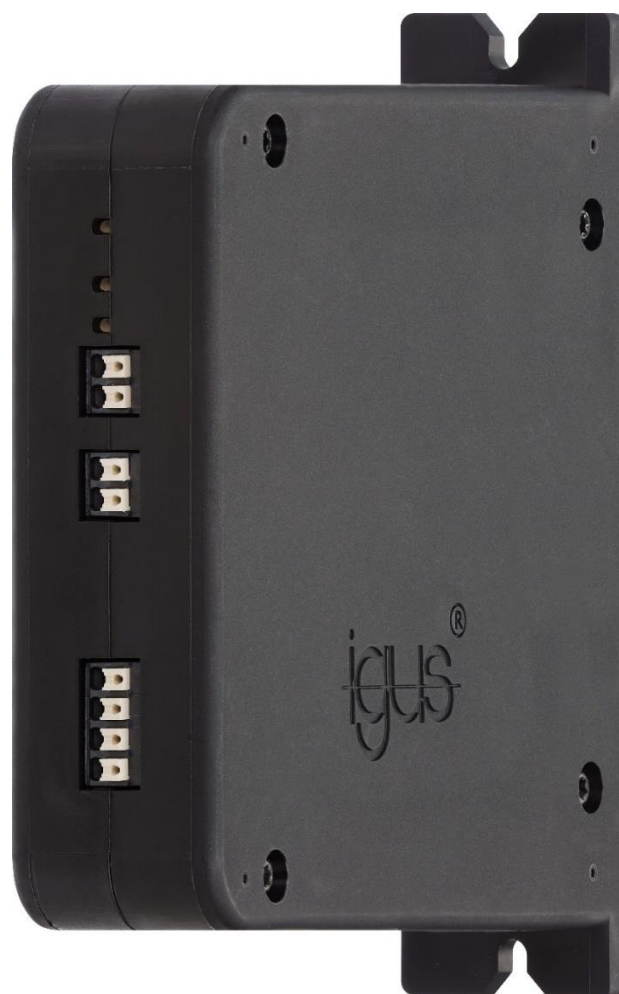


igus® motion Plastics®

dryve D5, DC Motor Driver

Manual V 1.0



Website MotorShop
<http://www.igus.eu/motorshop>



Support Videos
www.igus.eu/dryveXP

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1 Safety Instructions, Protective Measures and Guidelines

1.1 Important Instructions

Read this manual carefully before operating the motor controller. Familiarise with the safety instructions and ensure that the required safety measures are followed.

This manual was created according to the best of our knowledge and belief. It is used for technical documentation and for assisting the user during the initial operation. The warnings, cautions and instructions issued by igus® regarding the motor controller must in any case be passed on to the end user if the motor controller is used as part of an overall system.

igus® undertakes warranties only for igus® products in accordance with the standards, norms and specifications given in this manual. The guarantee covers only the replacement or repair of a defective motor controller. There is no liability for consequential damage and consequential errors. igus® does not take any responsibility for the integration of the motor controller into the overall system. The responsibility for it lies with the plant designer or the end user. Please observe the instructions under "**Qualified Personnel**". igus® assumes no liability for personal injury or damage to property resulting from misuse or unauthorised technical modification of the motor controller.

igus® reserves the right to make changes and improvements to the product or the technical documentation at any time without prior notice.

The motor controller must only be used if:

- All information and safety instructions in this manual have been observed.
- No changes have been made to the motor controller and it is in a technically flawless condition.
- The operating limits that are specified in technical data are complied with.
- Necessary measures, if called for, have been taken for radio interference suppression depending on the operating environment.
- All connection cables used are strain relieved.

1.2 Qualified Personnel

The operation of the product must only be carried out by qualified personnel.

Personnel must:

- Have read and understood this manual and documentation on the installed motor, axis and accessories.
- Be familiar with all relevant applicable standards, provisions and accident prevention regulations.
- Be able, due to their training, to anticipate or recognise any hazards that may arise when using the control system.
- Ensure the safety of persons and objects when using the motor control system in the overall system.

1.3 Maintenance

The motor controller is maintenance-free.

Never open the housing of the motor controller independently, even in the event of a malfunction.

Opening the housing will void the warranty.

1.4 Safety Instructions

1.4.1 Classification of Information

The degree and type of hazard are assigned to one of the following classes.

	DANGER!
Safety instructions marked with DANGER indicate an imminently hazardous situation. A disregard of the notice inevitably leads to a serious or even fatal accident .	

	WARNING!
Safety instructions marked with WARNING indicate a potential hazardous situation. Failure to observe this notice is likely to result in a serious or fatal accident or property damage .	

	CAUTION!
Safety instructions marked with CAUTION indicate potential danger. Failure to comply with the notice may possibly result in an accident or property damage .	

	NOTE
Safety instructions marked with NOTE indicate a potential hazardous situation. Disregard of the notice may possibly result in property damage .	

1.5 Electromagnetic Compatibility

	WARNING!
Risk of injury due to interference with signals and devices Disturbed signals can cause unforeseen device reactions. Carry out the wiring in accordance with the EMC measures. Failure to follow these instructions can result in death, serious injury, or material damage	

	Measures for EMC	Effect
Device assembly	Use cable clamps for the shield support, connect metal parts over a large area.	Good conductivity due to surface contact.
	Switching devices such as contactors, relays or solenoid valves with interference suppression units or spark suppressors (e.g. diodes, varistors, RC elements)	Reduce mutual interference couplings.
Wiring	Keep cables as short as possible.	Avoid capacitive and inductive interference.

2 Product Overview

This motor controller can control DC motors with up to 10 A continuous current (S2 operation) at a supply voltage of up to 24 V.

Ready for immediate use

Connect the voltage source, control signals and motor and you're ready to go. No complicated software installation or time-consuming wiring of various additional switches and sensors.

Simple control

The motors movement direction can be switched simply by applying a signal to the input "POS" or "NEG".

Speed Adjustment

When using a Pulse Width Modulated (PWM) signal source, the motor speed can be adjusted by changing the Duty Factor (On/Off ratio).

2.1 Technical Data

2.1.1 Mechanical Data

D x W x H motor controller in mm	117 x 31 x 124
Weight	130 g
Housing Material	igumid NB V0
Housing Weight (without metal parts)	94 g

2.1.2 Electrical Data

Power supply	12 V (-2 V) up to 24 V (+4 V)	
Actuator type	DC Motors, DC actuators	
Intermittent Duty (S2)	Motor current	10 A
	Peak motor current	30 A (150 ms)
Continuous Duty (S1)	Motor current	7 A
	Peak motor current	21 A (150 ms)
Current Drain Logic	30 mA	
Voltage Inputs	5 V (-2 V) up to 24 V (+4 V)	
PWM Input frequency	500 Hz up to 100 kHz	
PWM Duty Cycle	0% up to 99%	
Dissipation Loss @ 24V	6A	3 W
	10A	9 W
	30A	24 W
Cable length	Max.3 m	
Allowed Cable Cross Sections	0,34 mm ² up to. 1,5 mm ²	
	AWG 22 up to AWG 16	

2.1.3 Environmental conditions

Ambient temperature	Operation	-20 °C to +45 °C
	Transport	-40 °C to +60 °C
	Bearing	-40 °C to +60 °C
Relative humidity	≤ 90 %, non-condensing	
Protection class	IP 20	

3 Installation

3.1 Mechanical Installation

	WARNING!
• Danger of malfunction • Fire hazard • Explosion hazard Never operate the motor controller in water or in an aggressive, flammable, or explosive atmosphere. Always pay attention to the environmental conditions	

- The installation in a switch cabinet can be performed on a TS 35 mounting rail (EN 50022)
- The distance to neighbouring components must be at least 10 mm.
- The heated air flow of other units and components must not be routed through the area of the motor control unit
- The device must be aligned vertically. For horizontal alignment, the maximum power must be reduced by 30% to prevent overheating

3.2 Electrical Installation

The dryve D5 motor controller is constructed for use with direct currents.
Every voltage mentioned in this manual can be regarded as direct current.

	WARNING!
• Risk of injury Make sure that an emergency shutdown can be performed at all times.	

	CAUTION!
• Danger of electrical voltage • Danger of electric arcs Always turn off the power before disconnecting or making electrical connections in the system. Secure the power supply against restart. After switching the device off, wait at least 5 minutes. Check for the absence of voltage before working on the system. Danger of improperly mounted electrical connections. Do not allow cables to be unmounted and ensure that all connections are secure.	

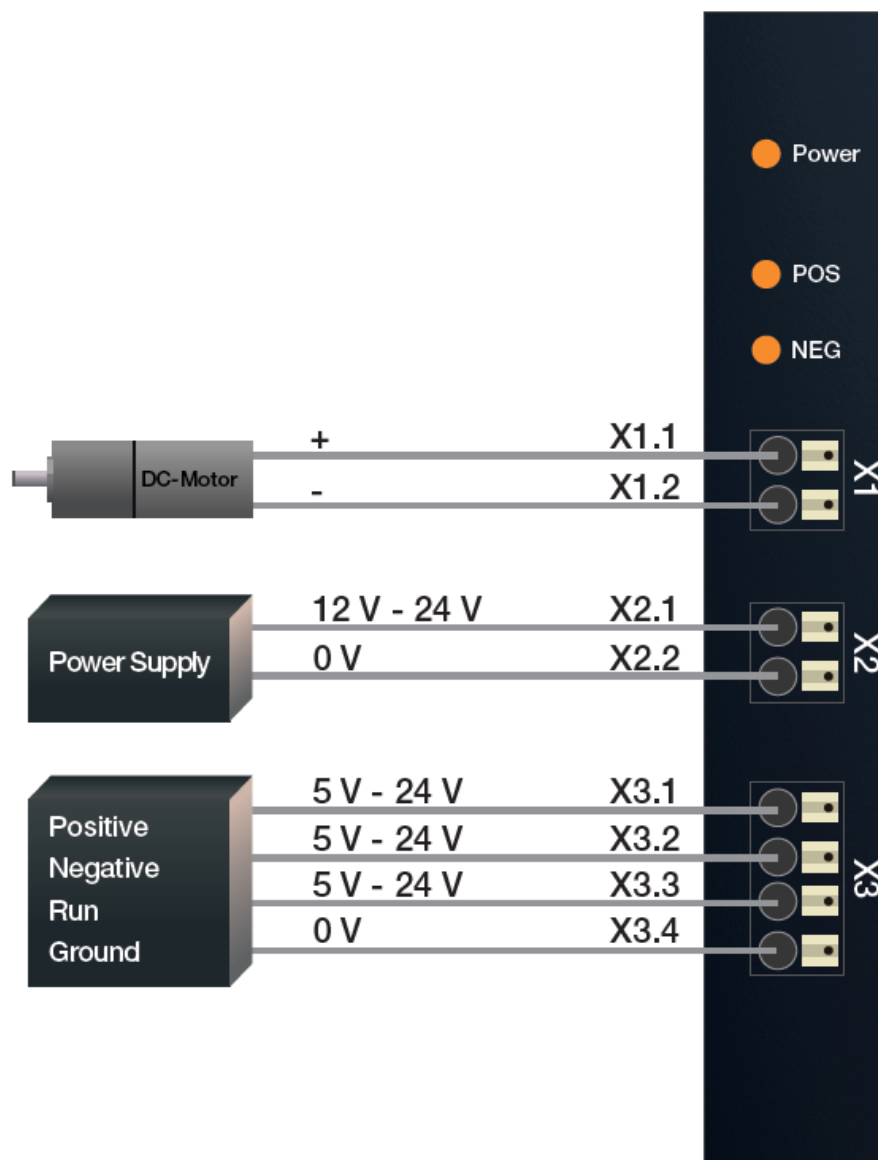
	CAUTION!
• Electromagnetic alternating fields Electromagnetic fields around the live wires may cause interference. Lay the supply and motor cables separately from the control cables. Use the shortest possible cable lengths. Follow the instructions for Electromagnetic Compatibility (p. 4)	

	NOTE
An operating voltage above the voltage specified in the technical data, as well as a voltage reversal will destroy the motor controller. Select an operating voltage within the voltage range specified in the technical data.	

3.2.1 Pin Assignment

The connectors must be wired according to your application.

Connector	Name	Pin	Description	Voltage limits
X1	Motor	+	Positive Motor connection	-
		-	Negative Motor connection	-
X2	DC IN	+	Power Supply connection	12 V to 24 V
		-	Ground	Ground
X3	Inputs	POS	Positive Motion	5 V to 24 V
		NEG	Negative Motion	5 V to 24 V
		RUN	Enable	5 V to 24 V
		GND	Input Ground	0 V



3.3 Integration into Safety Circuits

The integration into a safety circuit must always be in accordance with the applicable regulations.

The following options are available

Measures	Advantages	Disadvantages
Switching off the load supply voltage	Direct de-energisation of the motor	Uncontrolled coasting of the motor
Switching off control signals "POS" <u>and</u> "NEG"	Generation of a braking torque by short-circuit breaking	High mechanical stress
Switching off the enable signal "RUN"	Direct de-energisation of the motor	Uncontrolled coasting of the motor. Motor could remain energised in a fault condition.
Switching off the control signals at "POS" <u>and</u> "NEG" and delayed switch-off of the enable signal "RUN"	Generation of a braking torque by short-circuit breaking	No direct de-energisation of the motor. Motor could remain energised in a fault condition.
Switching off the control signals at "POS" <u>and</u> "NEG" and delayed switch-off of the load supply voltage	Generation of a braking torque by short-circuit breaking with subsequent de-energisation of the motor	No direct de-energisation of the motor.

4 Execution of Movements

Connect the whole system according to [Electromagnetic Compatibility](#) (p. 4)

Minimum equipment

To control a motor with the drive controller, a minimum equipment has to be provided by the user:

1. Power supply with 12 V to 24 V and connecting cables
2. DC motor with suitable cable
3. Switches/Digital Outputs with suitable cable

	DANGER!
• Danger of falling load Never work under unsecured vertical axes and loads. Secure the axis or load against falling by a mechanical safety device or other approved safety method.	

	WARNING!
• Fire hazard Faulty mechanical designs can lead to extremely high motor and motor control temperatures, as it can destroy them or cause fires..	

NOTE
A faulty connection can damage or destroy the motor controller.

To execute a movement, a 5 V to 24 V signal must be permanently applied to the "RUN" input.
A clockwise (CW) movement is executed by applying a 5 V to 24 V signal to "POS".
A counter-clockwise (CCW) movement is executed by applying a 5 V to 24 V signal to "NEG".

X3 Inputs			X1 Motor		Function
POS	NEG	RUN	+	-	
X	X	0	Open	Open	X1 Motor does not emit any Potential. Soft Stop executed when in motion
1	0	1	+V	GND	Positive (CW) motor movement
0	1	1	GND	+V	Negative (CCW) motor movement
0	0	1	GND	GND	Winding brake
1	1	1	+V	+V	Winding brake

4.1.1 Speed Adjust

If the motor speed shall be adjustable a Pulse Width Modulated signal (PWM) must be connected to the input "POS" or "NEG". Depending on the duty Cycle (ON-Off ratio of one signal period, 0 to 99%) an average signal height will be obtained thus changing the effective motor output voltage being emitted.

4.2 Motor Direction

For a proper operation, it is necessary that the motor rotates in a defined direction.
For determination, please use the following procedure:

1. View onto drive shaft
2. Executing a motion by applying a constant signal at "POS"
3. Clockwise rotation corresponds to a right-hand rotation

If the motor rotates counter clockwise (CCW), the polarity of the motor connecting cables must be changed.

5 Service

Customer service

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Technical support for igus dryve motor control systems

Support Videos

<http://www.igus.eu/dryveXP>

Video guides explaining the functional range and the setup of the motor controller

Additional product videos

Website Motor Shop

<http://www.igus.eu/motorshop>

Motors, limit switches and other accessories available to purchase

Download data sheets for electrical drive technology

Website drylin drive technology

www.igus.eu/drivetechology

Download data sheets of the mechanical drive technology

Ordering of axes, linear robots and accessories

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