A 7 degree of freedom robot arm moving by muscle

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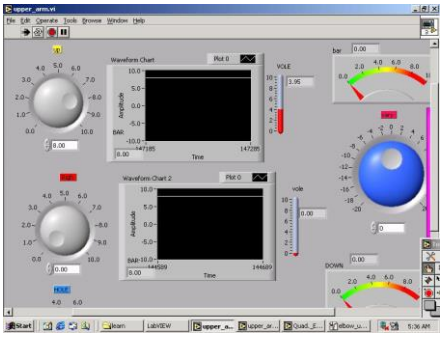
This project describes designing and building a 7 degree of freedom robot arm moving by muscle. First step of researching we study the moving of human arms to design a robot arm which have 7 degree of freedom consists of a wrist 2 degree of freedom, an elbow 2 degree of freedom and a shoulder 3 degree of freedom. The robot arm which is built has 6 kilograms in weight but there is not thinking a base weigh which it is showed in picture 1

Picture 1 7 degree of freedom robot arm

The muscle which is used to move the robot arm is MAS-10-N600-AA-MCFK type from Festo Company. The robot arm is worked by pneumatic systems. The systems operate at pressure 0-8 bar. The robot arm work by expanding and shrink of muscles which are installed with mechanisms of the arm parts. The distance of expanding and shrink are depending on size and length of the muscle.

The robot arm is moved and controlled by Lab View program and control panel" PXI module" which is used to control voltage to send to the Proportional Pressure Regulator to control air pressure which is sent to control expanding and shrink of muscles. The robot arm has 14 Proportional Pressure Regulator. The angular displacement can measure by using encoder which are installed at joints of each arm parts and can display feedback on the computer.



Picture 2 display of Lab View program