

# DC servo axis controller board(Whale) user's guide

## Introduction

The controller panel is capable of driving 1 DC brushed servomotor. The control method is closed-loop, you need an incremental encoder with A and B channels to provide position feedback to the controller.

The controller input signals must be step and directions signals, recommended PC controller softwares are MACH2 – 3 , KCAM4.

## Electronic properties

<b>Electronic properties</b>	<b>Min.</b>	<b>Max.</b>	<b>Unit</b>
Digital supply voltage	<b>8</b>	<b>30</b>	<b>V DC</b>
Motor supply voltage	<b>12</b>	<b>90</b>	<b>V DC</b>
Digil supply required current	<b>-</b>	<b>100</b>	<b>mA/controller</b>
Motor current continous	<b>0</b>	<b>20</b>	<b>A</b>
Motor current pulse	<b>0</b>	<b>80</b>	<b>A (max. 0.2sec)</b>
Stepping frequency	<b>-</b>	<b>300</b>	<b>kHz</b>
Encoder resolution	<b>2X</b>	<b>4X</b>	<b>1</b>
PWM frequency	<b>25</b>	<b>25</b>	<b>kHz</b>

## Details

Setable overcurrent. 0..20A.

Configuration via USB port.

Automatic and/or manual PID controller tuning.

Step/dir, digital supply connection via RJ45 , shielded ETHERNET connector.

Connect any number of controllers together with one error-wire.

Sign LEDs.

Diagnostic and error detection software.

Configurable maximum allowed error.

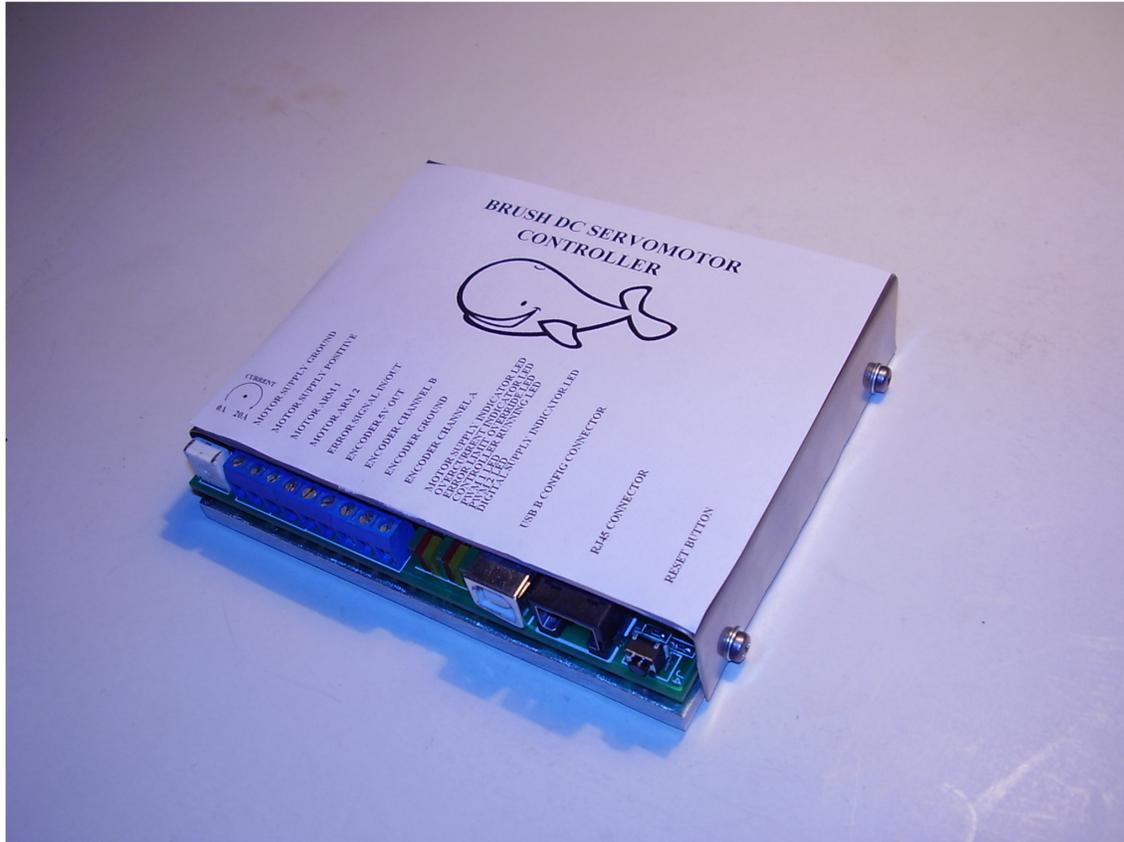
## Mechanical details

Width: 125 mm

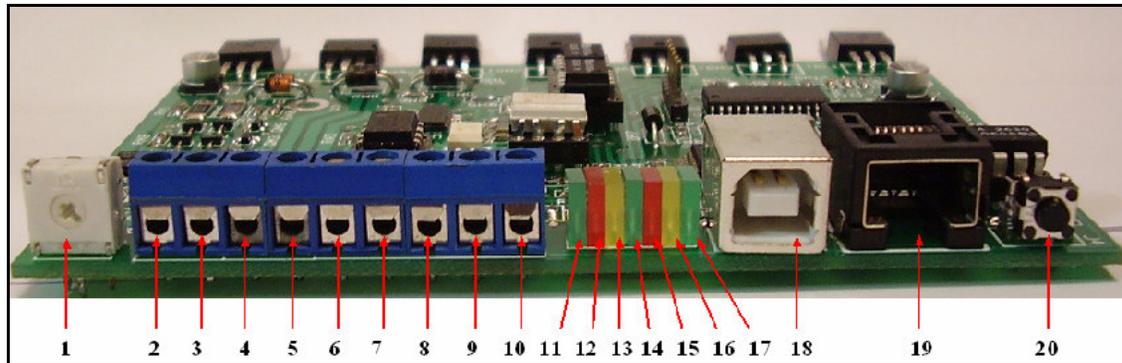
Length: 105 mm

Height: 25 mm

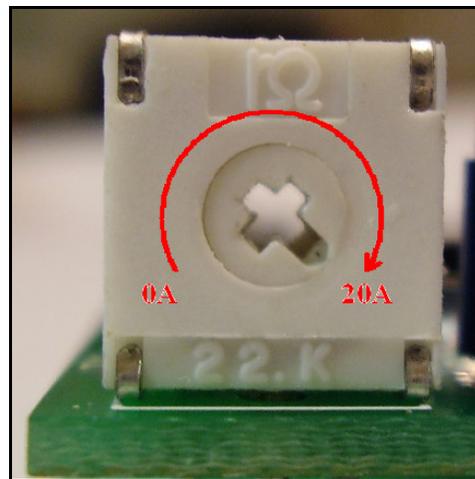
Weight: 400 gramms



## Connectors and pinouts



### 1.) Current limit adjusting from 0 to 20Amp.



If the motor coil's current exceeds the set value for more than 0,5s, then the controller stops all axis, and turns off all transistors and freewill the motor. The error condition pulls the error line to GND indicating the error to other controllers connected to the error line. About the overcurrent error indication see LED description chapter 7.

### Screw connectors:

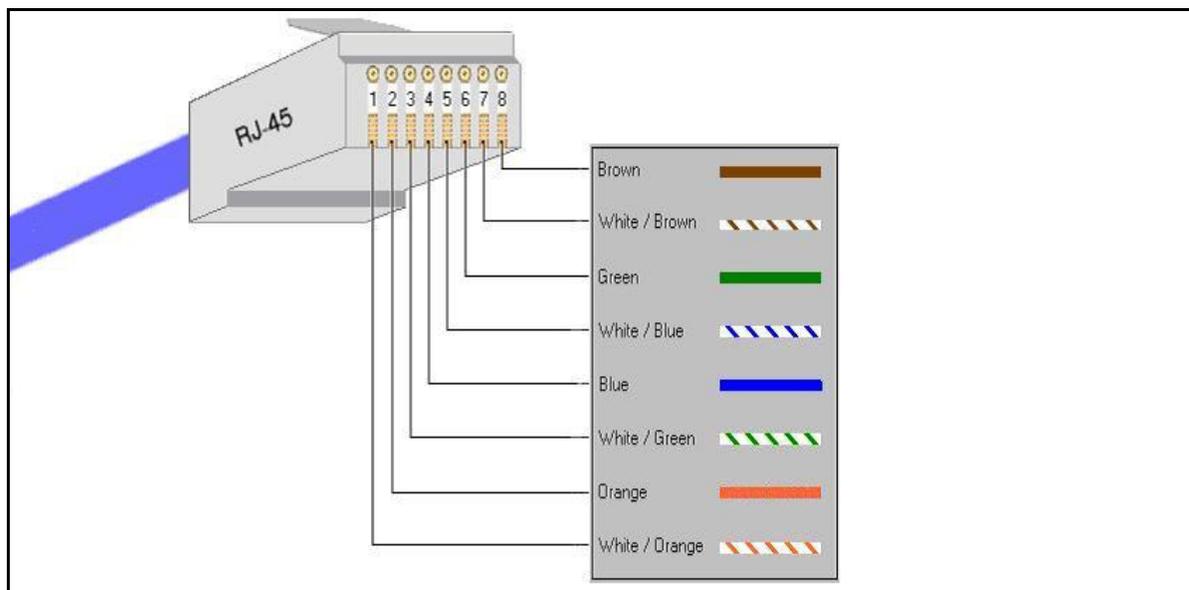
- 2.) Motor supply GND terminal.
- 3.) Motor supply positive terminal.
- 4.) Motor arm 1
- 5.) Motor arm 2
- 6.) ERROR signal connector.  
It is a common signal with the RJ45 connector's error signal. See below.
- 7.) Encoder 5V
- 8.) Encoder channel B
- 9.) Encoder GND
- 10.) Encoder channel A

### LED indicators:

- 11.) **Motor supply indicator LED.**  
Indicates motor supply.
- 12.) **Overcurrent indicator LED.**  
If the coil's current is greater than the set value, the LED will indicate overcurrent condition.
- 13.) **Error limit override LED.**  
If the error signal greater, than the set value in software, the LED will indicate this condition.
- 14.) **Controller running LED.**  
The LED blinks with about 3Hz frequency if the controller is in normal operation.
- 15.) **Motor moving to one direction LED.**
- 16.) **Motor moving to other direction LED.**
- 17.) **Digital supply indicator LED.**  
Indicates digital power supply.

### Connectors:

- 18.) **USB-B config connector.**  
Standard USB-A – USB-B connector can be used to connect the controller to the PC.  
This connection is only needed for tune the controller.
- 19.) **RJ45 connector.**  
Which can be connected into the controller's RJ45 socket.



- 1.) **Step signal.**
- 2.) **Direction signal**
- 3.) **GND for step and direction signals.**
- 4.) **N/C No Connection**
- 5.) **Master reset.**  
Resets the controller if pulls down to GND. You can reset all the connected controllers by pulling this line to GND.

6.) Error signal.

In case of error, the controller pulls this line to GND potential. Connect controllers together with this line. If one of the controllers generates error signal then all controllers will be stopped which is connected together.

7.) Digital supply +8..30 V.

8.) Digital supply GND.

**Buttons:**

20.) Reset Button.

You can restart the controller pushing this button when it stops in case of error.

STEP/DIR Inputs (the picture shows the controller's optical isolation):

