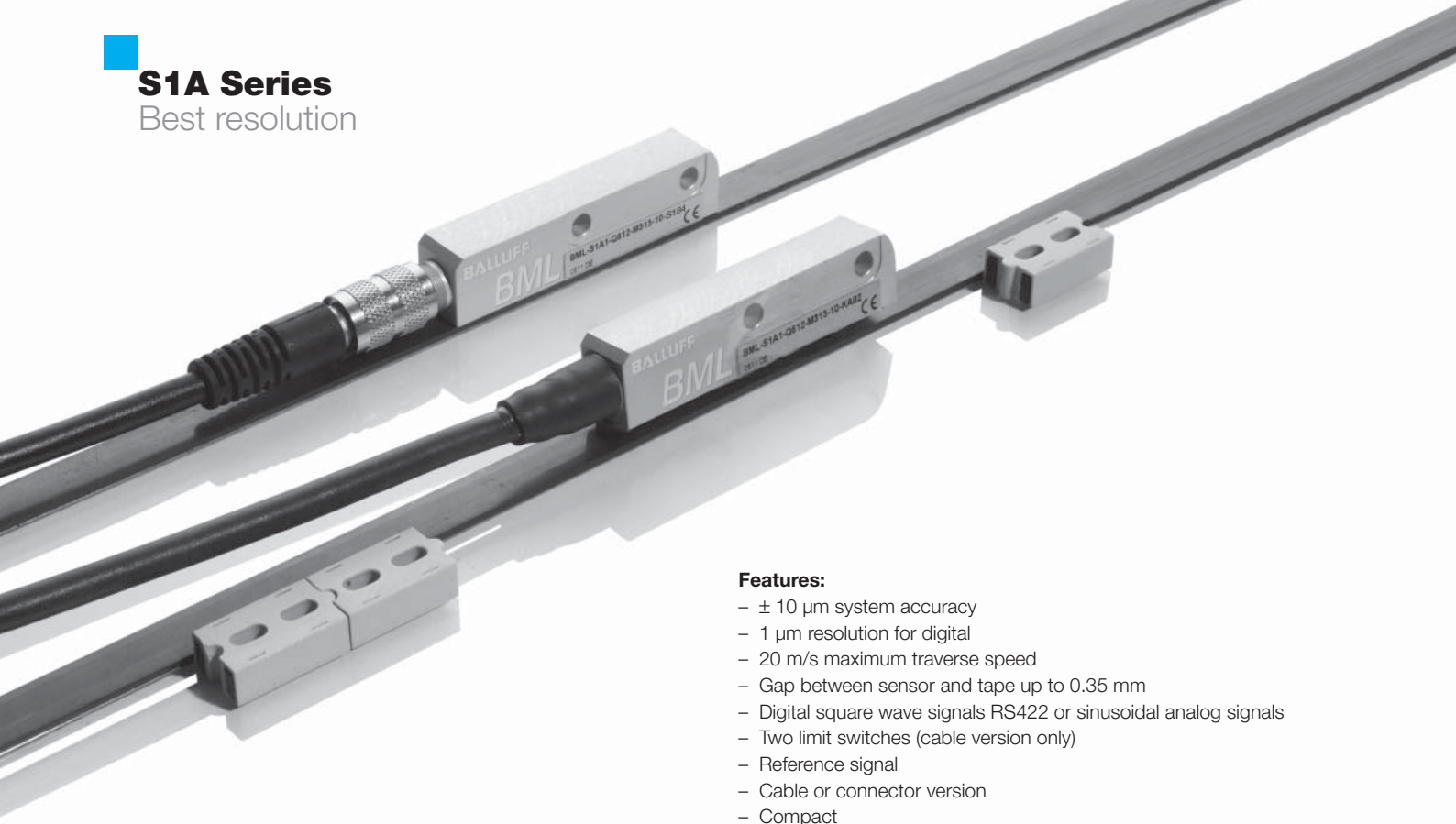


S1A Series

Best resolution



Features:

- $\pm 10 \mu\text{m}$ system accuracy
- $1 \mu\text{m}$ resolution for digital
- 20 m/s maximum traverse speed
- Gap between sensor and tape up to 0.35 mm
- Digital square wave signals RS422 or sinusoidal analog signals
- Two limit switches (cable version only)
- Reference signal
- Cable or connector version
- Compact
- Rugged metal housing
- Easy installation using mounting thread or through-hole
- Insulator for installing the sensor where EMC conditions are extreme

Selecting a suitable BML system: see selection guide on page 44.

Ordering example: sensor head with digital square wave signal RS422

BML-S1A-Q61-M3--_0-

Attachment	Resolution	Reference signal	Limit switch	min. edge separation	Connection type
1 Through-hole Ø 4.3 mm	D 1 μm E 2 μm F 5 μm	0 None 1 Single or fixed-periodic	0 No limit switch 3 Two limit switches*	D 0.12 μs E 0.29 μs F 0.48 μs	S184 Connector KA02 PUR cable 2 m KA05 PUR cable 5 m KA10 PUR cable 10 m KA15 PUR cable 15 m KA20 PUR cable 20 m
2 M3 thread	G 10 μm	2 Pole-periodic		G 1 μs H 2 μs K 4 μs L 8 μs N 16 μs P 24 μs	

*only with cable connection

Other sensor connectors (e.g. SUB-D) are available on request.

Preferred models:

BML-S1A1-A62Z-M310-90-S184 (BML0002):

Analog output sin/cos, with reference signal, plug-in connection

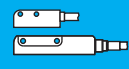
BML-S1A1-Q61D-M320-F0-S184 (BML0005):

Digital signal RS422, with pole-periodic reference signal, plug-in connection, resolution 1 μm , edge separation 0.48 μs , max. traverse speed 1 m/s

For detailed technical description and installation instructions, see user's guide at www.balluff.com

S1A Series

Best resolution

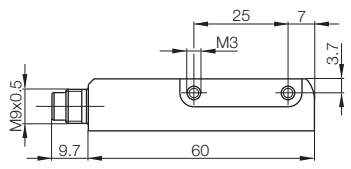


S1A
Best resolution
S1F
 Compact and high-resolution
S1A/S1F
 Magnetic tape
 Tape
 Accessories

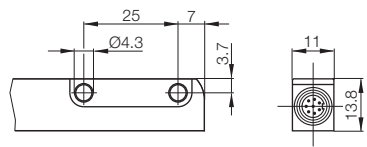
Series	BML-S1A-Q...	BML-S1A-A...
Output signal	Digital square wave signals RS422	Sinusoidal analog signals sin/cos processing-dependent
Resolution	1 μm, 2 μm, 5 μm or 10 μm	processing-dependent
Part number	BML-S1A-Q61-M3 _ _ _ 0- _ _ _	BML-S1A-A62Z-M3 _ _ _ 90- _ _ _
Output voltage (A/B/Z)	RS422 to DIN 66259	1 V _{pp}
Overall system accuracy	±10 μm	±10 μm
Operating voltage	5 V ±5 %	5 V ±5 %
Current draw at 5 V operating voltage	< 50 mA + current draw of the controller (depending on internal resistance)	< 50 mA + current draw of the controller (depending on internal resistance)
Max. read distance sensor/tape	0.35 mm	0.35 mm
Traverse speed max.	20 m/s	20 m/s
Operating temperature, cable style	-20...+80 °C	-20...+80 °C
Operating temperature, connector style	-20...+70 °C	-20...+70 °C
Recommended processing temperature for tape	0...+40 °C	0...+40 °C
Housing material	GD-Zn	GD-Zn
Degree of protection	IP 67	IP 67

All specifications in conjunction with tape
 BML-...-I34... (see page 22).

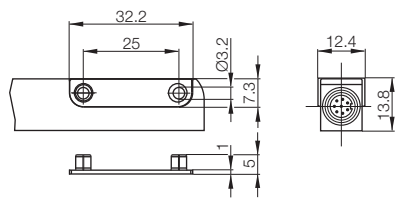
BML-S1A2...-S184 with M3 thread



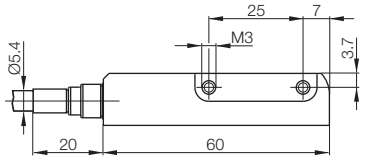
BML-S1A1...-S184 with through-hole Ø 4.3 mm



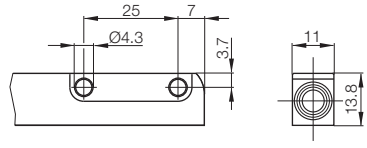
Insulator BML-Z0004 for BML-S1A1...



BML-S1A2...-KA..with M3 thread



BML-S1A1...-KA..with through-hole Ø 4.3 mm



S2B/S2E Series

Best resolution and fast



Features:

- 5 µm resolution
- 20 m/s maximum traverse speed
- Distance between sensor and tape up to 2 mm
- Digital square wave signals RS422 or output voltage 10...30 V
- Two freely positionable limit switches
- Reference signal
- Cable connection
- LED indicator for reference signal

Selecting a suitable BML system: see selection guide on page 44.

Ordering example: sensor head

BML-S2B0-Q -M4 - 0-

Operating voltage	Output voltage	Resolution	Reference signal	Limit switch	min. edge separation	Connection type	
5 10...30 V	1 Digital square wave signal RS422	F 5 µm	0 None	0 No limit switch	D 0.12 µs	KA02 PUR cable 2 m	
6 5 V		G 10 µm			1 Single or fixed-periodic	3 Two limit switches	E 0.29 µs
		H 25 µm	2 Pole-periodic	F 0.48 µs			KA10 PUR cable 10 m
		K 50 µm		G 1 µs			KA15 PUR cable 15 m
3 Same as operating voltage (for 10...30 V only)					H 2 µs	KA20 PUR cable 20 m	
					K 4 µs		
					L 8 µs		
					N 16 µs		
					P 24 µs		

Sensor connectors (e.g. SUB-D or M12 connectors) are available on request.

Preferred models:

BML-S2B0-Q53F-M410-D0-KA05

Digital signal, 10...30 V, with reference signal, 5 m cable, resolution 5 µm, edge separation 0.12 µs, max. traverse speed 20 m/s

BML S2E0-Q53G-M410-P0-KA05 (BML00JC)

Digital signal, 10...30 V, with reference signal, 5 m cable, resolution 10 µm, edge separation 24 µs, max. traverse speed 26 cm/s

BML S2E0-Q61F-M410-G0-KA05 (BML001E)

Digital signal, 5 V, with reference signal, 5 m cable, resolution 5 µm, edge separation 1 µs, max. traverse speed 3.25 m/s

For detailed technical description and installation instructions, see user's guide at www.balluff.com

S2B/S2E Series

Best resolution and fast

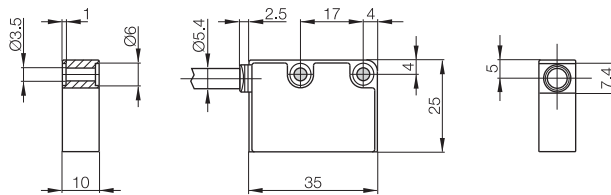


Series	BML-S2B0-...	BML-S2E0-...
Output signal	Digital square wave signals	Digital square wave signals
Resolution	5 µm, 10 µm, 25 µm or 50 µm	5 µm, 10 µm, 25 µm or 50 µm
Part number	BML-S2B0-Q___-M4_- 0-___	BML-S2E0-Q___-M4_- 0-___
Output voltage (A/B/Z)	RS422 to DIN 66259 or same as operating voltage 10...30 V (without A/B/Z)	RS422 to DIN 66259 or same as operating voltage 10...30 V (without A/B/Z)
Overall system accuracy	±50 µm	±100 µm
Operating voltage	10...30 V or 5 V ±5 %	10...30 V or 5 V ±5 %
Current draw at 5 V operating voltage	< 50 mA + current draw of the controller (depending on internal resistance)	< 50 mA + current draw of the controller (depending on internal resistance)
Current draw at 10...30 V operating voltage	< 40 mA + current draw of the controller (depending on internal resistance)	< 40 mA + current draw of the controller (depending on internal resistance)
Max. read distance sensor/tape	2 mm	2 mm
Traverse speed max.	20 m/s	20 m/s
Operating temperature	-20...+80 °C	-20...+80 °C
Recommended processing temperature for tape	0...+40 °C	0...+40 °C
Housing material	PBT	PBT
Degree of protection	IP 67	IP 67



S2B/S2E
Best resolution and fast
S1C
 Simple precision
S2B/S2E/S1C
 Magnetic tape
 Tape

All specifications in conjunction with tape BML-...-I45-... (BML-S2B0...) or BML-...-I46-... (BML-S2E0...) with read distance of 1 mm (see page 32).



S1C Series
Simple precision



Features:

- ±100 µm system accuracy
with distance to tape of 0.1...2 mm
- High repeat accuracy ±1 increment
- 0.1 mm resolution
- 10 m/s maximum traverse speed
- Distance between sensor and tape up to 2 mm
- Digital square wave signals, output voltage 10...30 V (HTL)
- Cable connection
- 10...30 V DC output voltage

Selecting a suitable BML system: see selection guide on page 44.

Ordering example: sensor head

BML-S1C0-Q53 -M400- 0-KA _ _

	Resolution	max. edge separation	Connection type
L	0.1 mm	M 10 µs	KA02 PUR cable 2 m
M	0.2 mm	R 100 µs	KA05 PUR cable 5 m
N	0.5 mm		KA10 PUR cable 10 m
P	1.0 mm		KA15 PUR cable 15 m
R	2.0 mm		KA20 PUR cable 20 m

Sensor connectors (e.g. SUB-D or M12 connectors) are available on request.

Preferred model:

BML S1C0-Q53L-M400-M0-KA05

Digital signal, 10..30 V, 5 m cable, resolution 0.1 mm, edge separation 10 µs, max. traverse speed 8 m/s

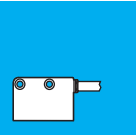
For detailed technical description and installation instructions, see user's guide at www.balluff.com

S1C Series

Simple precision



Series	BML-S1C0-...
Output signal	Digital square wave signals
Resolution	5 µm, 10 µm, 25 µm or 50 µm
Part number	BML-S1C0-Q53_-M400-_0-KA_ _
Output voltage (A/B)	Same as operating voltage 10...30 V
Overall system accuracy	±100 µm
Operating voltage	10...30 V
Current draw at 10...30 V operating voltage	< 40 mA + current draw of the controller (depending on internal resistance)
Max. read distance sensor/tape	2 mm
Traverse speed max.	10 m/s
Operating temperature	-20...+80 °C
Recommended processing temperature for tape	0...+40 °C
Housing material	PBT
Degree of protection	IP 67

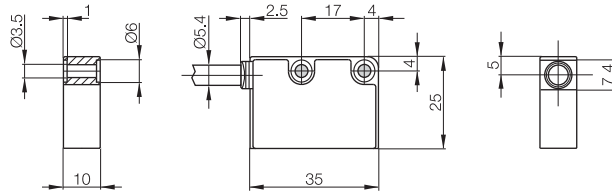


S2B/S2E
Best resolution and fast

S1C
Simple precision

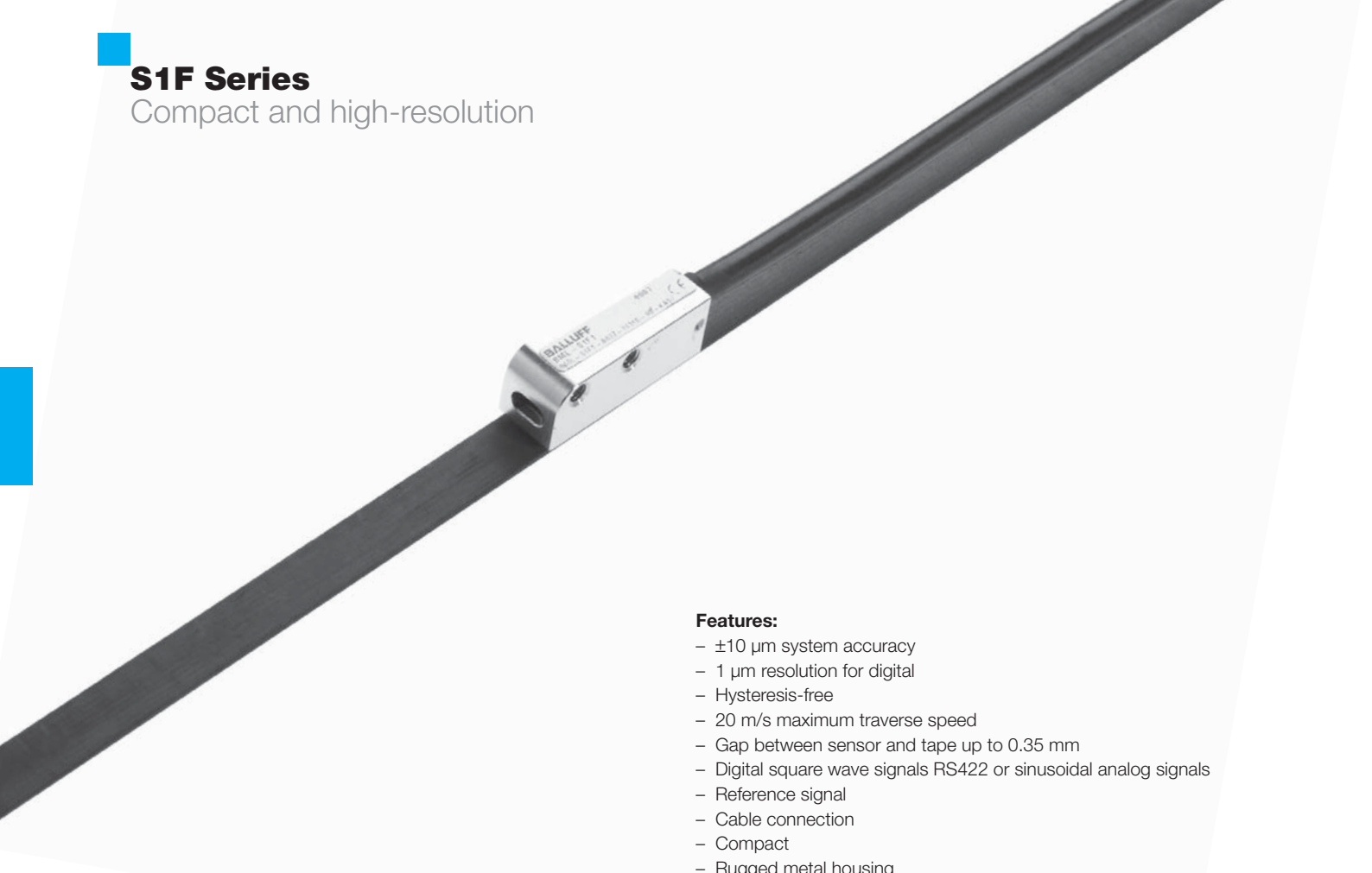
S2B/S2E/S1C
Magnetic tape
Tape

All specifications in conjunction with tape BML-...-I46-... with read distance of 1 mm (see page 32).



S1F Series

Compact and high-resolution



Features:

- $\pm 10 \mu\text{m}$ system accuracy
- $1 \mu\text{m}$ resolution for digital
- Hysteresis-free
- 20 m/s maximum traverse speed
- Gap between sensor and tape up to 0.35 mm
- Digital square wave signals RS422 or sinusoidal analog signals
- Reference signal
- Cable connection
- Compact
- Rugged metal housing
- Easy installation using mounting thread
- Mounted parallel or perpendicular to tape

Selecting a suitable BML system: see selection guide on page 44.

Ordering example: sensor head with digital square wave signal RS422

BML-S1F-Q61-M3-0-0-_-_-_-_-

Approach direction	Resolution	Reference signal	min. edge separation	Connection type	
1 Length-ways	D $1 \mu\text{m}$	0 None	D $0.12 \mu\text{s}$	KA02 PUR cable 2 m	
	E $2 \mu\text{m}$		E $0.29 \mu\text{s}$	KA05 PUR cable 5 m	
2 Cross-ways	F $5 \mu\text{m}$	1 Single or fixed-periodic	F $0.48 \mu\text{s}$	KA10 PUR cable 10 m	
	G $10 \mu\text{m}$		2 Pole-periodic	G $1 \mu\text{s}$	KA15 PUR cable 15 m
				H $2 \mu\text{s}$	KA20 PUR cable 20 m
	K $4 \mu\text{s}$				
	L $8 \mu\text{s}$				
	N $16 \mu\text{s}$				
	P $24 \mu\text{s}$				

Sensor connectors (e.g. SUB-D) are available on request.

Preferred models:

BML-S1F1-A62Z-M310-90-KA02 (BML0019):

Installed parallel to tape, analog output sin/cos, with reference signal, 2 m cable

BML-S1F2-A62Z-M310-90-KA05 (BML0001):

Installed perpendicular to tape, analog output sin/cos, with reference signal, 5 m cable

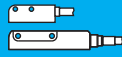
BML-S1F1-Q61D-M310-F0-KA05 (BML001A):

Installed parallel to tape, digital signal RS422, with reference signal, 5 m cable, resolution $1 \mu\text{m}$, edge separation $0.48 \mu\text{s}$, max. traverse speed 1 m/s

For detailed technical description and installation instructions, see user's guide at www.balluff.com

S1F Series

Compact and high-resolution



S1A
Best resolution

S1F
Compact and high-resolution

S1A/S1F
Magnetic tape
Tape
Accessories

Series	BML-S1F_-Q...	BML-S1F_-A...
Output signal	Digital square wave signals RS422	Sinusoidal analog signals sin/cos processing-dependent
Resolution	1 μm , 2 μm , 5 μm or 10 μm	processing-dependent
Part number	BML-S1F_-Q61_-M3_-_-0_-_-	BML-S1F_-A62Z-M3_-_-20_-_-
Output voltage (A/B/Z)	RS422 to DIN 66259	1 V _{pp}
Overall system accuracy	$\pm 10 \mu\text{m}$	$\pm 10 \mu\text{m}$
Operating voltage	5 V $\pm 5 \%$	5 V $\pm 5 \%$
Current draw at 5 V operating voltage	< 50 mA + current draw of the controller (depending on internal resistance)	< 50 mA + current draw of the controller (depending on internal resistance)
Max. read distance sensor/tape	0.35 mm	0.35 mm
Traverse speed max.	20 m/s	20 m/s
Operating temperature	-20...+80 °C	-20...+80 °C
Recommended processing temperature for tape	0...+40 °C	0...+40 °C
Housing material	Al	Al
Degree of protection	IP 67	IP 67

All specifications in conjunction with tape BML-...-I34... (see page 22).

