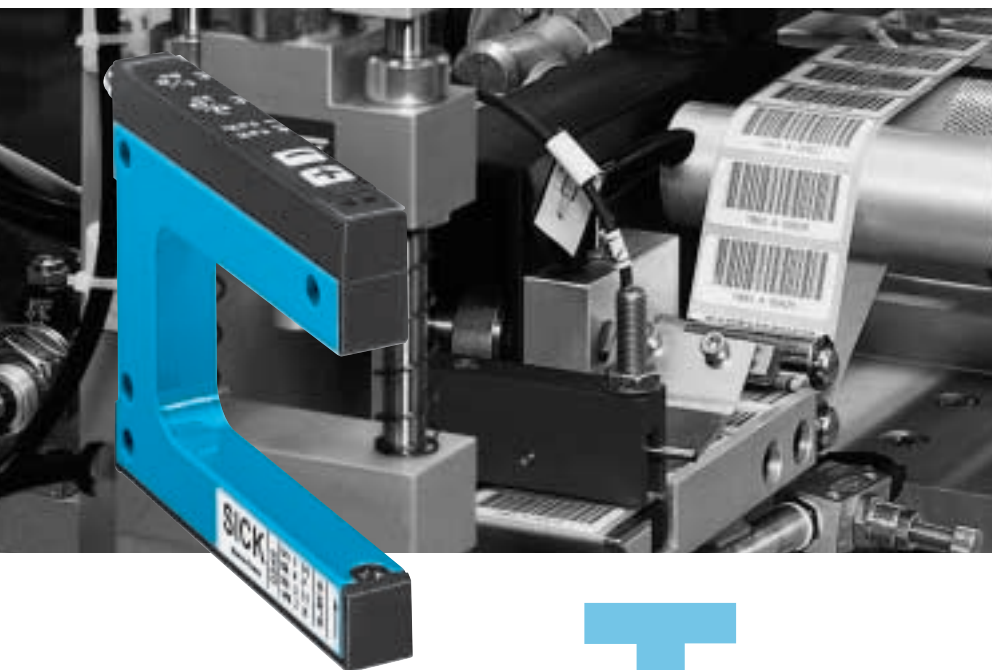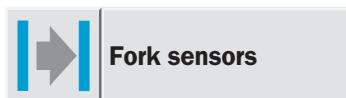# WF next: Fork sensors for a wide range of applications

- slot widths between
  2 and 120 mm,
  slot depths of 40, 60 and
  95 mm,
- manual adjustment via user-friendly keyboard,
- simple and quick adjustment via Teach-in,
- switching output PNP and NPN,
- L/D adjustable via button,
- rugged metal housing with glass optics,
- shortest response time,
- fine resolution.

Fork sensors

The detection of labels, marks and double sheets, as well as holes and edges are typical applications for the new WF fork sensors.
A complete range of sensors with the following features is available for a variety of operating conditions:
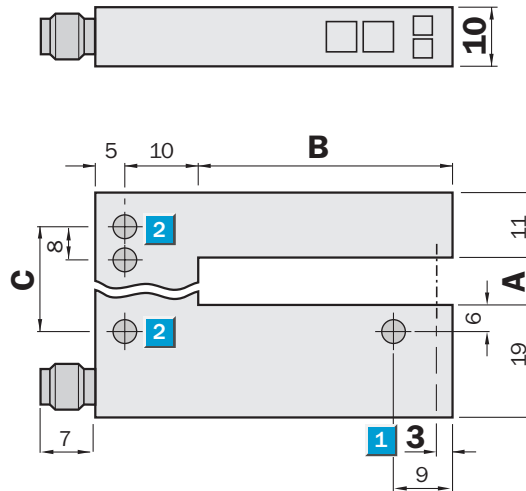
SICK

Fork sensors

**Fork width
2 ... 120 mm**

- Simple and accurate adjustment via "+" and "−" buttons
- PNP and NPN switching output
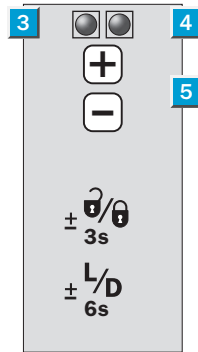- Light/dark switching, adjustable
- Rugged aluminium housing

CE ⬦III⬦

Accessories

Cables and Connectors

Dimensional drawing

All types

Adjustments possible

All types

1	Optical axis
2	Mounting holes, Ø 4.2 mm
3	Function indicator (red)
4	Function indicator (yellow), switching output
5	"+"/"−" buttons and function button

Dimensions

Dimensions (mm)	A Fork width	B Fork depth	C
WF 2	2	42/59/95	14
WF 5	5	42/59/95	14
WF 15	15	42/59/95	27
WF 30	30	42/59/95	42
WF 50	50	42/59/95	40
WF 80	80	42/59/95	70
WF 120	120	42/59/95	110

Connection types

All types

4-pin, M8

brn	1	L+
blk	4	Q_P
blu	3	M
wht	2	Q_N
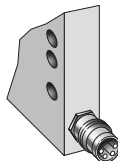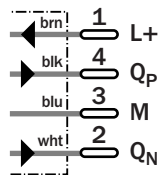
Technical data	WF	2-XX[1) B410	5-XX[1) B410	15-XX[1) B410	30-XX[1) B410	50-XX[1) B410	80-XX[1) B410	120-XX[1) B410			
Fork width	2 mm	▮									
	5 mm		▮								
	15 mm			▮							
	30 mm				▮						
	50 mm					▮					
	80 mm						▮				
	120 mm							▮			
Fork depth	40, 60 or 95 mm	▮	▮	▮	▮	▮	▮	▮			
Light source	LED, infra-red modulated	▮	▮	▮	▮	▮	▮	▮			
Minimum detectable object size	0.2 mm	▮	▮	▮	▮	▮	▮	▮			
Supply voltage U_V	10 ... 30 V DC [2)	▮	▮	▮	▮	▮	▮	▮			
Current consumption [3)	40 mA	▮	▮	▮	▮	▮	▮	▮			
Residual ripple [4)	< 10 %	▮	▮	▮	▮	▮	▮	▮			
Switching output	PNP and NPN	▮	▮	▮	▮	▮	▮	▮			
	Light/dark adjustable via button	▮	▮	▮	▮	▮	▮	▮			
Signal voltage											
PNP	HIGH $= U_V - (< 2$ V$)$/LOW $= 0$ V	▮	▮	▮	▮	▮	▮	▮			
NPN	HIGH $= U_V$/LOW $= < 2$ V	▮	▮	▮	▮	▮	▮	▮			
Output current I_A	100 mA	▮	▮	▮	▮	▮	▮	▮			
Stability of response time [5)	$\pm$ 20 µs	▮	▮	▮	▮	▮	▮	▮			
Response time [5), switching frequency [6)	Max. 100 µs; 10,000/s	▮	▮	▮	▮	▮	▮	▮			
Initialisation time	100 ms	▮	▮	▮	▮	▮	▮	▮			
Ambient light safety											
Incandescent lamp	5,000 Lux	▮	▮	▮	▮	▮	▮	▮			
Sunlight	10,000 Lux	▮	▮	▮	▮	▮	▮	▮			
VDE protection class [7)	III	▮	▮	▮	▮	▮	▮	▮			
Enclosure rating	IP 65	▮	▮	▮	▮	▮	▮	▮			
Circuit protection [8)	A, B, C	▮	▮	▮	▮	▮	▮	▮			
Ambient temperature [9)	Operation −20 °C ... +60 °C	▮	▮	▮	▮	▮	▮	▮			
	Storage −30 °C ... +80 °C	▮	▮	▮	▮	▮	▮	▮			
Housing	Aluminium	▮	▮	▮	▮	▮	▮	▮			
Weight	Approx. 36 g to 160 g [10)	▮	▮	▮	▮	▮	▮	▮			

[1) XX = Fork depth
(E.g. 40 = fork depth equivalent to 40 mm)
[2) Limit values, reverse-polarity protected
[3) Without load

[4) May not exceed or fall short of V_S-tolerances
[5) Signal transit time with resistive load
[6) With light/dark ratio 1:1; no time delay
[7) Reference voltage 50 V DC

[8) A = U_V connections reverse-polarity protected
B = Outputs short-circuit protected
C = Interference pulse suppression
[9) Do not bend below 0 °C

[10) Depending on fork width

Truth table

Switching type	Light-switching (Q)		Dark-switching ($\overline{Q}$)	
Light path free	yes	no	yes	no
PNP/NPN output	HIGH	LOW	LOW	HIGH
Function indicator (yellow)	On	Off	Off	On

Order information

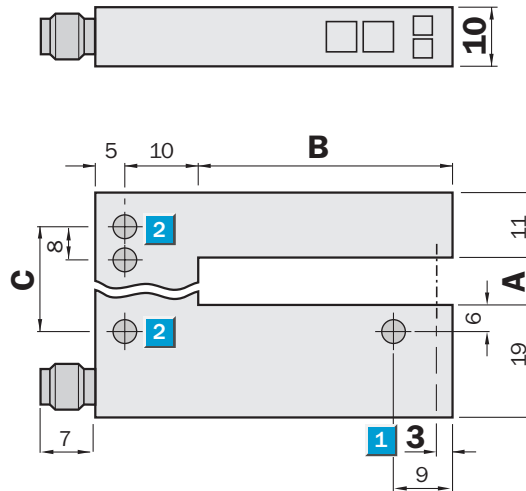| Fork depth 40 mm		Fork depth 60 mm		Fork depth 95 mm	
Type	Part no.	Type	Part no.	Type	Part no.
WF2-40B410	6 028 428	WF2-60B410	6 028 436	WF2-95B410	6 028 443
WF5-40B410	6 028 429	WF5-60B410	6 028 437	WF5-95B410	6 028 444
WF15-40B410	6 028 430	WF15-60B410	6 028 438	WF15-95B410	6 028 445
WF30-40B410	6 028 431	WF30-60B410	6 028 439	WF30-95B410	6 028 446
WF50-40B410	6 028 432	WF50-60B410	6 028 440	WF50-95B410	6 028 447
WF80-40B410	6 028 433	WF80-60B410	6 028 441	WF80-95B410	6 028 448
WF120-40B410	6 028 435	WF120-60B410	6 028 442	WF120-95B410	6 028 449

Fork width
2 ... 120 mm

Fork sensors

- **Simple setting using 2-point Teach-in**
- **PNP and NPN switching output**
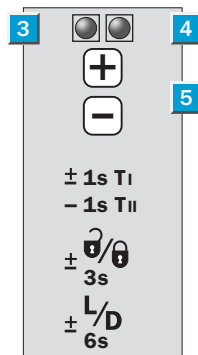- **Light/dark switching adjustable**
- **Rugged aluminium housing**

CE ⬦

Accessories

Cables and Connectors

Dimensional drawing

All types

Adjustments possible

All types

± 1s TI
− 1s TII

± 🔓/🔒
3s

± L/D
6s

1	Optical axis
2	Mounting holes, Ø 4.2 mm
3	Function indicator (red)
4	Function indicator (yellow), switching output
5	"+"/"−" buttons and function button

Dimensions

Dimensions	A	B	C
(mm)	Fork width	Fork depth	
WF 2	2	42/59/95	14
WF 5	5	42/59/95	14
WF 15	15	42/59/95	27
WF 30	30	42/59/95	42
WF 50	50	42/59/95	40
WF 80	80	42/59/95	70
WF 120	120	42/59/95	110

Connection types

All types

4-pin, M8

brn	1	L+
blk	4	Q_P
blu	3	M
wht	2	Q_N

Technical data

Technical data	WF	2-XX[1] B416	5-XX[1] B416	15-XX[1] B416	30-XX[1] B416	50-XX[1] B416	80-XX[1] B416	120-XX[1] B416
Fork width	2 mm	■						
	5 mm		■					
	15 mm			■				
	30 mm				■			
	50 mm					■		
	80 mm						■	
	120 mm							■
Fork depth	40, 60 or 95 mm	■	■	■	■	■	■	■
Light source	LED, infra-red modulated	■	■	■	■	■	■	■
Minimum detectable object size	0.2 mm	■	■	■	■	■	■	■
Supply voltage U_V	10 … 30 V DC [2]	■	■	■	■	■	■	■
Current consumption [3]	40 mA	■	■	■	■	■	■	■
Ripple [4]	< 10 %	■	■	■	■	■	■	■
Switching output	PNP and NPN	■	■	■	■	■	■	■
	Light/dark adjustable via button							
Signal voltage								
PNP	HIGH = U_V – (< 2 V)/LOW = 0 V	■	■	■	■	■	■	■
NPN	HIGH = U_V/LOW = < 2 V	■	■	■	■	■	■	■
Output current I_A	100 mA	■	■	■	■	■	■	■
Stability of response time [5]	± 20 µs	■	■	■	■	■	■	■
Response time [5], switching frequency [6]	Max. 100 µs; 10,000/s	■	■	■	■	■	■	■
Teach-in via button		■	■	■	■	■	■	■
Initialisation time	100 ms	■	■	■	■	■	■	■
Ambient light safety								
Incandescent lamp	5,000 Lux	■	■	■	■	■	■	■
Sunlight	10,000 Lux	■	■	■	■	■	■	■
VDE protection class [7]	III	■	■	■	■	■	■	■
Enclosure rating	IP 65	■	■	■	■	■	■	■
Circuit protection [8]	A, B, C	■	■	■	■	■	■	■
Ambient temperature [9]	Operation −20 °C … +60 °C	■	■	■	■	■	■	■
	Storage −30 °C … +80 °C	■	■	■	■	■	■	■
Housing	Aluminium	■	■	■	■	■	■	■
Weight	Approx. 36 g to 160 g [10]	■	■	■	■	■	■	■

[1] XX = Fork depth (E.g. 40 = fork depth equivalent to 40 mm)
[2] Limit values, reverse-polarity protected
[3] Without load
[4] May not exceed or fall short of V_S-tolerances
[5] Signal transit time with resistive load
[6] With light/dark ratio 1:1; no time delay
[7] Reference voltage 50 V DC
[8] A = U_V connections reverse-polarity protected
B = Outputs short-circuit protected
C = Interference pulse suppression
[9] Do not bend below 0 °C
[10] Depending on fork width

Truth table

Switching type	Light-switching (Q)		Dark-switching ($\bar{Q}$)	
Light path free	yes	no	yes	no
PNP/NPN output	HIGH	LOW	LOW	HIGH
Function indicator (yellow)	On	Off	Off	On

Order information

Fork depth 40 mm		Fork depth 60 mm		Fork depth 95 mm	
Type	**Part no.**	**Type**	**Part no.**	**Type**	**Part no.**
WF2-40B416	6 028 450	WF2-60B416	6 028 457	WF2-95B416	6 028 464
WF5-40B416	6 028 451	WF5-60B416	6 028 458	WF5-95B416	6 028 465
WF15-40B416	6 028 452	WF15-60B416	6 028 459	WF15-95B416	6 028 466
WF30-40B416	6 028 453	WF30-60B416	6 028 460	WF30-95B416	6 028 467
WF50-40B416	6 028 454	WF50-60B416	6 028 461	WF50-95B416	6 028 468
WF80-40B416	6 028 455	WF80-60B416	6 028 462	WF80-95B416	6 028 469
WF120-40B416	6 028 456	WF120-60B416	6 028 463	WF120-95B416	6 028 470

Teach-in: adjusting the switching threshold
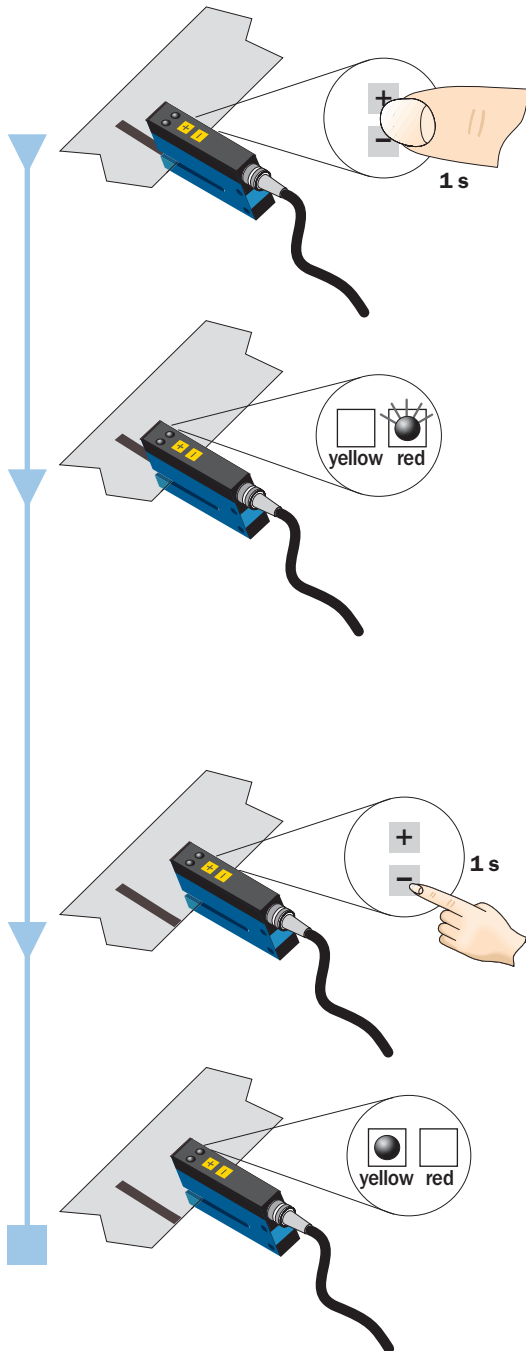
■ The material speed during Teach-in must equal zero (machine stationary).

1st operation

■ Operate both buttons for 1 sec (on mark or object).

■ After the first Teach-in operation, the red function indicator flashes slowly and signals that the second Teach-in operation must now be initiated.

yellow   red

2nd operation

■ Briefly operate the "−" button (on carrier material or without scanned object).

■ After the second Teach-in operation, the red function indicator extinguishes.
■ The Teach-in operation was unsuccessful if the red function indicator flashes.

yellow   red

Notes

■ **+** **−** Following completion of the Teach-in operation, the switching threshold can be further adjusted by the "+" or "−" button at any time. For slower adjustment, press the "+" or "−" button once. For faster adjustment, the finger remains on the "+" or "−" button.

■ ± 3s By simultaneously pressing the "+" and "−" buttons (3 seconds), the unit can be locked against unintentional adjustment

■ ± L/D 6s By simultaneously pressing the "+" and "−" buttons (6 seconds), the switching function (light/dark) can be inrated. Default setting: light switching.

Dimensional drawings and order information

SENSICK screw-in system M8, 4-pin, enclosure rating IP 67

Female connector M8, 4-pin, straight

Type	Part no.
DOS-0804-G	6 009 974

ø 11.6
M8x1
38.4
2 1
4 3
Cable diameter
max. 5.0 mm
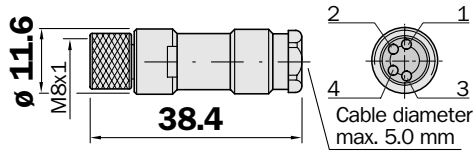
Female connector M8, 4-pin, right angle

Type	Part no.
DOS-0804-W	6 009 975

2 1
4 3
12.5
28.0
Cable diameter
max. 5.0 mm
M8x1
ø 11.6
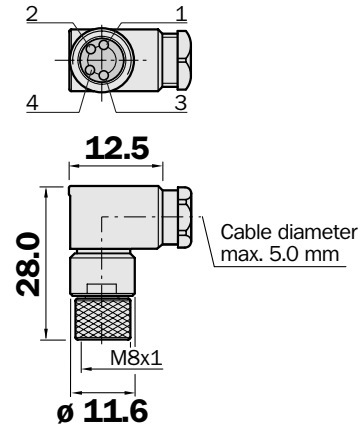
Female connector M8, 4-pin, straight

Cable diameter 5 mm, 4 x 0.25 mm², sheath PVC

Type	Part no.	Cable length
DOL-0804-G02M	6 009 870	2 m
DOL-0804-G05M	6 009 872	5 m
DOL-0804-G10M	6 010 754	10 m

ø 10
M 8x1
R$_{min}$[1]
30.5
2/wht 1/brn
4/blk 3/blu
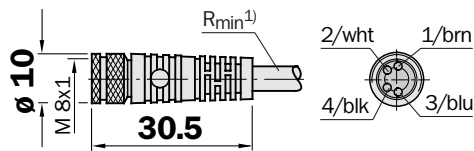
Female connector M8, 4-pin, right angle

Cable diameter 5 mm, 4 x 0.25 mm², sheath PVC

Type	Part no.	Cable length
DOL-0804-W02M	6 009 871	2 m
DOL-0804-W05M	6 009 873	5 m
DOL-0804-W10M	6 010 755	10 m

2/wht 1/brn
4/blk 3/blu
26
6
16.5
R$_{min}$[1]
M 8x1
ø 10
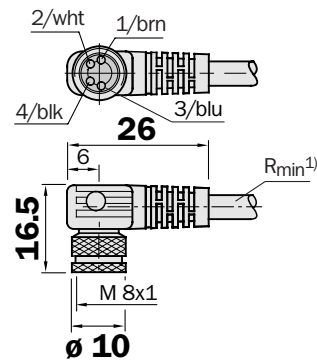
[1] Minimum bend radius in dynamic use
R$_{min}$ = 20 x cable diameter

SICK