ALLMOTION

General Specifications

EZStepper® Model **EZHR23EN48V**

Intelligent Controller/Driver with Dual Encoder Feedback, up to 50V supply

Supply Input.......................... +12 to +50V 3A

Dimensions........................... Board: 2.25" X 2.25" (57mm X 57mm) square, .762" (19mm) thick. With heat sink: 2.75" X 2.35" (70mm X 60mm), 1.217" (31mm) high.

Step Resolution/Speed......... Selectable 1/2 to 1/256th step; 20 million microsteps/second

Operating Modes.................. PC controlled or standalone

PC Control .... Up to 16 products can be daisy-chained together in RS485.

Communications Protocol..... USB and RS485. Direct USB and RS485 connections built in. Provision built in for future addition of CAN protocol.

Control Protocol................... Compatible with devices that use the Cavro DT or OEM protocol. Can use EZCommander™ Windows application or serial terminal program such as HyperTerminal to issue ASCII text-based commands.

Motor Compatibility.............. Typically compatible with any stepper motor that is 3" or smaller (size 23 or smaller). Outputs can regulate to any motor voltage via software commands.

Mating Connectors .... AMP MTA 100 series. Recommended tools: Digikey A9982; or (better) A1998 + A2031. (See Application Note 131021 for other connector options.) USB Mini-B receptacle included.

Digital/Analog Interface .... Accepts 2 opto-electronic inputs, or 4 ADC or mechanical switch inputs (I/O 1 through 4 not currently coded). ADC inputs accurate to 7 bits; can modify to 10 bit (contact factory).

Signal Levels: <0.8V Vlow; >2V Vhigh (TTL compatible). Threshold set at 1.23V; can be changed via programming.

Optical switch specifications: Transistor optical switch with IC> 1 mA @ IF=20mA. Examples: Digikey QVA11134 or H21A1; Honeywell HOA1887-012 or HOA1870-33 (prewired); OPTEK OPB830W11 (prewired).

5V Output Current .... <200mA (power available for encoders and sensors)

Encoder Interface .... Max. freq. 4 MHz, 5V signals (3.3V upon special request)

Operating Temperature......... -20 to 85 °C PCB copper temperature

Relative Humidity.................. 10% to 90% non condensing (operating and storage)

Approx. actual size

For rapid implementation of stepper motor solutions where up to 50V power is available.
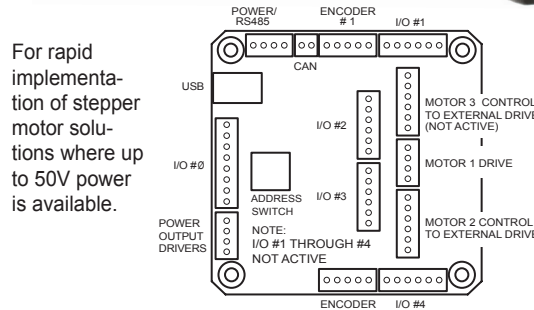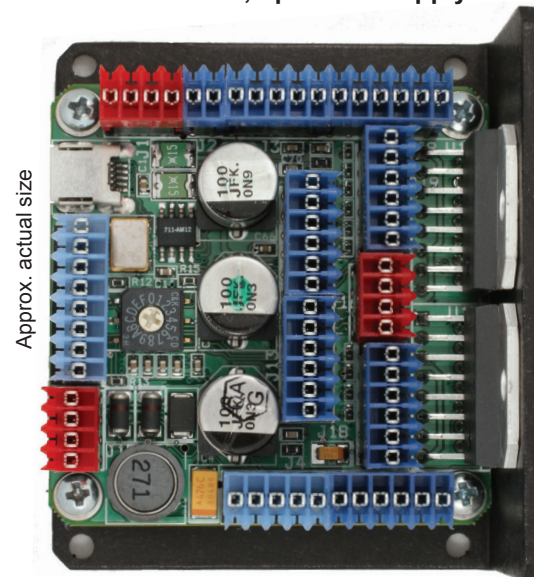
I/O #Ø CONNECTOR
Mating connector: AMP MTA 100 Series 8 pin, 26 GA, part 3-643815-8 Digikey part A31030-ND

Pin	Function	Notes
1	Switch input #2, A/D input #2	10k Ω pullup to 3.3V. Switch closure is to ground.
2	Switch input #1, A/D input #1	10k Ω pullup to 3.3V. Switch closure is to ground.
3	Opto sensor #2 LED	See Note 1.
4	Opto sensor #2 input, A/D input #4, switch	10k Ω pullup to 3.3V. Switch closure is to ground.
5	Opto sensor #2 ground	Common input ground
6	Opto Sensor #1 LED	See Note 1.
7	Opto Sensor #1 input, A/D Input #3, switch	10k Ω pullup to 3.3V. Switch closure is to ground.
8	Opto sensor #1 ground	Common input ground

ENCODER CONNECTORS (2)
Mating connector: AMP MTA 100 Series 5 pin, 26 GA, part 3-643815-5 Digikey part A31027-ND

Pin	Function	Notes
1	Ground	Ground for encoder
2	Index	Input from encoder. High level must be >4.5V (external pullups may be required).
3	Chan A	Input from encoder. See comment for Pin 2.
4	+5V (V+)	Power to encoder
5	Chan B	Input from encoder. See comment for Pin 2.

POWER OUTPUT DRIVERS CONNECTOR
Mating connector: AMP MTA 100 Series 4 pin, 22GA, part 3-643813-4 Digikey part A31108-ND

Pin	Function	Notes
1	ON/OFF Driver #2 (V-)	Open collector
2	ON/OFF Driver #2 (V+)	2A peak; 1A continuous
3	ON/OFF Driver #1 (V-)	Open collector
4	ON/OFF Driver #1 (V+)	2A peak; 1A continuous

Note 1: Each LED sensor input includes a series 200 Ω resistor to 5V. Resistor can be removed for sensors needing direct access to 5V. Max current draw is <200mA.

POWER AND RS485 COMMUNICATION
Mating connector: AMP MTA 100 Series 4 pin, 22 GA part 3-643813-4 Digikey part A31108-ND

| Pin	Function
1	V+ (external supply) +12–50V
2	GROUND
3	RS485 B
4	RS485 A

MOTOR 1 DRIVE CONNECTOR
Mating connector: AMP MTA 100 Series 4 pin, 22 GA part 3-643813-4 Digikey part A31108-ND

Pin	Function
1	Motor A+
2	Motor A-
3	Motor B+
4	Motor B-

MOTOR 2 & 3 CONTROL CONNECTORS
Mating connector: AMP MTA 100 Series 6 pin, 22 GA closed end part 3-640440-6 Digikey part A31084-ND

| Pin	Function	Notes
1	TTL	Not currently active.
2	PWM	Not currently active.
3	DIRECT	Pulse output. Not currently active on Motor 3.
4	STEP	Voltage level output. Not currently active on Motor 3.
5	GROUND	Common ground
6	Drive V+	Input power pass-through to external drive

Connectors continue on next page.

Mechanical Specifications
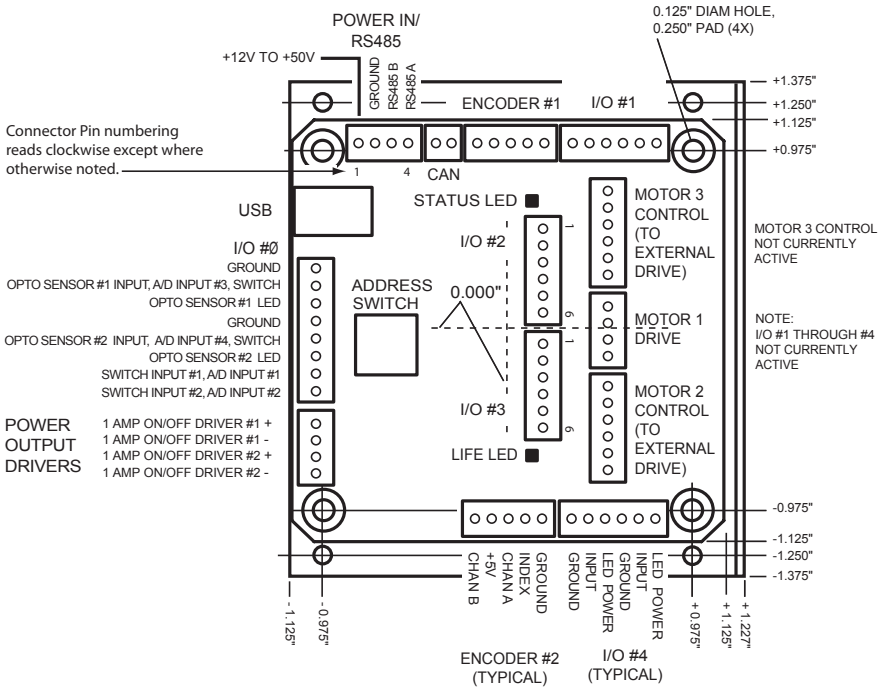
INPUT CHANNEL ASSIGNMENTS, I/O CONNECTORS #1 THROUGH 4

Connector	A/D	OPTO	SWITCH
I/O #1	A=TBD B=TBD	A=TBD B=TBD	A=TBD B=TBD
I/O #2	A=TBD B=TBD	A=TBD B=TBD	A=TBD B=TBD
I/O #3	A=TBD B=TBD	A=TBD B=TBD	A=TBD B=TBD
I/O #4	A=TBD B=TBD	A=TBD B=TBD	A=TBD B=TBD
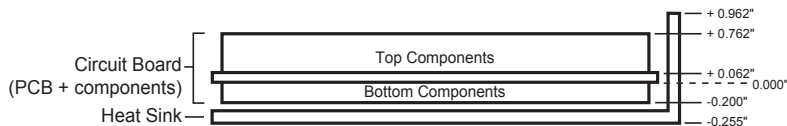
See wiring diagram (on website) for application details. EZInch Stepper Drive recommended for Motor Control outputs.

Ordering Information

Name	Order Number
EZHR23EN48V Stepper Controller/Driver	EZHR23EN48V
RS232 to RS485 Converter (option)	RS485
USB Communication Cable (option)	USB-MINI

RoHs-compliant available on special order

Connectors, continued

I/O CONNECTORS #1 THROUGH #4
Mating connector: AMP MTA 100 Series 6 pin, 26 GA,
part 3-643815-6   Digikey part A31028-ND

Pin	Function	Notes
1	LED power A	See Note 1 on front of sheet.
2	A/D, optical sensor, or switch input A	$10k\Omega$ pullup to 3.3V. Switch closure is to ground.
3	GROUND	Common input ground
4	LED power B	See Note 1 on front of sheet.
5	A/D, optical sensor, or switch input B	See pin 2 notes.
6	GROUND	Common input ground

See diagram at left for channel assignments on I/O connectors #1 through #4.

Key Features

- 12V to 50V 3A operation
- Fits on back of size 23 stepper motor
- Selectable step resolution from 1/2 to 1/256th
- Up to 20 million microsteps/second
- Pre-wired for opto-switch inputs
- 4 ADC inputs. Halt/branch on analog value
- RS232, RS485, or USB-based communications
- Direct USB and RS485 connection built in
- Industry-standard communications protocol
- Single 4-wire bus links up to 16 AllMotion® controllers/drivers
- Switch-selectable device address
- Standalone operation with no connection to a PC
- Accepts dual encoders, position maintain mode
- Five digital I/O and two 1A power on/off drivers included
- 3A chopper (PWM) driver
- On-board EEPROM for user program storage
- Software-selectable move and hold currents
- Hold current automatically selected upon move completion
- Homes to opto or switch closure with single command
- Fully programmable acceleration ramps and speeds
- Execution halt/branch pending switch closure