PRT-SERV-1.2

Eight Channel Servo Expansion Board

FEATURES

- **Servo ports: 8**
- **Small PCB Size: 0.91" x 0.91" x 0.06"**
- **Light Weight: 2.9 g**
- **12 bit servo resolution**
- **Resolution: 0.5 µs (about 0.05°)**
- **Range: 250-2750 µs**
- **Pulse rate: 50 Hz**
- **Current consumption: 5 mA (average)**

APPLICATION

- **Gimbal Azimuth, Gimbal Elevation, Gimbal Retract**
- **Parachute, Waypoint Servo, Flaps, Flaperons**
- **Auxiliary channels for payload deployment and landing gear.**

DESCRIPTION

The Servo Expansion Board supports up to 8 channels with 12 bit accuracy. It is the smallest high-performance serial servo controller on the market. The device is controlled and powered through a Kestrel serial port and can easily be enabled through the Virtual Cockpit. The servo power is separate from the device power allowing high current servos to be powered through a separate power regulator. Servos wires can be soldered directly to the board or the included servo headers can be soldered to the board to make changing servos a snap. At only 2.9 grams the Servo Expansion Board is ideal for small UAV applications.

PORT DESCRIPTIONS

This section describes ports or pin out on the Expansion Board, including servo mapping between Expansion Board ports and Kestrel autopilot channels. The mapping for all Expansion Board ports to Kestrel autopilot channels is shown in Figure 1.

0-7: Three pin servo ports. Each port contains a ground (GND), power (Vcc=Vs), and signal pin. All ground pins are tied together and to the PCB common ground. All power pins (Vcc=Vs) are connected together through the PCB. Ground pins lie near the PCB edge. Signal pins lie next to the PCB silkscreen label. These ports, shown in Figure 1, are labeled "0" through "7".

GND: Power common ground. This pin connects to all grounds on this device.

VIN: Servo signal power. Connect this pin to +5 Volts from autopilot. This pin powers the onboard IC and is rated to draw only low current (<100mA @ 5V). This pin is NOT used to supply servo power.

Vcc=Vs: Servo power. Connect this pin to the servo power supply or BEC that is used to power servos that connect to the Servo Expansion Board.

SIN: Serial data input. This pin connects to the serial data output line of the Kestrel autopilot (Port E, pin 3).

OUT, RST, Mode, COM: Leave unconnected. These pins are not used.

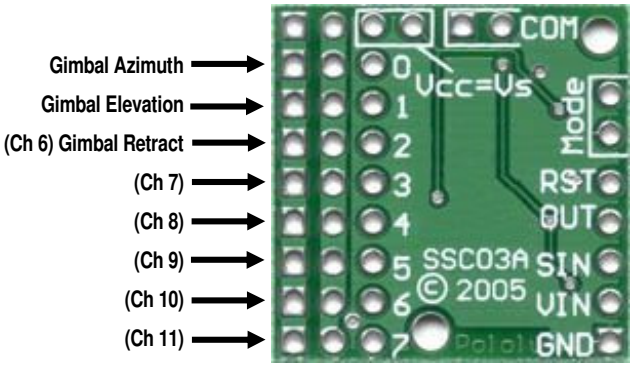

Figure 1 - Port Mapping

LED CODES

- The green LED indicates serial activity: it should flicker whenever the servo controller receives data.
- The yellow LED indicates a warning regarding position: either the absolute or neutral position you have requested is out of range. The yellow light will turn off when all requested positions are in range.
- The red LED indicates a fatal error that prevents further operation. This can often be resolved by power cycling the system.

ABSOLUTE MAXIMUM RATINGS

Input Supply Voltage 6.5V
Maximum I/O Pin Source/Sink Current 25mA
Operating Temperature Range ..... -40ºC to 85ºC
Storage Temperature Range ..... -40ºC to 125ºC
Humidity ..... 5% to 95%, no condensing

Stresses above those listed under the Absolute Maximum Ratings may cause permanent damage to this device. This is a stress rating only; functional operation of this device at these or any other conditions above those indicated in the operational section of this specification are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability

ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Min	Typ	Max	Units
Supply Input Voltage (Vcc)		4.5	5.0	5.5	V
Logic Output Voltage					
Low				0.6	V
High		Vcc-0.7		Vcc	V
Logic Input Voltage					
Low				0.8	V
High		2.0		Vcc	V

PHYSICAL CHARACTERISTICS

Parameter	Conditions	Typ	Units
Dimensions		0.91" x 0.91" x 0.06"	Inches
Weight		2.9	Grams

RELATED PARTS

The following table contains parts that may be used with the Servo Expansion Board. These parts can be purchased from Procerus Technologies or distributors like Digikey or Mouser.

Part Number	Manufacturer	Description	Comments
MOLEX5POS-L12	Procerus Technologies	5 PIN 1.25MM 12" WIRE PIGTAIL CONNECTOR	5 pin pigtails for Kestrel autopilot serial (Port E)
16-02-0103	Molex/Walden	CONN TERM FEMALE 22-24AWG GOLD	Crimp Terminal for Servo Power Connector
50-57-9403	Molex/Walden	CONN HOUSING 3POS .100 W/LATCH	3 Pin Servo Power Connector Housing
PEC36SAAN	Sullins Electronics Corp	CONN HEADER .100 SINGL STR 36POS	Male 0.1" pitch servo header
50058-8000	Molex/Walden	CONN TERM FEMALE 28-32AWG TIN	Crimp Terminal (Used For Hand Crimping)
51021-0500	Molex/Walden	CONN HOUSING 5POS 1.25MM	5 Pin Connector Housing (Used For Hand Crimping)

TYPICAL APPLICATION

The power diagram for a typical application using the Servo Expansion board is shown in Figure 2.

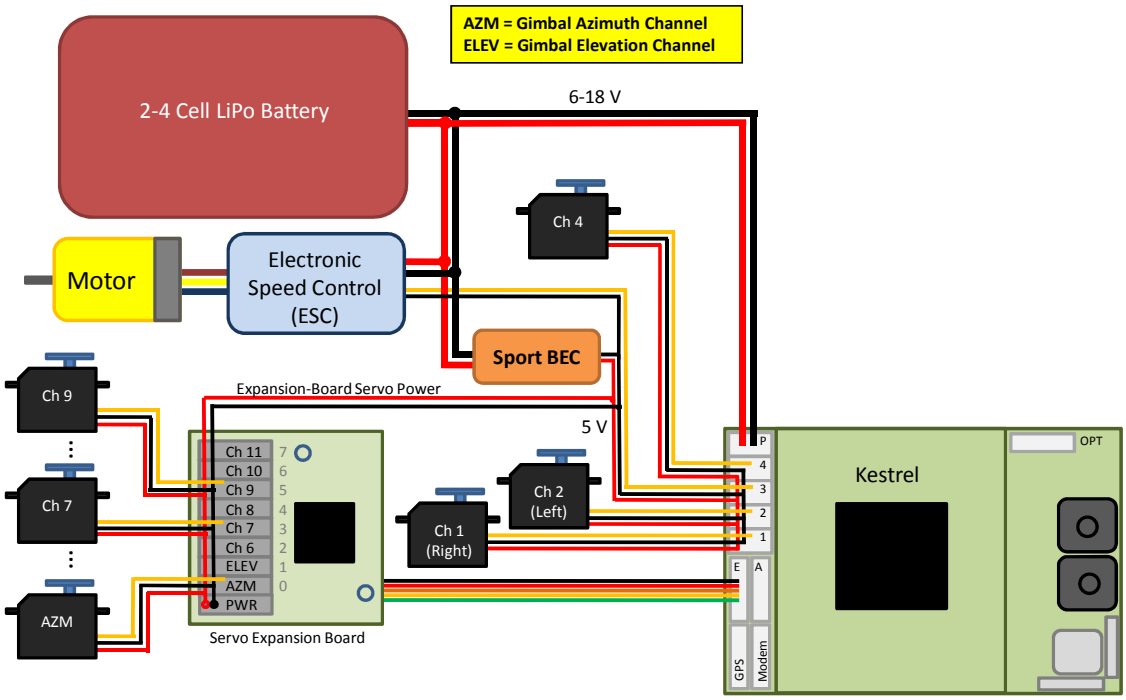

Figure 2 - Power diagram for Servo Expansion Board

The Servo Expansion Board plugs into serial port E of the Kestrel Autopilot and can easily be enabled using the Virtual Cockpit. See the Installation and Configuration User Manual for details. Figure 3 shows the pin out the Servo Expansion Board for all eight channels with the optional servo headers soldered on.

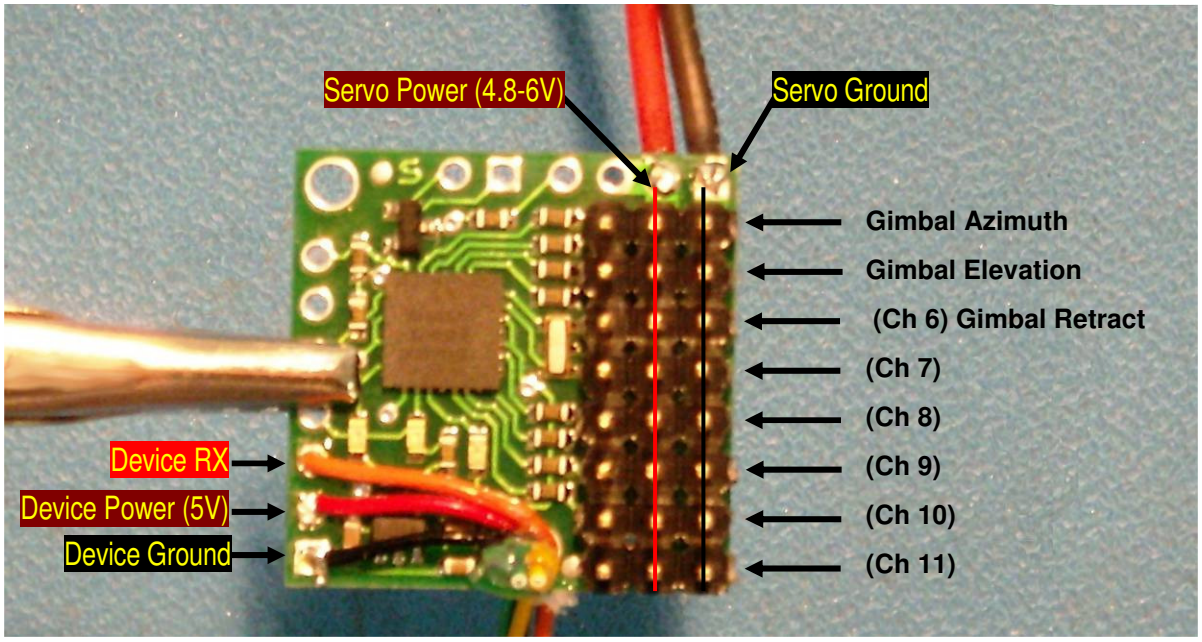

Figure 3 - Expansion board pin out. Note that the device ground is tied to servo ground, but the device power is separate from servo power.