Baumer

SCATEC-2

Laser Copy Counter

FLDK 110G1003/S14
FLDK 110G1003/S42
FLDK 110C1003/S42
FLDK 110G1005/S14
FLDK 110G1005/S42
FLDK 110G1006/S14
FLDK 110x10/xxxxxx

User manual

Sensor Solutions
Motion Control
Vision Technologies
Process Instrumentation

General notes

Rules for proper usage	This product represents a precision measuring device which has been designed for the detection of objects and parts. It generates and provides measured values issued as electrical signals for following systems. Unless this product has not been specifically marked it may not be used in hazardous areas.
Set-up	Installation, mounting and adjustment of this product may only be executed by skilled employees.
Installation	Only mounting devices and accessories specifically provided for this product may be used for installation. Unused outputs may not be connected. Unused strands of hard-wired sensors must be isolated. Do not exceed the maximum permissible bending radius of the cable. Before connecting the product electrically the system must be powered down. Where screened cables are mandatory, they have to be used in order to assure EMI protection. When assembling connectors and screened cables at customer site the screen of the cable must be linked to the connector housing via a large contact area.

0 Table of Contents

FLDK 110x10/xxxxxx

Check section 14 for data and information varying from the standard manual !

1 Safety information and Certifications

The laser diode installed in the ***SCATEC-2*** emits visible red light. This laser belongs to the Class 2 laser standard specified by the IEC 60825-1 / 2007.

Avoid looking directly into the beam for long periods. Brief irradiation of the eye (0.25 sec) that can occur during an accidental glance is not regarded to be dangerous.

However, the laser should not be aimed deliberately at people. The laser beam should also be blocked at the end of its intended path.

Scatec-2 complies with the following safety standards:

c UL us LISTED IND. CONT. EQ. 1DD2

CE

Complies with 21CFR 1040.10 and 1040.11 except for deviations pursuant to laser notice No.50, dated June 24, 2007

2 Introduction

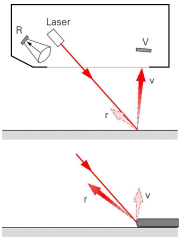
SCATEC-2 has the same key feature as all the other sensors from the ***SCATEC*** family: The capability of non-contact detection of object edges. ***SCATEC*** is the sensor of choice when it comes to detect flat objects conveyed in an overlapping stream or individually. The sensors in the ***SCATEC*** family were developed and highly optimized particularly with regard to the specific demands of non-contact counting of overlapping paper sheets and newspapers. Therefore the printing industry will be the ideal area of application for the ***SCATEC***.
Generally speaking a ***SCATEC*** sensor reacts to an edge facing the sensor's laser beam. If the laser beam strikes such an edge, ***SCATEC*** responds with an electrical output pulse of fixed duration. However, built-in software allows the sensor among other things to suppress the reaction to certain edges which were identified by the sensor as "false edges". Therefore, ***SCATEC-2*** makes it possible to count newspapers to the highest degree of accuracy even at high conveyor speed.

Within the ***SCATEC*** family, the ***SCATEC-2*** is characterized by the following properties:
(For details see specifications of the individual Scatec-2 types.)

- counts edges from a thickness of 0.2 mm and greater
- optimum working distance: 40 mm or 100 mm
- intelligent false pulse suppression
- parameter setting by means of DIP-switches
- counting rate up to 600,000 copies per hour
- with interface for remote control and data analysis

3 Principle of operation

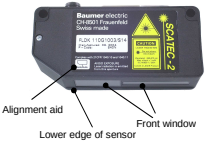
Described simply, the ***SCATEC-2*** consists of a laser light source and two photodetectors. The beam is aimed diagonally at the objects to be detected. Photodetector *R* is located close to the laser light source and photodetector *V* a little further away. The sensor measures the ratio between signal *v* (light scattered forward) and signal *r* (light scattered backward).
The ratio *v/r* differs widely depending whether the beam strikes on a flat surface or on an edge. When an edge moves into the laser beam, the direct line of sight from detector *V* to the point of contact of the laser is obstructed, which reduces signal *v*, and the edge also increases the backward scattering, causing signal *r* to increase. Both effects cause ratio *v/r* to become substantially smaller than with a flat surface. If ratio *v/r* falls below a specific level, the sensor interprets this as an edge.

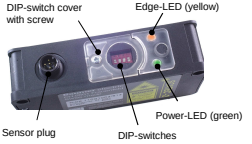


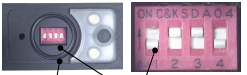
This principle of operation clearly demonstrates that:

- The orientation of the object to the beam is significant. An edge facing towards the beam creates a small ratio *v/r*, in contrast to an edge facing away from the beam.
- Edge detection is independent of the color, as only the ratio of the light intensities and not the absolute value is used for detection.

4 Part identification

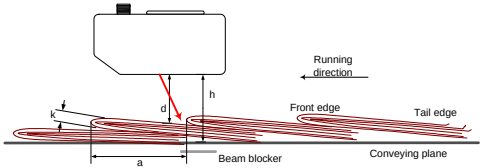






5 Terms and definitions

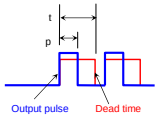
For reference, the terms defined in this section are used throughout the manual.



Mounting height: *h* — Distance between the lower edge of the sensor and the conveying plane.

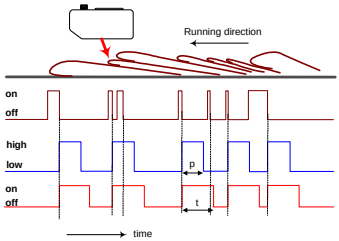
Working plane — The edge lies on the working plane. With thick overlapping copies, the working plane is slightly higher than the top of the conveying plane on which the copies are transported. Distance *d* is measured vertically to the lower edge of the sensor.

Working distance: *d* — Distance between the lower edge of the sensor and the working plane.

Overlap: *a*	Distance between two successive edges, measured along the conveying plane. (Also referred to as the object spacing.)
Edge thickness: *k*	Thickness of the copy at the point where the edge is to be detected.
Front edge	The edge of an object facing the laser beam. Front edges are detected by the sensor.
Tail edge	The edge of an object facing away from the laser beam. Tail edges are not detected by the sensor unless they are pointing upwards.
Running direction	The preferred running direction (front edges leading) is indicated. The opposite direction is also permitted by the ***SCATEC-2***.
Dead time *t*	The sensor responds to an edge with an output pulse with length *p*. The dead time begins when the pulse is issued. The sensor can only issue the next pulse after both the dead time *t* and the output pulse *p* have expired. This means: an edge detected by the beam while still either the dead time *t* or the the output pulse *p* is on does not initiate an output pulse. 
False pulse	Output pulse generated by an edge which should not be counted.

6 Signal sequence

The yellow edge indicator LED lights as long as an edge is located in the beam. The output pulse is issued at the end of the edge. The dead time begins when the output pulse is issued. During the dead time and when issuing the pulse, the ***SCATEC-2*** is inactive, i.e. an edge ending during the dead time or the pulse issue of the previous edge will not initiate an output pulse. Therefore, the next output pulse can only be issued after the dead time has expired and the output pulse has been issued.



7 Installation

7.1 Electrical connection

Make the electrical connections as specified in Sections *10.2 Electrical data* and *10.3 Pin assignement*.

7.2 Mounting

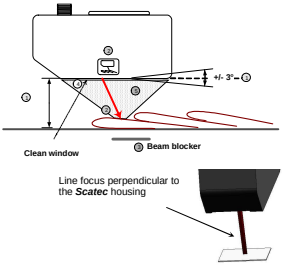
(1) Mount the sensor at the nominal working distance *h* (+/-3 mm) with the front window parallel to the conveying plane.

(2) Adjust the sensor so that the laser beam is aimed towards the edges to be counted. When mounted correctly, the overlap of the copies is facing in the same direction as indicated in the alignment aid. Note: the laser beam is focused into a line which must be aligned in parallel to the edge to be detected!

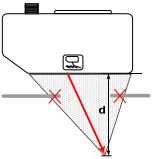
(3) Block the laser beam after the objects whenever possible.

(4) Keep the window clean (remove any fingerprints after mounting!).

(5) A direct line of sight from the laser impact point to the entire front window must be ensured.



Nominal working distance *h*	FLDK 110x1003/Sxx 40 mm above the conveyor belt FLDK 110x1005/Sxx 100 mm above the conveyor belt FLDK 110x1006/Sxx The resolution is dependent on the distance. The highest resolution is achieved at the nominal working distance. (See also Section *10.6 Specific application data*)
Angular tolerance	max. +/- 3°
Overlap orientation	The copies are counted when the edge facing the laser beam moves through the beam. If an edge faces away from the beam, it is not detected. Tail edges are therefore not counted unless they face upwards.
Running direction	The ***SCATEC-2*** permits both running directions. The edges facing the laser beam (front edges) are detected by the sensor regardless of the running direction.
Front window	The direct line of sight from the impact point of the laser to the entire front window must not be obstructed by any hardware in a distance range *d* = 0 – 80 mm FLDK 110x100**3**/Sxx *d* = 0 – 120 mm FLDK 110x100**5**/Sxx FLDK 110x100**6**/Sxx If mountings or other components are close to this zone for any reason, you should consult a technician from Baumer Electric AG.



7.3 Beam blocker

Uncontrolled reflections of the laser beam can cause malfunctioning of the sensor or disturb people. Therefore, a beam blocker should be fitted whenever possible to block the beam when there is no target present. A flat surface (at least approx. 25x25 mm) made of a matte, non-reflecting material is recommended as the beam blocker. The beam blocker must be mounted parallel to the sensor. The yellow edge indicator LED must not light when the laser beam strikes the beam blocker.

7.4 Cleaning the front window

Fingerprints, dust and other forms of dirt on the front window can impair the function of the sensor. There is a high risk of accidentially leaving fingerprints on the windows when mounting the sensor. Make sure that after the mounting the front windows are cleaned! It is normally sufficient to wipe the glass pane dry with a clean (!), soft cloth. Alcohol may be used for heavier soiling.

7.5 Checklist for correct mounting

When the ***SCATEC-2*** is mounted correctly:

- the green power LED lights as long as the electrical supply is connected
- the product overlap faces in the same direction as indicated on the sensor label
- the laser beam is focused on the conveying plane into a line about 2 (3) mm long
- the laser line focus must be aligned in parallel to the edges to be detected
- the yellow edge indicator LED does *not* light when the laser beam strikes the beam blocker
- the yellow edge indicator LED lights as long as an edge is located in the beam
- the front windows are clean

8 Adjustments

With the ***SCATEC-2***, the following parameters and operating modes can be adjusted:

- Output pulse length
- False pulse suppression
- Sensitivity

The parameters can be adjusted in two ways: via the interface or using DIP switches.
Parameter setting through the interface allows continuous choice of the parameters, whereas a selection is made from a defined set when the parameters are set with the DIP switches. Parameter setting through the interface using a computer is described in the user manual for the software package *ScaDiag*.

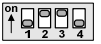
Note: ***The sensor is only in DIP switch mode when the power LED lights green.***

- If the power LED lights *yellow* instead of green, the parameters of the sensor have been set through the interface. In this case, the DIP switches are inactive on the sensor and their settings are irrelevant. The sensor can be reset to DIP switch mode, in which the parameters are defined by the DIP switches, in two ways.
  a) Through the interface (see user manual for the software package *ScaDiag*).
  b) By setting the DIP switches in the following sequence:
     1. Set all switches to OFF (at least one must have been ON previously)
     2. Set all switches to ON within 16 seconds
     3. Set all switches back to OFF within 16 seconds
     4. The power LED should then light green after a brief delay. The parameters of the sensor can then be adjusted with the DIP switches
- To prevent the loss of the DIP switch cover screw, do not fully remove it from the cover. The screw is retained by the cover.

DIP-switch settings:

The effects of the various DIP-switch settings are described in *Section 9 Instructions for use* below

o Do remount the cover after having set the DIP-switch to avoid intrusion of dust



Factory setting

FLDK 110x1003/Sxx
FLDK 110x1005/Sxx

Parameter	*DIP-switch*	*Setting*	*Value*
Output pulse length	1 / 2	off / off off / on on / off on / on	5 ms 10 ms 15 ms 20 ms
False pulse suppression	3	off on	inactive Active
Sensitivity	4	on off	reduced maximum

FLDK 110x1006/Sxx

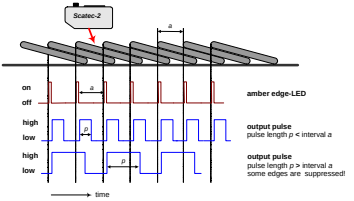
Parameter	*DIP-switch*	*Setting*	*Value*
Running direction	1	off on	leading trailing
Output pulse length	2	off on	5 ms 10 ms
False pulse suppression	3	off on	inactive active
Sensitivity	4	on off	reduced maximum

Factory settings

9 Instructions for use

9.1 Output pulse length and maximum counting rate

On the one hand, the duration of an output pulse must be long enough so that the customer's control system can process it. On the other hand, the length of the output pulse limits the maximum counting rate. Because output pulses must not overlap, the interval between edges must be at least as long as one output pulse length. If the interval is shorter, then this edge will be suppressed meaning that the edge will not initiate an output pulse.
The following figure illustrates how every other edge is suppressed because of a too long of an output pulse length.



A helpful rule of thumb is: Output pulse length *p* in milliseconds must be shorter than 1.2 million divided by the production rate given in copies per hour

The theoretical maximum production rate where output pulses follow each other without any gap in between is 3 times higher than the recommended value given by the rule of thumb. Exceeding the recommended value of the production rate increases the risk of missing edges due to irregular intervals between copies.
The following table lists the recommended maximum production rate for some values of the output pulse length.

set **output pulse length** [milliseconds]	**recommended maximum production rate** [copies/hour]
1	**1,200,000**
2	**600,000**
5	**240,000**
10	**120,000**
15	**80,000**
20	**60,000**

If suddenly the ***Scatec*** starts to miss copies while the production rate is run up, the reason very often is too short an output pulse length for the actual production rate in combination with fluctuations of the interval between copies.

9.2 False pulse suppression

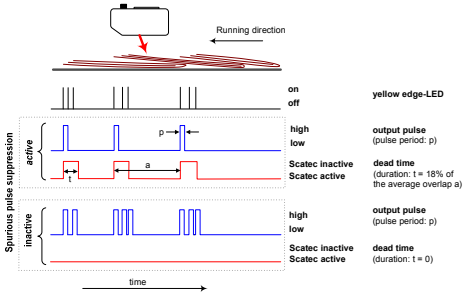
It is generally recommended that the ***SCATEC-2*** should be operated with the false pulse suppression feature active. In this way, multiple pulses caused by thicker copies (newspapers, folded cardboard boxes etc.) or by a small crease at the edge can be suppressed.

The false pulse suppression feature ensures that no further pulses can be issued when an output pulse is active and during the dead time. Activating the false pulse suppression feature causes the sensor to automatically initiate a dead time when each pulse is issued, whose duration is 18% of the average overlap spacing. If an output pulse is followed by another in less than about 1/6 of the current average overlap spacing time, this pulse is suppressed, as it lies within the dead time of the preceding pulse. The average overlap spacing time is constantly recalculated automatically by the ***SCATEC-2***. This ensures that the dead time is adjusted if the conveying speed changes. In certain cases, one edge may be suppressed if the conveying speed is very quickly accelerated, whereas one false impulse may not be suppressed during very fast braking. However, gaps in the overlapping stream caused when individual copies are removed or when the overlapping stream is briefly diverted have no effect. The false pulse suppression feature has no effect on the maximum counting rate as the dead time is shortened as the counting frequency rises and can even become shorter than the output pulse length. This occurs when the average copy spacing time becomes less than 6 times of the output pulse length.

Ideally, the sensor would not issue further pulses after a valid output pulse for a specific *length*, as the typical distance between two edges is often known regardless of the speed. Anything between these would be false pulses. However, to allow the sensor to suppress pulses for a specific *length* and not for a defined *time*, it must be synchronized to the conveying speed. This is possible with the ***Scatec-10*** and ***Scatec-15***.

☞ *Always switch on false pulse suppression unless the overlap spacing is highly unregular. Individual copies may be ignored during abrupt acceleration or if the overlap spacing suddenly becomes smaller.*

The following diagram shows a comparison of the pulse sequences for active and inactive false pulse suppression with an identical lap stream.



9.3 Sensitivity

Because the Scatec cannot discern between a front edge (which the customer wishes to detect) and a spot on the object similar to an edge (e.g. crests or creases in the paper, creases in a carton etc), the sensitivity of the sensor should be adjusted to the edge thickness to be detected. This means that the sensor should be set to a sensitivity at which it detects all leading edges without being sensitive enough to react to edge-like spots on the object thinner than the actual edge thickness.
It is possible to choose between two different sensitivity levels with DIP switch 4.
A diagram of the sensitivity in relation to the working distance and transportation speed is shown in Section 10.6.

9.4 Variation of the working distance

The thickness that an edge must have to be detected by the ***SCATEC-2*** depends on the working distance. The ***SCATEC-2*** is most sensitive at the nominal working distance which is 40mm for the *FLDK 110x1003/Sxx* and 100mm for the FLDK *110x1005/Sxx* and FLDK 110x1006/Sxx. The relationship between the sensitivity and the working distance is contained in the specifications in Section 10.6.

☞ *the sensitivity of the sensor varies with the working distance*

9.5 Signal sequence

Every output pulse is preceeded by a flash of the yellow edge-LED, however, not every flash of the yellow edge-LED is followed by an output pulse! The yellow edge-LED lights as long as an edge is located in the beam. Whether this edge actually results in an output pulse or not depends on the current settings. The pulse could still be suppressed due to restrictions imposed by the dead-time or pulse length (see section 6).

Because the yellow edge-LED lights up exactly during the time an edge is in the laser beam, the flashing of the yellow LED may become difficult to recognize by eye when fine edges pass the sensor at high speed. Consequently, at high conveying speed and/or fine edges, supposedly absent flashing of the yellow LED does not necessarily mean malfunction of the sensor.

- *not every flash of the yellow edge-LED is followed by an output pulse*
- *at a high conveying speed the flashing of the yellow edge-LED may be difficult to recognize*

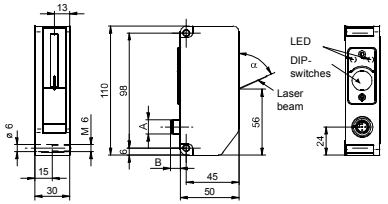
9.6 Applications outside the paper processing industry

Due to the fundamental principle of edge detection employed by the ***SCATEC-2***, the field of application for the sensor is not restricted to the paper processing industry. For applications concerning high-gloss surfaces (e.g. sheet metals), it is advisable to consult a technician from Baumer Electric AG on the application.

10 Specifications

10.1 Mechanical and thermal data

Sensor size	110 x 50 x 30 mm
Housing material	plastic (PA6.6)
Front window	glass
Weight	approx. 130 g
Protection class	IP 54
Working temperature range	0℃ to +50℃ (non-condens ing)
Storage temperature	-20℃ to +60℃



Sensor-Typ	*A*	*B*
FLDK .../S14	M12x1	8.5
FLDK .../S42	M16x0.75	11.8

Beam angle α	
FLDK 110x1003/Sxx	65°
FLDK 110G1005/Sxx	81°
FLDK 110G1006/Sxx	81°

10.2 Electrical data

Operating voltage V_S	
Limits:	+10 VDC to +30VDC (UL-Class 2)
reverse-protected	yes
Ripple V_S	10% within the limits of V_S
Power consumption	< 2 W
Current consumption	
Average:	< 170 mA
Peak (after switching on)	< 180 mA
Output connector	
*FLDK.../**S14***	M12 connector, 5-pole
*FLDK.../**S42***	DIN 45322, 6-pole
FLDK110x10/xxxxxx	*see section 14*
Output circuit	
*FLDK 110**G**...*	Push-pull
normal state	low
*FLDK 110**C**...*	Opto-isolated
switchable voltage	maximum 40 V
load resistance	maximum 50 kOhm
current load:	max. 100 mA
short-circuit protected	yes
Output pulse length	
*FLDK...**1003**/...and ...**1005**/...*	5, 10, 15, 20 ms selected by DIP switch
*FLDK...**1006**/...*	5, 10 ms selected by DIP switch

10.3 Pin assignment

*FLDK.../**S14*** M12-connector, 5-pole

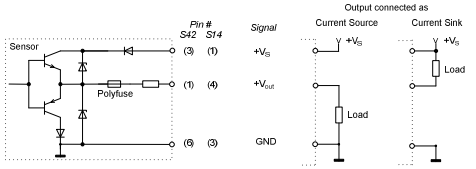
Pin	Assignment
1	Operating voltage +Vs
2	Seriell TxD (sensor)
3	GND (0V)
4	Signal output +Vout
5	Seriell RxD (sensor)

*FLDK.../**S42*** DIN 45322, 6-pole

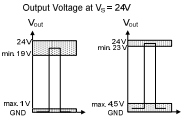
Pin	Assignment	
1	Signal output +Vout	
2	not connected	(FLDK 110***G***...)
	Signal output -Vout	(FLDK 110**C**...)
3	Operating voltage +Vs	
4	Seriell RxD (sensor)	
5	Seriell TxD (sensor)	
6	GND (0V)	

10.4 Output connection

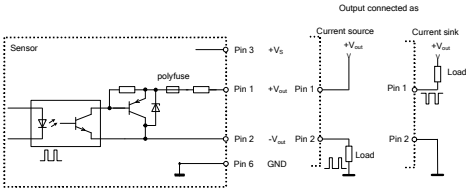
10.4.1 Push-pull output (*FLDK 110G...)*



$+V_S$	Operating voltage (+10VDC ... +30VDC)
$+V_{out}$	Signal output
GND	0 V
I_{Load}	maximum 100 mA

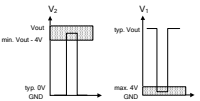


10.4.2 Opto-isolated output (*FLDK 110C...)*



$+V_S$	Operating voltage (+10VDC ... +30VDC)
$+V_{out}$	Signal output +
$-V_{out}$	Signal output -
GND	0 V
R_{Load}	maximum 50 kOhm
I_{Load}	maximum 100 mA

switchable voltage (+Vout minus -Vout) maximum 40 V



10.5 Optical data

Laser	
Wavelength	650nm - 680 nm (visible red)
Pulse frequency	50 kHz
Duty cycle	50%
Average power	< 0.5 mW
Laser class	2 (to IEC 60825-1 / 2007)
Beam diameter	
FLDK110x1003/Sxx	
at emission point	about 2.5 mm
40 mm beneath sensor	Line focus, 2 mm long, perpendicular to the ***Scatec*** housing
FLDK110x1005/Sxx	
FLDK110x1006/Sxx	
at emission point	about 2.5 x 4 mm
100 mm beneath sensor	Line focus, 3 mm long, perpendicular to the ***Scatec*** housing
Focus position	
FLDK110x1003/Sxx	40 mm beneath sensor
FLDK110x1005/Sxx	100 mm beneath sensor
FLDK110x1006/Sxx	
Optical receiver	equipped with NIR suppression filter and daylight suppression filter

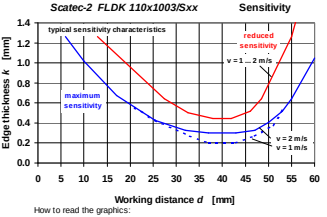
10.6 Application data

Measuring range	
FLDK110x1003/Sxx	0 to 60 mm beneath sensor
FLDK110x1005/Sxx	0 to 120 mm beneath sensor
FLDK110x1006/Sxx	
Mounting height	
FLDK110x1003/Sxx	40 mm above conveyor
FLDK110x1005/Sxx	100 mm above conveyor
FLDK110x1005/Sxx	
Object speed	2 m/s maximum (5 m/s maximum for thicker edges)
Minimum object spacing	10 mm @ v = 1 m/s and output pulse length 10 ms, or proportional to the speed and output pulse length
Counting rate	600,000 maximum copies/h
Product orientation	Fold facing laser beam
Output pulse length	5, 10, (15, 20) ms selected by DIP switch
Dead time	0 ms with inactive false pulse suppression, otherwise 18% of the average product spacing time
Pulse issue time	
FLDK110x1003/Sxx	at the end of the edge
FLDK110x1005/Sxx	at the beginning of the edge
FLDK110x1006/Sxx	depending on the selected running direction

Sensitivity

FLDK 110x1003/Sxx:
Edges from 0.20 mm thickness and greater are detected
FLDK 110x1005/Sxx and FLDK 110x1006/Sxx
Edges from 0.25 mm thickness and greater are detected

Sensitivity is dependant on distance and speed
Typical sensitivity characteristics see figure below

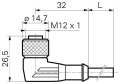


How to read the graphics:
An edge with thickness *k* (*) at distance *d* can be detected when in the graphics *k* is above the curve at the corresponding distance *d*.
(*) Test object: cleanly cut white paper or cardboard

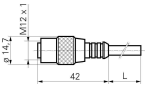
11 Accessories

Cable with plug

Article number		Cable length L
ESW 33AH0200	4-pin	2m PUR/halogen-free
ESW 33AH0500	4-pin	5m PUR/halogen-free
ESW 33AH1000	4-pin	10m PUR/halogen-free



Article number		Cable length L
ESG 34AH0200	4-pin	2m PUR/halogen-free
ESG 34AH0500	4-pin	5m PUR/halogen-free
ESG 34AH1000	4-pin	10m PUR/halogen-free



12 Maintenance

The ***SCATEC-2*** requires no maintenance apart from keeping the front windows clean. Dust or fingerprints can impair the sensor function. It is normally sufficient to wipe the windows dry with a clean (!), soft cloth. Alcohol may be used for heavy soiling.
The cover of the DIP switch must be mounted, otherwise dust might intrude. Dust inside the housing can cause the sensor to malfunction.

13 Troubleshooting

Whenever possible use the application software *ScaDiag* for trouble shooting !
Otherwise first try to resolve the problem using the following tables. If this is unsuccessful, consult Baumer Electric AG (www.baumerelectric.com) for technical support.
The search for fault causes can be substantially shortened if the following issues are clarified before you make contact with a technician from Baumer Electric AG:

1. What is the part number and P-code of the sensor (see white area on the sensor label)?
2. Give exact description of the problem. (Does the SCATEC count more or less copies than actually pass the sensor?)
3. Retain several samples of the products causing the counting error. (Mark the running direction on one sample and the approximate line along which it passes the laser beam.)
4. If possible, take digital images of the installed sensor in operation and of the immediate surroundings.

	Fault	Possible causes	Corrective actions (see manual section x.x)
1	Scatec counts ***less*** copies than actually pass the sensor	a) Wrong sensitivity setting.	Set DIP-swich 4 off. (8; 9.3)
		b) Copies too close to or too far away from the Scatec, so that the copies are in a distance range at which the sensitivity of the sensor is inadequate.	Set the distance of the copies in a range where the sensor is sufficiently sensitive to detect the copies. (10.6)
		c) Overlap spacing sporadically too small.	Increase the overlap spacing or reduce the conveying speed (production rate). (9.1)
		d) Some copies are completely covered by another copy.	Prevent complete coverage of copies.
		e) Conveying speed too high.	Reduce conveying speed. (10.6)
		f) False pulse suppression active while overlap *a* is highly irregular or conveying speed is occasionally accelerated very quickly.	Deactivate false pulse suppression (DIP-switch 3 set off) or make overlap *a* more regular or accelaerate slower (9.2)

	Fault	Possible causes	Corrective actions (see manual section x.x)
2	Scatec counts ***more*** copies than actually pass the sensor	a) Apart from the edges, there are other patches on the copies which cause false pulses.	Prevent critical patches on the copies.
		b) Laser beam on beam blocker causes false pulses.	Adjust beam blocker correctly (yellow edge LED must never light when the laser beam strikes the beam blocker).
		c) Unblocked laser beam is reflected and causes false pulses.	Install beam blocker at proper distance.
		d) Conveyor belt stands still and vibrates while an edge is still in the laser beam.	This problem can be eliminated only by synchronizing the sensor to the conveyor speed. Scatec-10 and –15 can be synchronized.

14 Varying data for customized FLDK 110x10/xxxxxx

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