

Overview:

18 DOF Hexapod Robot from Robokits comes with 18 degrees of freedom joints. Its actuated using 18 Metal Gear Standard Servo (or) Servo Economy. This Hexapod Robot is controlled by ARDUINO UNO R3 BASED USB 18 SERVO CONTROLLER (Optionally available with Bluetooth). It can also be controlled by PC using USB 18 Servo Controller Software. The software helps to develop the complex sequences in real time on the hardware. It also generates Arduino based code for the developed sequence which can be deployed on the controller on board thereby making the robot autonomous.

The power requirement for this robot is 5 to 6V DC 10 Amp power supply. It could be either battery or a AC power supply rated at 5-6VDC. You can also use a modified computer SMPS supply, it is available for sale on Robokits website. The detailed features of the Servo Controller are:

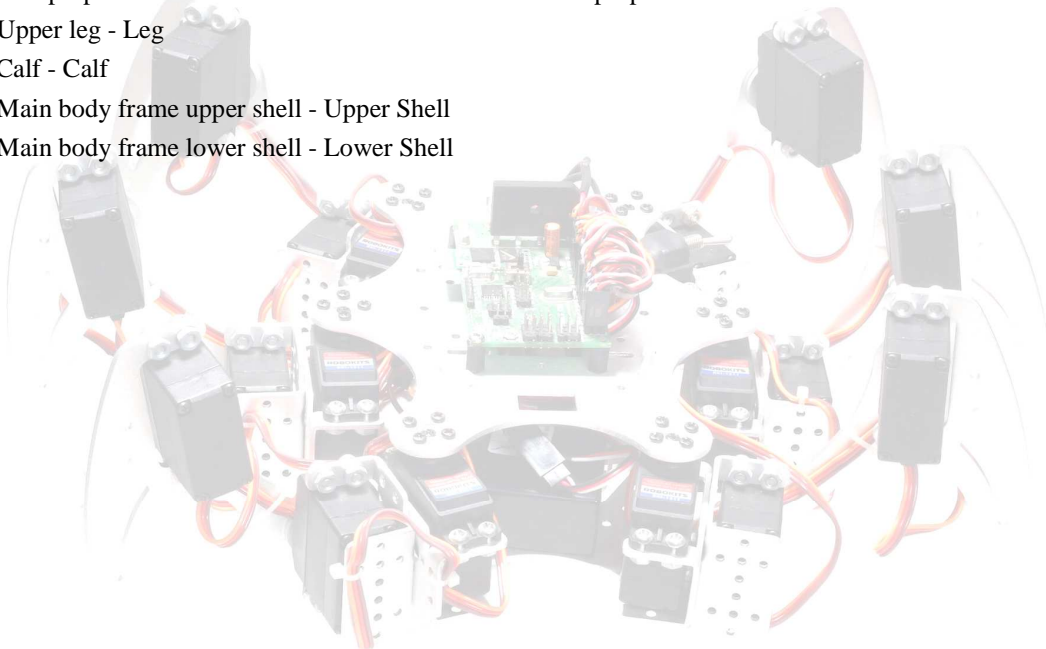
- Control 18 hobby servos from PC and Microcontroller
- USB interface
- Comes Pre-loaded Arduino Uno bootloader
- Software exports servo sequences to Arduino Uno for running servo sequences
- Independent range setting for each servo
- Independent offset, Maximum, Minimum and Direction setting for each servo
- 0.5-microsecond resolution
- 50 Hz update rate
- Small size of 80 X 47 mm
- Plug and Play, Auto detection of hardware
- Easy to use software
- Servo sequencer with speed, delay, goto and many other features
- Home and neutral position setting
- Easy to install USB driver and Application software
- Bluetooth interface for wireless control of robots (Optionally available)

After assembling the Hexapod Robot you will be able to control it from a Windows PC. You can also develop your own sequences in real time on hardware and can generate the code for Arduino which will be deployed onto the board making robot autonomous.

Let's start with the basic assembly of Hexapod Robot. Some basic tools like screw drivers, pliers, small spanners, soldering iron, wire cutter, nipper, stripper are required to complete the assembly.

The notations used in this document for screws, nuts, bolts and other parts are like these:

1. M4 x 12 Screw - M4 Screw
2. M4 x 12 Screw Nut - M4 Nut
3. 3 x 6 Servo Screw - Servo Screw
4. Miniature Ball Radial Bearing - Bearing
5. 3 mm Nut - Nut
6. M3 x 8 Screw - M3 Mid Screw
7. Metal Horn for Servo 25T - Servo Horn
8. Metal Gear Standard Servo (or) Servo Economy - Servo Motor
9. Multipurpose Aluminium Standard Servo Bracket - Multipurpose Bracket
10. Upper leg - Leg
11. Calf - Calf
12. Main body frame upper shell - Upper Shell
13. Main body frame lower shell - Lower Shell



Steps to Assemble Hexapod Robot:

Step 1: As Shown in Image below take one Upper Shell provided in the Kit , 6 x Servo Horns and 24 x Servo Screws. One such Servo Horn and four such Servo Servo Screws can be seen in the below Image.



After fixing the Servo Horns with the help of Servo Screws on the Upper Shell, the Upper Shell will look as in the below image.



Step 2: Now take 2 x Calfs, 2 x Servo Horns, 8 x Servo Screws as shown in the following Image. Note the orientation of the two Calfs.



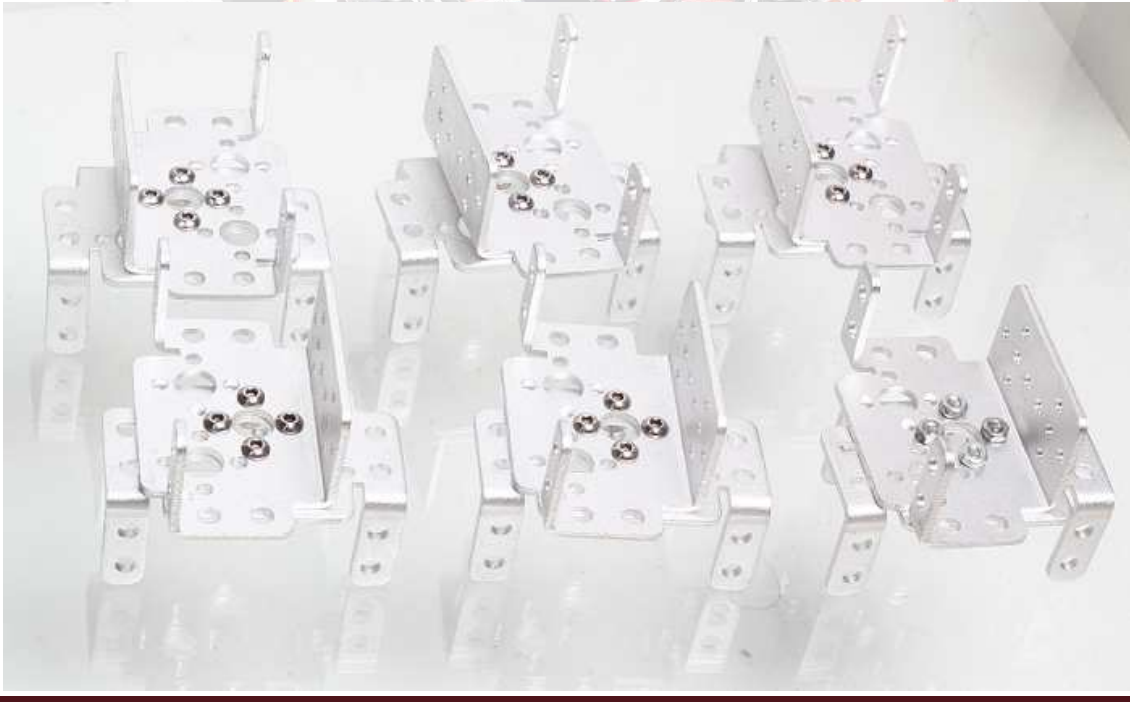
Fix the Servo Horns with the help of Servo Screws. The Servo Horns are to be fixed on all the Calfs as shown below.



Step 3: Now take 12 x Multipurpose Brackets, 24 x Small Button Screws and 24 x Nuts. One such set consisting of 2 x Multipurpose Brackets, 4 x Small Button Screws and 4 x Nuts are shown in the below Image.



Below image show Six Structures which are assembled using Multipurpose Brackets. Note that the Orientation of top three sets is different from bottom three sets.



Step 4: Now take the Lower Shell, two different sets of Multipurpose Structures which are assembled in previous step, 2 x M3 Mid Screws, 2 x Nuts (Image shows Lock Nut but you can use Nut which is provided in the Screw Nut Pack) and 2 x bearings as shown in below image.



After fixing the structure will look as in the below Image. Note the Orientation of the Assembly.



Step 5: Now take 4 x Servo Motors, 16 x M4 Screws, and 16 x M4 Nuts. One such set consisting of one Servo Motor, 4 x M4 Screws and 4 x M4 Nuts is shown in the Black Box in the below Image. After fixing the Servo Motors in the Multipurpose Brackets the complete assembly will look like the below Image.

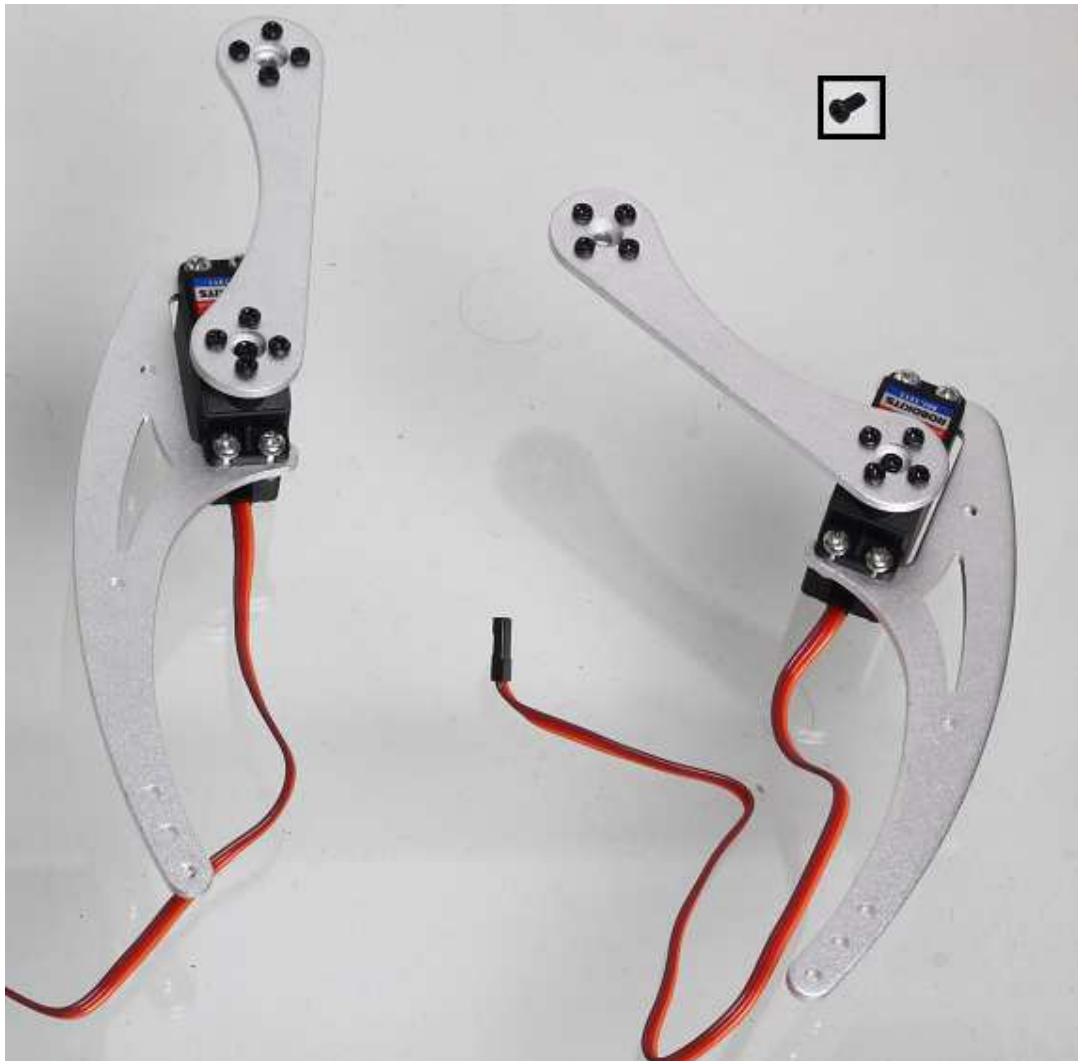


Step 6: Now again take the 2 x Servo Motors, 8 x M4 Screws and 8 x M4 Nuts and fix the Servo Motors on the two legs as shown in the below Image. Note the Orientation of the Servo Motors

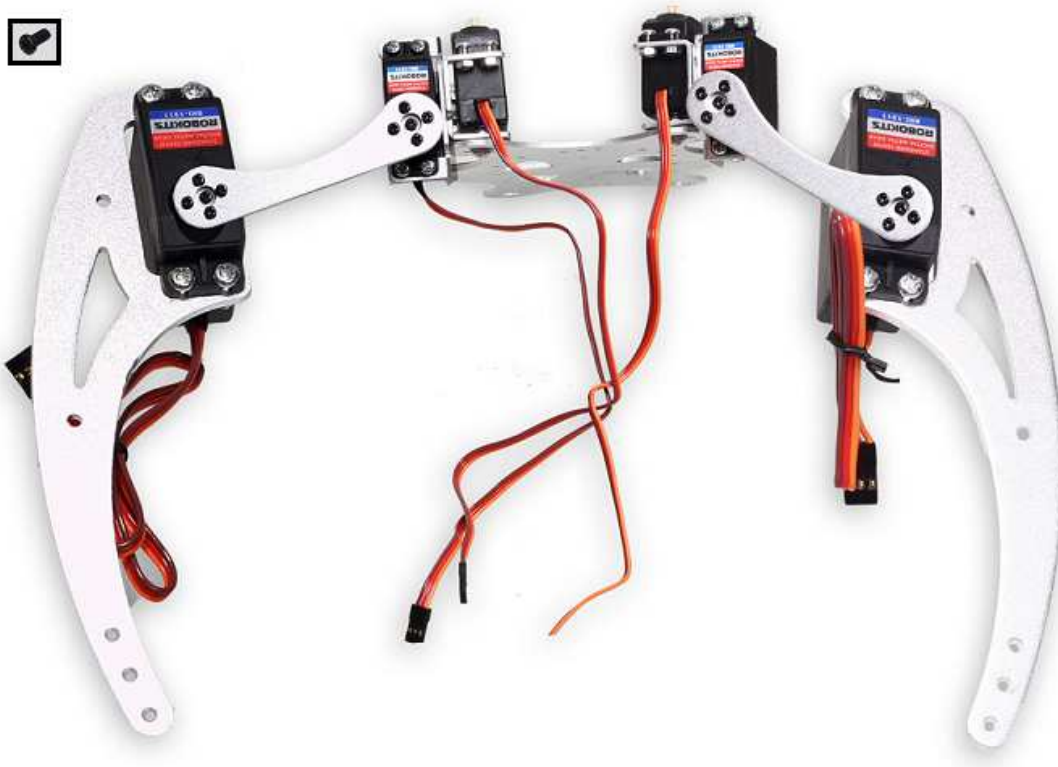


Step 7: Now take 2 x Calfs, 2 x Legs having servo motors fixed in the previous step and 2 x Servo Screws and fix them as shown in the below Image.

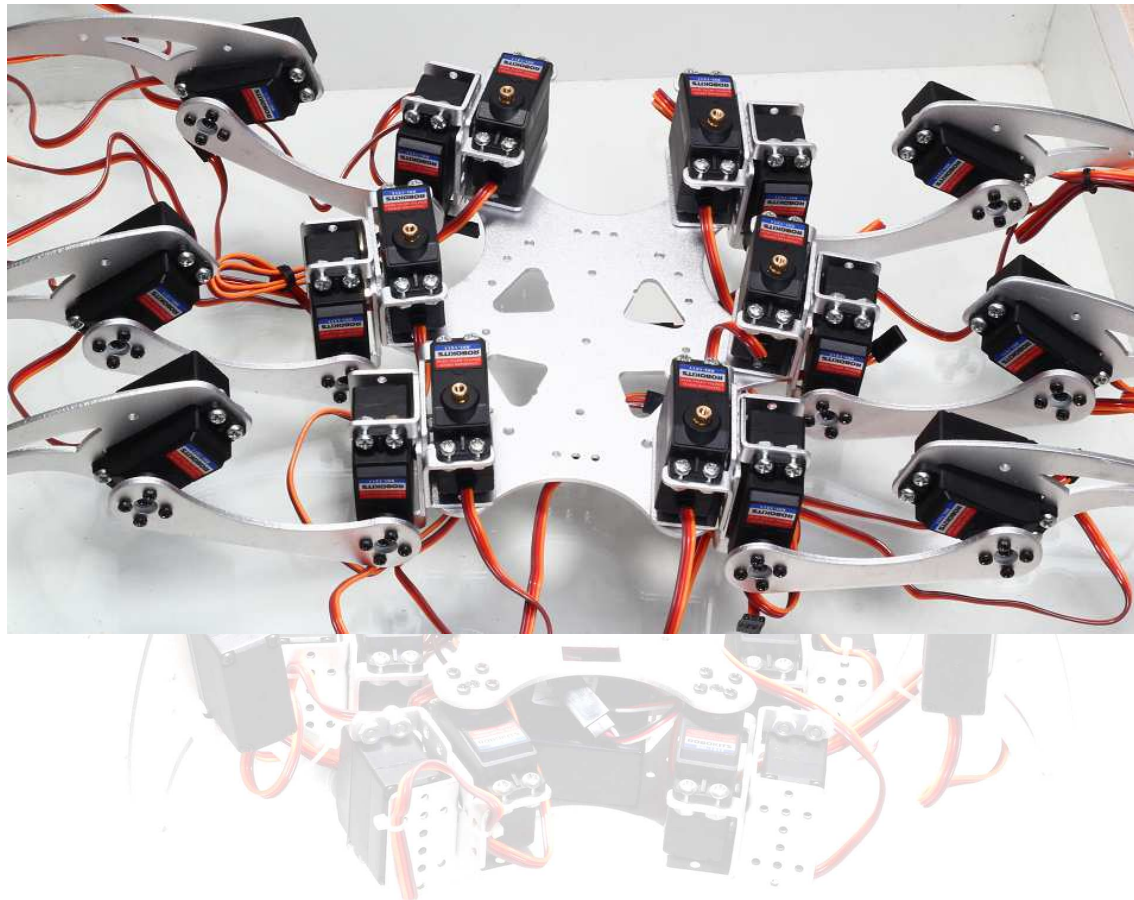
The Servo Screw shown in the Black Box in the below Image is to be fixed to Servo Motor Shaft after Neutralizing the Servo Motor. To Neutralize connect the Servo Motor to Servo Controller. Power up Servo Controller with 5 to 6 VDC power supply and connect to PC software with USB or Bluetooth connection. Neutralize the servo (Put the servo to center position) using software. After that tight the Servo Screw (Shown in Black Box) to the Shaft of the Servo Motor as shown in the below image



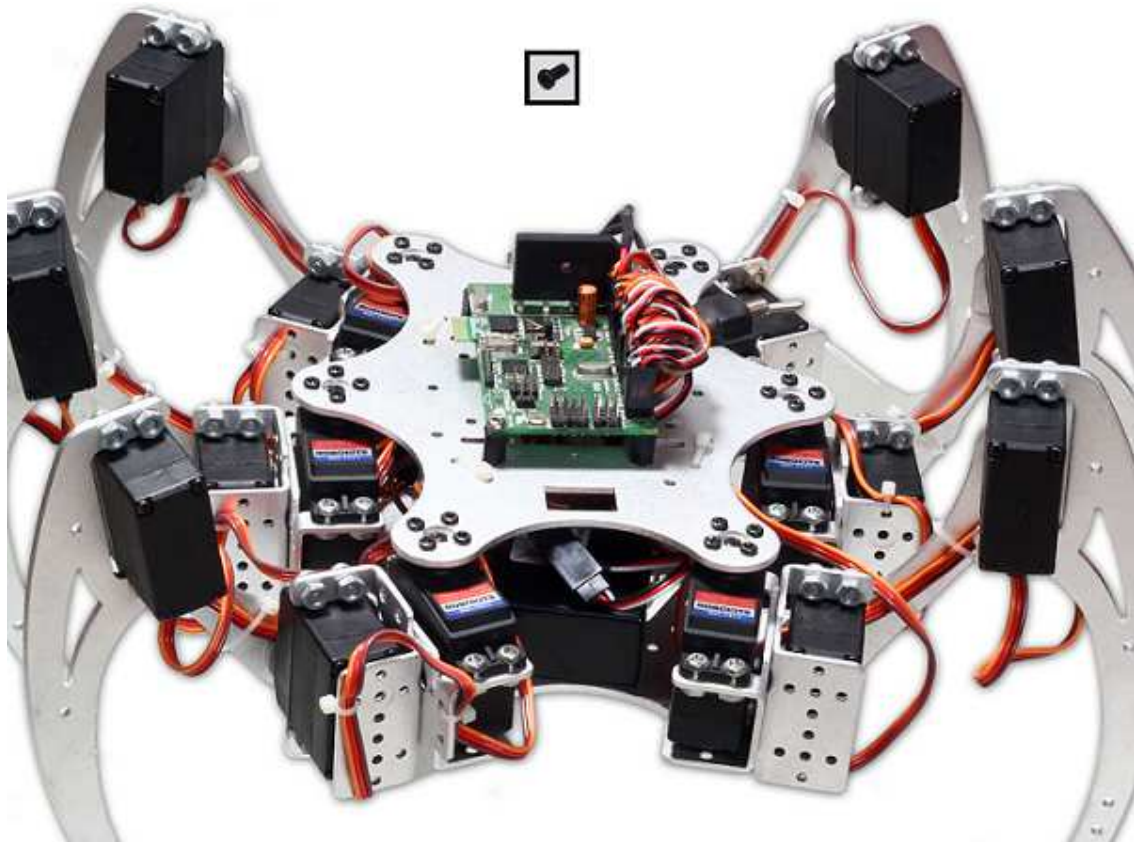
Step 8: Now we have the two structures with us. One is shown in Step 5 and other is shown in Step 7. One end of the Calf is already fixed with the Servo Motor of the Leg while the other end of the Calf is to be fixed with the help of Servo Screw to the Shaft of the Servo Motor which is already fixed on the Lower Shell. The Complete Structure is shown in the below Image. The small black box shows the Servo Screw. Note the Servo Screw is to be tighten only after neutralizing the Servo Motor.



Step 9: Similarly follow the Step 4 to Step 8 for the other four Legs of the Hexapod Robot. The Complete Lower Shell Structure is shown in the Below Image.



Step 10: Now take 6 x Servo Screws, Upper Shell having already fixed Servo Horns and the Lower Shell Structure which is assembled in last step. The Servo Horns in the Upper Shell are to be fixed on the Shaft of the Servo Motors on Lower Shell Structure already assembled. Tight the Servo Screws after neutralizing the Servo Motors. The assembly will look as in the below Image.



After following all the steps your Hexapod is assembled and will look as below Image.

