maxon

IDX

Quick Installation Guide

CANopen
EtherCAT
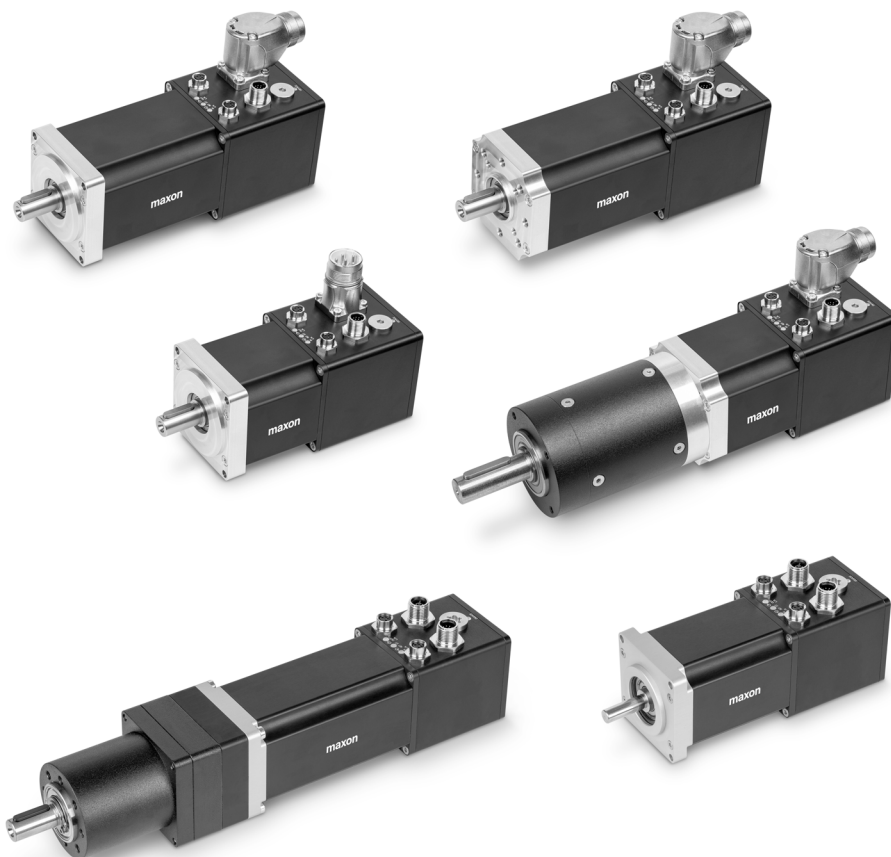I/O ⟷

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.

Continued on next page.

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:
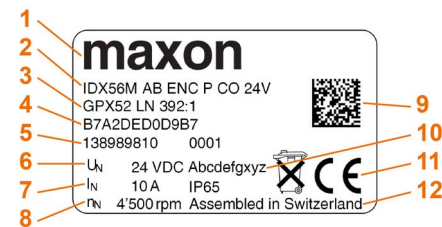
1) Open your web browser and enter ➔ www.maxongroup.com

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

IDX56L AB ENC P CO 48V

Product series
Size 56 | 70
Length M | L
Brake left blank | AB
Encoder ENC | EMT
Type P | S
Interface CO | ET | IO
System-optimized voltage

AB — without brake / with brake
ENC — Single-turn absolute
EMT — Multi-turn absolute
P — Position control
S — Speed control
CO — CANopen
ET — EtherCAT
IO — Inputs and Outputs

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 lose.*
- *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 scaling
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.*
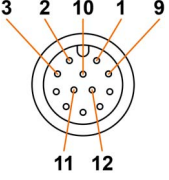- *Handle device with extra care.*

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
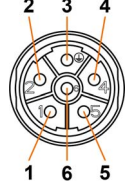
CANOPEN AND ETHERCAT INTERFACE

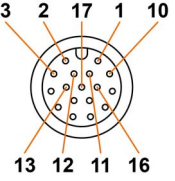|	CANopen IN	CANopen OUT	EtherCAT IN	EtherCAT OUT
Connector	M8, male, 5 poles, B-coded	M8, female, 5 poles, B-coded	M8, female, 4 poles, A-coded	
Pin 1	CAN_V+		IN_TX+	
Pin 2	CAN_SHLD		IN_RX+	
Pin 3	CAN_H		IN_RX−	
Pin 4	CAN_L		IN_TX−	
Pin 5	CAN_GND		—	
Cable L = 0.15 m	662946 [a]	662947 [a]	—	
Cable L = 1.5 m	662951 [b]	662950 [b]	662961 [b] / 662956 [c]	
Cable L = 3.0 m	662935 [b]	662934 [b] / 662959 [c]	662941 [b] / 662942 / 662960 [c]	
Bus termination	—	662933 [b]	—	

POWER PLUG AND I/O INTERFACE

	Power (IDX 56)	Power (IDX 70)	I/O (IDX 56; IDX 70)
Connector	M8, male, 5 poles, B-coded	M23, male, 6 poles, N-coded	M12, male, 12 poles, A-coded
Pin 1	+VCC	+VCC	AnIN1+
Pin 2	+VC	GND	GND
Pin 3	GND	FE	AnIN1−
Pin 4	+VI/O	+VC	AnIN2+
Pin 5	FE	+VI/O	DigIN1
Pin 6	—	not connected	AnIN2−
Pin 7	—	—	DigOUT1
Pin 8	—	—	DigIN2
Pin 9	—	—	DigIN3
Pin 10	—	—	DigOUT2
Pin 11	—	—	DigIN4
Pin 12	—	—	+VI/O
Cable L = 1.5 m	662953 / 662958 [b]	—	662952 / 662957 [b]
Cable L = 3.0 m	662945 / 662955 [b]	711319 [b]	662948 / 662954 [b]

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POWER PLUG (WITHOUT ELECTRONICS)

	Power (IDX 56)	Power (IDX 70)
	M12, male, 5 poles, L-coded	M23, male, 6 poles, N-coded
Connector		
Pin 1	W1	W1
Pin 2	W2	W2
Pin 3	W3	FE
Pin 4	UBrake + (optional)	UBrake + (optional)
Pin 5	UBrake GND (optional)	UBrake GND (optional)
Pin 6	—	W3
Cable L = 1.5 m	684644 / 684647 [b]	—
Cable L = 3.0 m	684646 / 684648 [b]	711319 [b]

ENCODER INTERFACE

	Sensor (Singleturn Encoder)	Sensor (Multiturn Encoder)
	M12, male, 17 poles, A-coded	
Connector		
Pin 1	GND	GND
Pin 2	NTC	NTC
Pin 3	+VCC	+VCC
Pin 4	Channel A	do not connect
Pin 5	Channel I\	do not connect
Pin 6	Channel A\	do not connect
Pin 7	Channel B\	do not connect
Pin 8	Channel I	do not connect
Pin 9	NTC	NTC
Pin 10	Channel B	do not connect
Pin 11	Data\	Data\
Pin 12	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
Cable L = 3.0 m	684650 / 684651 [b]	

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"
3) Follow the instructions that will guide you through the configuration process