

# HMG10-T - EtherCAT

Through hollow shaft

EtherCAT / 13 bit ST / 16 bit MT / Speed switch

## Overview

- Interface EtherCAT
- Magnetic sensing method
- Resolution: singleturn 13 bit, multiturn 16 bit
- Function display via LEDs
- Multiturn sensing with Energy Harvesting technology "MicroGen", without gear or battery
- Two-sided bearing system with hybrid bearings
- Special protection against corrosion CX (C5-M)



Picture similar

**HUBNER**  
BERLIN  
A Baumer Brand

**microGen**  
Energy Harvesting

## Technical data

### Technical data - electrical ratings

Voltage supply	10...30 VDC
Short-circuit proof	Yes
Consumption w/o load	≤200 mA
Initializing time	≤ 500 ms after power on
Interface	EtherCAT
Function	Multiturn
Transmission rate	100 MBaud
Device address	Automatic address designation
Steps per revolution	8192 / 13 bit
Number of revolutions	65536 / 16 bit
Additional outputs	Square-wave TTL/HTL, TTL/RS422
Sensing method	Magnetic
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Programmable parameters	Steps per revolution Number of revolutions Preset, scaling, rotating direction
Diagnostic function	Position or parameter error
Status indicator	DUO-LED and LEDs link/activity in bus connecting box 4 LEDs in device back side
Approval	CE UL approval / E217823 EAC

### Technical data - electrical ratings (speed switch)

Switching accuracy	± 2 % (or 1 Digit)
Switching outputs	1 output (Open collector, solid state relay on request)

### Technical data - electrical ratings (speed switch)

Output switching capacity	30 VDC; ≤100 mA
Switching delay time	≤20 ms
<b>Technical data - mechanical design</b>	
Size (flange)	ø105 mm
Shaft type	ø16...20 mm (through hollow shaft)
Flange	Support plate, 360° freely positionable
Protection EN 60529	IP 66/IP 67
Operating speed	≤6000 rpm
Range of switching speed	ns (off) = ±2...6000 rpm
Operating torque typ.	10 Ncm
Rotor moment of inertia	950 gcm <sup>2</sup>
Admitted shaft load	≤450 N axial ≤650 N radial
Material	Housing: aluminium alloy Shaft: stainless steel
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions CX (C5-M) according to ISO 12944-2
Operating temperature	-40...+85 °C
Relative humidity	95 % non-condensing
Resistance	IEC 60068-2-6 Vibration 30 g, 10-2000 Hz IEC 60068-2-27 Shock 400 g, 1 ms
Weight approx.	2.2 kg (depending on version)
Connection	Bus connecting box Terminal box incremental

## Optional

- Integrated speed switch
- Additional output incremental with zero pulse

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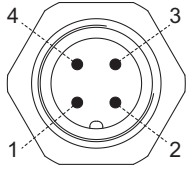
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## Terminal assignment

### View A1 (see dimension)

View into connector bus "voltage supply"

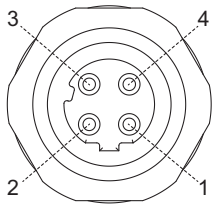


Connector M12 (male)  
4-pin, A-coded

Pin	Connection
1	UB
2	dnu
3	GND
4	dnu

### View A2 and A3 (see dimension)

View into connector bus „data transmission“



Connector M12 (female)  
4-pin, D-coded

Pin	Connection
1	TxD+
2	RxD+
3	TxD-
4	RxD-

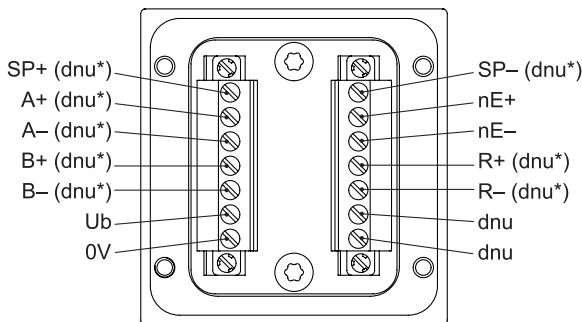
### View B (see dimension)

Connecting terminal terminal box

Speed switch /

additional output II (HTL, TTL)

\* Assignment depends on encoder version



## Terminal significance

### Bus interface

Connection	Description
GND	Ground for UB
UB	Voltage supply 10...30 VDC
TxD+	Transmission data+
TxD-	Transmission data-
RxD+	Receiving data+
RxD-	Receiving data-
dnu	Do not use

Ub	Voltage supply
0V	Ground
A+	Output signal channel 1
A-	Output signal channel 1 inverted
B+	Output signal channel 2 (offset by 90° to channel 1)
B-	Output signal channel 2 inverted
R+	Zero pulse (reference signal)
R-	Zero pulse inverted
nE+	System OK+ / error output
nE-	System OK- / error output inverted
SP+	DSL_OUT1 / speed switch (open collector, solid state relay on request)
SP-	DSL_OUT2 / speed switch (0V, solid state relay on request)
dnu	Do not use

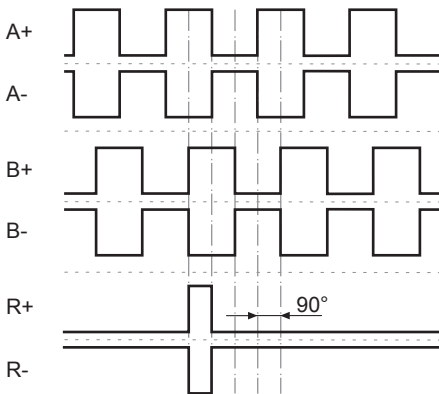
## EtherCAT features

Bus protocol	EtherCAT
Device profile	CoE (CANopen over EtherCAT) DSP406
Features	<ul style="list-style-type: none"> <li>100 MBaud Ethernet</li> <li>Automatic address designation</li> <li>Distributed clock for precise synchronization. Optional device configuration as „Reference Clock“</li> <li>Factory setting 10 byte PDO, configurable 4 byte PDO / 2 byte PDO for shorter cycle times</li> </ul>
Process data	Position value, Warnings, System time
Cycle times	Depending on sensor type, enabled scaling functionality and length of PDO. Minimum cycle time: 62,5 µs
Synchronization	<ul style="list-style-type: none"> <li>0x00 Free Run, not synchronized</li> <li>0x03 Distributed clocks DC, synchronized with SYNCO/SYNC1 Event</li> </ul>

## Output signals

### Additional output II (HTL/TTL)

At positive rotating direction (see dimension)



## Trigger level

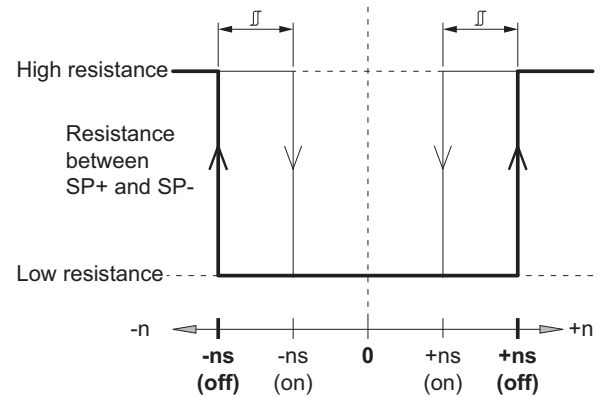
### Incremental HTL/TTL

Electrically isolated:

The output TTL/HTL ( $V_{in} = V_{out}$ ) at the additional output II is electrically isolated and requires a separate power supply.

Trigger level	TTL/RS422
High / Low	$\geq 2.5 \text{ V} / \leq 0.5 \text{ V}$
Transmission length	$\leq 550 \text{ m @ } 100 \text{ kHz}$
Output frequency	$\leq 600 \text{ kHz}$
Trigger level	TTL/HTL ( $V_{in} = V_{out}$ )
High / Low	$\geq 2.5 \text{ V} / \leq 0.5 \text{ V}$ (TTL) $\geq U_b - 3 \text{ V} / \leq 1.5 \text{ V}$ (HTL)
Transmission length	$\leq 550 \text{ m @ } 100 \text{ kHz}$ (TTL) $\leq 350 \text{ m @ } 100 \text{ kHz}$ (HTL)
Output frequency	$\leq 600 \text{ kHz}$ (TTL); $\leq 350 \text{ kHz}$ (HTL)

## Switching characteristics speed switch



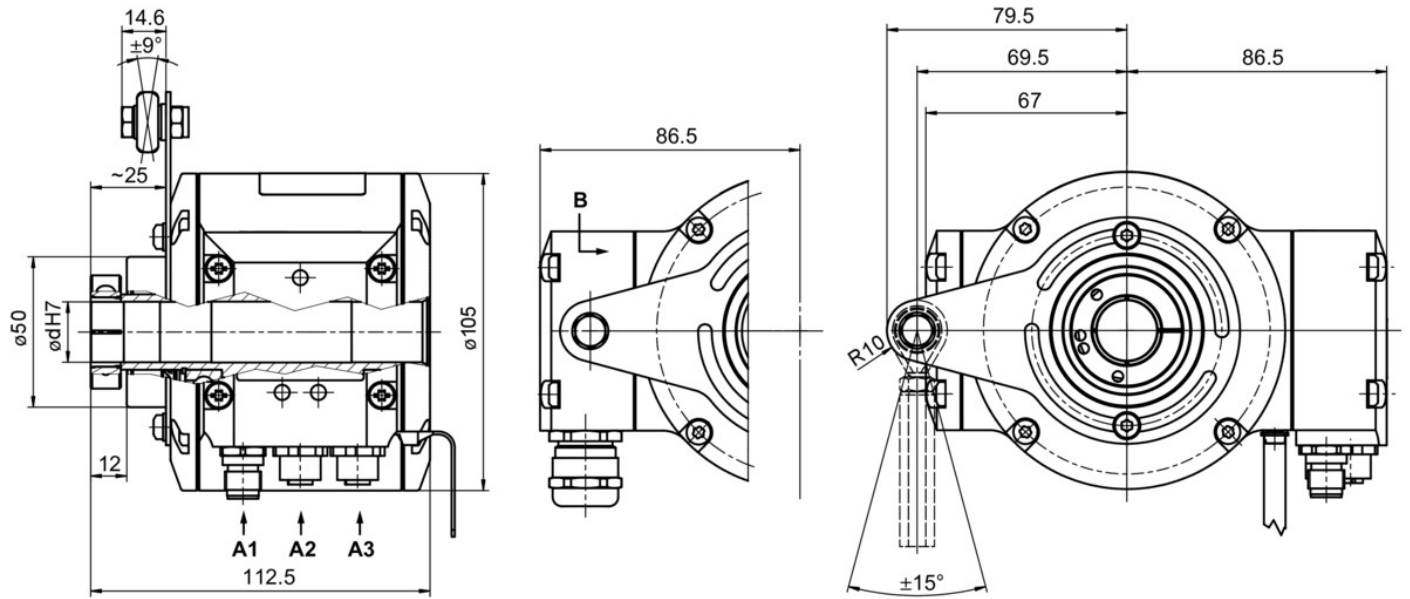
n	Speed
+ns (off)	Switch-off speed at shaft rotation in positive rotating direction (see dimension).
-ns (off)	Switch-off speed at shaft rotation in negative rotating direction (see dimension).
	Switching hysteresis $\Delta$ : 10...100 % (factory setting = 10 % min. 1 Digit)
+ns (on)	Switch-on speed at shaft rotation in positive rotating direction (see dimension).
-ns (on)	Switch-on speed at shaft rotation in negative rotating direction (see dimension).

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## Dimensions



Through hollow shaft with terminal box

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## Ordering reference

	HMG10	#	-	T	H	#	.	#	#	EC	3	.	#	0	0	#	A
<b>Product</b>	HMG10																
Absolute encoder																	
<b>Digital speed switch</b>																	
Without																	
With																	
<b>Shaft type</b>																	
Through hollow shaft																	
<b>Flange (Hollow shaft)</b>																	
Support (Support plate) for torque arm, hybrid bearings																	
<b>Protection class</b>																	
IP 66 and IP 67, optimized for dusty, abrasive environment																	
IP 66 and IP 67, optimized for oily, wet environment																	
<b>Through hollow shaft</b>																	
Ø16 mm, clamping ring, A end																	
Ø20 mm, clamping ring, A end																	
Ø16 mm, keyway																	
<b>Connection</b>																	
Bus connecting box with 3 connectors M12, radial																	
Bus connecting box with 3 connectors M12, radial + terminal box with 1 cable gland M20, radial																	
<b>Supply voltage (field bus)</b>																	
10...30 VDC, EtherCAT																	
<b>Resolution singleturn position</b>																	
13 Bit																	
<b>Resolution multiturn position</b>																	
No multiturn signal																	
16 Bit																	
<b>Resolution speed</b>																	
No speed signal																	
<b>Resolution supplement I</b>																	
No additional output I																	
<b>Resolution supplement II</b>																	
No additional output II																	
512 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated																	
512 ppr TTL (RS422), 6 channels																	
1024 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated																	
1024 ppr TTL (RS422), 6 channels																	
2048 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated																	
2048 ppr TTL (RS422), 6 channels																	
3072 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated																	
3072 ppr TTL (RS422), 6 channels																	
4096 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated																	
4096 ppr TTL (RS422), 6 channels																	
5000 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated																	
5000 ppr TTL (RS422), 6 channels																	
8192 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated																	
8192 ppr TTL (RS422), 6 channels																	
<b>Operating temperature</b>																	
-40...+85 °C																	

(1) Please specify the exact switching speed in addition to the part number (factory setting).

The product features and technical data specified do not express or imply any warranty. Technical modifications subject to change.

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## Ordering reference

It may happen that not all variants of the type code can be combined. Any restrictions can be found in the web configurator at [www.baumer.com](http://www.baumer.com) or on request.

## Accessories

### Mounting accessories

11043628	Torque arm M6, length 67...70 mm
11004078	Torque arm M6, length 120...130 mm ( $\geq 71$ mm)
11002915	Torque arm M6, length 425...460 mm ( $\geq 131$ mm)
11054917	Torque arm M6 insulated, length 67...70 mm
11082677	Torque arm M6 insulated, length 425...460 mm ( $\geq 131$ mm)
11077197	Mounting kit for torque arm size M6 and earthing strap
11238694	CAM12.WS13-11238694