



## General Specifications

|                              |                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply Input .....           | 12V to 40V 5A.<br><i>Examples:</i> Digikey part 285-1820 or 1470-1015                                                                                                                                                                                                                                                                                                               |
| Dimensions .....             | 2.25" x 2.25" (57 mm x 57 mm) square, 1" (25.4mm) thick                                                                                                                                                                                                                                                                                                                             |
| Operating Modes .....        | PC controlled or standalone. Position, velocity, and torque.<br>Optional Step & Direction mode.                                                                                                                                                                                                                                                                                     |
| PC Control.....              | Can control up to 16 drives daisy chained together.                                                                                                                                                                                                                                                                                                                                 |
| Communications protocol..... | RS485. Can convert to RS232/USB with appropriate converters.                                                                                                                                                                                                                                                                                                                        |
| Control protocol .....       | Compatible with devices that use the Cavo DT or OEM protocol.<br>Can use EZCommander™ Windows application or serial terminal program such as HyperTerminal to issue commands.                                                                                                                                                                                                       |
| Motor compatibility.....     | Accommodates most DC brush or brushless servo motors less than 3" in diameter. Best performance is with motor rated at about 1/2 of supply voltage. Outputs short protected.                                                                                                                                                                                                        |
| Mating Connectors.....       | AMP MTA 100 series (except high-current power drivers).<br>Recommended tool: Digikey part A9982, or better Digikey parts A2031 + A1998. (See Application Note 131021 for non-standard connector options.)                                                                                                                                                                           |
| I/O Interface.....           | Accepts 2 opto-electronic and two mechanical switch inputs, or 4 mechanical switch inputs. Also ADC and encoder inputs.<br>Signal Levels: <0.8V Vlow; >2V Vhigh (TTL compatible)<br>Optical switch specifications: Transistor optical switch with IC> 1 mA @ IF=20mA. <i>Examples:</i> OPTEK part OPB841W55 or Digikey part 365-1103-ND (prewired); Honeywell HOA1870-33 (prewired) |
| Encoder interface.....       | Primary and secondary quadrature encoders, maxi. freq. 4 MHz                                                                                                                                                                                                                                                                                                                        |
| Operating Temperature .....  | -20 to 85 °C PCB copper temperature                                                                                                                                                                                                                                                                                                                                                 |
| Relative Humidity.....       | 10% to 90% non condensing (operating and storage)                                                                                                                                                                                                                                                                                                                                   |

### I/O CONNECTOR

Mating Connector: AMP MTA 100 series 8 pin, 26 GA, part 3-643815-8  
Digikey part A31030-ND

| Pin | Name                                                     | Notes                                        |
|-----|----------------------------------------------------------|----------------------------------------------|
| 1   | A/D in #2, secondary encoder Chan B, or Direct input     | Includes 10k $\Omega$ pullup to 3.3V         |
| 2   | A/D in #1, secondary encoder Chan A, or Step input       | Includes 10k $\Omega$ pullup to 3.3V.        |
| 3   | LED Drive #2                                             | Includes series 200 $\Omega$ resistor to 5V. |
| 4   | A/D in #4, secondary encoder Index, or Upper Limit input | Includes 10k $\Omega$ pullup to 3.3V.        |
| 5   | Ground                                                   | Common input ground                          |
| 6   | LED Drive #1                                             | Includes series 200 $\Omega$ resistor to 5V. |
| 7   | A/D in #3 or Home/Lower Limit input                      | Includes 10k $\Omega$ pullup to 3.3V.        |
| 8   | Ground                                                   | Common input ground                          |

### ENCODER CONNECTOR

Mating Connector: AMP MTA 100 series 5 pin, 26 GA, part 3-643815-5  
Digikey part A31027-ND

| Pin | Name     | Notes                                                                                     |
|-----|----------|-------------------------------------------------------------------------------------------|
| 1   | Ground   | Ground for encoder                                                                        |
| 2   | Index    | Input from encoder                                                                        |
| 3   | Chan A   | Input from encoder. May use as Hall sensor input for position mode control if no encoder. |
| 4   | +5V (V+) | Power to encoder                                                                          |
| 5   | Chan B   | Input from encoder. May use as Hall sensor input for position mode control if no encoder. |

### 1A ON/OFF 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 #1 (V-) | Open collector         |
| 2   | ON/OFF driver #1 (V+) | 2A peak; 1A continuous |
| 3   | ON/OFF driver #2 (V-) | Open collector         |
| 4   | ON/OFF driver #2 (V+) | 2A peak; 1A continuous |

### HIGH-CURRENT DRIVERS CONNECTOR

Screw terminal alternative motor drive outputs.  
Use for motors requiring 3A or more current.

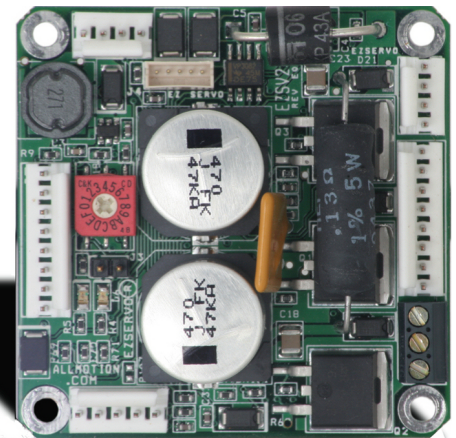
| Pin | Function             |
|-----|----------------------|
| 1   | PHASE A power driver |
| 2   | PHASE B power driver |
| 3   | PHASE C power driver |

For connector locations, see reverse side.



Model EZSV23

## Fully intelligent Servo Motor Controller + Driver with Encoder Feedback



Model EZSV23 actual size

### HALL SENSOR & MOTOR CONNECTOR

Mating Connector: AMP MTA 100 series 8 pin, 26 GA, part 3-643813-8  
Digikey part A31111-ND

| Pin | Name                                      | Notes                                                         |
|-----|-------------------------------------------|---------------------------------------------------------------|
| 1   | Hall sensor A                             | AllMotion will provide assistance determining correct hookups |
| 2   | Hall sensor B                             |                                                               |
| 3   | Hall sensor C                             |                                                               |
| 4   | +5V Hall sensor power                     |                                                               |
| 5   | Ground                                    | Ground for Hall sensors                                       |
| 6   | Phase A driver (BLDC) Motor+ (brush DC)   | 5A peak PWM                                                   |
| 7   | Phase B driver (BLDC) Not used (brush DC) | 5A peak PWM                                                   |
| 8   | Phase C driver (BLDC) Motor- (brush DC)   | 5A peak PWM                                                   |

### POWER AND COMMUNICATIONS CONNECTOR

Mating connector: AMP MTA 100 series 4 pin, 22GA, part 3-643813-4  
Digikey part A31108-ND

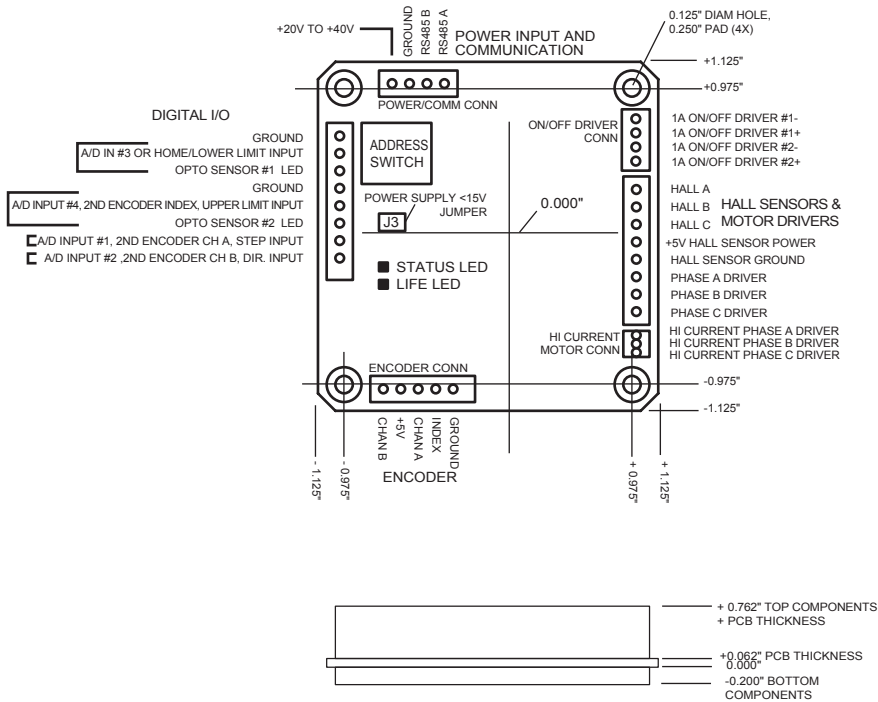
| Pin | Function                         |
|-----|----------------------------------|
| 1   | V+ (external supply) +12V to 40V |
| 2   | GROUND                           |
| 3   | RS485 B                          |
| 4   | RS485 A                          |

## Key Features

- Single 4-wire bus linking up to 16 drives
- 5A BLDC or DC brush motor drivers, short protected
- Operates from 12V to 40V.
- RS232, RS485 or USB based control communications
- Optional standalone operation with no connection to PC
- On-board EEPROM for user program storage
- 4-quadrant operation
- Homes to an opto or encoder index with a single command.
- Execution halt/branch pending switch closure
- ADC inputs, halt/branch to ADC value
- Position, velocity, and torque modes. Velocity mode possible using only Hall sensor feedback.
- Quadrature encoder-based feedback for position mode
- Step & Direction mode, 4MHz step frequency
- Secondary encoder mode
- Prewired for optoswitch inputs
- Four digital I/O; and two 1A power On/Off drivers for driving relays, dc motors, solenoids, etc.
- Cavo DT or OEM protocol compatible
- Fully programmable ramps and speeds
- Switch-selectable device address
- Software-settable maximum currents

**Fully intelligent Servo Motor Controller  
+ Driver with Encoder Feedback**

## Mechanical Specifications



## Ordering Information

| Name                                 | Order Number |
|--------------------------------------|--------------|
| EZSV23 Servo Drive.....              | EZSV23       |
| RS232 to 485 Converter (option)..... | RS485        |
| USB to 485 Converter (Option).....   | USB485       |