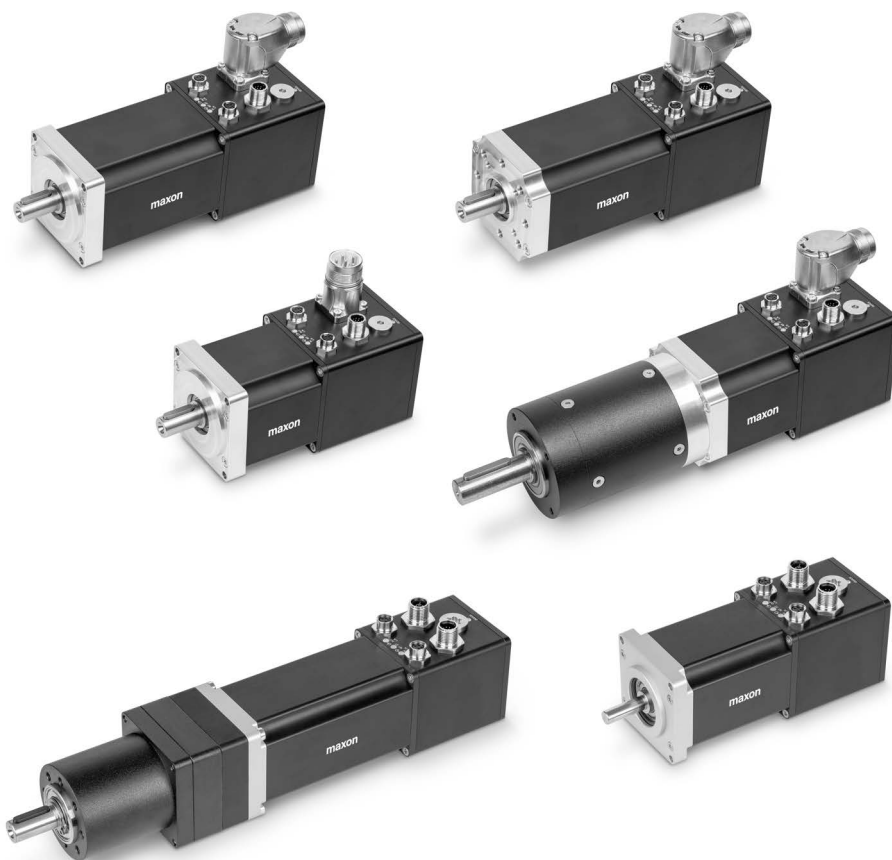


IDX

Quick Installation Guide



idx.maxongroup.com

1 GENERAL INFORMATION

The «IDX» must be installed in a particular and specific way. Therefore, closely follow the described information in given order to achieve both safe and easy installation as well as reliable operational service.

The easiest and safest way of doing

- Do not engage with any task unless you have the knowledge to do so.
 - Make sure that you have read and understood the safety precautions. Observe them, keep them in mind, and follow them at all times.
-

1.1 About this Document

The present document is intended for trained and skilled personnel. If you have any questions or if you should need assistance, please contact your maxon sales partner.

The present document is part of a comprehensive documentation set and must not be understood as an user manual. It makes no claims to completeness and contains only brief descriptions on how to handle the device, how to mount it, and how to establish the electrical connections. For in-depth information, for specifications, and for particular details on the device, consult the respective IDX drive's user manual. You can access the full documentation in maxon's software «EPOS Studio» or download it from ➔www.maxongroup.com or ➔<http://idx.maxongroup.com/>.

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1.2 About the Device

The maxon IDX drives are compact, high-performance, IP65-protected, brushless DC drives particularly suitable for the use in harsh environmental conditions. They come either with integrated positioning controller or speed controller and are also available without integrated electronics.

The IDX drives are designed to be commanded and controlled as a slave node in a CANopen or EtherCAT network. They fully integrate into the maxon EPOS4 environment and possess outstanding position control and speed control capabilities. Latest technology, such as field-oriented control (FOC), acceleration/velocity feed forward in combination with highest control cycle rates and a broad range of other functionalities allow sophisticated, ease-of-use motion or speed control.

Consult the additionally available document «IDX Feature Chart» for detailed information on the range of functions, features, and usable modes.

INTENDED USE

The IDX drives are considered as partly completed machinery according to EU Directive 2006/42/EC, Article 2, Clause (g) and are intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment. They are designed to be used in an industrial machine and must be installed and commissioned according to the information given in its respective user manual. The maxon IDX drive may only be operated within the specifications stated.

Before you continue: Check the user manual for your particular drive's specification and fulfilled standards.

You can access and download the complete configuration of your drive as follows:

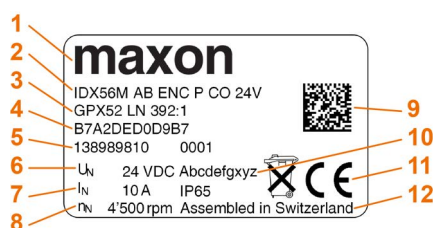
- 1) Open your web browser and enter → www.maxongroup.com
- 2) In the search line: Enter the Configuration ID as to your drive's nameplate
- 3) Sign in with your E-mail address and password
- 4) Download the full specification of your drive

OPERATING CONDITIONS

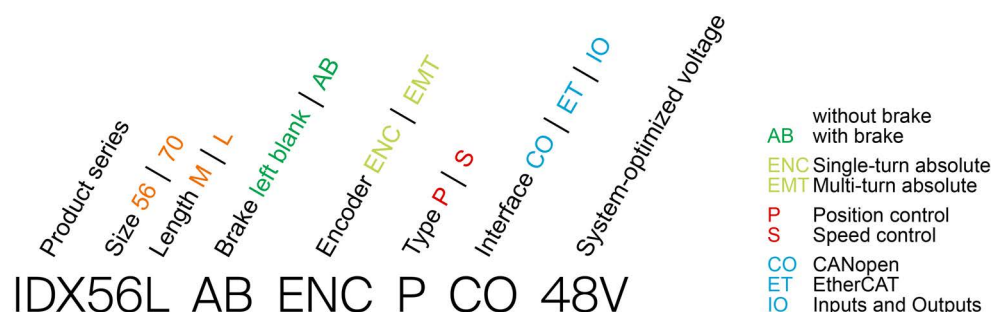
Consult the drive's user manual, the maxon catalog, or the web site <http://idx.maxongroup.com/> for the drive's specific operating temperature range and the specified working points. Outside this temperature range, the drive can be operated up to the specified operating temperature limits but the maximum continuous torque may differ. The built-in EPOS4 motion controller monitors both the winding and the controller temperature and will stop operation when exceeded to avoid damage of the drive until cooled down. Take this fact into consideration when the drive unintentionally ceases operation.

For the operating temperature range of the mounted gear and brake consult the data sheet in the maxon catalog. Consider the lowest temperature of the individual components and reduce the motor's output to meet the specified temperature limits.

NAMEPLATE & IDENTIFICATION KEY



1	Name of manufacturer	7	Nominal supply current
2	Drive type (product designation)	8	Nominal speed
3	Gear type (product designation)	9	Manufacturing code
4	Configuration ID	10	Customer-specific marking
5	Serial number	11	CE marking
6	Nominal power supply voltage	12	Country of origin



1.3 About the Safety Precautions

Do not engage with any work unless you possess the stated skills. Make sure that you observe any regulation with regard to health, safety, and accident prevention as well as to environmental protection applicable in your country and at the site of implementation. Observe them, keep them in mind, and follow them at all times.



DANGER

High voltage and/or electrical shock

Touching live wires causes death or serious injuries!

- Consider any power cable as connected to live power, unless having proven the opposite!
- Make sure that neither end of cable is connected to live power!
- Make sure that power source cannot be engaged while work is in process!
- Obey lock-out/tag-out procedures!
- Make sure to securely lock any power engaging equipment against unintentional engagement and tag it with your name!



WARNING

Draw in/pull in/entanglement hazard

Rotating shaft and drive elements attached to it can cause serious injuries!

- Stay clear of the drive's driven end and do not touch while in operation.
- Keep clothes and other objects away from the drive's driven end and make sure that no loose objects can entangle or be drawn-in with any rotating part.



WARNING

Burst or break hazard

Ejected or slung away parts can cause serious injuries!

- Make sure that the produced centrifugal force at the drive's driven end cannot cause any part to become loose.
- Install suitable safety guards to protect the vicinity around the drive's driven end from possibly ejected or slung away parts or components.



WARNING

Risk of injury

Unintentional or automatic operation can lead to serious injury

- Make sure that the surrounding system is protected from automatic start-up.
- Make sure to apply all necessary safeguards against unintentional operation.



CAUTION

Risk of burns and scalding

Touching hot surfaces may cause serious injuries!

- Do not touch the drive during operation or shortly thereafter.
- Allow the drive to cool down and test the temperature before you touch the casing.

Requirements

- Make sure that all associated devices and components are installed according to local regulations.
- Be aware that, by principle, an electronic apparatus can not be considered fail-safe. Therefore, you must make sure that any machine/apparatus has been fitted with independent monitoring and safety equipment. If the machine/apparatus should break down, if it is operated incorrectly, if the control unit breaks down or if the cables break or get disconnected, etc., the complete drive system must return – and be kept – in a safe operating mode.
- Be aware that you are not entitled to perform any repair on components supplied by maxon.

Improper handling or exceeding forces and loads can cause irreversible hardware damage

- Handle the components with particular care.
- Pay special attention to cleanliness.
- Make sure that no impurities, foreign objects, or particles can penetrate the drive.
- Make sure not to exceed the permitted axial and radial forces while handling the device.
- Make sure that the permitted axial and radial loads will not be exceeded while the drive is in operation.

Electrostatic sensitive device (ESD)

- Wear working cloth and use equipment in compliance with ESD protective measures.
- Handle device with extra care.

2 CONNECTIONS

The subsequent information contains these notations: [a] = adapter M8/M12, A-coded, pinning as to CiA 303 / [b] = cable with open end / [c] = cable with connector / six-digit numbers represent maxon part numbers

CANOPEN AND ETHERCAT INTERFACE / POWER PLUG (WITHOUT ELECTRONICS)

	CANopen IN	CANopen OUT	EtherCAT IN	EtherCAT OUT	Power (IDX 56)	Power (IDX 70)
Connector	M8, male, 5 poles, B-coded	M8, female, 5 poles, B-coded	M12, male, 5 poles, L-coded	M12, male, 5 poles, L-coded	M12, male, 5 poles, L-coded	M23, male, 6 poles, N-coded
Pin 1	CAN_V+		IN_TX+		W1	W1
Pin 2	CAN_SHLD		IN_RX+		W2	W3
Pin 3	CAN_H		IN_RX-		W3	FE
Pin 4	CAN_L		IN_TX-		UBrake + (optional)	UBrake + (optional)
Pin 5	CAN_GND		—		UBrake GND (optional)	UBrake GND (optional)
Pin 6	—		—		—	W2

POWER PLUG, I/O AND ENCODER INTERFACE

	Power (IDX 56)	Power (IDX 70)	I/O (IDX 56; IDX 70)	Sensor (Single-turn Encoder)	Sensor (Multiturn Encoder)
Connector	M12, male, 5 poles, B-coded	M23, male, 6 poles, N-coded	M12, male, 12 poles, A-coded	M12, male, 17 poles, A-coded	
Pin 1	+VCC	+VCC	AnIN1+	GND	GND
Pin 2	+VC	GND	GND	NTC	NTC
Pin 3	GND	FE	AnIN1-	+VCC	+VCC
Pin 4	+VI/O	+VC	AnIN2+	Channel A	do not connect
Pin 5	FE	+VI/O	DigIN1	Channel I\	do not connect
Pin 6	—	not connected	AnIN2-	Channel A\	do not connect
Pin 7	—	—	DigOUT1	Channel B\	do not connect
Pin 8	—	—	DigIN2	Channel I	do not connect
Pin 9	—	—	DigIN3	NTC	NTC
Pin 10	—	—	DigOUT2	Channel B	
Pin 11	—	—	DigIN4	Data\	Data\
Pin 12	—	—	+VI/O	Data	Data
Pin 13	—	—	—	Clock	Clock
Pin 14	—	—	—	Clock\	Clock\
Pin 15	—	—	—	Hall 3	do not connect
Pin 16	—	—	—	Hall 1	do not connect
Pin 17	—	—	—	Hall 2	do not connect

3 MOUNTING

We recommend to mount the IDX with at least four screws (class 6.8 or higher / stainless steel class 70 or higher). The respective tightening torque must be evaluated and calculated in regard to the expected forces in the operative application including necessary safety margins. The screws must be tightened to the specified torque and secured using medium strength threadlocker.

The drive's free shaft end must be connected to the surrounding system by a force-fit, free of play, zero-backlash coupling. First choices are, for example, metal bellow, collet chucks, or shaft-hub joint coupling. They form a frictional connection and are capable to transmit the occurring torque. As with all rigid couplings, an adequately accurate radial, axial, and angular alignment of the two connecting shaft ends is essential.

4 COMMISSIONING

The functionality of the device is determined by its internal operating system (the so-called firmware). The firmware itself is subject to continuous development as part of an ongoing improvement process and is therefore being updated on a regular basis.

- New versions may feature additional or enhanced functionality as well as improved safety-relevant functions, which might not be fully compatible with former versions!
- You can update your device with the latest available versions of firmware and «EPOS Studio» which you can download from <http://idx.maxongroup.com>.

Before downloading a new version, you must check for its compatibility with the hardware version and the existing system setup you are currently using! Consult maxon if you are in doubt.

- Earlier versions are available on request.
- Details on firmware modifications are listed in the document "IDX Firmware Version «Readme»". You may access the document from the «EPOS Studio» or at ➔<http://idx.maxongroup.com>.
- The currently used versions of both firmware and hardware can be read out from the controller using the «EPOS Studio».
- To install a new firmware version, use the functionality "Firmware Update" in «EPOS Studio».
- Be aware that you alone are responsible for using the appropriate firmware version in your present device. Consult maxon if you are in doubt.

maxon or its representatives do not take responsibility nor obligation for any defect (such as, but not concluding; malfunction of the device and/or attached equipment, loss of production, etc.) caused by incompatibility of firmware versions and/or by mismatch of a particular firmware version with a given hardware version!

REQUIREMENTS FOR THE INSTALLATION OF «EPOS STUDIO»

- PC with Windows® 10, 8, 7
- Internet connection








INSTALLING THE GRAPHICAL USER INTERFACE «EPOS STUDIO» ON YOUR PC








- 1) Visit ➔<http://idx.maxongroup.com>
- 2) Click "Download EPOS Setup"

Follow the instructions that will guide you through the configuration process.






5 CABLING

CABLES FOR MAXON IDX DRIVES WITH INTEGRATED POSITIONING AND SPEED CONTROLLER

	Power IDX 56	Power IDX 56	Power IDX 70	IO	IO	EtherCAT	EtherCAT
							
Connector 1	M12 female, 5 poles, L-coded straight	M12 female, 5 poles, L-coded 90°	M23 female, 6 poles, N-coded, straight	M12 female, 12 poles, A-coded, straight	M12 female, 12 poles, A-coded, 90°	M8 male, 4 poles, A-coded, straight	M8 male, 4 poles, A-coded, straight
Connector 2	no connector	no connector	no connector	no connector	no connector	no connector	M8, male, 4 poles, A-coded, straight
Part No. L= 1.5 m	662958	662953	—	662957	662952	662961	—
Part No. L= 3.0 m	662955	662945	711319	662954	662948	662941	662960

	EtherCAT	CANopen	CANopen	CANopen	CANopen	CANopen	CANopen
							
Connector 1	M8 male, 4 poles, A-coded, straight	M8 female, 5 poles, B-coded, straight	M8 male, 5 poles, B-coded, straight	M8 male, 5 poles, B-coded, straight	M12 male, 5 poles, A-coded, straight	M12 female, 5 poles, A-coded, straight	M8 male, 5 poles, B-coded, straight
Connector 2	RJ45	no connector	no connector	M8, female, 5 poles, B-coded, straight	M8 female, 5 poles, B-coded, straight	M8 male, 5 poles, B-coded, straight	—
Part No. L= 1.5 m	662956	662951	662950	—	L = 0.15 m: 662946	L = 0.15 m: 662947	662933
Part No. L= 3.0 m	662942	662935	662934	662959			





CABLES FOR MAXON IDX MOTORS WITHOUT INTEGRATED POSITIONING AND SPEED CONTROLLER

	Power IDX 56	Power IDX 56	Power IDX 70	Sensor	Sensor
					
Connector 1	M12 female, 5 poles, L-coded straight	M12 female, 5 poles, L-coded 90°	M23 female, 6 poles, N-coded, straight	M12 female, 17 poles, A-coded, straight	M12 female, 17 poles, A-coded, 90°
Connector 2	no connector	no connector	no connector	no connector	no connector
Part No. L= 1.5 m	684644	684647	—	—	—
Part No. L= 3.0 m	684646	684648	711319	684650	684651




Note: All IDX 56 are powered by cables with M12 connector, all IDX 70 are powered by cables with M23 connector.

All other connectors (IO, EtherCAT, CANopen and Sensor) are the same on both IDX motor and drive sizes.

CABLES FOR MAXON IDX DRIVES WITH INTEGRATED POSITIONING AND SPEED CONTROLLER [a]

	Power IDX 56	Power IDX 70	IO	CANopen	EtherCAT
					
Cable Manufacturer					
Cable Manufacturer	Phoenix Contact	Helukabel	Phoenix Contact	Phoenix Contact	Phoenix Contact
Manufacturer Part-No.	1379710	707231	1405789	1408543	1408538
Outer sheath, material	PUR	PUR	PUR	PUR	PUR
Wire 1	+V _{CC} , brown	+V _{CC} · L1	AnIN1+, brown	CAN_V+, red	TX+, yellow
Wire 2	+V _C , white	GND · L3	GND, blue	CAN_SHLD · Drain	RX+, white
Wire 3	GND, blue	FE, green-yellow	AnIN1-, white	CAN_H, white	RX-, blue
Wire 4	+V _{I/O} , black	+V _C , brown	AnIN2+, green	CAN_L, blue	TX-, orange
Wire 5	FE, pink [b]	+V _{I/O} , white	DigIN1, pink	CAN_GND, black	—
Wire 6	—	—, L2	AnIN2-, yellow	—	—
Wire 7	—	—	DigOUT1, black	—	—
Wire 8	—	—	DigIN2, grey	—	—
Wire 9	—	—	DigIN3, red	—	—
Wire 10	—	—	DigOUT2, violet	—	—
Wire 11	—	—	DigIN4, grey-pink	—	—
Wire 12	—	—	+V _{I/O} , red-blue	—	—

CABLES FOR MAXON IDX MOTORS WITHOUT INTEGRATED POSITIONING AND SPEED CONTROLLER [a]

	Power IDX 56	Power IDX 70	Sensor
			
Cable Manufacturer	Phoenix Contact	Helukabel	Phoenix Contact
Manufacturer Part-No.	1435446	707231	1435447
Outer sheath, material	PUR	PUR	PUR
Wire 1	W1, brown	W1 · L1	GND, brown
Wire 2	W2, white	W3 · L3	NTC, blue
Wire 3	W3, blue	FE, green-yellow	V _{CC} , white
Wire 4	U _{Brake} +, black	U _{Brake} +, brown	A, green
Wire 5	U _{Brake} GND, pink [b]	U _{Brake} GND, white	I/, pink
Wire 6	—	W2 · L2	A/, yellow
Wire 7	—	—	B/, black
Wire 8	—	—	I, grey
Wire 9	—	—	NTC, red
Wire 10	—	—	B, violet
Wire 11	—	—	DATA/, grey-pink
Wire 12	—	—	DATA, red-blue
Wire 13	—	—	CLK, white-green
Wire 14	—	—	CLK/, brown-green
Wire 15	—	—	HS3, white-yellow
Wire 16	—	—	HS1, yellow-brown
Wire 17	—	—	HS2, white-grey

[a] maxon IDX cables connected to a maxon IDX Motor (without integrated controller) or maxon IDX Drive (with integrated controller) have the color-signal assignment as indicated in this table.

[b] maxon power cables with production year until 2021 have the wire 5 color grey, cables with production year 2022 and newer have the wire color pink; the production month and year are marked on the cable.