

ECAT-2094DS

4-axis Stepper Motor Controller/Driver

Features

- Support CiA402 protocol
- Supports four stepper motors (2-phase bipolar)
- Stepper motors are controlled in an open loop operation
- Programmable coil current level: up to 3.3 A/phase
- Programmable microstep size: maximum 256 microsteps per full step
- Automatic current reduction to reduce heat generation when motor is at standstill
- Distance between stations up to 100 m (100BASE-TX)
- Support daisy chain connection

Introduction

The ECAT-2094DS stepper motor controller is a cost-effective, two-phase bipolar stepper driver. The ECAT-2094DS simultaneously controls up to four stepper motors. A motor voltage range between 16 to 29VDC and a maximum motor coil current of 3.3A/phase is being supported. For each motor the maximum running coil current, microstep resolution and other motion parameters are software selectable.

The ECAT-2094DS is a standard EtherCAT SubDevice and an EtherCAT MDevice is required to operate the device. The ECAT-2094DS supports two operation modes: Free-Run and Distributed Clock (DC).

Two-phase bipolar stepper motors can be directly connected to the ECAT-2094DS device. The device is designed to operate the stepper motor in an open loop. Configuration has to be done by the EtherCAT MDevice and the application program. Each stepper motor is being independently controlled by a separated driver IC. The four driver ICs are not synchronized and work independently from each other. The driver automatically controls the torque and position of the motor. An integrated ramp generator automatically calculates the acceleration and deceleration distance. In position mode the controller drives the motor to the target position and in velocity mode accelerates the motor to the target velocity. All motion parameters can be changed on the fly.

The ECAT-2094DS has four integrated incremental encoder interfaces. Four 32 bit high frequency encoder counter counts the input signal of external incremental encoders. The encoder can for example be used for homing purposes and for consistency checks.

High resolution of up to 256 microsteps per full step is supported for a ensuring smooth and precise motor operation.

For each motor three digital input channels are provided.Left and right hardware limit switch and a home switch.Hardware limit switch which automatically stops the motor when activated, and all three digital inputs can be used to search home position.

Applications

- Automated Test Equipment
- Surveillance Systems
- Labeling Machinery
- Packaging
- Semiconductor Manufacturing
- Engraving Machine
- Automatic Feeding Machine

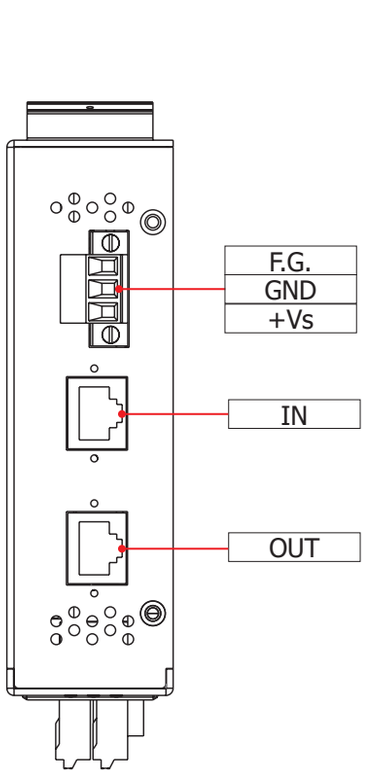
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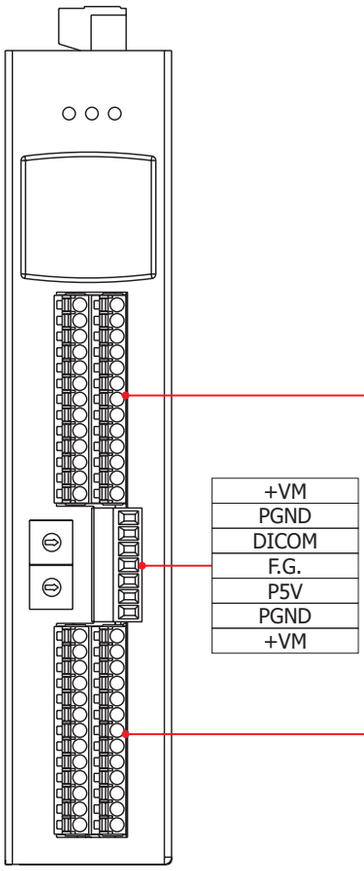
Specifications

Model		ECAT-2094DS
EMS Protection		
EFT (IEC 61000-4-4)		Signal : 1 KV Class A; Power : 1 KV Class A
ESD (IEC 61000-4-2)		4 KV Contact for each channel
Surge (IEC 61000-4-5)		1 KV Class A
LED Indicators		
Status		1 x Power 1 x Operation State 2 x Communication 12 x DI status 18 x Motion status
Encoder Input		
No. of Axes		4, differential
Mode		A/B phase, CW/CCW, Pules/Dir
Frequency		1 MHz Max.
Motor Output		
No. of Axes		4
Microsteps Per Step		256, 128, 64, 32, 16, 8, 4, 2
Output Current		3.3 A/phase
Step Frequency		8.192 MHz Max.
Voltage Range of The Motor Output		16 to 29 VDC
Digital Input		
Channels		12
Type		Wet Contact
ON Voltage Level		10 ~ 24 VDC
OFF Voltage Level		4 VDC Max.
Isolation		3750 VDC
EtherCAT		
Ports		2 x RJ-45
Distance Between Stations		100 m Max. (100Base-TX)
Data Transfer Medium		Ethernet/EtherCAT Cable (Min. CAT 5), Shielded
Cycle Time		0.5 Millisecond
Distributed Clocks		Yes
Power		
Input Range		+20 VDC ~ +30 VDC
Mechanical		
Casing		Metal
Dimensions (W x L x H)	DIN-rail mounting	37 mm x 191 mm x 148 mm
	Wall mounting	37 mm x 229 mm x 142 mm
Installation		DIN-rail mounting or wall mounting
Environmental		
Operating Temperature		-25 ~ +40 °C
Storage Temperature		-30 ~ +80 °C
Ambient Relative Humidity		10 ~ 90% RH (non-condensing)

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Pin Assignments



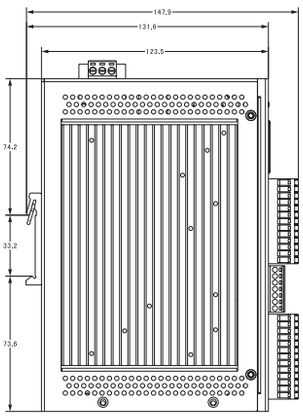


Y_OA1	X_OA1
Y_OA2	X_OA2
Y_OB1	X_OB1
Y_OB2	X_OB2
Y_A+	X_A+
Y_A−	X_A−
Y_B+	X_B+
Y_B−	X_B−
Y_C+	X_C+
Y_C−	X_C−
Y_LL	X_LL
Y_RL	X_RL
Y_ORG	X_ORG

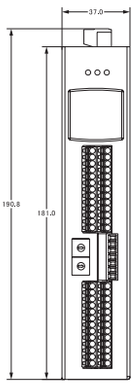
U_OA1	Z_OA1
U_OA2	Z_OA2
U_OB1	Z_OB1
U_OB2	Z_OB2
U_A+	Z_A+
U_A−	Z_A−
U_B+	Z_B+
U_B−	Z_B−
U_C+	Z_C+
U_C−	Z_C−
U_LL	Z_LL
U_RL	Z_RL
U_ORG	Z_ORG

Dimensions (Units: mm)

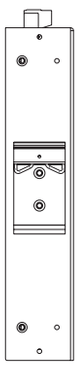
DIN-rail mounting



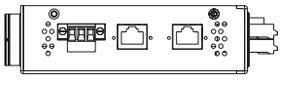
Left Side View



Front View

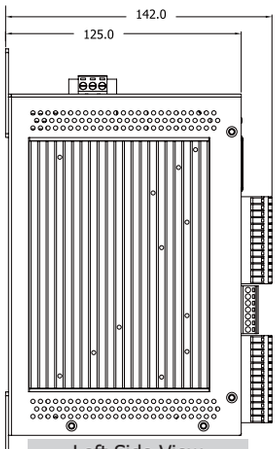


Right View

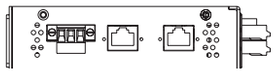


Top View

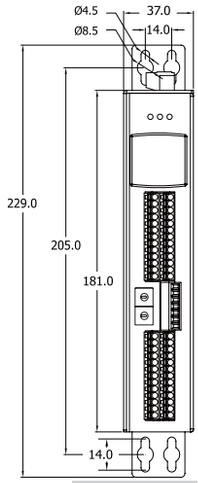
Wall mounting



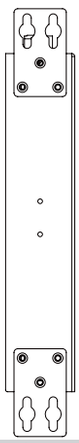
Left Side View



Top View



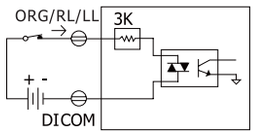
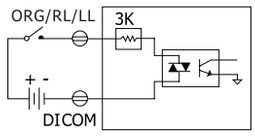
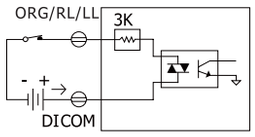
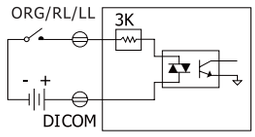
Front View

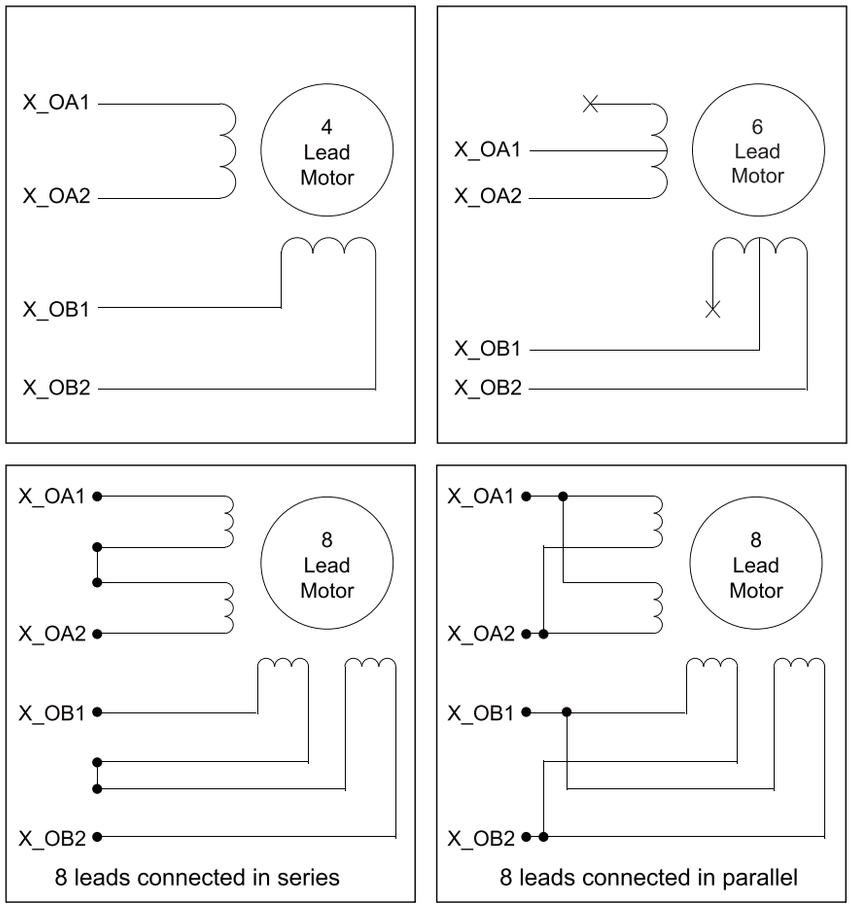


Right View

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Wire Connections

Digital Input	Readback as 1	Readback as 0
Sink	+10 ~ +24 VDC	OPEN or <4 VDC
		
Source	+10 ~ +24 VDC	OPEN or <4 VDC
		



Ordering Information

ECAT-2094DS CR	EtherCAT SubDevice CiA402 Standard 4-axis stepper motor controller/driver (Metal Case) (RoHS)

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