other things, can be used for positioning or for strip width monitoring. This analog signal is monitored with the electronic control unit FLB-CON2, and an error signal is generated if the measured value rises above or falls below the set tolerances.

The frame light barriers of FLB Series are extremely insensitive to outside light due to optical filtering and partly modulated operation. Still they guarantee safe measurement of parts with sizes starting from only 0.2 mm. An impact protection facility (aluminum baffle plates, rubber-metal vibration dampers) protects the optical unit of the frame light barrier against impacting parts.

With its compact design and with the remote control unit (in case of FLB-FR3) this type of frame light barrier is excellently suited for eject monitoring in a punching die, for example.

### High sensitivity due to threshold correction

By continuously monitoring the maximum value at the receiver a dynamic switching threshold correction compensates the effect of dirt accumulation. Increasing dirt accumulation therefore does not lead to change of sensitivity.



**Example:**  
The switching threshold (sensitivity) is set to 50% of the maximum value. After increased dirt accumulation the switching threshold still is 50%. This means that the sensitivity does not change.

### Parameterisable under Windows®: (FLB-CON2, FLB-CON8)

#### FLB-CON2:

With the FLB-CON2 sensor parameters such as tolerance, reference, switching hysteresis, bright/dark switching, and pulse lengthening can be set through the RS232 interface by means of Windows® software FLB/TLB-Scope. In addition the analog signal or the tolerance band, respectively, are graphically displayed at the PC.

#### FLB-CON8:

The products FLB-F, FLB-H, and FLB-V of the FLB Series respectively the products FKB-...-P and SLB-...-P of the TLB Series can be connected to the electronic control unit FLB-CON8. The electronic control unit guarantees a stable voltage supply for the respective transmitter/receiver of the FLB or TLB Series.

The electronic control unit also amplifies and processes the analog signal of the receiver in a suitable manner. A micro-controller performs 12-bit analog/digital conversion of the analog signal, allowing recording and evaluation of the signal characteristics at the sensor. Furthermore the electronic control unit offers various options for intelligent transmitting power control (dirt accumulation compensation) at the sensor.

Parameters and measured values can be exchanged between the PC and the electronic control unit through either the RS232 interface or Ethernet interface (by means of an Ethernet adapter). All the parameters can be stored in the non-volatile EEPROM of the electronic control unit through the interface.

The FLB-TLB-CON8-Scope V3.0 Windows® software facilitates parameterisation, diagnostics, and adjustment of the sensor system (oscilloscope function). The FLB-TLB-CON8-Scope V3.0 software furthermore features the function of a data recorder that automatically records data and saves them on the PC's hard disk.

### Functional principle

The optoelectronic components of the transmitter and receiver units are arranged opposite to each other in the frame (in the sides in case of fork or split design). Both the transmitter and the receiver unit consist of a row of IR transmitter diodes or phototransistors, which form a homogeneous light curtain between the transmitter and receiver unit.

If a measuring object now passes through this light curtain, part of the light band is covered, and less IR light thus impinges on the receiver unit. The signal generated by the phototransistors is then attenuated and differentiated proportional to the impinging quantity of light, and the differentiated signal is sent to a comparator pulse lengthening unit.

**Characteristics**

**Optical filtering**

The frame light barriers of FLB Series are equipped with IR filters. Furthermore, outside light suppression is also improved by way of sophisticated aperture technology.

**Adjustable transmitter/receiver distance**

With type FLB-F2 transmitter and receiver unit are each contained in a separate housing. The transmitter/receiver distance can be easily varied by means of sliding these units on a rail. At the transmitter side the pulse power of the IR diodes can be adjusted with a step switch.

**Analog output**

At the output of the electronic control unit FLB-CON1 an analog signal that provides information on light barrier covering is available for checking and monitoring tasks.

**Dynamic measurement**

When the measuring object passes the light curtain of a frame light barrier it triggers a voltage pulse, the pulse length of which is independent of the time the measuring object stays in the light curtain. With a step switch the pulse length can be set between 10 ms and 300 ms.

**Static measurement**

The duration of light curtain interruption by a measuring object determines the pulse length (the pulse duration corresponds with the time the measuring object stays in the light curtain).

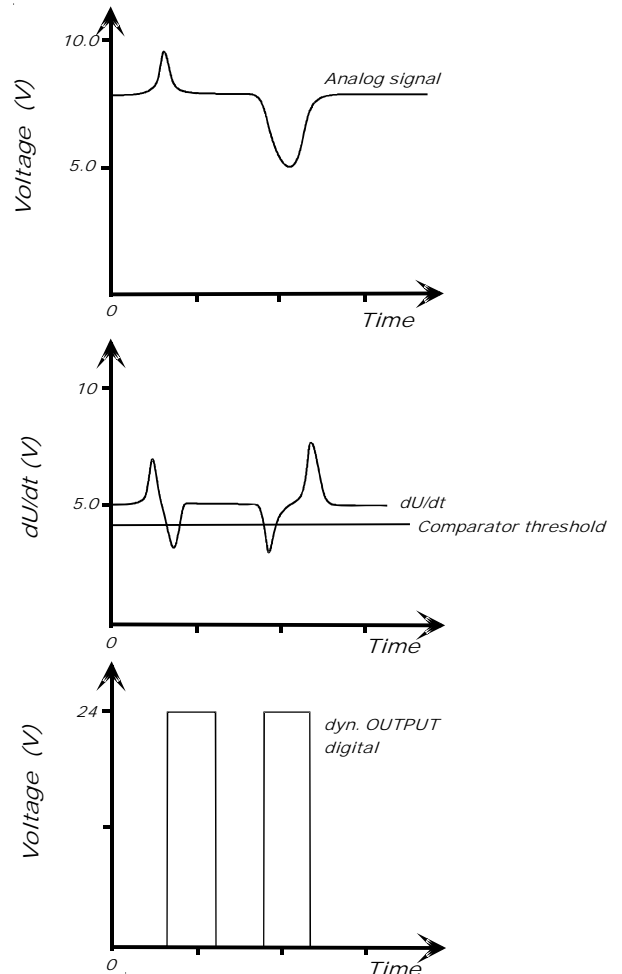
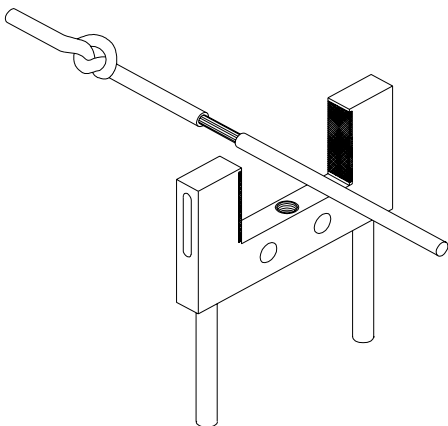
**Compact and sturdy housing**

With their sturdy metal housing and the high type of protection the frame light barriers of FLB Series are designed for sophisticated applications in the machine building industry.

**Application Example**

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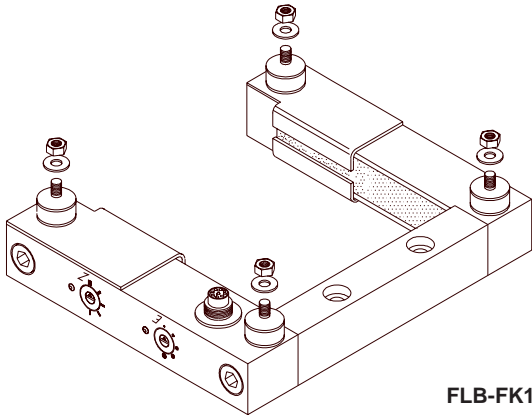
Cable checking:  
Cable diameter deviations (e.g. thick spots or damaged insulation) are safely detected by means of the differentiator with subsequent comparator unit and pulse lengthening.



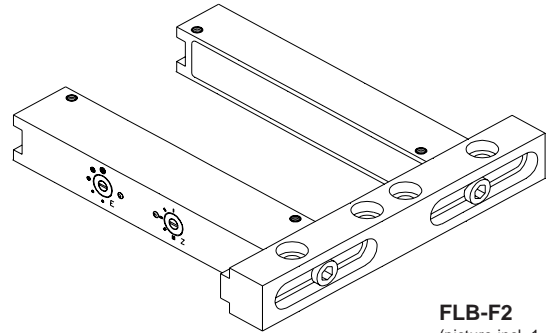


Product Line

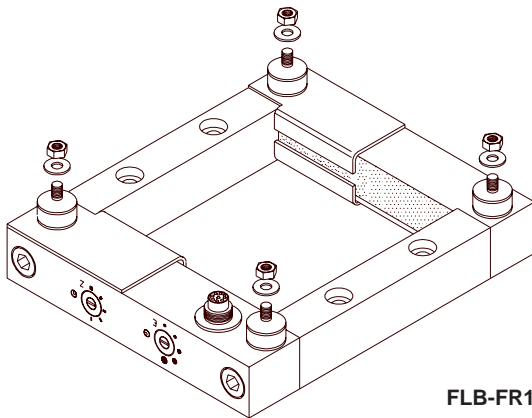
Frame light barriers with controller inside:



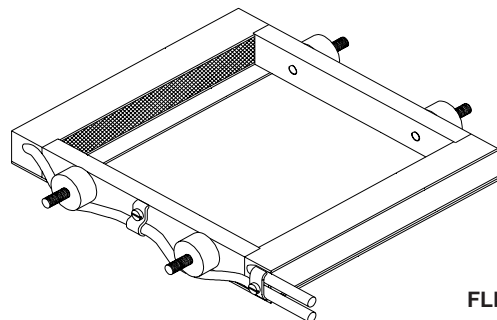
FLB-FK1



FLB-F2  
(picture incl. 1 cross bar TRA)



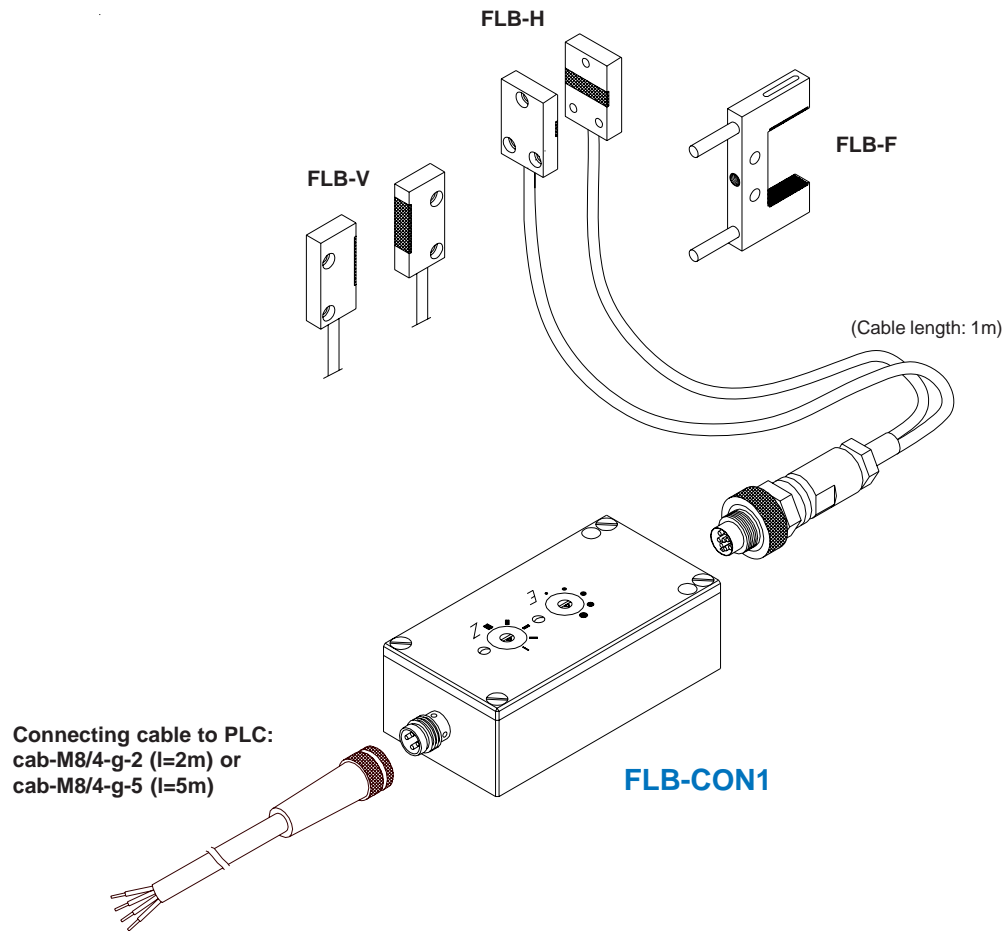
FLB-FR1



FLB-FR3



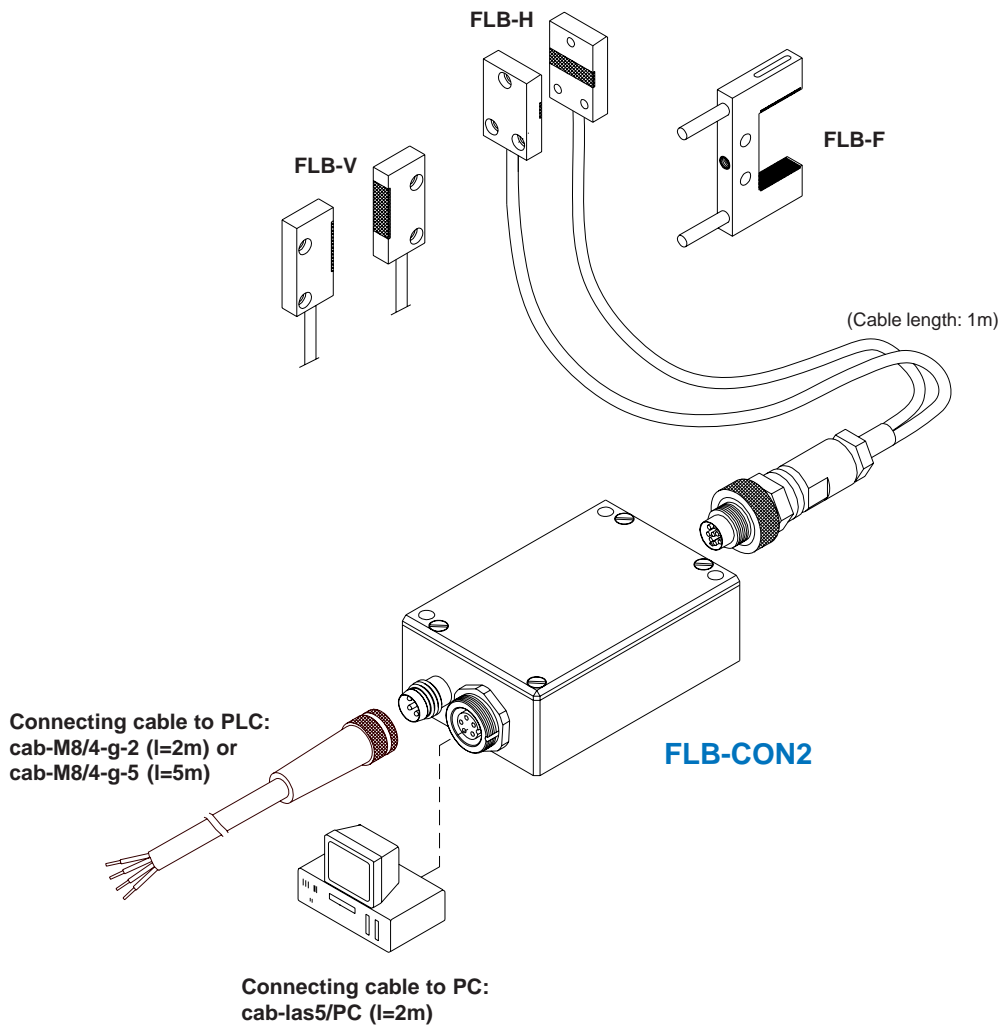
FLB-CON1 electronic control unit and suitable frontends:



Please note:  
 FLB-F-50, FLB-H-50, FLB-V-50 not suitable  
 for use with FLB-CON1



FLB-CON2 electronic control unit (parameterizable under Windows®) and suitable frontends:

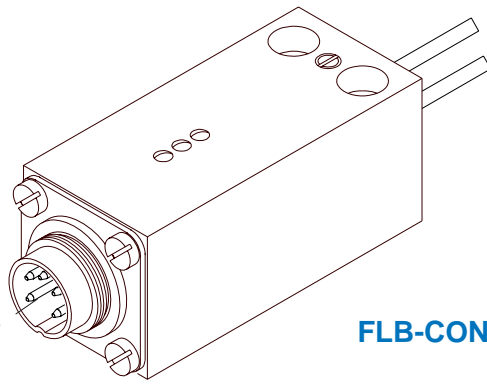




Product Line

FLB-CON3-5 electronic control unit and suitable frontends:

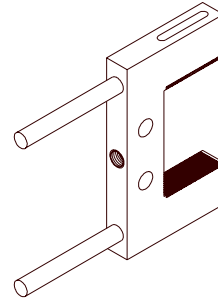
Suitable for connection to  
frame light barriers of type  
FLB-F-...-C (however not FLB-F-50-C)  
FLB-H-...-C (however not FLB-H-50-C)  
FLB-V-...-C (however not FLB-V-50-C)



FLB-CON3-5

5-pin circular connector  
type Binder 680 (270°)

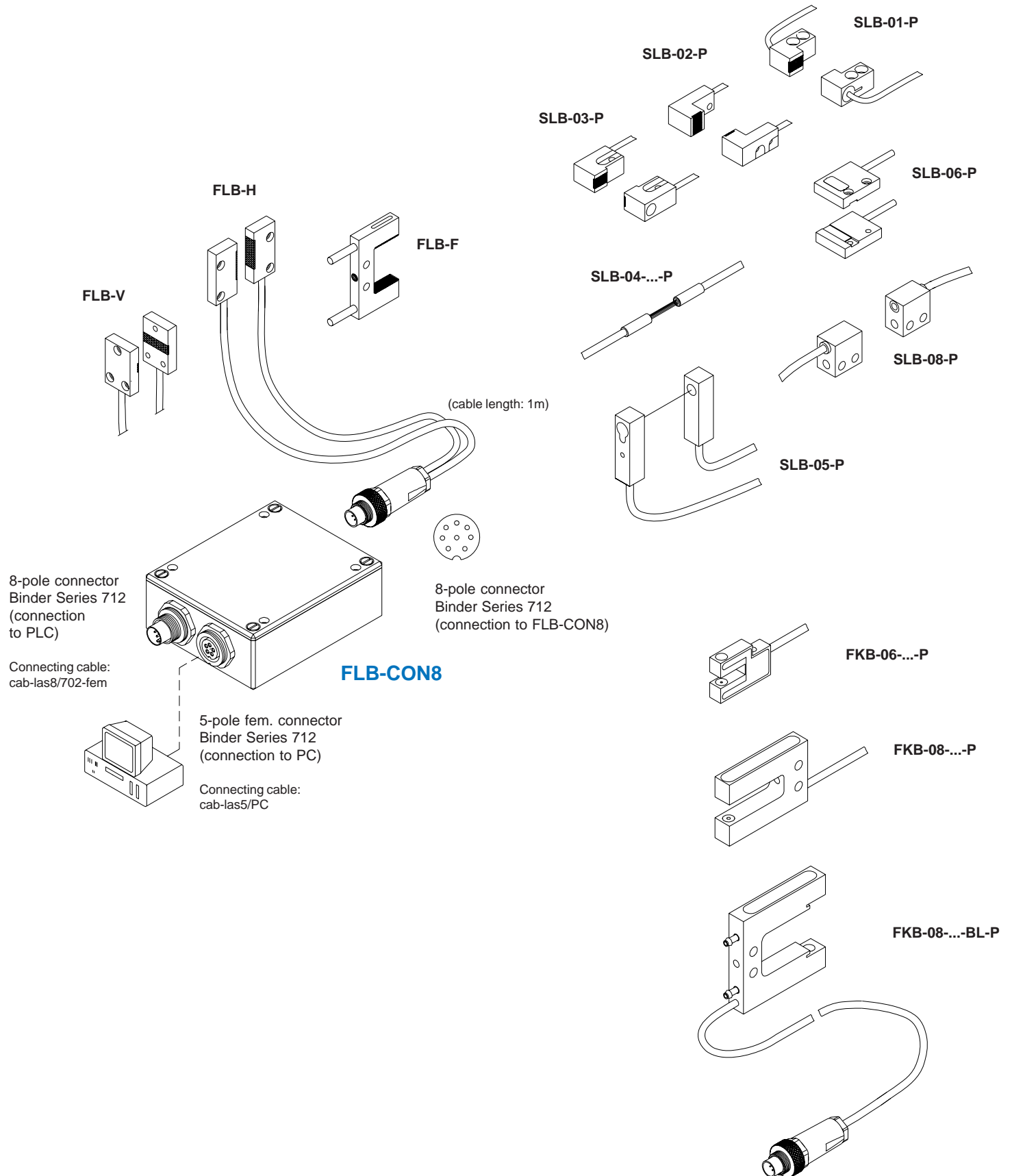
Connecting cable:  
cab-agl5





Product Line

(parameterizable under Windows®) and suitable frontends:



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

Connecting cable:  
cab-las8/702-fem

5-pole fem. connector  
Binder Series 712  
(connection to PC)

Connecting cable:  
cab-las5/PC

8-pole connector  
Binder Series 712  
(connection to FLB-CON8)

(cable length: 1m)

**FLB-CON8**

SLB-01-P

SLB-02-P

SLB-03-P

SLB-04-...-P

SLB-05-P

SLB-06-P

SLB-08-P

FKB-06-...-P

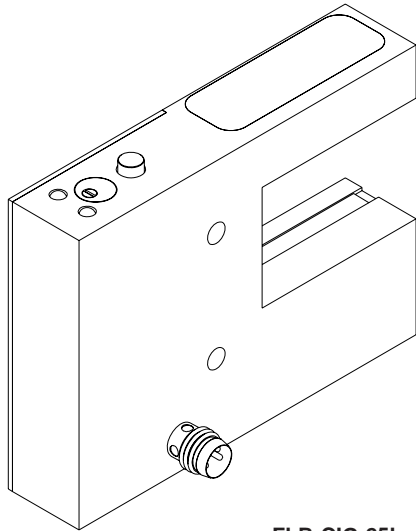
FKB-08-...-P

FKB-08-...-BL-P

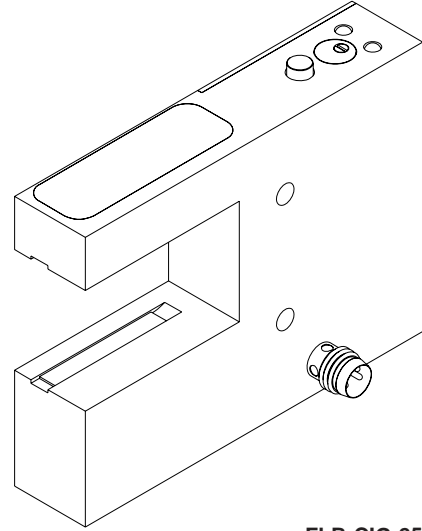


Product Line

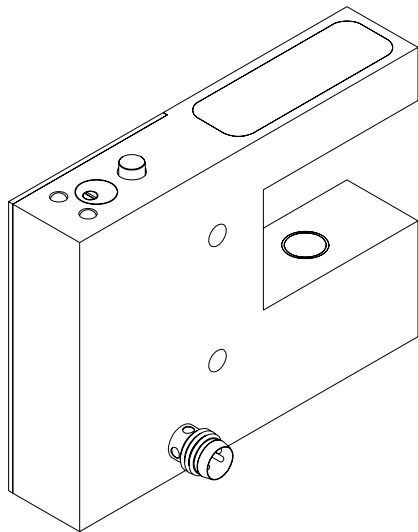
Special sensors FLB-CIG-...  
( for paper tear checking or glue joint detection)



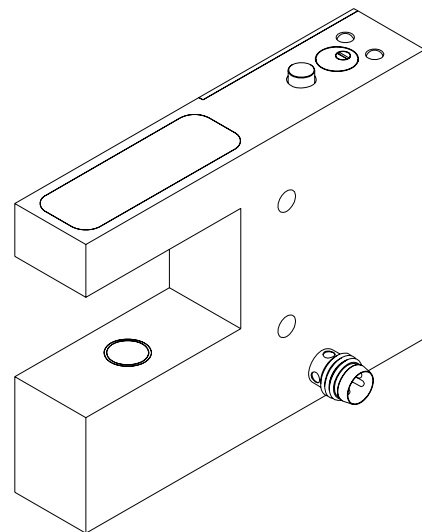
FLB-CIG-25L



FLB-CIG-25R



FLB-CIG-25L-RD



FLB-CIG-25R-RD