



## 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 9 and 29V DC 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 slave and an EtherCAT master 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 master 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.

The module must be supplied by three power sources. Two motor supply and a 24Vdc control supply. Two motors share one power supply.

### Applications

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

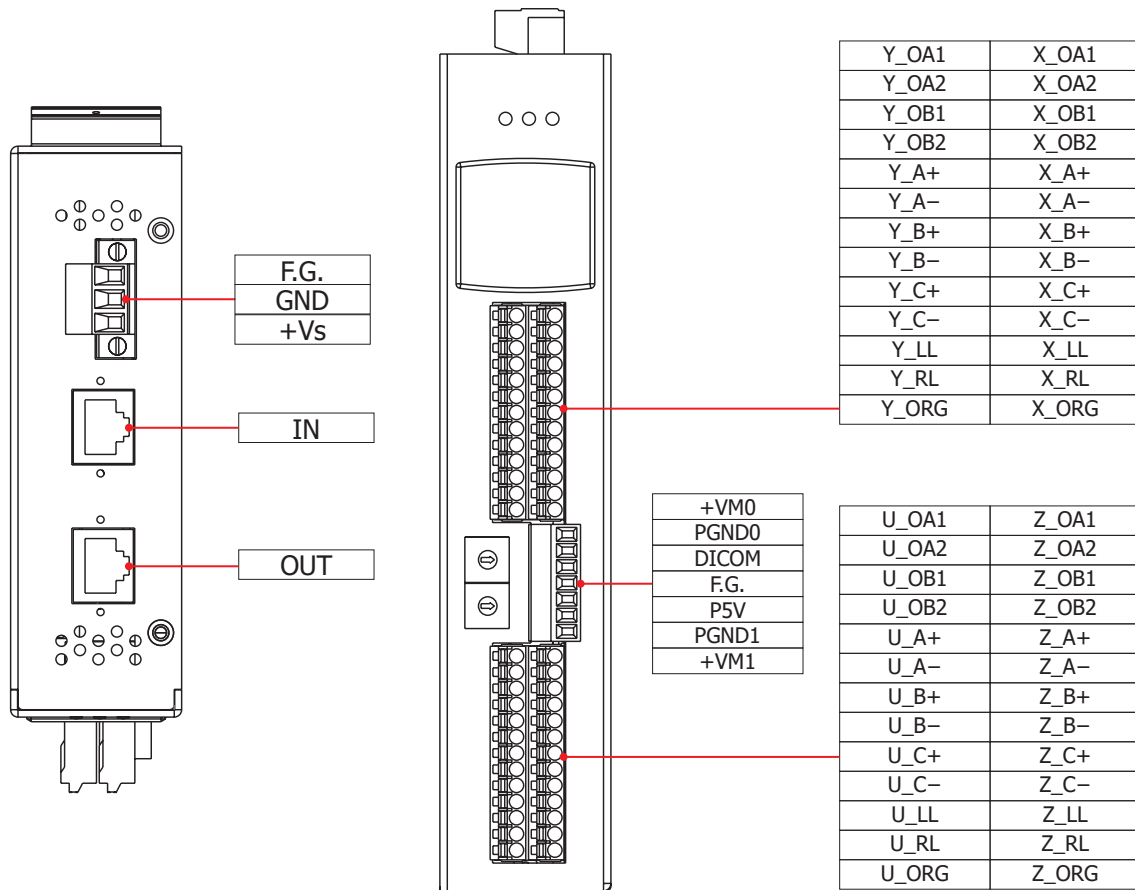


## Specifications

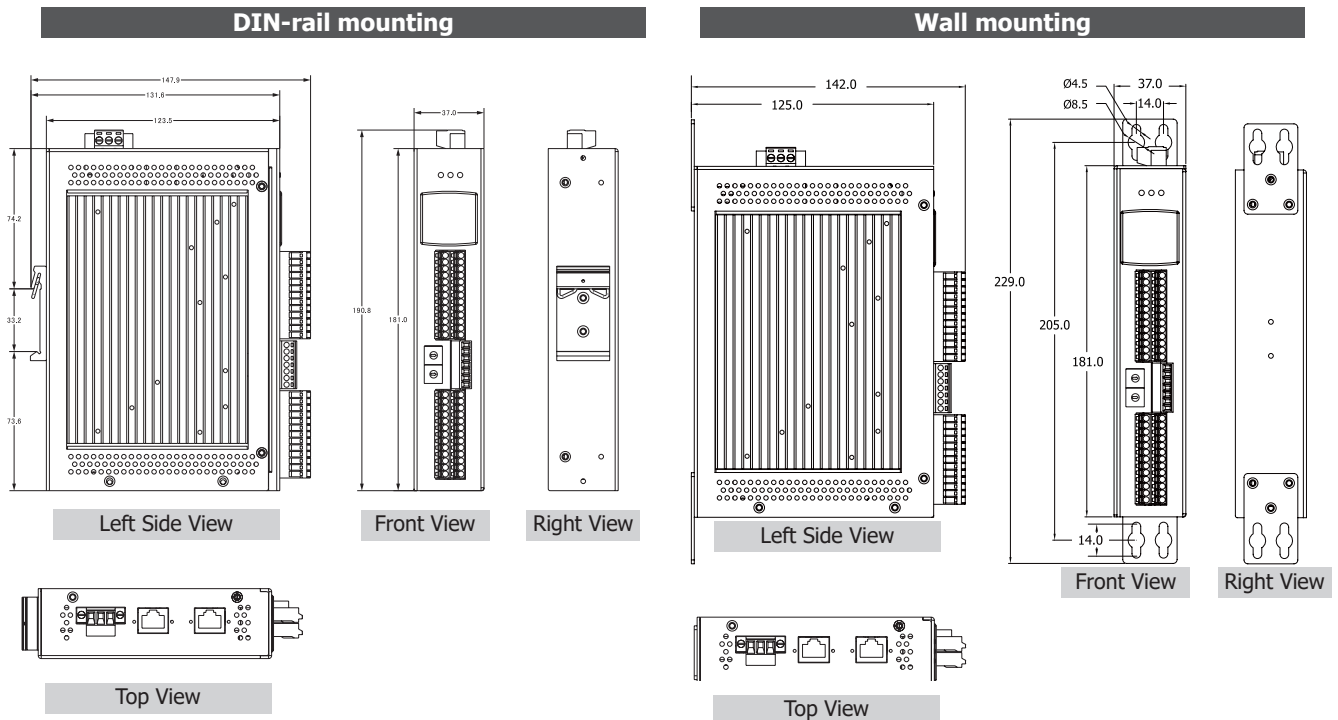
Model	ECAT-2094DS	
<b>EMS Protection</b>		
EFT (IEC 61000-4-4)	Signal : 1 KV Class A; Power : 1 KV Class A	
ESD (IEC 61000-4-2)	4 KV Contact for each channel	
Surge (IEC 61000-4-5)	1 KV Class A	
<b>LED Indicators</b>		
Status	1 x Power 1 x Operation State 2 x Communication 12 x DI status 18 x Motion status	
<b>Encoder Input</b>		
No. of Axes	4, differential	
Mode	A/B phase, CW/CCW, Pules/Dir	
Frequency	1 MHz Max.	
<b>Motor Output</b>		
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	9 to 29 VDC	
<b>Digital Input</b>		
Channels	12	
Type	Wet Contact	
ON Voltage Level	10 ~ 24 VDC	
OFF Voltage Level	4 VDC Max.	
Isolation	3750 VDC	
<b>EtherCAT</b>		
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	
<b>Power</b>		
Input Range	+20 VDC ~ +30 VDC	
<b>Mechanical</b>		
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	
<b>Environmental</b>		
Operating Temperature	-25 ~ +40 °C	
Storage Temperature	-30 ~ +80 °C	
Ambient Relative Humidity	10 ~ 90% RH (non-condensing)	



## Pin Assignments



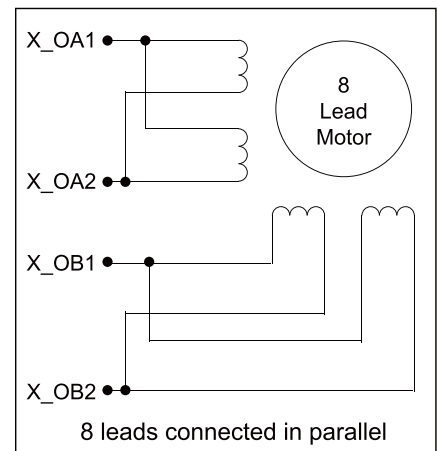
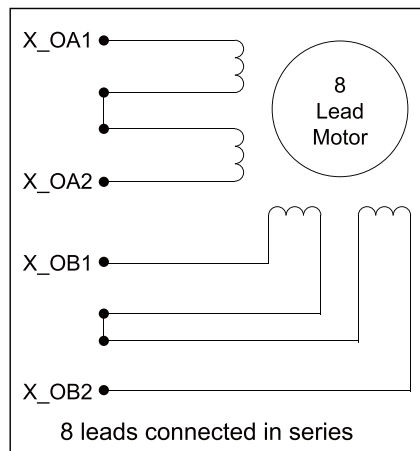
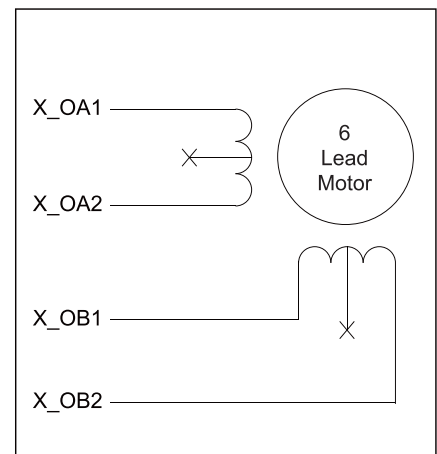
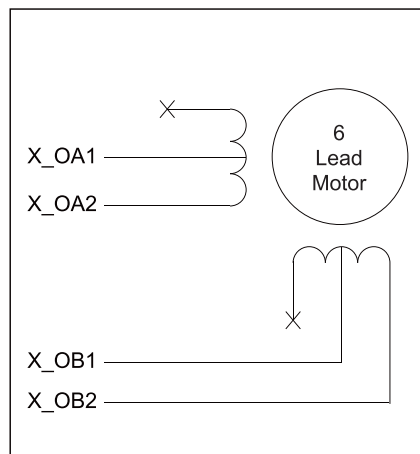
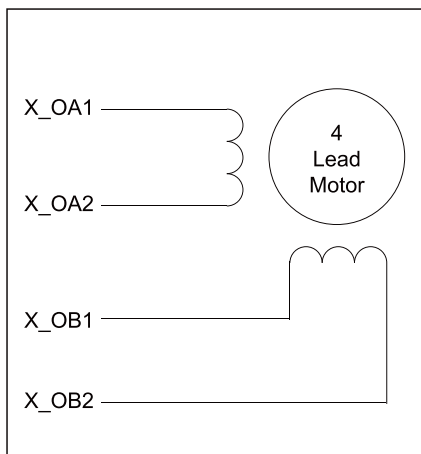
## Dimensions (Units: mm)





## Wire Connections

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



## Ordering Information

ECAT-2094DS

EtherCAT slave CiA402 Standard 4-axis stepper motor controller/driver (Metal Case) (RoHS)