

## General Specifications

|                              |                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supply Input.....            | USB or 5V external                                                                                                                                                                                                                                                                                                                  |
| Dimensions.....              | 1.0" X 2.0" X 0.5" thick (25.4mm X 50.8 mm X 12.7mm)                                                                                                                                                                                                                                                                                |
| Operating Modes.....         | PC controlled or standalone. Position, velocity, and torque                                                                                                                                                                                                                                                                         |
| Communications protocol..... | USB                                                                                                                                                                                                                                                                                                                                 |
| Control protocol.....        | Compatible with devices that use the Cervo DT or OEM protocol. Can use EZCommander <sup>®</sup> Windows application or serial terminal program such as HyperTerminal to issue commands.                                                                                                                                             |
| Motor compatibility.....     | 500 mA continuous DC brush motor driver                                                                                                                                                                                                                                                                                             |
| Mating Connectors.....       | (Supplied) HIROSE DF11 series. Recommended tool: Digikey H9924-ND. Pins are HIROSE DF11-2428sc; Digikey H2139. (For pre-crimped wires, search H3BXT on www.digikey.com.)                                                                                                                                                            |
| I/O Interface.....           | Accepts 2 opto-electronic and two mechanical switch inputs, or 4 A/D inputs. Signal Levels: <0.8V Vlow; >2V Vhigh (TTL compatible) Optical switch specifications: Transistor optical switch with IC> 1 mA @ IF=20mA. Examples: Digikey OPB830W55 or H21A1 or OPB830W11 or QVA11134; Honeywell HOA1887-012 or HOA1870-33 (prewired); |
| Encoder Interface.....       | Quadrature encoder, maximum frequency 4 MHz                                                                                                                                                                                                                                                                                         |
| Operating Temperature.....   | -20 to 85 °C PCB Copper temperature                                                                                                                                                                                                                                                                                                 |
| MTBF.....                    | 5000 hr @ 85° C PCB copper temperature. Doubles each 10° C below 85° C copper temperature.                                                                                                                                                                                                                                          |
| Relative Humidity.....       | 10% to 90% non condensing (operating and storage)                                                                                                                                                                                                                                                                                   |

## Fully intelligent servo motor controller + driver with encoder feedback



SERVOSTICK<sup>™</sup> actual size

### MOTOR CONNECTOR

Mating connector: HIROSE DF11 8 pin, 24 GA, part DF11-8DS-2C Digikey part H2022-ND

| Pin | Function  | Notes                               |
|-----|-----------|-------------------------------------|
| 1   | ON/OFF 2  | 24 mA TTL-level driver <sup>1</sup> |
| 2   | ON/OFF 1  | 24 mA TTL-level driver <sup>1</sup> |
| 3   | PWM OUT 2 | 24 mA TTL-level driver <sup>1</sup> |
| 4   | PWM OUT 1 | 24 mA TTL-level driver <sup>1</sup> |
| 5   | Ground    | Ground for encoder                  |
| 6   | Ground    | Ground for encoder                  |
| 7   | Motor -   | 500mA continuous                    |
| 8   | Motor +   | 500mA continuous                    |

<sup>1</sup> 200 Ω series internal resistor may be removed if desired.

### ENCODER AND ALTERNATE POWER

Mating connector: HIROSE DF11 6 pin, 24 GA, part DF11-6DS-2C Digikey part H2021-ND

| Pin | Function              | Notes                           |
|-----|-----------------------|---------------------------------|
| 1   | Ground                | Power and encoder ground        |
| 2   | Optional external +5V | Standalone power input          |
| 3   | Index                 | Input from encoder <sup>1</sup> |
| 4   | Encoder +5V input     | Power to encoder                |
| 5   | Encoder Channel B     | Input from encoder <sup>1</sup> |
| 6   | Encoder Channel A     | Input from encoder <sup>1</sup> |

<sup>1</sup> Some encoders may require external pullups to 5V. Inputs from encoders must have min. 4V high level.

## Key Features

- 500mA continuous DC brush motor driver
- Optional standalone operation unconnected to PC
- USB communications protocol
- Optional ADC inputs, halt/branch on ADC value
- Optional digital PWM output
- On-board EEPROM for user program storage
- 4-quadrant operation
- Position, velocity, and torque modes
- Homes to opto, switch closure, or encoder index with a single command
- Quadrature encoder-based feedback
- 4MHz max. encoder frequency
- Pre-wired for optoswitch inputs
- Cervo DT or OEM control protocol compatible
- Fully programmable ramps and speeds
- Software-settable maximum currents

## Ordering Information

Name  
ServoStick<sup>™</sup> Controller/Driver..... Order Number  
SERVOSTICK

### I/O CONNECTOR

Mating connector: HIROSE DF11 Series 8 pin, 24 GA, part DF11-8DS-2C Digikey part H2022-ND

| Pin | Function                                                   | Notes                                                |
|-----|------------------------------------------------------------|------------------------------------------------------|
| 1   | A/D in #1 or Switch #1 to ground                           | Includes equivalent 6.8k Ω pullup to 3.3V.           |
| 2   | A/D in #2 or Switch #2 to ground                           | Includes equivalent 6.8k Ω pullup to 3.3V.           |
| 3   | A/D in #4 or opto sensor #2 phototransistor open collector | Includes equivalent 6.8k Ω pullup to 3.3V.           |
| 4   | LED drive #2 or optional TTL PWM output                    | Includes series 200 Ω current source resistor to 5V. |
| 5   | LED drive #1                                               | Includes series 200 Ω current source resistor to 5V. |
| 6   | Ground                                                     | Common ground                                        |
| 7   | Ground                                                     | Common ground                                        |
| 8   | A/D in #3 or opto sensor #1 phototransistor open collector | Includes equivalent 6.8k Ω pullup to 3.3V.           |

## Mechanical/Connection Specifications

### CAUTION

Do not connect or disconnect motor when power is on. Interrupting current to an inductive load creates a high voltage/arc, which will damage the driver.

