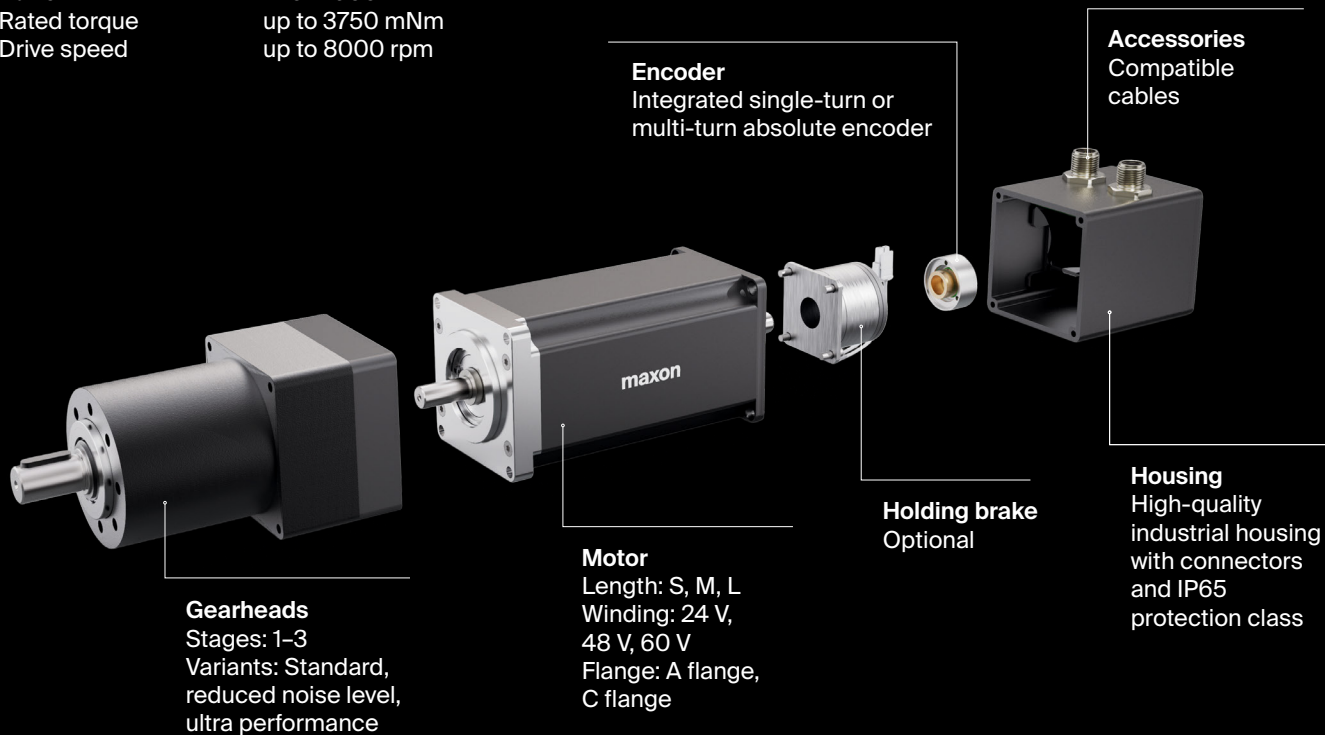


maxon IDX

The compact brushless EC-i motor combined with a high-quality sensor in robust industrial housing is ideally suited to demanding speed and positioning tasks. This motor is also available as a drive with integrated positioning and speed controller.

Key data

Drive □	56 ... 70 mm
Drive length	107 ... 193 mm
Power	270 ... 900 W
Rated torque	up to 3750 mNm
Drive speed	up to 8000 rpm



- High continuous torque
- Outstanding energy efficiency
- Maximum power density
- Unmatched precision in dynamic motion
- IP65-protected design
- Easily configured online



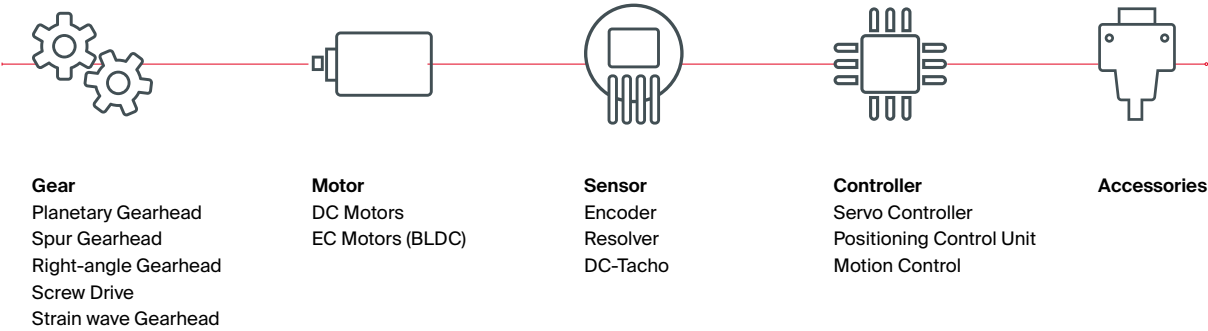
shop.maxongroup.com

Combine

The maxon modular system

The motors, gearheads, sensors, brakes, and controllers of maxon are perfectly matched to each other and can be combined in a number of ways. Our modular system makes it easy to find suitable components for your motor – in the catalog and in the online shop.

shop.maxongroup.com



Great choice, easy ordering

The diversity of motors and product combinations offered by maxon is unmatched worldwide. The maxon modular system and the numerous options for windings offer even more possibilities for variation. To make the delivery times as short as possible for our customers, we organized our products into program groups.



Stock program

The market-oriented selection from our extensive product portfolio offers you short delivery times.



Standard program

In the comprehensive standard program, products are included which can be produced and delivered in a short time. The plenitude of versions in this program offer tried and tested standard products for optimized application.




Special program

A wide range of motors and combinations is available on request.

Explanations of maxon terminology EC motor

Dimensional drawings

Presentation of the views according to the projection method E (ISO).  All dimensions in [mm].

Motor Data

The values in lines 2–15 are valid when using block commutation.

1 Nominal voltage U_N [Volt]

is the applied voltage between two powered phases in block commutation. See page 66 for the timing diagram of the voltage in the three phases. All nominal data (lines 2–9) refer to this voltage. Lower and higher voltages are permissible, provided that limits are not exceeded.

2 No load speed n_0 [rpm] $\pm 10\%$

is the speed at which the unloaded motor runs with the nominal voltage applied. It is approximately proportional to the applied voltage.

3 No load current I_0 [mA] $\pm 50\%$

This is the typical current that the unloaded motor draws when operating at nominal voltage. It increases with rising speed owing to bearing friction and iron losses. No load friction depends heavily on temperature. In extended operation, the motor heats up and the no load friction and no load current decrease.

4 Nominal speed n_N [rpm]

is the speed set for operation at nominal voltage and nominal torque at a motor temperature of 25°C.

5 Nominal torque M_N [mNm]

is the torque generated for operation at nominal voltage and nominal current at a motor temperature of 25°C. It is at the limit of the motor's continuous operation range. Higher torques heat up the winding too much.

6 Nominal current I_N [A]

is the current in the active phase in block commutation that generates the nominal torque at the given nominal speed (= max. permissible continuous load current). The maximum winding temperature is reached at 25°C ambient temperature in continuous operation with I_N . I_N decreases as speed increases due to additional losses in the lamination.

7 Stall torque M_H [mNm]

For ironless windings, this is the calculated load torque that brings the shaft to a standstill at nominal voltage. For windings with an iron core, this is the measured value, as they are subject to the saturation effect.

8 Stall current I_A [A]

is the quotient from nominal voltage and the motor's terminal resistance. Stall current is equivalent to stall torque. With larger motors, I_A cannot often be reached due to the amplifier's current limits.

9 Max. efficiency η_{\max} [%]

is the optimal relationship between input and output power at nominal voltage. It also doesn't always denote the optimal operating point.

10 Terminal resistance phase to phase R [Ω]

is determined by the resistance at 25°C between two connections of the default configuration.

11 Terminal inductance phase to phase L [mH]

is the winding inductance between two connections. It is measured at 1 kHz, sinusoidal.

12 Torque constant k_M [mNm/A]

This may also be referred to as «specific torque» and represents the quotient from generated torque and applicable current.

13 Speed constant k_n [rpm/V]

indicates the theoretical no load speed per volt of applied voltage, disregarding friction losses.

14 Speed/torque gradient

$\Delta n / \Delta M$ [rpm/mNm]

The speed/torque gradient is an indicator of the motor's performance. The smaller the value, the more powerful the motor and consequently the less motor speed varies with load variations. It is based on the quotient of ideal no load speed and ideal stall torque (tolerance $\pm 20\%$).

The real characteristic curve depends on the speed for EC motors with slotted winding (EC flat and EC-I); it is steeper at high speeds and flatter at slow speeds. The real gradient at nominal voltage can be approximated by a straight line between no load speed and the nominal operating point (see page 83).

15 Mechanical time constant τ_m [ms]

is the time required for the rotor to accelerate from standstill to 63% of its no load speed.

16 Rotor moment of inertia J_R [gcm²]

is the mass moment of inertia of the rotor, based on the axis of rotation.

17 Thermal resistance housing-ambient R_{th2} [K/W]

and

18 Thermal resistance winding-housing R_{th1} [K/W]

Characteristic values of thermal contact resistance without additional heat sinking. Lines 17 and 18 combined define the maximum heating at a given power loss (load). Thermal resistance R_{th2} on motors with metal flanges can decrease by up to 80% if the motor is coupled directly to a good heat-conducting (e.g. metallic) mounting rather than a plastic panel.

19 Thermal time constant winding τ_w [s]

and

20 Thermal time constant motor τ_s [s]

These are the typical reaction times for a temperature change of winding and motor. It can be seen that the motor reacts much more sluggishly in thermal terms than the winding. The values are calculated from the product of thermal capacity and given heat resistances.

21 Ambient temperature [°C]

Operating temperature range. This derives from the heat reliability of the materials used and viscosity of bearing lubrication.

22 Max. winding temperature [°C]

Maximum permissible winding temperature.

23 Max. speed n_{\max} [rpm]

is the maximum recommended speed based on thermal and mechanical perspectives. A reduced service life can be expected at high speeds.

24 Axial play [mm]

On motors that are not preloaded, these are the tolerance limits for the bearing play. A preload cancels out the axial play up to the specified axial force. When load is applied in the direction of the preload force (away from the flange), the axial play is always zero. The length tolerance of the shaft includes the maximum axial play.

25 Radial play [mm]

Radial play is the bearing's radial movement. A spring is utilized to preload the motor's bearings, eliminating radial play up to a given axial load.

26/27 Max. axial load [N]

Dynamic: axial loading permissible in operation. If different values apply for traction and thrust, the smaller value is given.

Static: maximum axial force that does not cause permanent damage when applied to the front of the shaft at standstill.

Shaft supported: maximum axial force applying to the shaft at standstill if the force is not input at the other shaft end. This is not possible for motors with only one shaft end.

28 Max. radial load [N]

The value is given for a typical distance from the front flange. As the distance increases, this value decreases.

29 Number of pole pairs

Number of north poles of the permanent magnet. The phase streams and commutation signals pass through per revolution p cycles. Servo-controllers require the correct details of the number of pole pairs.

30 Number of phases

All maxon EC motors have three phases.

31 Weight of motor [g]

32 Typical noise level [dBA]

Is the statistical average of the noise level measured in accordance with the maxon standard (10 cm distance radially to the drive, no-load operation at a certain speed. The drive lies freely on a plastic foam mat in the noise chamber).

The acoustic noise level depends on a number of factors, such as component tolerances, and it is greatly influenced by the overall system in which the drive is installed. When the drive is installed in an unfavorable constellation, the noise level may be significantly higher than the noise level of the drive alone.

The acoustic noise level is measured and determined during product qualification. In manufacturing, a structure-borne noise test is performed with defined limits. Impermissible deviations can thus be identified.

33 Max. torque M_{\max} [mNm]

Maximum torque the motor can briefly deliver. It is limited by the overload protection of the electronics.

34 Max. current I_{\max} [A]

Surge current with which the peak torque is generated at nominal voltage. With an active speed controller, surge current is not proportionate to the torque, but also depends on the supply voltage. As a result, this value only applies at nominal voltage.

35 Type of control

«Speed» means that the drive is fitted with an integral speed controller. «Controlled» means that the drive is fitted with true commutation electronics.

36 Supply voltage $+V_{CC}$ [V]

Range of supply voltages measured in respect of GND at which the drive functions.

37 Speed set value input U_c [V]

Range of analog voltage for set speed value measured in respect of GND. For 2 wire solutions, the supply voltage acts as speed setting at the same time.

38 Scaling Set speed value input k_c [rpm/V]

Set speed value n_c is based on the product $n_c = k_c \cdot U_c$.

39 Speed range

Achievable speeds in the controlled range.

40 Max. acceleration

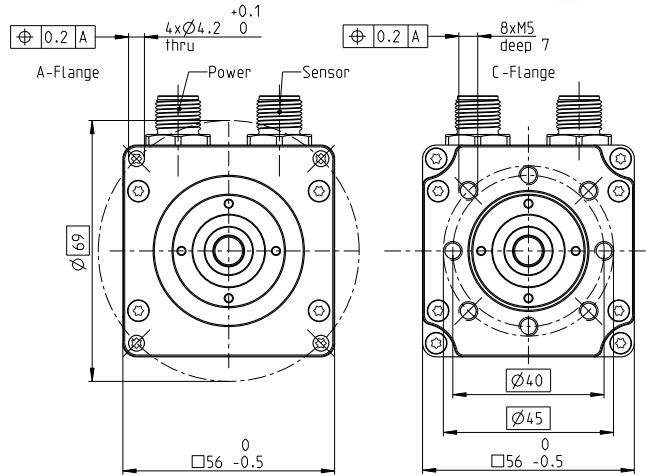
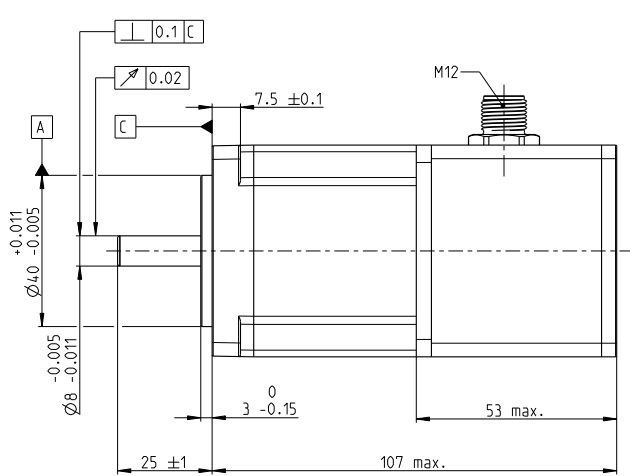
The set speed value follows a sudden set point change with a ramp. This value indicates the increase in the ramp.

IDX 56 S □56 mm, brushless, BLDC motor

IP65 motor with industrial housing

Key Data: 270/305 W, 469 mNm, 8000 rpm

IDX



M 1:2

Motor Data

1. Nominal voltage	V	24	48
2. No load speed	rpm	7010	7010
3. No load current	mA	710	355
4. Nominal speed	rpm	5660	5660
5. Nominal torque	mNm	470	475
6. Nominal current (max. continuous current)	A	12.9	6.49
7. Stall torque	mNm	2960	3020
8. Stall current	A	305	161
9. Max. efficiency	%	90.3	90.6
10. Terminal resistance	Ω	0.0787	0.299
11. Terminal inductance	mH	0.121	0.485
12. Torque constant	mNm/A	32.3	64.6
13. Speed constant	rpm/V	296	148
14. Speed/torque gradient	rpm/mNm	0.72	0.683
15. Mechanical time constant	ms	0.807	0.766
16. Rotor inertia	gcm ²	107	107

Thermal data

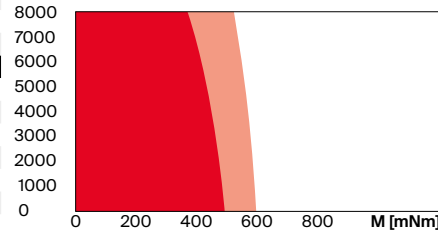
17. Thermal resistance housing-ambient	K/W	2.32
18. Thermal resistance winding-housing	K/W	1.4
19. Thermal time constant winding	s	31.9
20. Thermal time constant motor	s	687
21. Ambient temperature	°C	-40...+100
22. Max. winding temperature	°C	155

Operating Range

n [rpm] winding 48 V

Mechanical data ball bearings

23. Max. speed	rpm	8000
24. Axial play	mm	0...0.14
Preload	N	16
Direction of force		pull
25. Radial play		preloaded
26. Max. axial load (dynamic)	N	12
27. Max. force for press fits (static)	N	150
(static, shaft supported)	N	
28. Max. radial load [mm from flange]	N	110 [12.5]



- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Short term operation

Other specifications

29. Number of pole pairs	8
30. Number of phases	3
31. Weight of motor	g 574
32. Typical noise level [rpm]	dBA 55 [4000]
Protection class without shaft	IP65

Power Connection (M12, male, 5 poles, L-coded)

- Pin 1 Motor winding 1
- Pin 2 Motor winding 2
- Pin 3 Motor winding 3
- Pin 4 U_{brake} + (optional)
- Pin 5 U_{brake} GND (optional)

Sensor Connection (M12, male, 17 poles, A-coded)

Pin assignment available in encoder data sheet.

NTC resistor 25°C: 10 kΩ ±1%, beta (25–100°C): 3460 K

Compatible cables available online in the configurator.

Modular System

Gear	Stages [opt.]
406_GPX 52 A/UP	1–3
407_GPX 52 LN	1–3
456_GSW 62	
458_GB 80	1
459_GB 12	1

Sensor

- 517_ENX 22 EASY INT
- 518_ENX 22 EMT INT

Accessories

- 591_Brake AB 42 S

Details on catalog page 44

Motor Control

- 552_ESCON Module 50/8
- 552_ESCON Module 50/8 HE
- 553_ESCON 70/10
- 557_ESCON2 Micro 60/5
- 558_ESCON2 Module 60/12
- 559_ESCON2 Compact 60/12
- 565_EPOS4 Module 50/15
- 568_EPOS4 Compact 50/15
- 569_EPOS4 70/15

Configuration

Flange front: A-Flange/C-Flange
Encoder Interface: SSI/BiSS-C
Shaft: standard/short

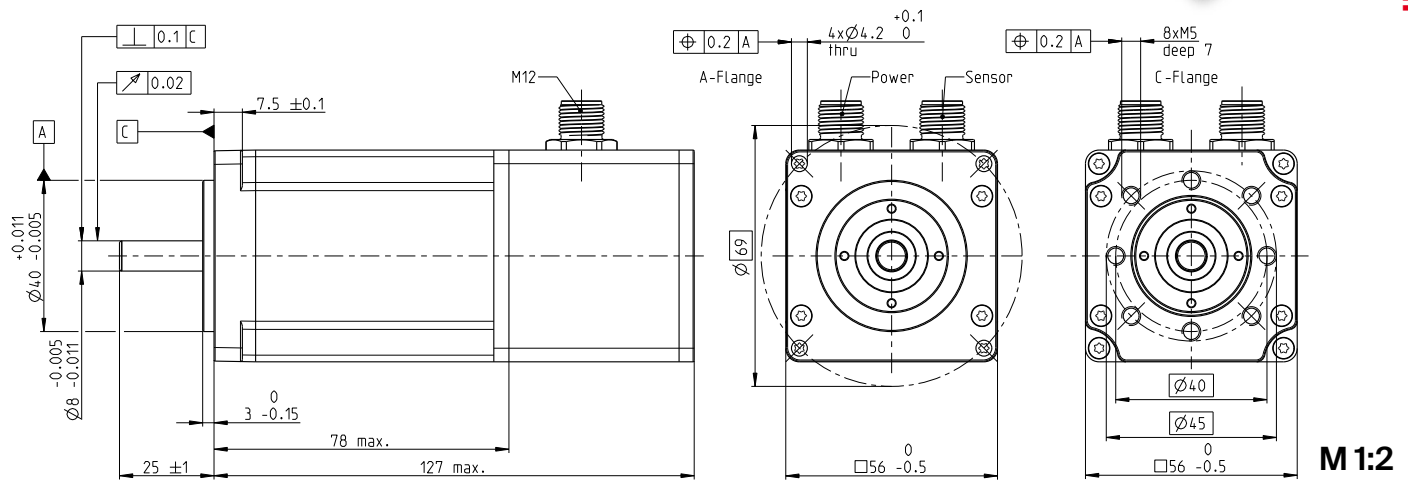
IDX 56 M □56 mm, brushless, BLDC motor

IP65 motor with industrial housing

Key Data: 330/375 W, 640 mNm, 8000 rpm



IDX



Motor Data

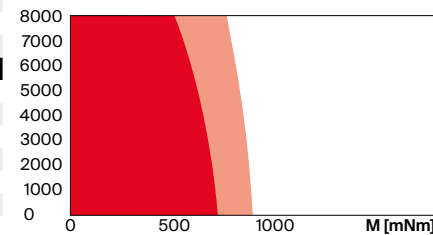
1_	Nominal voltage	V	24	48
2_	No load speed	rpm	5740	7270
3_	No load current	mA	911	653
4_	Nominal speed	rpm	4870	6350
5_	Nominal torque	mNm	645	563
6_	Nominal current (max. continuous current)	A	15.2	8.6
7_	Stall torque	mNm	4280	4800
8_	Stall current	A	406	333
9_	Max. efficiency	%	90.5	91.1
10_	Terminal resistance	Ω	0.0592	0.144
11_	Terminal inductance	mH	0.0939	0.234
12_	Torque constant	mNm/A	39.5	62.4
13_	Speed constant	rpm/V	242	153
14_	Speed/torque gradient	rpm/mNm	0.362	0.354
15_	Mechanical time constant	ms	0.644	0.629
16_	Rotor inertia	gcm ²	170	170

Thermal data

17_	Thermal resistance housing-ambient	K/W	2.69	
18_	Thermal resistance winding-housing	K/W	1.07	
19_	Thermal time constant winding	s	36.8	
20_	Thermal time constant motor	s	1100	
21_	Ambient temperature	°C	-40...+100	
22_	Max. winding temperature	°C	155	

Operating Range

n [rpm] winding 48 V



- Continuous operation
- Continuous operation with reduced thermal resistance R_{m2} 50%
- Short term operation

Mechanical data ball bearings

23_	Max. speed	rpm	8000
24_	Axial play	mm	0...0.14
	Preload	N	16
	Direction of force		pull
25_	Radial play	preloaded	2000
26_	Max. axial load (dynamic)	N	12
27_	Max. force for press fits (static)	N	150
	(static, shaft supported)		
28_	Max. radial load [mm from flange]	N	110 [12.5]

Other specifications

29_	Number of pole pairs	8
30_	Number of phases	3
31_	Weight of motor	g 815
32_	Typical noise level [rpm]	dBA 54 [4000]
	Protection class without shaft	IP65

Power Connection (M12, male, 5 poles, L-coded)

- Pin 1 Motor winding 1
- Pin 2 Motor winding 2
- Pin 3 Motor winding 3
- Pin 4 U_{brake} + (optional)
- Pin 5 U_{brake} GND (optional)

Sensor Connection (M12, male, 17 poles, A-coded)

Pin assignment available in encoder data sheet.

NTC resistor 25°C: 10 kΩ ±1%, beta (25–100°C): 3460 K

Compatible cables available online in the configurator.

Modular System

Gear	Stages [opt.]
406_GPX 52 A/UP	1-3
407_GPX 52 LN	1-3
456_GSW 62	
458_GB 80	1
459_GB 12	1

Sensor
517_ENX 22 EASY INT
518_ENX 22 EMT INT

Accessories
591_Brake AB 42 S

Details on catalog page 44

Motor Control
552_ESCON Module 50/8
552_ESCON Module 50/8 HE
553_ESCON 70/10
558_ESCON2 Module 60/12
559_ESCON2 Compact 60/12
565_EPOS4 Module 50/15
568_EPOS4 Compact 50/15
569_EPOS4 70/15

Configuration

Flange front: A-Flange/C-Flange
Encoder Interface: SSI/BiSS-C
Shaft: standard/short

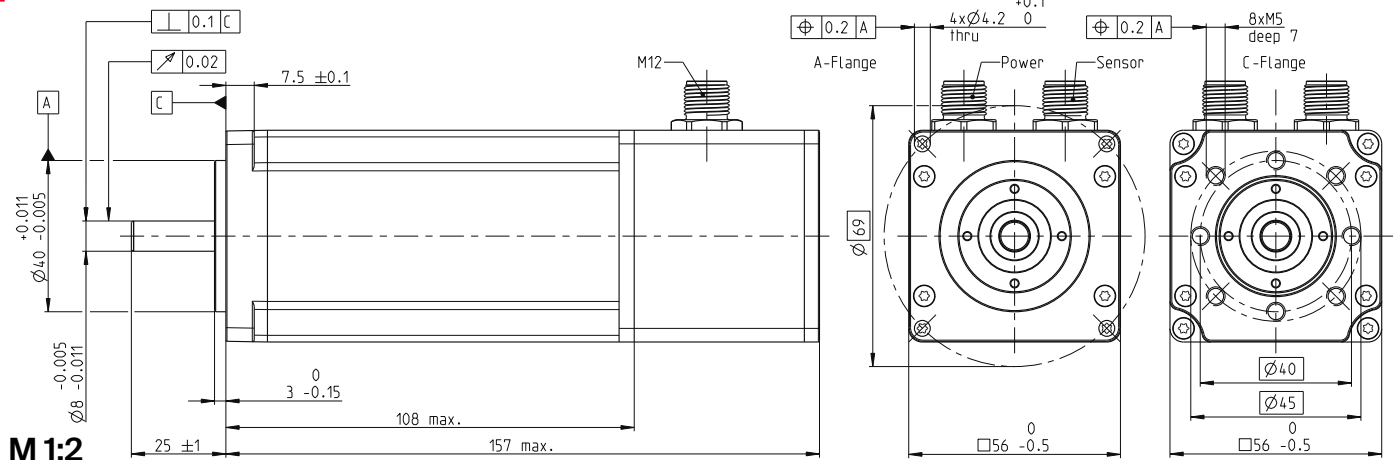
IDX 56 L □56 mm, brushless, BLDC motor

IP65 motor with industrial housing

Key Data: 400/457 W, 1040 mNm, 6000 rpm



IDX



M 1:2

Motor Data

1_	Nominal voltage	V	24	48
2_	No load speed	rpm	3430	5440
3_	No load current	mA	693	673
4_	Nominal speed	rpm	2900	4800
5_	Nominal torque	mNm	1040	897
6_	Nominal current (max. continuous current)	A	14.8	10.3
7_	Stall torque	mNm	7760	8910
8_	Stall current	A	256	329
9_	Max. efficiency	%	87.9	90.4
10_	Terminal resistance	Ω	0.0938	0.146
11_	Terminal inductance	mH	0.138	0.221
12_	Torque constant	mNm/A	66.2	83.6
13_	Speed constant	rpm/V	144	114
14_	Speed/torque gradient	rpm/mNm	0.204	0.199
15_	Mechanical time constant	ms	0.567	0.552
16_	Rotor inertia	gcm ²	265	265

Thermal data

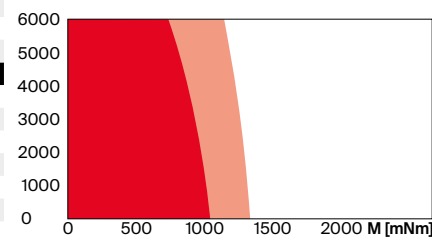
17_	Thermal resistance housing-ambient	K/W	2.2
18_	Thermal resistance winding-housing	K/W	0.68
19_	Thermal time constant winding	s	37.9
20_	Thermal time constant motor	s	1320
21_	Ambient temperature	°C	-40...+100
22_	Max. winding temperature	°C	155

Operating Range

n [rpm] winding 48 V

Mechanical data ball bearings

23_	Max. speed	rpm	6000
24_	Axial play	mm	0...0.14
	Preload	N	16
	Direction of force		pull
25_	Radial play	preloaded	
26_	Max. axial load (dynamic)	N	12
27_	Max. force for press fits (static)	N	150
	(static, shaft supported)	N	
28_	Max. radial load [mm from flange]	N	110 [12.5]



- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Short term operation

Other specifications

29_	Number of pole pairs	8
30_	Number of phases	3
31_	Weight of motor	g 1196
32_	Typical noise level [rpm]	dBA 58 [4000]
	Protection class without shaft	IP65

Power Connection (M12, male, 5 poles, L-coded)

- Pin 1 Motor winding 1
- Pin 2 Motor winding 2
- Pin 3 Motor winding 3
- Pin 4 U_{brake} + (optional)
- Pin 5 U_{brake} GND (optional)

Sensor Connection (M12, male, 17 poles, A-coded)

Pin assignment available in encoder data sheet.

NTC resistor 25°C: 10 kΩ ±1%, beta (25-100°C): 3460 K

Compatible cables available online in the configurator.

Modular System

Gear	Stages [opt.]
406_GPX 52 A/UP	1-3
407_GPX 52 LN	1-3
456_GSW 62	
458_GB 80	1
459_GB 12	1

Sensor
517_ENX 22 EASY INT
518_ENX 22 EMT INT

Accessories
591_Brake AB 42 S

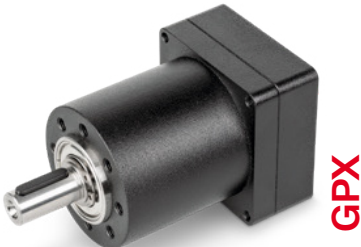
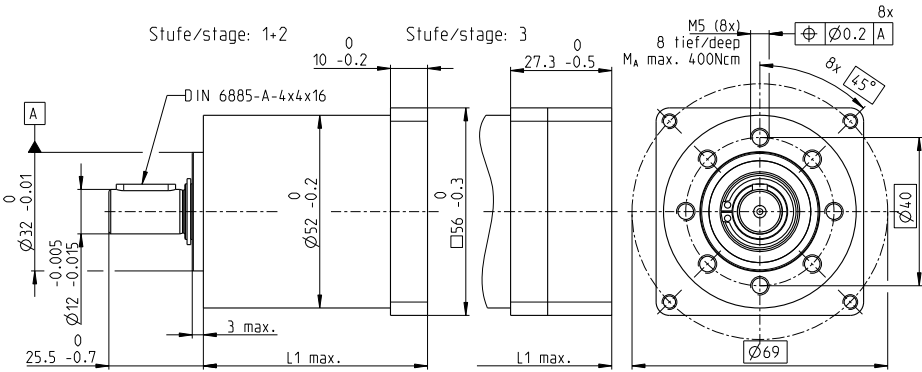
Details on catalog page 44

552_ESCON Module 50/8
552_ESCON Module 50/8 HE
553_ESCON 70/10
558_ESCON2 Module 60/12
559_ESCON2 Compact 60/12
565_EPOS4 Module 50/15
568_EPOS4 Compact 50/15
569_EPOS4 70/15

Configuration

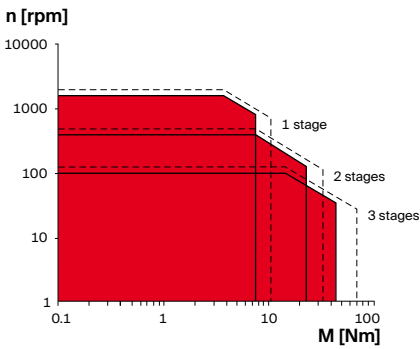
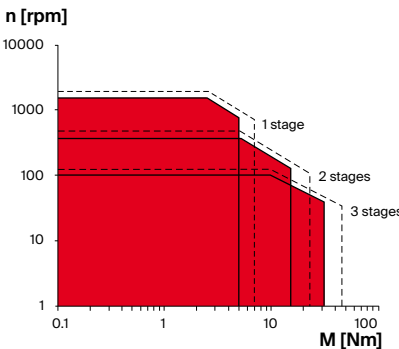
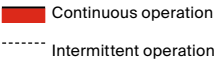
Flange front: A-Flange/C-Flange
Encoder Interface: SSI/BiSS-C
Shaft: standard/short

GPX 52
 Ø52 mm, planetary gearhead



Key data	A Standard version	UP Ultra performance
Max. transmittable power	W 400	600
Max. continuous torque	Nm 30.0	45.0
Max. continuous input speed	rpm 6000	6000
Ambient temperature	°C -40...+100	-40...+100
Bearing at output	Ball bearing	Ball bearing

Operating range (output shaft)	A Standard version	UP Ultra performance
--------------------------------	--------------------	----------------------



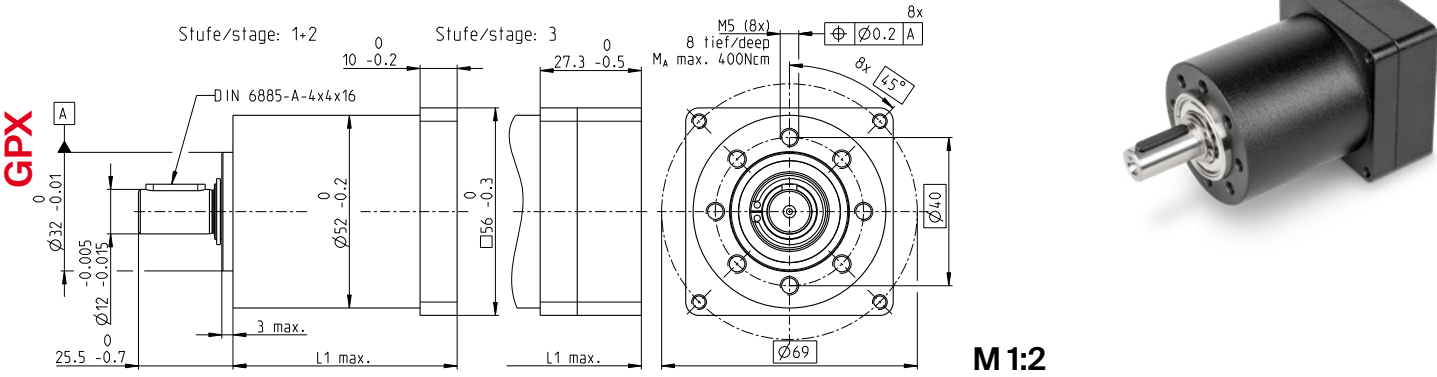
Specifications	A Standard version	UP Ultra performance
Number of stages	1 2 3	1 2 3
Max. transmittable power (continuous)	W 400 200 100	600 300 150
Max. transmittable power (intermittent)	W 500 250 125	750 375 188
Max. continuous torque	Nm 5.0 15.0 30.0	7.5 22.5 45.0
Max. intermittent torque	Nm 7.0 23.0 45.0	10.5 34.5 67.5
Max. continuous input speed	rpm 6000 6000 6000	6000 6000 6000
Max. intermittent input speed	rpm 7500 7500 7500	7500 7500 7500
Max. efficiency	% 95 92 89	95 92 89
Average backlash no load	° 0.5 0.6 0.8	0.3 0.4 0.5
Max. axial load (dynamic)	N 200 200 200	200 200 200
Max. permissible radial load, 10 mm from flange	N 420 630 900	420 630 900
Gearhead length L1 ¹	mm 44 61 78	44 61 78
Weight	g 545 713 930	552 719 926

Configuration	A Standard version				UP Ultra performance							
Number of stages	1		2		3		1		2		3	
Reduction	3.9, 5.3, 6.6		16, 21, 26, 28, 35, 44		62, 83, 103, 111, 138, 172		3.9, 5.3, 6.6		16, 21, 26, 28, 35, 44		62, 83, 103, 111, 138, 172	
Version	Standard/noise reduced/ultra performance											
Flange	Standard flange											
Shaft	Length/diameter/feather key											

Modular system		Page			Page
EC motor	Nº of stages [opt.]		Compact drive	Nº of stages [opt.]	
IDX 56 S	1-3	249	IDX 56 S	1-3	353
IDX 56 M	1-3	250	IDX 56 M	1-3	354
IDX 56 L	1-3	251	IDX 56 L	1-3	355

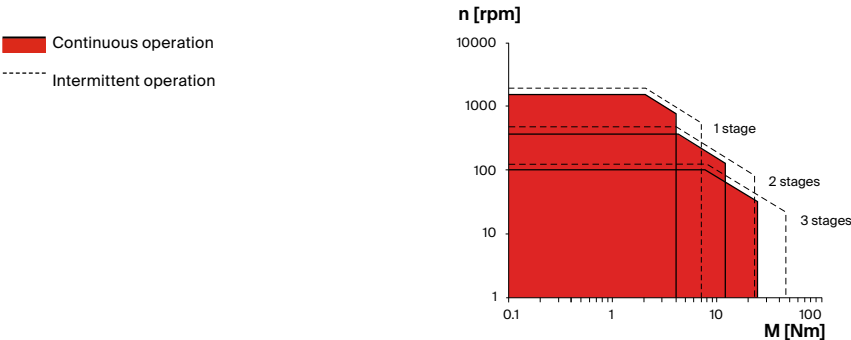
¹This length may vary depending on the configuration and choice of motor. The effective length is calculated at the end of the configuration process.

GPX 52
 Ø52 mm, planetary gearhead



Key data	LN Noise reduced
Max. transmittable power	W 320
Max. continuous torque	Nm 24.0
Max. continuous input speed	rpm 6000
Ambient temperature	°C -20...+85
Bearing at output	Ball bearing
Typical noise level	dBA -5 compared to standard configuration

Operating range (output shaft)	LN Noise reduced
--------------------------------	------------------



Specifications	LN Noise reduced
Number of stages	1 2 3
Max. transmittable power (continuous)	W 320 160 80
Max. transmittable power (intermittent)	W 400 200 100
Max. continuous torque	Nm 4.0 12.0 24.0
Max. intermittent torque	Nm 7.0 23.0 45.0
Max. continuous input speed	rpm 6000 6000 6000
Max. intermittent input speed	rpm 7500 7500 7500
Max. efficiency	% 95 92 89
Average backlash no load	° 0.5 0.6 0.8
Max. axial load (dynamic)	N 200 200 200
Max. permissible radial load, 10 mm from flange	N 420 630 900
Gearhead length L ¹	mm 44 61 78
Weight	g 544 712 995

Configuration	LN Noise reduced
Number of stages	1 2 3
Reduction	3.9, 5.3, 6.6 16, 21, 26, 28, 35, 44 62, 83, 103, 111, 138, 172
Version	Standard/noise reduced/ultra performance
Flange	Standard flange
Shaft	Length/diameter/feather key

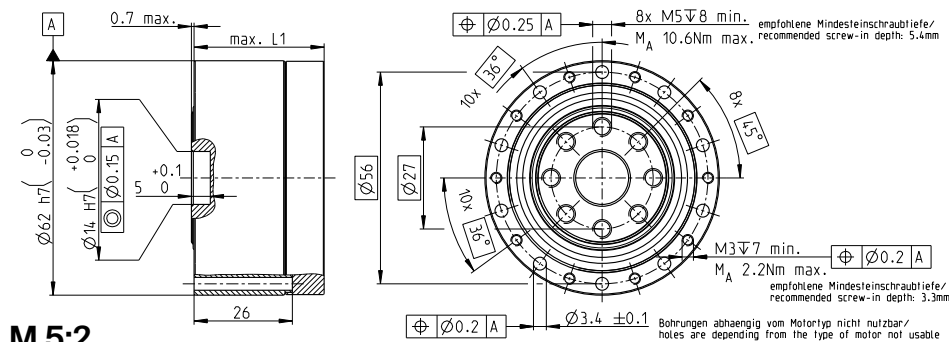
Modular system	Page	Modular system	Page
EC motor	Nº of stages [opt.]	Compact drive	Nº of stages [opt.]
IDX 56 S	1-3	IDX 56 S	1-3
IDX 56 M	1-3	IDX 56 M	1-3
IDX 56 L	1-3	IDX 56 L	1-3

¹This length may vary depending on the configuration and choice of motor. The effective length is calculated at the end of the configuration process.

GSW 62 A Ø62 mm, strain wave gearhead

Zero backlash

NEW



strain wave gear

M 5:2

- ☒ Stock program
- ☐ Standard program
- ☐ Special program (on request)

Part numbers

867137 867132 867073

Gearhead data

1	Reduction		50:1	80:1	100:1
2	Max. continuous torque	Nm	18.0	19.0	27.0
3	Max. intermittent torque	Nm	23.0	29.0	37.0
4	Max. overload torque	Nm	48.0	61.0	71.0
5	Max. continuous input speed	rpm	3500	3500	3500
	Max. intermittent input speed	rpm	7300	7300	7300
6	Max. efficiency	%	72	72	75
7	Weight	g	460	460	460
8	Mass moment of inertia	gcm ²	8.77	8.49	8.40
9	Gearhead length L1	mm	32.4	32.4	32.4
10	Mech. positioning accuracy	arcmin	1.50	1.80	1.56
11	Mech. repeatability	arcmin	k.a.	0.036	0.047
12	Hysteresis loss	arcmin	2.00	1.00	1.00
13	Torsional rigidity C1	10 ⁴ Nm/rad	0.67	0.56	0.63
	Torsional rigidity C2	10 ⁴ Nm/rad	0.88	0.56	0.66
	Torsional rigidity C3	10 ⁴ Nm/rad	1.20	0.67	0.56
14	Torque M1	Nm	3.90	3.00	3.00
	Torque M2	Nm	12.00	7.00	7.00
15	Starting torque, no load	mNm	34.0	22.0	19.0
16	Backdriving torque, no load	Nm	2.50	2.00	2.30
17	Ratcheting torque	Nm	105	140	110
18	Buckling torque	Nm	330	330	330

Technical data

19	Bearing at output	cross roller bearings
20	Tilting rigidity	17 Nm/arcmin
21	Max. tilting torque	42.0 Nm
22	Max. radial load	2030 N
23	Max. axial load	4075 N
24	Dynamic load rating	2060 N
25	Static load rating	2640 N
26	Distance rolling bearing center to output	10 mm
27	Pitch diameter	42.7 mm
28	Ambient temperature	-40...+100 °C

Modular system

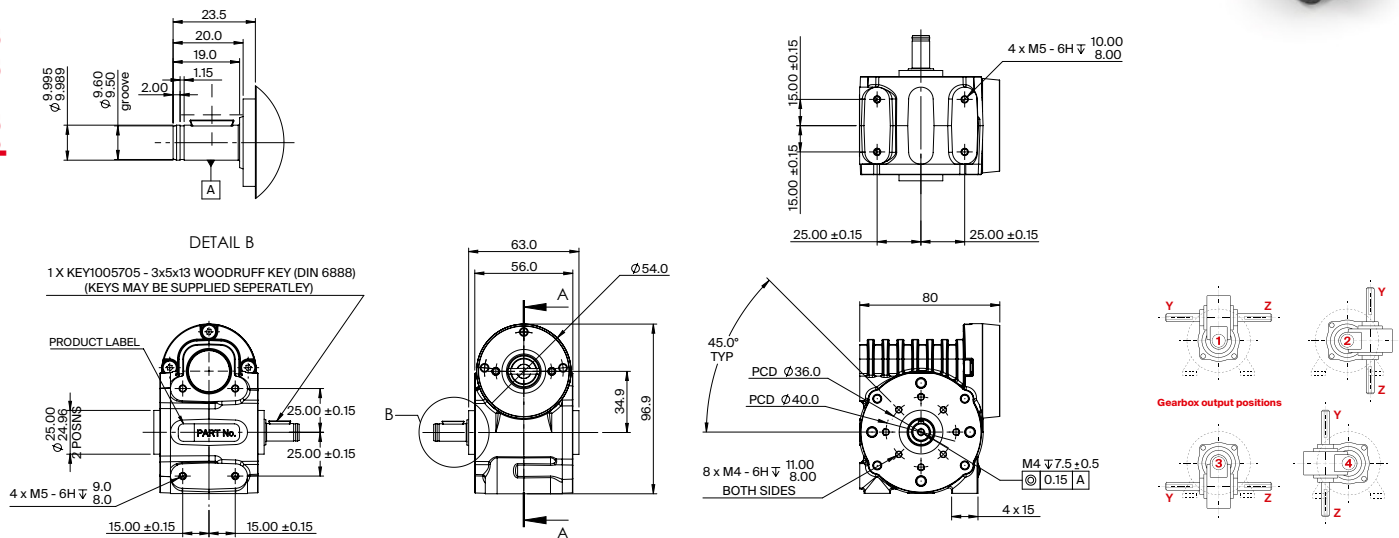
EC motor
249-251_IDX 56
312-313_EC-i 52
321-323_EC 60 flat
Compact drive
353-355_IDX 56

Additional information

Explanation of the line numbers and additional information on page 454.

GB 80 Worm Gear
Composite Version

parvalux gear



Key data	Composite version
Max. continuous torque	Nm 8
Ambient temperature	°C -30...+130
Max. continuous input speed	rpm 4000
Gearhead length ¹	mm 80
Bearing at output	Ball bearing
Weight	kg 0.7

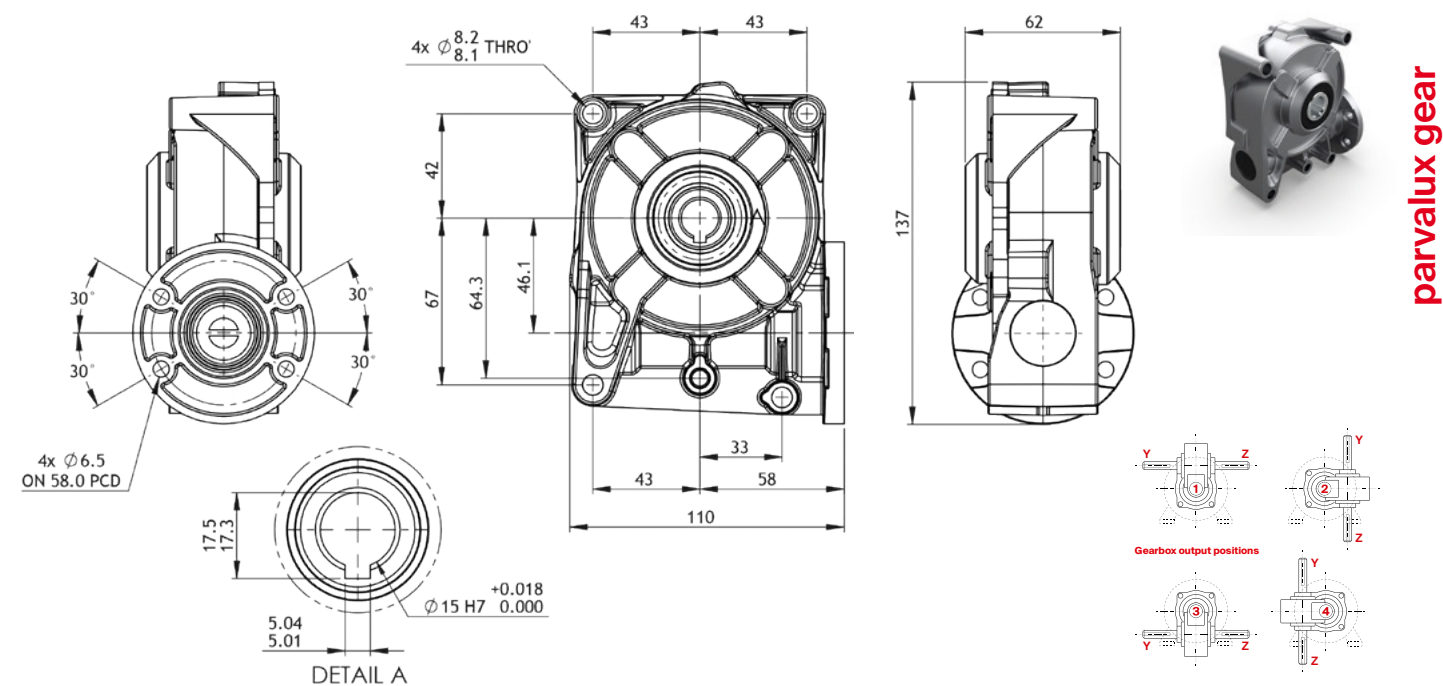
Specifications	Composite version
Part numbers (special program on request)	812954 848376 848379
Reduction	X:1 15.5 30 60
Number of stages	1 1 1
Max. continuous torque	Nm 8 8 6
Max. intermittent torque	Nm 13 13 10
Max. continuous input speed	rpm 4000 4000 4000
Max. intermittent input speed	rpm 5000 5000 5000
Max. efficiency	% 77 70 54
Average backlash no load	arcmin 10-25 10-25 10-25
Max. axial load (dynamic)	N 150 150 150
Max. permissible radial load, 12 mm from flange	N 500 500 500

Configuration	Composite version
Gearhead position to motor	4 positions, all at 90°

Modular system	Notes
EC motor	Page
IDX 56	249-251
EC-i 52	312-313
EC 60 flat	321-323
EC 90 flat	324-329

Compact drive	
IDX 56	353-355

GB 12 Worm Gear
Bronze Version



Key data		Bronze version	
Max. continuous torque		Nm	30
Ambient temperature		°C	-30...+130
Max. continuous input speed		rpm	4000
Gearhead length¹		mm	110
Bearing at output			Ball bearing
Weight		kg	1.5

Specifications		Bronze version			
Part numbers (special program on request)		735900	735901	735902	
Reduction	X:1	15	30	60	
Number of stages		1	1	1	
Max. continuous torque	Nm	30	30	30	
Max. intermittent torque	Nm	48	48	48	
Max. continuous input speed	rpm	4000	4000	4000	
Max. intermittent input speed	rpm	5000	5000	5000	
Max. efficiency	%	75	65	50	
Average backlash no load	arcmin	10-25	10-25	10-25	
Max. axial load (dynamic)	N	600	600	600	
Max. permissible radial load, 12 mm from flange	N	800	800	800	

Configuration		Bronze version	
Gearhead position to motor		4 positions, all at 90°	

Modular system			Notes
EC motor	Page		¹Length given excludes intermediate plate for motor combination Standard shaft Ø25, length 50 mm with 8 mm keyway 735903
IDX 56	249-251		
IDX 70 S, M	252-253		
EC-i 52	312-313		
EC 90 flat	324-329		
Compact drive			
IDX 56	353-355		
IDX 70 S, M	356-357		

ENX 22 EASY INT Encoder Ø22 mm,
1024 CPT / 4096 steps, Single Turn

Integrated into motor

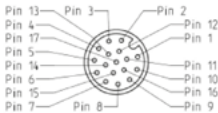


Key data		EASY incremental and absolute	
Number of channels		3	
Counts per turn		1024	
Steps per turn		4096	
Resolution (bit single turn)		12	
Encoder length L	mm	0 (integrated into motor)	
Ambient temperature	°C	-40...+125	

Selection criteria	EASY incremental and absolute	
Speed and rotation direction detection	■	
Speed and position control	■	
Compact and robust design	■	
High resolution	■	
Cost effective	■	

■ suitable ▲ suitable to a limited extent ● not suitable

Specifications	EASY incremental and absolute	
Supply voltage V _{cc}	V	5 ±0.5
Typical current draw	mA	22
Max. operating frequency	kHz	4000
Max. Speed	rpm	200 000
Connector ¹ M12, male, A-coded	Pin	1 GND (ground)
	Pin	2 Motor NTC
	Pin	3 +V _{cc}
	Pin	4 channel A
	Pin	5 channel Ī
	Pin	6 channel Ā
	Pin	7 channel B̄
	Pin	8 channel I
	Pin	9 Motor NTC
	Pin	10 channel B
	Pin	11 Data_out-
	Pin	12 Data_out
	Pin	13 CLK_in
	Pin	14 CLK_in-
	Pin	15 Hall 3
	Pin	16 Hall 1
	Pin	17 Hall 2



Output signal: EIA-Standard RS 422
Output current per channel: ± 20 mA

Configuration	EASY incremental and absolute	
Signalprotokoll	BISS-C, SSI	

Modular system	Page	Notes
EC motor		¹ Connecting cables available in Online Configurator
IDX 56	249–251	
IDX 70	252–254	

ENX 22 EMT Encoder Ø22 mm, 65 536 turns, Multi Turn 131 072 steps, Single Turn

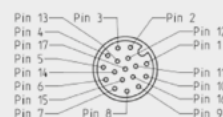


Key data		EMT absolute differential
Multi-turn: max. no. of turns		65 536
Multi-turn: resolution	bits	16
Single-turn: steps per turns		131 072
Single-turn: resolution	bits	17
Encoder length L ¹	mm	22.7
Ambient temperature	°C	-40...+105
Weight	g	25

Selection criteria	EMT absolute differential
Multi-turn detection	■
Detection of speed and rotation direction	■
Speed and position control	■
Compact and robust design	■
High resolution	■
Economical	▲

■ suitable ▲ suitable to a limited extent ● not suitable

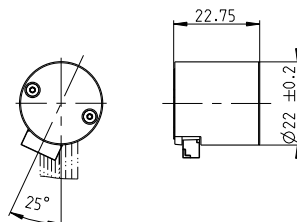
Specifications	EMT for DCX, EC-4pole and EC-i		EMT integrated into IDX	
Supply voltage V _{CC}	V	5 ±0.5	5 ±0.5	
Typical current draw	mA	90	90	
Max. speed	rpm	12 000	12 000	
Data encoding		Binary	Binary	
Min. clock frequency CLK	MHz	BiSS-C: 0.08 SSI: 0.3	BiSS-C: 0.08 SSI: 0.3	
Max. clock frequency CLK	MHz	BiSS-C: 5 SSI: 1	BiSS-C: 5 SSI: 1	
Timeout	µs	BiSS-C: 18 SSI: 7	BiSS-C: 18 SSI: 7	
Setup time after Power On	s	Max. 0.1	Max. 0.1	
Moment of inertia of pulse disk	gcm ²	≤1.55	≤1.55	
Plug manufacturer JST		Pin 1 GND	Pin 1 GND	
Plug type no. BM08B-NSHSS -TBT		Pin 2 do not connect	Pin 2 Motor NTC	
Matching connector type no. NSHR-08V-S		Pin 3 do not connect	Pin 3 +V _{CC}	
		Pin 4 Data+ / SLO+	Pin 9 Motor NTC	
		Pin 5 Data- / SLO-	Pin 11 Data- / SLO-	
		Pin 6 CLK- / MA-	Pin 12 Data+ / SLO+	
		Pin 7 CLK+ / MA+	Pin 13 CLK+ / MA+	
		Pin 8 V _{CC}	Pin 14 CLK- / MA-	
		Output signals: EIA standard RS422	Other pins not connected	
		Output current per channel: ±20 mA	Output signals: EIA standard RS422	
			Output current per channel: ±20 mA	



Configuration	EMT absolute differential
Signal protocol	BiSS-C, SSI

Modular system	Page	Dimensions of standard configuration	M 1:2	Additional information
DC motor				
DCX 22	111-114			
DCX 26 L	115-116			
DCX 32 L	117			
DCX 35 L	118			

EC motor	
IDX 56	249-251
IDX 70	252-254
EC-4pole 22	291-292
EC-4pole 30	293/295
EC-i 30	302-305
EC-i 40	306-311
EC-i 52	312-313
ECX PRIME 22 L	239



¹ The length shown here refers to the encoder. An additional intermediate plate is required for motor mounting. For more detailed information, see the combined dimensional drawing.

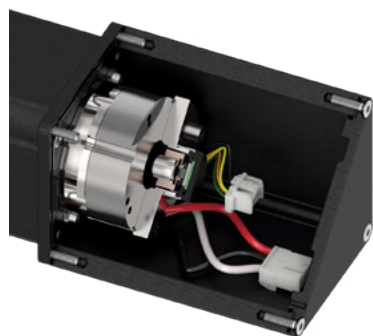
EC motors: The angle value 0 is calibrated to the commutation phase of coil 1 (equates to Hall signal 1 for motors with Hall sensors, block commutation), see p. 66

Ordering information: For motors that cannot be configured online, the part numbers **711113** (BiSS-C) and **711112** (SSI) must be used when ordering.

Connecting cable 300 mm for EMT to EPOS4 **708590**

Further technical details can be found in the product information in the online shop under Downloads.

accessories



- Spring-loaded brake – single-disc brake with two friction surfaces for direct current. Braked in unpowered condition (dry operation).
- Holding brake, prevents rotation of the shaft at standstill or with turned off motor power.
- Not suitable for dynamic braking.
- Not backlash-free ($\pm 1^\circ$ max.).
- Additional length +20 mm.

x drives

Type



+ Drive	Page	+ Gearhead	Page	+ Sensor	Page	Overall length [mm] / * see Gearhead
IDX 56 S	353					online
IDX 56 S	353	GPX 52	406-407			online
IDX 56 S	353	GB 80	458			online
IDX 56 S	353	GB 12	459			online
IDX 56 M	354					online
IDX 56 M	354	GPX 52	406-407			online
IDX 56 M	354	GB 80	458			online
IDX 56 M	354	GB 12	459			online
IDX 56 L	355					online
IDX 56 L	355	GPX 52	406-407			online
IDX 56 L	355	GB 80	458			online
IDX 56 L	355	GB 12	459			online

+ Motor	Page	+ Gearhead	Page	+ Sensor	Page	Overall length [mm] / • see Gearhead
IDX 56 S	249					online
IDX 56 S	249	GPX 52	406-407			online
IDX 56 S	249	GB 80	458			online
IDX 56 S	249	GB 12	459			online
IDX 56 M	250					online
IDX 56 M	250	GPX 52	406-407			online
IDX 56 M	250	GB 80	458			online
IDX 56 M	250	GB 12	459			online
IDX 56 L	251					online
IDX 56 L	251	GPX 52	406-407			online
IDX 56 L	251	GB 80	458			online
IDX 56 L	251	GB 12	459			online

Holding torque	1.4 Nm	Nominal voltage, smoothed	24 VDC -10 ... +5%
Mass inertia	6.1 gcm ²	Resistance	R ₂₀ = 82.6 Ω +10%
Max. speed	8000 rpm	Duty cycle	100%
Weight	0.14 kg	Reaction time	- Coupling ≤ 30 ms
Ambient temperature range	-40...+120°C		- Opening ≤ 85 ms

online



	ESCON Module 50/8	ESCON Module 50/8 HE
DC motors up to (continuous / maximum)	400 W / 750 W	400 W / 750 W
EC motors up to (continuous / maximum)	400 W / 750 W	400 W / 750 W
Sensors		
	Digital Incremental Encoder (2 channel with or without Line Driver)	Digital Incremental Encoder (2 channel with or without Line Driver)
	DC Tacho	DC Tacho
	Without sensor (DC motors)	Without sensor (DC motors)
	Digital Hall Sensors (EC motors)	Digital Hall Sensors (EC motors)
Operating mode		
	Current controller (torque control), Speed controller (closed and open loop)	Current controller (torque control), Speed controller (closed and open loop)
Electrical data		
Nominal operating voltage V_{CC}	10 - 50 VDC	10 - 50 VDC
Max. output voltage	$0.98 \times V_{CC}$	$0.98 \times V_{CC}$
Max. output current	15 A (<20 s)	15 A (<20 s)
Continuous output current	8 A	8 A
Pulse width modulation frequency	53.6 kHz	53.6 kHz
Sampling rate PI current controller	53.6 kHz	53.6 kHz
Sampling rate PI speed controller	5.36 kHz	5.36 kHz
Max. efficiency	99%	99%
Max. speed (DC)	limited by max. speed (motor) and max. output voltage (controller)	limited by max. speed (motor) and max. output voltage (controller)
Max. speed (EC; 1 pole pair)	150 000 rpm	150 000 rpm
Built-in motor choke	-	-
Inputs/Outputs		
Hall sensor signals	H1, H2, H3	H1, H2, H3
Encoder signals	A, A\, B, B\	A, A\, B, B\
Max. encoder input frequency differential (single-ended)	1 MHz (100 kHz)	1 MHz (100 kHz)
Potentiometers	-	-
Digital inputs	2	2
Digital inputs/outputs	2	2
Analog inputs	2	2
Resolution, Range, Circuit	12-bit, -10...+10 V, differential	12-bit, -10...+10 V, differential
Analog outputs	2	2
Resolution, Range, Max. output current	12-bit, -4...+4 V, 1 mA	12-bit, -4...+4 V, 1 mA
Auxiliary voltage output	5 VDC (IL ≤10 mA)	5 VDC (IL ≤10 mA)
Hall sensor supply voltage	5 VDC (IL ≤30 mA)	5 VDC (IL ≤30 mA)
Encoder supply voltage	5 VDC (IL ≤70 mA)	5 VDC (IL ≤70 mA)
Status Indicators	Operation: green LED / Error: red LED	Operation: green LED / Error: red LED
Environmental conditions		
Temperature - Operation	-40...+45 °C	-40...+65 °C
Temperature - Extended range	45...85 °C; Derating: see device reference	65...92 °C; Derating: see device reference
Temperature - Storage	-40...+85 °C	-40...+85 °C
Humidity (condensation not permitted)	5...90%	5...90%
Mechanical data		
Weight	Approx. 16 g	Approx. 84 g
Dimensions (L x W x H)	53.3 x 37.5 x 14.5 mm	53.3 x 37.5 x 30.6 mm
Mounting holes	Plugable (socket headers with 2.54 mm pitch)	Plugable (socket headers with 2.54 mm pitch)
Part numbers		
	532872 ESCON Module 50/8	586137 ESCON Module 50/8 HE
	Order accessories separately, from page 549	Order accessories separately, from page 549

ESCON Data

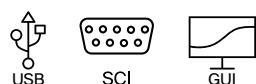
motor control



	ESCON 50/5	ESCON 70/10
DC motors up to (continuous / maximum)	250 W / 750 W	700 W / 2100 W
EC motors up to (continuous / maximum)	250 W / 750 W	700 W / 2100 W
Sensors		
	Digital Incremental Encoder (2 channel with or without Line Driver)	Digital Incremental Encoder (2 channel with or without Line Driver)
	DC Tacho	DC Tacho
	Without sensor (DC motors)	Without sensor (DC motors)
	Digital Hall Sensors (EC motors)	Digital Hall Sensors (EC motors)
Operating mode		
	Current controller (torque control), Speed controller (closed and open loop)	Current controller (torque control), Speed controller (closed and open loop)
Electrical data		
Nominal operating voltage V_{CC}	10 - 50 VDC	10 - 70 VDC
Max. output voltage	$0.98 \times V_{CC}$	$0.95 \times V_{CC}$
Max. output current	15 A (<20 s)	30 A (<20 s)
Continuous output current	5 A	10 A
Pulse width modulation frequency	53.6 kHz	53.6 kHz
Sampling rate PI current controller	53.6 kHz	53.6 kHz
Sampling rate PI speed controller	5.36 kHz	5.36 kHz
Max. efficiency	95%	98%
Max. speed (DC)	limited by max. speed (motor) and max. output voltage (controller)	limited by max. speed (motor) and max. output voltage (controller)
Max. speed (EC; 1 pole pair)	150 000 rpm	150 000 rpm
Built-in motor choke	3 x 30 μ H / 5 A	3 x 15 μ H / 10 A
Inputs/Outputs		
Hall sensor signals	H1, H2, H3	H1, H2, H3
Encoder signals	A, A\, B, B\	A, A\, B, B\
Max. encoder input frequency differential (single-ended)	1 MHz (100 kHz)	1 MHz (100 kHz)
Potentiometers	2	2
Digital inputs	2	2
Digital inputs/outputs	2	2
Analog inputs	2	2
Resolution, Range, Circuit	12-bit, -10...+10 V, differential	12-bit, -10...+10 V, differential
Analog outputs	2	2
Resolution, Range, Max. output current	12-bit, -4...+4 V, 1 mA	12-bit, -4...+4 V, 1 mA
Auxiliary voltage output	5 VDC (IL \leq 10 mA)	5 VDC (IL \leq 10 mA)
Hall sensor supply voltage	5 VDC (IL \leq 30 mA)	5 VDC (IL \leq 30 mA)
Encoder supply voltage	5 VDC (IL \leq 70 mA)	5 VDC (IL \leq 70 mA)
Status Indicators	Operation: green LED / Error: red LED	Operation: green LED / Error: red LED
Environmental conditions		
Temperature – Operation	-30...+45 °C	-30...+45 °C
Temperature – Extended range	45...85 °C; Derating: -0.11 A/°C	45...82 °C; Derating: -0.270 A/°C
Temperature – Storage	-40...+85 °C	-40...+85 °C
Humidity (condensation not permitted)	5...90%	5...90%
Mechanical data		
Weight	Approx. 204 g	Approx. 259 g
Dimensions (L x W x H)	115 x 75.5 x 24 mm	125 x 78.5 x 27 mm
Mounting holes	for screws M4	for screws M4
Part numbers		
	409510 ESCON 50/5	422969 ESCON 70/10
	Order accessories separately, from page 549	Order accessories separately, from page 549

ESCON2 Data

CANopen I/O ↔



NEW

NEW

motor control



ESCON2 Nano 24/2

ESCON2 Micro 60/5

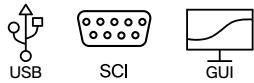
Controller version	Commands via I/O or CANopen Slave	Commands via I/O or CANopen Slave
Electrical data		
Operating voltage V_{CC}	5 - 24 VDC	10 - 60 VDC
Logic supply voltage V_C (optional)	–	10 - 60 VDC
Max. output voltage	$0.9 \times V_{CC}$	$0.95 \times V_{CC}$
Max. output current I_{max}	6 A (<6.5 s)	15 A (<4 s)
Continuous output current I_{cont}	2 A	5 A
Switching frequency of power stage	50 kHz	50 kHz
Sampling rate of PI current controller	50 kHz (20 μ s)	50 kHz (20 μ s)
Sampling rate of PI speed controller	10 kHz (100 μ s)	10 kHz (100 μ s)
Max. speed (1 pole pair)	120 000 rpm (sinusoidal)	120 000 rpm (sinusoidal)
Built-in motor choke per phase	–	–
Inputs		
Hall sensor signals	H1, H2, H3	H1, H2, H3
Encoder signals	A, B (max. 6.25 MHz)	A, A', B, B' (max. 6.67 MHz)
Sensor signals	Clock ¹ , Data ¹	Clock ¹ , Data ¹
Digital inputs	4	4
Digital inputs "High-speed"	4	4
Analog inputs	2 (12-bit resolution, 0...+5 V)	2 (12-bit resolution, -10...+10 V)
CAN ID	configurable with external wiring	configurable with external wiring
Outputs		
Digital outputs	2	2
Digital outputs "High-speed"	1	1
Analog outputs	2 (12-bit resolution, 0...+3.3 V, max. 1 mA)	2 (12-bit resolution, -4...+4 V, max. 1 mA)
Encoder voltage output	5 VDC, max. 145 mA	5 VDC, max. 145 mA
Hall sensor voltage output		
Auxiliary voltage output	3.3 VDC, max. 20 mA	3.3 VDC, max. 20 mA
Communication interfaces		
CAN	yes (ext. transceiver)	yes
SCI (RS232 ext. transceiver)	yes	yes
USB	yes	yes
Indicator		
LED green = READY, red= ERROR	External LEDs required	External LEDs required
Environmental conditions		
Temperatrue – Operation	-30...+45 °C	-30...+50 °C
Temperature – Extended Range	45...70 °C; Derating: -0.077 A/°C	50...70 °C; Derating: -0.227 A/°C
Temperature – Storage	-40...+85 °C	-40...+85 °C
Humidity (condensation not permitted)	5...90%	5...90%
Mechanical data		
Weight	approx. 2.5 g	approx. 6 g
Dimensions (L x W x H)	23.0 x 16.0 x 4.5 mm	36.8 x 23.8 x 6.5 mm
Mounting	Pluggable and M2 screws	Pluggable and M2 screws
Part numbers		
	809635 ESCON2 Nano 24/2	809631 ESCON2 Micro 60/5
Accessories		
	309687 DSR 50/5 Shunt regulator	235811 DSR 70/30 Shunt regulator
	Order accessories separately, see page 555	Order accessories separately, see page 555

¹in preparation

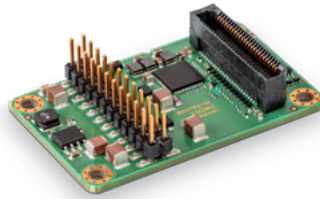
ESCON2 Data

motor control

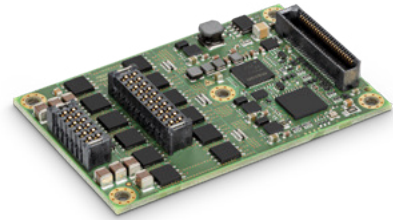
CANopen I/O↔



NEW



ESCON2 Module 60/12



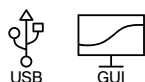
ESCON2 Module 60/30

Controller version		
	Commands via I/O or CANopen Slave	Commands via I/O or CANopen Slave
Electrical data		
Operating voltage V_{CC}	10 - 60 VDC	10 - 60 VDC
Logic supply voltage V_C (optional)	10 - 60 VDC	10 - 60 VDC
Max. output voltage	$0.90 \times V_{CC}$	$0.95 \times V_{CC}$
Max. output current I_{max}	30 A (<2 s)	60 A (<4 s)
Continuous output current I_{cont}	12 A	30 A
Switching frequency of power stage	100 kHz	50 kHz
Sampling rate of PI current controller	50 kHz (20 μ s)	50 kHz (20 μ s)
Sampling rate of PI speed controller	10 kHz (100 μ s)	10 kHz (100 μ s)
Max. speed (1 pole pair)	120 000 rpm (sinusoidal)	120 000 rpm (sinusoidal)
Built-in motor choke per phase	–	–
Inputs		
Hall sensor signals	H1, H2, H3	H1, H2, H3
Encoder signals	A, A', B, B' (max. 6.67 MHz)	A, A', B, B' (max. 6.67 MHz)
Sensor signals	Clock ¹ , Data ¹	Clock ¹ , Data ¹
Digital inputs	4	4
Digital inputs "High-speed"	4	4
Analog inputs	2 (12-bit resolution, -10...+10 V)	2 (12-bit resolution, -10...+10 V)
CAN ID	configurable with external wiring	configurable with external wiring
Outputs		
Digital outputs	2	2
Digital outputs "High-speed"	1	1
Analog outputs	2 (12-bit resolution, -4...+4 V, max. 1 mA)	2 (12-bit resolution, -4...+4 V, max. 1 mA)
Encoder voltage output	5 VDC, max. 145 mA	5 VDC, max. 145 mA
Hall sensor voltage output		
Auxiliary voltage output	3.3 VDC, max. 20 mA	3.3 VDC, max. 20 mA
Communication interfaces		
CAN	yes	yes
SCI (RS232 ext. transceiver)	yes	yes
USB	yes	yes
Indicator		
LED green = READY, red= ERROR	External LEDs required	External LEDs required
Environmental conditions		
Temperatrue – Operation		-30...+25 °C
Temperature – Extended Range		25...75 °C; Derating: -0.506 A/°C
Temperature – Storage	-40...+85 °C	-40...+85 °C
Humidity (condensation not permitted)	5...90%	5...90%
Mechanical data		
Weight	approx. 12 g	approx. 19 g
Dimensions (L x W x H)	49.5 x 31 x 12.4 mm	67.0 x 43.0 x 7.8 mm
Mounting	Pluggable and M2.5 screws	Pluggable and M2.5 screws
Part numbers		
	854796 ESCON2 Module 60/12	783722 ESCON2 Module 60/30
Accessories		
	235811 DSR 70/30 Shunt regulator	235811 DSR 70/30 Shunt regulator
	Order accessories separately, see page 555	Order accessories separately, see page 555

¹in preparation

ESCON2 Data

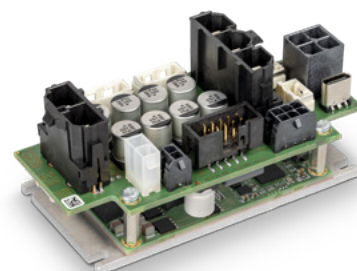
CANopen I/O ↔



NEW



ESCON2 Compact 60/12



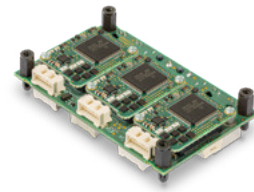
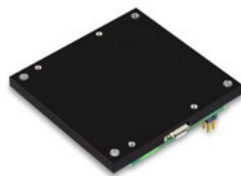
ESCON2 Compact 60/30

motor control

Controller version	Commands via I/O or CANopen Slave	Commands via I/O or CANopen Slave
Electrical data		
Operating voltage V_{CC}	10 - 60 VDC	10 - 60 VDC
Logic supply voltage V_C (optional)	10 - 60 VDC	10 - 60 VDC
Max. output voltage	$0.90 \times V_{CC}$	$0.95 \times V_{CC}$
Max. output current I_{max}	30 A (<2 s)	60 A (<4 s)
Continuous output current I_{cont}	12 A	30 A
Switching frequency of power stage	100 kHz	50 kHz
Sampling rate of PI current controller	50 kHz (20 μ s)	50 kHz (20 μ s)
Sampling rate of PI speed controller	10 kHz (100 μ s)	10 kHz (100 μ s)
Max. speed (1 pole pair)	120 000 rpm (sinusoidal)	120 000 rpm (sinusoidal)
Built-in motor choke per phase	4.7 μ H / 12 A	0.47 μ H / 30 A
Inputs		
Hall sensor signals	H1, H2, H3	H1, H2, H3
Encoder signals	A, A', B, B' (max. 6.67 MHz)	A, A', B, B' (max. 6.67 MHz)
Sensor signals	Clock ¹ , Data ¹	Clock ¹ , Data ¹
Digital inputs	4	4
Digital inputs "High-speed"	4	4
Analog inputs	2 (12-bit resolution, -10...+10 V)	2 (12-bit resolution, -10...+10 V)
CAN ID	configurable with DIP switch 1...5	configurable with DIP switch 1...5
Outputs		
Digital outputs	2	2
Digital outputs "High-speed"	1	1
Analog outputs	2 (12-bit resolution, -4...+4 V, max. 1 mA)	2 (12-bit resolution, -4...+4 V, max. 1 mA)
Encoder voltage output	5 VDC, max. 145 mA	5 VDC, max. 145 mA
Hall sensor voltage output		
Auxiliary voltage output	-	-
Communication interfaces		
CAN	yes	yes
SCI (RS232 ext. transceiver)	-	-
USB	yes	yes
Indicator		
LED green = READY, red= ERROR	yes	yes
Environmental conditions		
Temperatrue - Operation		-30...+25 °C
Temperature - Extended Range		25...75 °C; Derating: -0.506 A/°C
Temperature - Storage	-40...+85 °C	-40...+85 °C
Humidity (condensation not permitted)	5...90%	5...90%
Mechanical data		
Weight	approx. 90 g	approx. 128 g
Dimensions (L x W x H)	81 x 41 x 33.5 mm	93.5 x 46.0 x 41.0 mm
Mounting	M3 screws	M3 screws
Part numbers		
	854801 ESCON2 Compact 60/12	783734 ESCON2 Compact 60/30
Accessories		
	235811 DSR 70/30 Shunt regulator	235811 DSR 70/30 Shunt regulator
	Order accessories separately, see page 555	Order accessories separately, see page 555
		¹ in preparation

EPOS4 Positioning Controllers Data

motor control



EPOS4 Module 50/8

OEM position control module, designed for use with brushed DC motors with encoders or brushless EC motors with Hall sensors and encoders up to 400/1500 Watt.

EPOS4 Module 50/15

OEM position control module, designed for use with brushed DC motors with encoders or brushless EC motors with Hall sensors and encoders up to 750/1500 Watt.

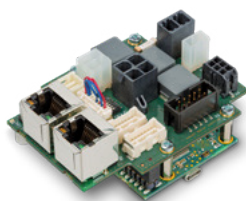
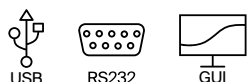
EPOS4 Compact 24/5 EtherCAT 3-axes

Ready-to-install 3-axis compact solution, designed for use with brushed DC motors with encoders or brushless EC motors with Hall sensors and encoders up to 120/360 W per axis.

Controller version		
CANopen Slave with EtherCAT option	CANopen Slave with EtherCAT option	EtherCAT Slave
Electrical data		
10 - 50 VDC	10 - 50 VDC	10 - 24 VDC
10 - 50 VDC	10 - 50 VDC	10 - 24 VDC
0.9 x V _{CC}	0.9 x V _{CC}	0.9 x V _{CC}
30 A (<5 s)	30 A (<60 s)	15 A (<10 s) per axis
8 A	15 A	5 A per axis
50 kHz	50 kHz	50 kHz
25 kHz (40 µs)	25 kHz (40 µs)	25 kHz (40 µs)
2.5 kHz (400 µs)	2.5 kHz (400 µs)	2.5 kHz (400 µs)
2.5 kHz (400 µs)	2.5 kHz (400 µs)	2.5 kHz (400 µs)
50 000 rpm (sinusoidal), 100 000 rpm (block)	50 000 rpm (sinusoidal), 100 000 rpm (block)	50 000 rpm (sinusoidal), 100 000 rpm (block)
-	-	-
Inputs		
H1, H2, H3	H1, H2, H3	H1, H2, H3 per axis
A, A\, B, B\, I, I\ (max. 6.25 MHz)	A, A\, B, B\, I, I\ (max. 6.25 MHz)	
A, A\, B, B\, I, I\, Clock, Clock\, Data, Data\	A, A\, B, B\, I, I\, Clock, Clock\, Data, Data\	A, A\, B, B\, I, I\, Clock, Clock\, Data, Data\ per axis
4 (logic level)	4 (logic level)	4 (level switchable: logic/PLC) per axis
4, differential	4, differential	-
2 (12-bit resolution, -10...+10 V)	2 (12-bit resolution, -10...+10 V)	2 (12-bit resolution, -10...+10 V) per axis
configurable with external wiring	configurable with external wiring	-
Outputs		
2	2	2 per axis
1, differential	1, differential	-
2 (12-bit resolution, -4...+4 V, max. 1 mA)	2 (12-bit resolution, -4...+4 V, max. 1 mA)	1 (12-bit resolution, -4...+4 V, max. 1 mA) per axis
5 VDC, max. 70 mA	5 VDC, max. 70 mA	5 VDC, max. 100 mA per axis
5 VDC, max. 30 mA	5 VDC, max. 30 mA	5 VDC, max. 30 mA per axis
5 VDC, max. 145 mA	5 VDC, max. 145 mA	
Communication interfaces		
high; low (max. 1 Mbit/s)	high; low (max. 1 Mbit/s)	-
Optional 581245 EPOS4 EtherCAT Card available	Optional 581245 EPOS4 EtherCAT Card available	100 Mbit/s (Full Duplex)
RxD; TxD (max. 115 200 bit/s)	RxD; TxD (max. 115 200 bit/s)	-
Data+; Data- (Full Speed)	Data+; Data- (Full Speed)	Data+; Data- (Full Speed) per axis
Indicator		
Green LED, red LED	Green LED, red LED	Green LED, red LED
Environmental conditions		
-30...+45 °C	-30...+25 °C	-30...+25 °C
45...77 °C; Derating: -0.250 A/°C	25...77 °C; Derating: -0.288 A/°C	25...50 °C; Derating: -0.200 A/°C
-40...+85 °C	-40...+85 °C	-40...+85 °C
5...90%	5...90%	5...90%
Mechanical data		
approx. 23 g	approx. 70 g	approx. 85 g
59.5 x 46.0 x 14.1 mm	59.5 x 62.0 x 16.4 mm	90.0 x 56.0 x 29.0 mm
Socket header 2.54 mm or M2.5 screws	Socket header 2.54 mm or M3 screws	M2.5 screws
Part numbers		
504384 EPOS4 Module 50/8	504383 EPOS4 Module 50/15	684519 EPOS4 Compact 24/5 EtherCAT 3-axes
Accessories		
235811 DSR 70/30 Shunt regulator	235811 DSR 70/30 Shunt regulator	235811 DSR 70/30 Shunt regulator
Order accessories separately, see page 562	Order accessories separately, see page 562	Order accessories separately, see page 562

EPOS4 Positioning Controllers Data

EtherCAT  CANopen 



motor control

EPOS4 Compact 50/8 EtherCAT

Ready-to-install compact solution, designed for use with brushed DC motors with encoders or brushless EC motors with Hall sensors and encoders up to 400/1500 Watt.

EPOS4 Compact 50/15 CAN

Ready-to-install compact solution, designed for use with brushed DC motors with encoder or brushless EC motors with Hall sensors and encoders up to 750/1500 Watt.

Controller version	EtherCAT Slave	CANopen Slave
Electrical data		
Operating voltage V_{CC}	10 - 50 VDC	10 - 50 VDC
Logic supply voltage V_C (optional)	10 - 50 VDC	10 - 50 VDC
Max. output voltage	$0.9 \times V_{CC}$	$0.9 \times V_{CC}$
Max. output current I_{max}	30 A (<5 s)	30 A (<60 s)
Continuous output current I_{cont}	8 A	15 A
Switching frequency of power stage	50 kHz	50 kHz
Sampling rate of PI current controller	25 kHz (40 μ s)	25 kHz (40 μ s)
Sampling rate of PI speed controller	2.5 kHz (400 μ s)	2.5 kHz (400 μ s)
Sampling rate of PID position controller	2.5 kHz (400 μ s)	2.5 kHz (400 μ s)
Max. speed (1 pole pair)	50 000 rpm (sinusoidal), 100 000 rpm (block)	50 000 rpm (sinusoidal), 100 000 rpm (block)
Built-in motor choke per phase	2.2 μ H / 15 A	2.2 μ H / 15 A
Inputs		
Hall sensor signals	H1, H2, H3	H1, H2, H3
Encoder signals	A, A\, B, B\, I, I\ (max. 6.25 MHz)	A, A\, B, B\, I, I\ (max. 6.25 MHz)
Sensor signals	A, A\, B, B\, I, I\, Clock, Clock\, Data, Data\	A, A\, B, B\, I, I\, Clock, Clock\, Data, Data\
Digital inputs	4 (level switchable: logic/PLC)	4 (level switchable: logic/PLC)
Digital inputs "High-speed"	4, differential	4, differential
Analog inputs	2 (12-bit resolution, -10...+10 V)	2 (12-bit resolution, -10...+10 V)
CAN ID / DEV ID	configurable with DIP switch 1...5	configurable with DIP switch 1...5
Outputs		
Digital outputs	2	2
Digital outputs "High-speed"	1, differential	1, differential
Analog outputs	2 (12-bit resolution, -4...+4 V, max. 1 mA)	2 (12-bit resolution, -4...+4 V, max. 1 mA)
Encoder voltage output	5 VDC, max. 70 mA	5 VDC, max. 70 mA
Hall sensor voltage output	5 VDC, max. 30 mA	5 VDC, max. 30 mA
Auxiliary voltage output	5 VDC, max. 145 mA	5 VDC, max. 145 mA
Communication interfaces		
CAN	-	high; low (max. 1 Mbit/s)
EtherCAT	100 Mbit/s (Full Duplex)	-
RS232	-	RxD; TxD (max. 115 200 bit/s)
USB 2.0/3.0	Data+; Data- (Full Speed)	Data+; Data- (Full Speed)
Indicator		
LED green = READY, red = ERROR	Green LED, red LED	Green LED, red LED
Environmental conditions		
Temperature - Operation	-30...+45 °C	-30...+25 °C
Temperature - Extended Range	45...77 °C; Derating: -0.250 A/°C	25...77 °C; Derating: -0.288 A/°C
Temperature - Storage	-40...+85 °C	-40...+85 °C
Humidity (condensation not permitted)	5...90%	5...90%
Mechanical data		
Weight	approx. 100 g	approx. 126 g
Dimensions (L x W x H)	59.5 x 79.5 x 35.7 mm	59.5 x 65.5 x 35.1 mm
Mounting	M2.5 screws	M3 screws
Part numbers		
	605298 EPOS4 Compact 50/8 EtherCAT	520886 EPOS4 Compact 50/15 CAN
Accessories		
	235811 DSR 70/30 Shunt regulator	235811 DSR 70/30 Shunt regulator
	Order accessories separately, see page 562	Order accessories separately, see page 562

EPOS4 Positioning Controllers Data

motor control



EPOS4 Compact 50/15 EtherCAT

Ready-to-install compact solution, designed for use with brushed DC motors with encoders or brushless EC motors with Hall sensors and encoders up to 750/1500 Watt.

EPOS4 50/5

Positioning controller in a robust housing, designed for use with brushed DC motors with encoders or brushless EC motors with Hall sensors and encoders up to 250/750 Watt.

EPOS4 70/15

Positioning controller in a robust housing, designed for use with brushed DC motors with encoders or brushless EC motors with Hall sensors and encoders up to 1050/2100 Watt.

Controller version		
EtherCAT Slave	CANopen Slave with EtherCAT option	CANopen Slave with EtherCAT option
Electrical data		
10 - 50 VDC	10 - 50 VDC	10 - 70 VDC
10 - 50 VDC	10 - 50 VDC	10 - 70 VDC
0.9 x V _{CC}	0.9 x V _{CC}	0.9 x V _{CC}
30 A (<60 s)	15 A (<15 s)	30 A (<60 s)
15 A	5 A	15 A
50 kHz	50 kHz	50 kHz
25 kHz (40 µs)	25 kHz (40 µs)	25 kHz (40 µs)
2.5 kHz (400 µs)	2.5 kHz (400 µs)	2.5 kHz (400 µs)
2.5 kHz (400 µs)	2.5 kHz (400 µs)	2.5 kHz (400 µs)
50 000 rpm (sinusoidal), 100 000 rpm (block)	50 000 rpm (sinusoidal), 100 000 rpm (block)	50 000 rpm (sinusoidal), 100 000 rpm (block)
2.2 µH / 15 A	15 µH / 5 A	15 µH / 15 A
Inputs		
H1, H2, H3	H1, H2, H3	H1, H2, H3
A, A\, B, B\, I, I\ (max. 6.25 MHz)	A, A\, B, B\, I, I\ (max. 6.25 MHz)	A, A\, B, B\, I, I\ (max. 6.25 MHz)
A, A\, B, B\, I, I\, Clock, Clock\, Data, Data\	A, A\, B, B\, I, I\, Clock, Clock\, Data, Data\	A, A\, B, B\, I, I\, Clock, Clock\, Data, Data\
4 (level switchable: logic/PLC)	4 (level switchable: logic/PLC)	4 (level switchable: logic/PLC)
4, differential	4, differential	4, differential
2 (12-bit resolution, -10...+10 V)	2 (12-bit resolution, -10...+10 V)	2 (12-bit resolution, -10...+10 V)
configurable with DIP switch 1...5	configurable with DIP switch 1...5	configurable with DIP switch 1...5
Outputs		
2	2	2
1, differential	1, differential	1, differential
2 (12-bit resolution, -4...+4 V, max. 1 mA)	2 (12-bit resolution, -4...+4 V, max. 1 mA)	2 (12-bit resolution, -4...+4 V, max. 1 mA)
5 VDC, max. 70 mA	5 VDC, max. 70 mA	5 VDC, max. 70 mA
5 VDC, max. 30 mA	5 VDC, max. 30 mA	5 VDC, max. 30 mA
5 VDC, max. 145 mA	5 VDC, max. 145 mA	5 VDC, max. 145 mA
Communication interfaces		
-	high; low (max. 1 Mbit/s)	high; low (max. 1 Mbit/s)
100 Mbit/s (Full Duplex)	Optional 581245 EPOS4 EtherCAT Card available	Optional 581245 EPOS4 EtherCAT Card available
-	RxD; TxD (max. 115 200 bit/s)	RxD; TxD (max. 115 200 bit/s)
Data+; Data- (Full Speed)	Data+; Data- (Full Speed)	Data+; Data- (Full Speed)
Indicator		
Green LED, red LED	Green LED, red LED	Green LED, red LED
Environmental conditions		
-30...+25 °C	-30...+50 °C	-30...+50 °C
25...77 °C; Derating: -0.288 A/°C	50...80 °C; Derating: -0.167 A/°C	50...85 °C; Derating: -0.429 A/°C
-40...+85 °C	-40...+85 °C	-40...+85 °C
5...90%	5...90%	5...90%
Mechanical data		
approx. 140 g	approx. 206 g	approx. 372 g
59.5 x 79.5 x 37.8 mm	105.0 x 83.0 x 38.7 mm	125.0 x 94.5 x 38.7 mm
M3 screws	Flange for M4-screws	Flange for M4-screws
Part numbers		
605299 EPOS4 Compact 50/15 EtherCAT	546047 EPOS4 50/5	594385 EPOS4 70/15
Accessories		
235811 DSR 70/30 Shunt regulator	309687 DSR 50/5 Shunt regulator	235811 DSR 70/30 Shunt regulator
Order accessories separately, see page 562	Order accessories separately, see page 562	Order accessories separately, see page 562

Multi-Axis Motion Controller Summary



MicroMACS6



MicroMACS6
Module

NEW



MiniMACS6-
AMP4



MiniMACS6-
AMP4-IF1



MiniMACS6-
AMP4 OEM



MasterMACS

motion control

Fully programmable	✓	✓	✓	✓	✓	✓
Integrated power stage	No	No	✓	✓	✓	No
Number of axes	6	6	6 (4)	6 (4)	6 (4)	32
CANopen	✓	✓	✓	✓	✓	✓
Ethernet interfaces	✓	✓	No	✓	No	✓
EtherCat slave	No	No	No	✓	No	✓
EtherCat master	No	No	No	No	No	✓
Bluetooth	on request	on request	No	No	No	No

Solutions optimized for less complex or cost-sensitive applications:

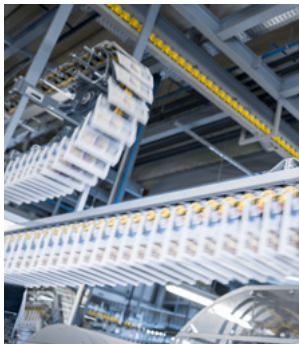
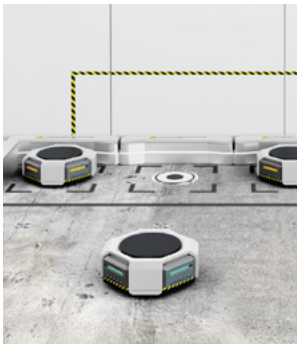
- MicroMACS6
- MicroMACS6 Module
- MiniMACS6-AMP-4/50/10

Solutions for high flexibility:

- MiniMACS6-AMP-4/50/10-IF1
- Variants with integrated amplifiers (50 V/up to 10 A/30 A) and various encoder inputs (also absolute)

Solutions for highest performance:

- MasterMACS
- Most powerful Motion Controller
- Synchronization of up to 32 axes
- Various fieldbus interfaces



MiniMACS6-AMP-4/50/10-IF1 Data

Programmable Motion Controller

motion control



MiniMACS6-AMP-4/50/10 OEM

Freely programmable, compact multi-axis motion controller with integrated high-performance power stages, without housing.

MiniMACS6-AMP-4/50/10

Freely programmable, compact multi-axis motion controller with integrated high-performance power stages.

MiniMACS6-AMP-4/50/10-IF1

Freely programmable, compact multi-axis motion controller with integrated high-performance power stages and a network option card (Ethernet/EtherCAT/ProfiNet in planning).

Controller versions	
	CANopen Master/Slave, EtherCAT Slave optional, Ethernet optional, Standalone with APOSS® win
Features	
Motion features	Trapezoidal, jerk limited, CAM, synchronous travel, path, kinematics
Profile generator cycle	1 kHz (1 ms)
Sampling rate of PID positioning controller with speed and acceleration feed-forward control	1 kHz (1 ms)
Maximum number of axes	6
Web server (visualization)	optional
Expandable memory	yes (datalogging on USB stick)
Electrical data	
Logic supply voltage V_C	18 - 30 VDC
Inputs	
Digital inputs	16 (PLC level, 4 latch capable)
Analog inputs	2 (12-bit resolution, 0...10 V)
Hall sensor signals	4 x (H1, H2, H3)
CAN-ID (CAN node identification)	configurable with DIP switch
Output	
Digital output	8 (max. 100 mA per output)
Analog output	-
Encoder voltage output	5 VDC, max. 200 mA per output, total 1 A
Interfaces	
EtherCAT-Master / Profinet	on request
CAN	2 (max. 1 Mbit/s)
RS232 / RS485	-
EtherCAT-Slave	1
Ethernet	1
USB 2.0	1 Data+; Data- (High Speed)
Encoder inputs	
Digital incremental	4 (differential, max. 6.25 MHz)
SSI absolute	4 (39 kHz...5 MHz)
Analog incremental (sin/cos)	4 (differential, max. 150 kHz)
Hiperface/EnDat	-
Encoder outputs	
Encoder TTL outputs	-
Indicator	
LEDs	3 (status) / EtherCAT
Display	-
Environmental conditions	
Temperature - Operation	-30...+70 °C
Temperature - Storage	-30...+85 °C
Humidity (condensation not permitted)	5...90%
Mechanical data	
Weight	ca. 600 g
Dimensions (L x W x H)	141 x 110 x 34 mm
Mounting	Metal compact housing / OEM without housing
Ordering Information: Please contact your maxon sales engineer	

Amplifier
Operating voltage V_{CC} : 12 - 60 VDC
6 DC / 4 EC (BLDC) / 3 stepper motors / Twin Mode / Chopper
Max. output voltage: $0.9 \times V_{CC}$
Max. output current (per axis)
$I_{cont.}$: 10 A
$I_{max.}$: 30 A
Switching frequency of power stage: 48 kHz
Sampling rate of PI current controller: 24 kHz (41 µs)
Sampling rate of PI speed controller: 8 kHz (125 µs)
Sampling rate of PID positioning controller: 1 kHz (1 ms)
Product variants
Order no. 001755 MiniMACS6-AMP-4/50/10
Order no. 001756 MiniMACS6-AMP-4/50/10 OEM
Order no. 001757 MiniMACS6-AMP-4/50/10-IF1 EtherCAT
Order no. 001784 MiniMACS6-AMP-4/50/10-IF1 Ethernet

MicroMACS6 Data

Programmable Motion Controller



MicroMACS6
Compact, freely programmable multi-axis controller with optional BLE (Bluetooth Low Energy) interface.

Controller versions	
	CANopen Master/Slave, Ethernet, Standalone with APOSS® win
Features	
Motion features	Trapezoidal, jerk limited, CAM, synchronous travel, path, kinematics
Profile generator cycle	1 kHz (1 ms)
Sampling rate of PID positioning controller with speed and acceleration feed-forward control	–
Maximum number of axes	6
Web server (visualization)	–
Expandable memory	–
Electrical data	
Logic supply voltage V_c	8 - 28 VDC
Inputs	
Digital inputs	6 (PLC 9...30 VDC or Logic 2...30 VDC)
Analog inputs	2 (12-bit resolution, 0...10 V, 1 kHz)
Hall sensor signals	–
CAN-ID (CAN node identification)	configurable with DIP switch
Output	
Digital output	4 (24 VDC, 100 mA, max. 25 kHz PWM)
Analog output	–
Encoder voltage output	–
Interfaces	
Profinet	–
CAN	2 (max. 1 Mbit/s)
BLE (Bluetooth Low Energy)	optional
EtherCAT-Master / EtherCAT-Slave	–
Ethernet	1 (TCP/IP, max. 100 Mbit/s)
USB 2.0	1
Encoder inputs	
Digital incremental	–
SSI absolute	–
Analog incremental (sin/cos)	–
Hiperface/EnDat	–
Encoder outputs	
Encoder TTL outputs	–
Indicator	
LEDs	3 (status) / Ethernet
Display	–
Environmental conditions	
Temperature – Operation	-30...+55 °C
Temperature – Storage	-40...+85 °C
Humidity (condensation not permitted)	5...90%
Mechanical data	
Weight	ca. 80 g
Dimensions (L x W x H)	55 x 40 x 21 mm
Mounting	M2.5 screws
Ordering Information: Please contact your maxon sales engineer	

001794 MicroMACS6

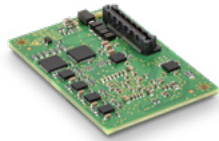
MicroMACS6
Compact and powerful

The MicroMACS6 is a high-performance, ultra-compact, freely programmable multi-axis controller without power output stages. One Ethernet and two independent CAN interfaces are available for commanding up to 6 power stages. The axes can be set up individually or as a kinematics group. Four PWM outputs are available for use with ESCON controllers. An optional BLE (Bluetooth Low Energy) board expands the controller, making it possible to communicate with the controller via a smart-phone app. Note: BLE option on request.

MicroMACS6 Module Data

Programmable Motion Controller

NEW



MicroMACS6 Module
Compact, programmable multi-axis controller as plug-in option for integration into custom motherboards.

Controller versions	
	CANopen Master/Slave, Ethernet, Standalone with APOSS® win
Features	
Motion features	Trapezoidal, jerk limited, CAM, synchronous travel, path, kinematics
Profile generator cycle	1 kHz (1 ms)
Sampling rate of PID positioning controller with speed and acceleration feed-forward control	–
Maximum number of axes	6
Web server (visualization)	–
Expandable memory	–
Electrical data	
Logic supply voltage V_c	8 - 28 VDC
Inputs	
Digital inputs	6 (PLC 9...30 VDC or Logic 2...30 VDC)
Analog inputs	2 (12-bit resolution, 0...10 V, 1 kHz)
Hall sensor signals	–
CAN-ID (CAN node identification)	configurable
Output	
Digital output	4 (24 VDC, 100 mA, max. 25 kHz PWM)
Analog output	–
Encoder voltage output	–
Interfaces	
Profinet	–
CAN	2 (max. 1 Mbit/s)
BLE (Bluetooth Low Energy)	optional
EtherCAT-Master / EtherCAT-Slave	–
Ethernet	1 (TCP/IP, max. 100 Mbit/s)
USB 2.0	1
Encoder inputs	
Digital incremental	–
SSI absolute	–
Analog incremental (sin/cos)	–
Hiperface/EnDat	–
Encoder outputs	
Encoder TTL outputs	–
Indicator	
LEDs	3 (status) / Ethernet
Display	–
Environmental conditions	
Temperature – Operation	-30...+55°C
Temperature – Storage	-40...+85°C
Humidity (condensation not permitted)	5...90%
Mechanical data	
Weight	ca. 9 g
Dimensions (L x W x H)	45 x 30 x 9.8 mm
Mounting	M2 screws
Ordering Information: Please contact your maxon sales engineer	
001822 MicroMACS6 Module	

MicroMACS6 Module
Flexible and compact

The MicroMACS6 Module is designed for flexibility and can be integrated into custom motherboards. The MicroMACS6 Module, with its small size and focused functions (similar to the MicroMACS6), is an excellent choice for users looking for a more affordable alternative to high-performance master motion controllers. For initial commissioning, the MicroMACS6 with identical functionality can be used as a fully integrated and ready-to-use solution. This simplifies the setup process.

MasterMACS Data Programmable Motion Controller



MasterMACS
Rounds off the Motion Controller portfolio with the highest computing power and multiple integrated bus interfaces as standard.

Controller versions	
	CANopen Master/Slave, EtherCAT Master, EtherCAT Slave, Ethernet, Standalone with APOSS® win
Features	
Motion features	Trapezoidal, jerk limited, CAM, synchronous travel, path, kinematics
Profile generator cycle	1 kHz (1 ms)
Sampling rate of PID positioning controller with speed and acceleration feed-forward control	1 kHz (1 ms)
Maximum number of axes	32
Web server (visualization)	yes
Expandable memory	SD-Card
Electrical data	
Logic supply voltage V _C	18 - 30 VDC
Inputs	
Digital inputs	10 (PLC level)
Analog inputs	–
Hall sensor signals	–
CAN-ID (CAN node identification)	configurable with DIP switch
Output	
Digital output	4 (max. 100 mA per output)
Analog output	–
Encoder voltage output	5 VDC, max. 200 mA
Profinet	on request
Interfaces	
CAN	2 high; low (max. 1 Mbit/s)
RS232 / RS485	1 x Rx/D; Tx/D / 1 x Data+; Data-
EtherCAT-Master / EtherCAT-Slave	1 / 1
Ethernet	1
USB 2.0	1 Data+; Data- (Full Speed)
Encoder inputs	
Digital incremental	1 (differential, max. 5 MHz)
Hiperface/EnDat	–
Encoder outputs	
Encoder TTL outputs	–
Indicator	
LEDs	10 (status, USB, EtherCAT)
Display	Option
Environmental conditions	
Temperature – Operation	0...40 °C
Temperature – Storage	–20...+85 °C
Humidity (condensation not permitted)	20...80%
Mechanical data	
Weight	500 / 300 g (DIN/compact housing)
Dimensions (L x W x H)	108 x 108 x 67 / 125 (108) x 98 x 42 mm
Mounting	DIN mounting / compact housing
Ordering Information: Please contact your maxon sales engineer	

001725 MasterMACS DIN 32 ax
001728 MasterMACS compact housing 32ax

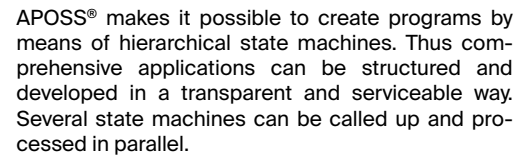
Data logger/web server
For development and analysis purposes, it is frequently helpful to collect, prepare and output data on drive systems.
Our MACS controllers provide easy options for high-performance data storage, be it on an internal SD card or via a connected PC tool. Relevant data can be recorded on a per-event basis or for long-term observation.
This data can be read out and analyzed at a later time. This flexibility makes it possible to use the MasterMACS purely as data collectors. An integrated web server provides the option of performing analysis and configuration via remote diagnostics.

motion control

APOSS® enables simplified implementation of complex motion control applications. The programming is performed in the high-level languages C, which has been supplemented with very powerful, specific motion control commands.

APOSS® IDE – Application Engineering

The development of extensive software systems requires a structured and modular procedure. It is essential to have an appropriate system architecture, including its components and the interfaces to the subsystems and system environment.



Comprehensive positioning and synchronization tasks are initiated with APOSS® using simple commands [e.g. `AxisPosAbsStart()`; `AxisPosRelStart()`; `SyncPos()`; `SyncVel()`;] and processed independently in the background.

- [illegible]

© 2025 maxon. All rights reserved. March edition. Subject to change.



Engineering tailored to your needs

The engineers at maxon have many years of experience in developing controllers and applications, and provide support from programming to commissioning.

