

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 |
| Technical data - mechanical design | |
| 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 ² |
| 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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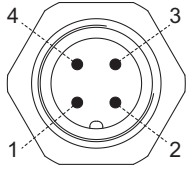
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Terminal assignment

View A1 (see dimension)

View into connector bus "voltage supply"

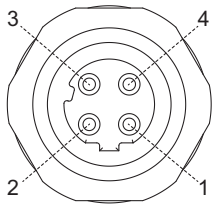


Connector M12 (male)
4-pin, A-coded

| 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- |

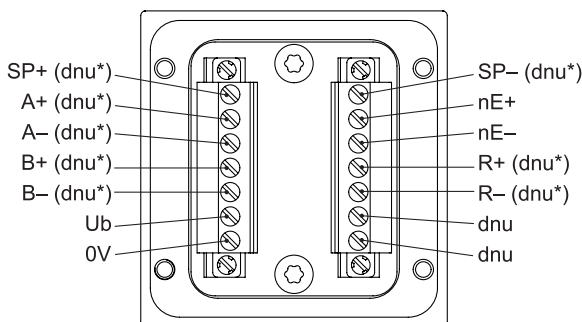
View B (see dimension)

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 |

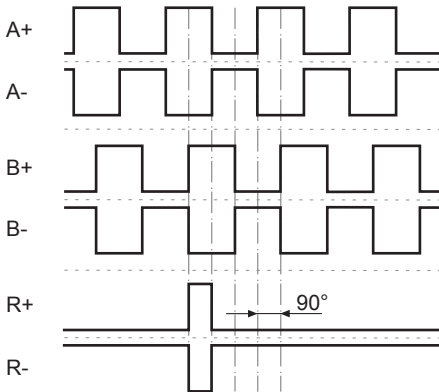
EtherCAT features

| | |
|-----------------|---|
| Bus protocol | EtherCAT |
| Device profile | CoE (CANopen over EtherCAT) DSP406 |
| Features | <ul style="list-style-type: none"> 100 Mbaud Ethernet Automatic address designation Distributed clock for precise synchronization. Optional device configuration as „Reference Clock“ Factory setting 10 byte PDO, configurable 4 byte PDO / 2 byte PDO for shorter cycle times |
| 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"> 0x00 Free Run, not synchronized 0x03 Distributed clocks DC, synchronized with SYNCO/SYNC1 Event |

Output signals

Additional output II (HTL/TTL)

At positive rotating direction (see dimension)



Trigger level

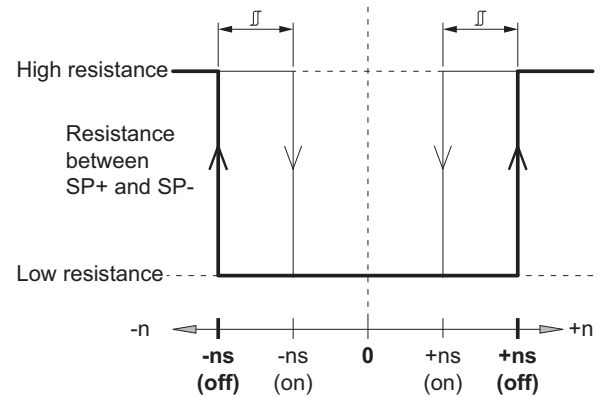
Incremental HTL/TTL

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



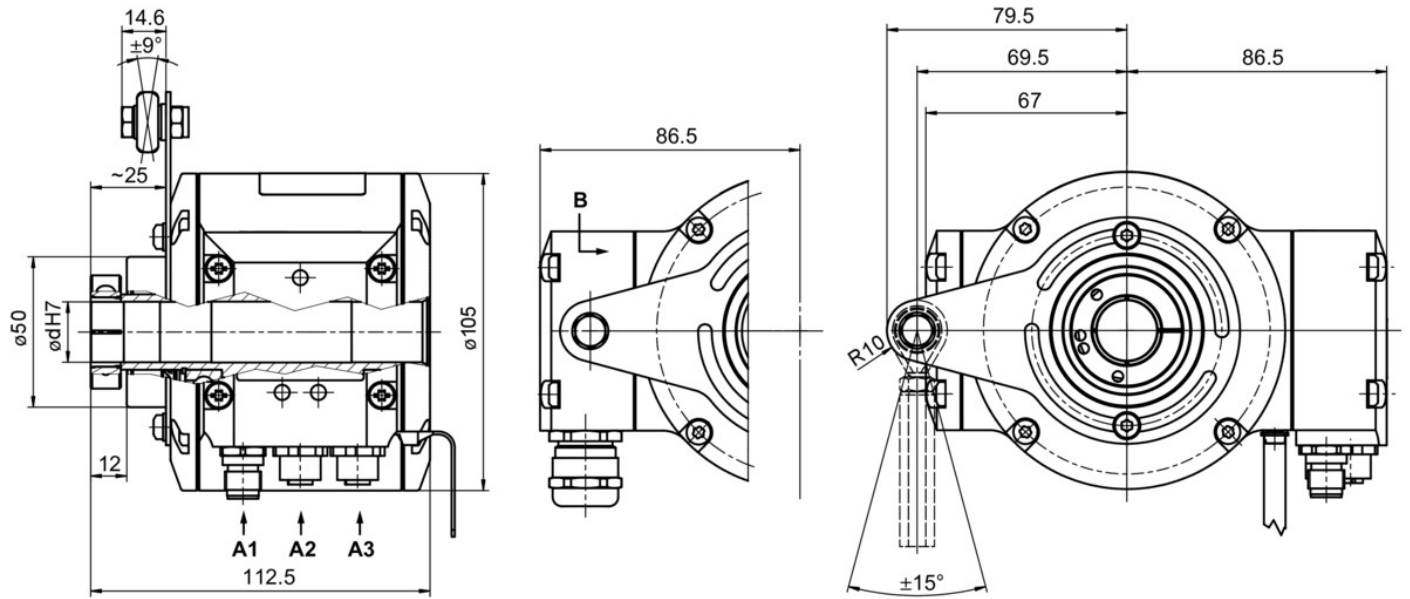
| n | Speed |
|--|--|
| +ns (off) | Switch-off speed at shaft rotation in positive rotating direction (see dimension). |
| -ns (off) | Switch-off speed at shaft rotation in negative rotating direction (see dimension). |
| Switching hysteresis Δ : 10...100 % (factory setting = 10 % min. 1 Digit) | |
| +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 |
|--|-------|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|
| Product | HMG10 | | | | | | | | | | | | | | | | |
| Absolute encoder | HMG10 | | | | | | | | | | | | | | | | |
| Digital speed switch | | | | | | | | | | | | | | | | | |
| Without | | | - | | | | | | | | | | | | | | |
| With | | | D | | | | | | | | | | | | | | |
| Shaft type | | | | | | | | | | | | | | | | | |
| Through hollow shaft | | | | T | | | | | | | | | | | | | |
| Flange (Hollow shaft) | | | | | | | | | | | | | | | | | |
| Support (Support plate) for torque arm, hybrid bearings | | | | | H | | | | | | | | | | | | |
| Protection class | | | | | | | | | | | | | | | | | |
| IP 66 and IP 67, optimized for dusty, abrasive environment | | | | | | D | | | | | | | | | | | |
| IP 66 and IP 67, optimized for oily, wet environment | | | | | | L | | | | | | | | | | | |
| Through hollow shaft | | | | | | | | | | | | | | | | | |
| Ø16 mm, clamping ring, A end | | | | | | | | | | | | | | | | | C |
| Ø20 mm, clamping ring, A end | | | | | | | | | | | | | | | | | F |
| Ø16 mm, keyway | | | | | | | | | | | | | | | | | P |
| Connection | | | | | | | | | | | | | | | | | |
| Bus connecting box with 3 connectors M12, radial | | | | | | | | | | | | | | | | | 3 |
| Bus connecting box with 3 connectors M12, radial + terminal box with 1 cable gland M20, radial | | | | | | | | | | | | | | | | | G |
| Supply voltage (field bus) | | | | | | | | | | | | | | | | | |
| 10...30 VDC, EtherCAT | | | | | | | | | | EC | | | | | | | |
| Resolution singleturn position | | | | | | | | | | | | | | | | | |
| 13 Bit | | | | | | | | | | | | | | | | | 3 |
| Resolution multiturn position | | | | | | | | | | | | | | | | | |
| No multiturn signal | | | | | | | | | | | | | | | | | 0 |
| 16 Bit | | | | | | | | | | | | | | | | | 6 |
| Resolution speed | | | | | | | | | | | | | | | | | |
| No speed signal | | | | | | | | | | | | | | | | | 0 |
| Resolution supplement I | | | | | | | | | | | | | | | | | |
| No additional output I | | | | | | | | | | | | | | | | | 0 |
| Resolution supplement II | | | | | | | | | | | | | | | | | |
| No additional output II | | | | | | | | | | | | | | | | | 0 |
| 512 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | 1 |
| 512 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | 2 |
| 1024 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | 5 |
| 1024 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | 6 |
| 2048 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | 9 |
| 2048 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | 4 |
| 3072 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | 7 |
| 3072 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | 8 |
| 4096 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | K |
| 4096 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | J |
| 5000 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | G |
| 5000 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | H |
| 8192 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | Q |
| 8192 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | P |
| Operating temperature | | | | | | | | | | | | | | | | | |
| -40...+85 °C | | | | | | | | | | | | | | | | | A |

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

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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 or on request.

Accessories

Mounting accessories

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