

# Underwater Servo SER-110X



## Features

- Submersible up to 100 meters
- Programmable digital servo
- Compact size
- Low power draw
- Engineered for months of exposure in seawater or fresh water
- Corrosion-resistant titanium output shaft, Delrin<sup>®</sup> enclosure
- Standard R/C PWM interface
- Servo horns included

## Description

Blue Trail Engineering's SER-110X is in a class by itself: a depth-rated, underwater servo at a fraction of the size and cost of other subsea actuators. Ideal for Autonomous Surface Vehicles as well as Remotely Operated Vehicles, the SER-110X provides reliable, long-term actuation at depths up to 100 meters.

The SER-110X is based on the Hitec D954SW 32-bit digital servo. Blue Trail integrates a modified D954SW into a corrosion-resistant, depth-rated Delrin<sup>®</sup> housing with a ball-bearing-supported titanium output shaft and nitrile quad-ring shaft seal.

The SER-110X utilizes the compact and reliable Cobalt 3-pin dry-mate bulkhead connector, compatible with Cobalt Series cables from Blue Trail Engineering. Custom connection options are also available.

## Specifications

Environmental	
Depth Rating	100 meters
Operating Temperature	-10° C to +50° C
Performance	
Torque	18.0 kg-cm / 250 oz-in @ 4.8 V 29.0 kg-cm / 403 oz-in @ 7.4 V
Speed	0.19 seconds/60 deg. @ 4.8 V 0.12 seconds/60 deg. @ 7.4 V
Travel Angle	± 74 deg. maximum
Microcontroller	32-Bit MCU with 12-Bit ADC circuitry, 4096 resolution
Programmable Features (requires Hitec DPC-11 or HFP-30 programmer, not included)	End Point Adjustments Direction Fail Safe Dead Band Speed (Slower) Soft Start Rate Overload Protection Data Save / Load Program Reset
Electrical	
Operating Voltage	4.8 V - 7.4 V
Idle Current	0.03 A
No-load Current	0.5 A
Stall Current	5.2 A
Motor Type	coreless brushed
Feedback Type	1-million cycle potentiometer
Materials	
Gears	steel
Output Shaft	titanium
Case	Delrin®
Size/Weight	
Dimensions	56 mm X 82 mm X 29 mm
Weight in Air	180 grams
Weight in Water	65 grams
Interface	
Connector	Blue Trail Engineering Cobalt 3-pin dry-mate bulkhead connector
PWM Range	850µs - 2350µs
PWM Voltage Range	3 - 5 V

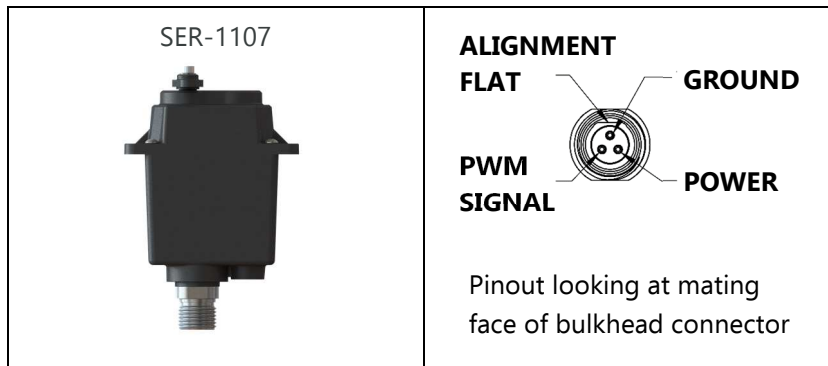
## Electrical Connection

The SER-110X features a Cobalt 3-pin dry-mate bulkhead connector as the standard connection option. Matching waterproof cables, with connectors on one end or both ends, are available from Blue Trail Engineering. Custom connection options are also available.

Part Number	Connection Type	Description
SER-1107	Blue Trail Cobalt 3-pin dry-mate bulkhead connector	Compatible with Cobalt Series underwater cables. Allows easy connection/disconnection at the servo.
Custom	Custom	Options include 1-meter unterminated cable, Micro-Circular bulkhead connector, and others. Contact Blue Trail Engineering for details.

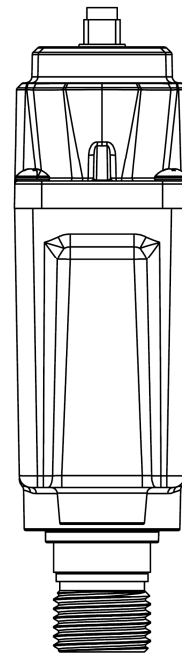
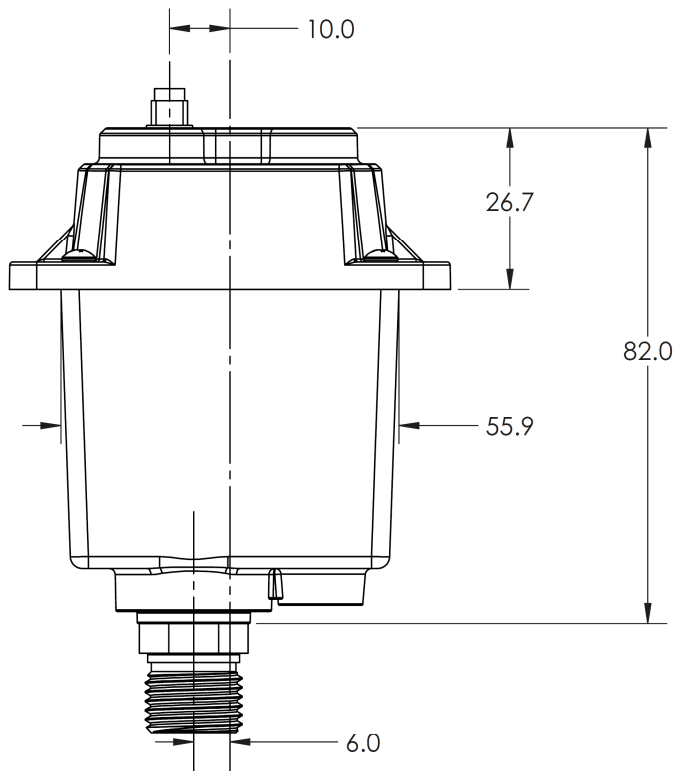
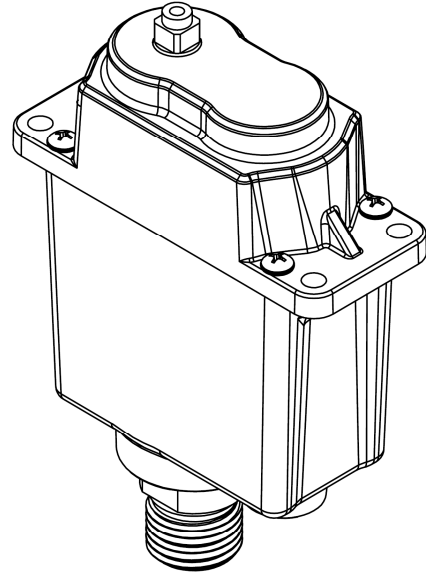
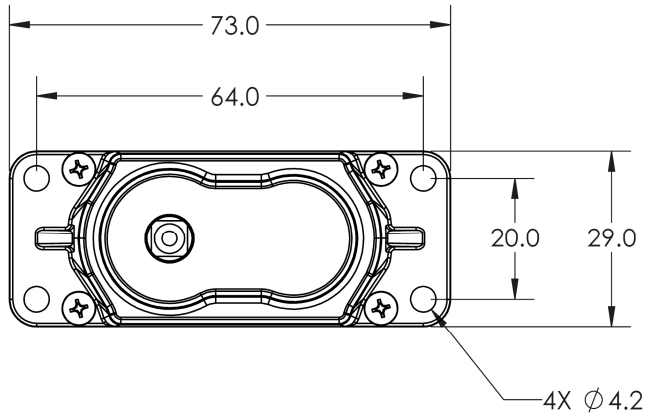
The SER-110X requires a DC power input between 4.8 and 7.4 volts.

For control, the SER-110X requires a standard R/C input signal. This consists of a PWM signal between 3 and 5 volts, typically at 50 Hz. The pulse width is varied within the range of 850 – 2350 microseconds to control the position of the servo.



## Dimensions

All dimensions are in mm.



# Output Shaft Detail

