Draw wire mechanics with redundant sensors | **Draw wire encoder C100** | **Measuring length up to 5 m integrated inclinometer**

Thanks to its robust design and its high IP67 protection level, the draw wire encoder C100 reliably provides accurate length measurement. Its simple and optimal integration in the application is a particular highlight of this product. Many additional options, ranging from the integrated inclinometer up to the relay output, are available.

To increase plant availability, this draw wire encoder allows combining a redundant system in a very compact housing.

RoHS Analog output CANopen

Wide temperature range

High protection level


Shock / vibration resistant


Redundancy

Relay output

Switching outputs

Characteristics

- Measuring length up to 5 m.
- Integrated inclinometer.
- Redundant sensors.
- Different types of sensors (analog, incremental, CANopen, relay output, switch output).
- Linearity up to ±0.1 % of the measuring range.
- High protection level IP67 and wide temperature range from -40°C ... +85°C.

Advantages

- The suitable measuring length for every application.
- Cost, space and installation work saving.
- For even higher plant availability.
- Simple selection and fast installation.
- High accuracy at economic prices.
- Reliability and long service life for outdoor applications.

Order code with analog sensor

D8.C100.XXXX.XXX1.X000
(a) (b) (c) (d)

(a) *Measuring length*
0100 = 1 m
0200 = 2 m
0300 = 3 m
0400 = 4 m
0500 = 5 m

(b) *Sensor type*
A22 = 0 ... 10 V [1]
A44 = 0.5 ... 4.5 V
R22 = 0 ... 10 V, redundant [1]
R44 = 0.5 ... 4.5 V, redundant

(c) *Type of connection*
1 = M12 connector, 5-pin

(d) *Power supply*
1 = 9 ... 30 V DC
2 = 5 V DC [2]

Order code with CANopen and inclinometer

D8.C100.XXXX.RC11.1X00
(a) (b) (c) (d) (e)

(a) *Measuring length*
0100 = 1 m
0200 = 2 m
0300 = 3 m
0400 = 4 m
0500 = 5 m

(b) *Sensor type*
RC1 = CANopen redundant

(c) *Type of connection*
1 = M12 connector, 5-pin

(d) *Power supply*
1 = 9 ... 30 V DC

(e) *Inclinometers*
0 = none
1 = 1 inclinometer
2 = 2 inclinometers

1) Available from 09/2017.
2) Only in conjunction with type of sensor A44 and R44.

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Order code with incremental output

D8.C100.XXXX.XXXX.1000

ⓐ XXXX — ⓑ XXX — ⓒ X — ⓓ 1

ⓐ *Measuring length*
0100 = 1 m
0200 = 2 m
0300 = 3 m
0400 = 4 m
0500 = 5 m

ⓑ *Sensor type*
I11 = incremental AB, 512 ppr
I12 = incremental ABZ, 512 ppr
I21 = incremental AB, 1024 ppr
I22 = incremental ABZ, 1024 ppr

ⓒ *Type of connection*
1 = M12 connector, 5-pin
3 = radial cable, 2 m [6.56']

ⓓ *Output circuit / Power supply*
1 = TTL / 9 ... 30 V DC

Order code with relais output

D8.C100.XXXX.RL11.1000

ⓐ XXXX — ⓑ RL1 — ⓒ 1 — ⓓ 1

ⓐ *Measuring length*
0100 = 1 m
0200 = 2 m
0300 = 3 m
0400 = 4 m
0500 = 5 m

ⓑ *Sensor type*
RL1 = relay output

ⓒ *Type of connection*
1 = M12 connector, 5-pin

ⓓ *Power supply*
1 = 9 ... 30 V DC

Order code with switch output

D8.C100.XXXX.SW34.1000

ⓐ XXXX — ⓑ SW3 — ⓒ 4 — ⓓ 1

ⓐ *Measuring length*
0100 = 1 m
0200 = 2 m
0300 = 3 m
0400 = 4 m
0500 = 5 m

ⓑ *Sensor type*
SW3 = 3 switch outputs

ⓒ *Type of connection*
4 = M12 connector, 12-pin

ⓓ *Power supply*
1 = 9 ... 30 V DC

Accessories relais output		Order no.
Teach adapter (for sensor type RL1)	M12 connector, 5-pin adapter with button	**D8.C100.RL1.TEACH**

Accessories switch output		Order no.
Visualization adapter (for sensor type SW3)	M12 connector, 12-pin	**D8.C100.SW3.VISUAL**

Connection technology for analog sensor		Order no.
Cordset, pre-assembled	M12 female connector with coupling nut, 5-pin 2 m [6.56'] PVC cable	**05.00.6081.2211.002M**
Connector, self-assembly (straight)	M12 female connector with coupling nut, 5-pin	**8.0000.5116.0000**

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Technical data

Mechanical characteristics (draw wire mechanics)

Measuring range		1.0 ... 5.0 m
Measuring wire	material	AISI304 steel wire Nylon coated
	diameter	ø 0.9 mm ø 0.61 mm (ABZ Incremental)
Wire fastening		eyelet
	internal diameter	ø 8 mm
	outer diameter	ø 15 mm
	height	2 mm
Wire pull-out speed max.		max. 1 m/s
Acceleration		max. 10 m/s²
Linearity (whole measuring range)		
	analog	±0.8 %
	incremental (1 - 2 m)	±0.1 %
	incremental (3 - 5 m)	±0.3 %
	CANopen / relay	±0.5 %
Repetition accuracy (whole measuring range)	analog	±0.1 %
	incremental (1, 2 m)	±0.1 %
	incremental (3 - 5 m)	±0.15 %
	CANopen / relay	±0.1 %
Pull-back force		typ. 2 N [1]
Pull-out force		typ. 8 N
Drum circumference		245 mm
Type of connection		M12 connector, 5-pin cable, 2 m [6.56'] (only incremental)
Housing		polycarbonate reinforced with glass fibers
Protection		IP67
Temperature range		-40°C ... +85°C [-40°F ... +185°F]
Weight		approx. 0.5 kg [17.67 oz]
Shock resistance acc. to EN 60068-2-27		300 m/s², 11 ms
Vibration resistance acc. to EN 60068-2-6		100 m/s², 10 ... 500 Hz

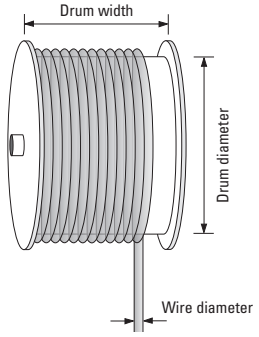
Electrical characteristics

Power supply	9 ... 30 V DC 5 V DC ±10 % [2]
Electromagnetic compatibility	acc. to EN 61326-1, EN 61326-3-1
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Operating principle

Construction
The core of a draw wire device is a drum mounted on bearings, onto which a wire is wound.
Winding takes place via a spring-loaded device.

Note
Exceeding the maximum extension length of the draw wire will lead to damage to the wire and the mechanics.



Analog sensor

Output signal	analog
Resolution	12 bit

Incremental output

Output signal	AB (Z optional)
Resolution	512 / 1024 ppr
Current consumption (non load)	max. 100 mA
Output current	max. 50 mA
Circuit	TTL

CANopen

Output signal	CANopen (DS301)
Resolution	14 bit
Resolution inclinometer	0.1°
Accuracy inclinometer	±0.6°
Temperature drift inclinometer	±0.01 % / °C

Relay output

Output signal	1x relay (Normaly Open)
Maximum current	50 mA
Hysteresis	20 mm (factory setting)

Switch output

Output signal		switch
Maximum current		0.5 A
Mechanical service live		
	without load	min. 1,000,000 switching operations (60 switching operations/ min.)
	under load	min. 30,000 switching operations (30 switching operations/ min.)

1) May be lower at low temperatures.
2) Only in conjunction with type of sensor A44 and R44.

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Terminal assignment

Sensor type	Type of connection	M12 connector, 5-pin					
A22, A44, R22, R44 (analog sensor)	1	Signal:	+V	n.c.	0 V	$U_{out\,1}$	$U_{out\,2}$
		Pin:	1	2	3	4	5

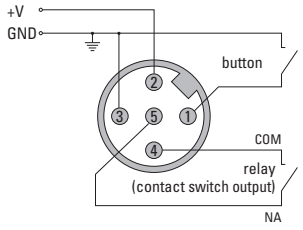
Sensor type	Type of connection	M12 connector, 5-pin					
I11, I12, I21, I22 (incremental output)	1	Signal:	+V	0 V	A	B	0
		Pin:	1	2	3	4	5

Sensor type	Type of connection	Cable (isolate unused wires individually before initial start-up)					
I11, I12, I21, I22 (incremental output)	3	Signal:	+V	0 V	A	B	0
		Core color:	WH	YE	BN	GN	GY

Sensor type	Type of connection	M12 connector, 5-pin					
RC1 (CANopen)	1	Signal:	0 V	+V	CAN-GND	CAN-H	CAN-L
		Pin:	3	2	1	4	5

Sensor type	Type of connection	M12 connector, 5-pin					
RL1 (relay)	1	Signal:	Teach	+V	0 V	C	NO
		Pin:	1	2	3	4	5

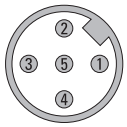
The switching point of the relay can be set by means of a button connected to pin 1 (Teach). To do so, position the draw wire mechanic at the desired switching point and then press the button once.



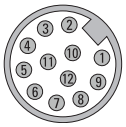
Sensor type	Type of connection	M12 connector, 12-pin											
SW3 (switching output)	4	Signal:	NC 1	NO 1	C 1	NC 2	NO 2	C 2	NC 3	NO 3	C 3	n.c.	n.c.	n.c.
		Pin:	1	2	3	4	5	6	7	8	9	10	11	12

+V : Power supply +V DC
0 V : Power supply GND (0V)
$U_{out\,1}$: Voltage output 1
$U_{out\,2}$: Voltage output 2
A : Incremental output channel A
B : Incremental output channel B
0 : Reference signal
Teach : Teach function input
C : Relay contact C
NO : Relay contact N.O.
C 1 : Switching contact C.1
C 2 : Switching contact C.2
C 3 : Switching contact C.3
NO 1 : Switching contact N.O.1
NO 2 : Switching contact N.O.2
NO 3 : Switching contact N.O.3
NC 1 : Switching contact N.C.1
NC 2 : Switching contact N.C.2
NC 3 : Switching contact N.C.3

Top view of mating side, male contact base



M12 connector, 5-pin



M12 connector, 12-pin

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Technology in detail

Inclinometer with option RC1

Setting possibility 360°

Setting possibility ±180°

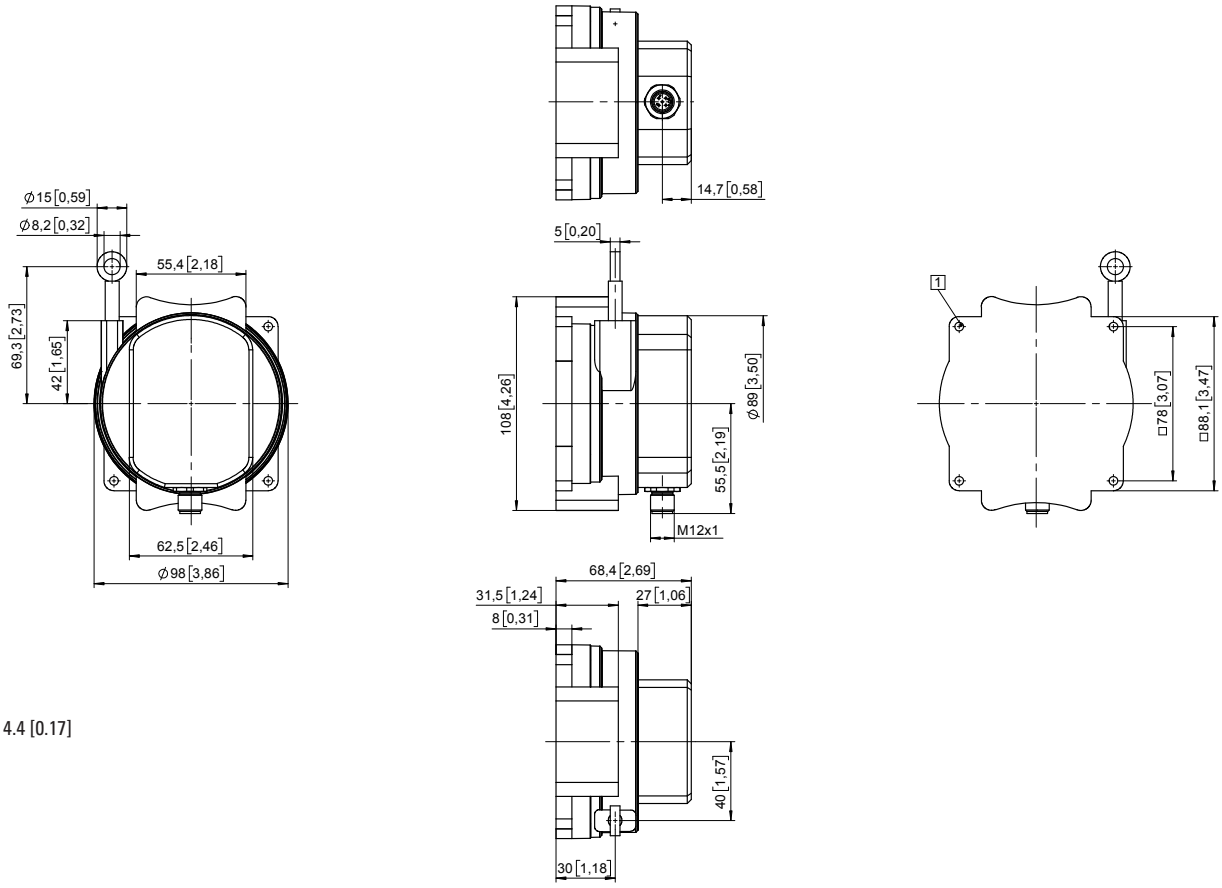
Redundant signals possible.

Setting possibilities:

- Switching between setting possibilities 180° and 360°.
- Switching between synchronous and asynchronous output.
- Change of direction of rotation (cw/ccw).
- Setting and resetting an offset.

Dimensions

Dimensions in mm [inch]



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