CHAPTER V

Result & Discussions

5. Result and Discussion

This chapter presents discusses and the results obtained upon running the system.

5.1 Hand Design

Every single cable of the single finger is attached to the dc motor. When the motor actuated and rotate causing tension in the cable witch cause finger to flex and vice versa when the motor rotate in the reverse direction.

Figure 5.1: forming the hand

5.2 Testing the Voice Module

After finishing recording and configuring the voice module as mentioned on chapter IV, eight commands have been stored (one, tow, three, four, five, grip, relax, and ok) as shown on the table below:

Command No	1	2	2	4
Voice Command	one	Tow	three	four
Expected response				
Command No	5	6	7	8
Voice Command	Five	Grip	Ok	Relax
Expected response				

Table 5.1: Command words

Cmnd	IO1	IO2	IO3	IO4	IO5	IO6	IO7	IO8	IO9	IO10	IO11	IO12
One	1	0	0	0	0	0	0	0	0	0	0	0
Tow	0	1	0	0	0	0	0	0	0	0	0	0
Three	1	1	0	0	0	0	0	0	0	0	0	0
Four	0	0	1	0	0	0	0	0	0	0	0	0
Five	1	0	1	0	0	0	0	0	0	0	0	0
Grip	0	1	1	0	0	0	0	0	0	0	0	0
Relax	0	0	0	1	0	0	0	0	0	0	0	0
Ok	1	0	0	1	0	0	0	0	0	0	0	0

Table 5.2: Equivalent binary code of the voice commands

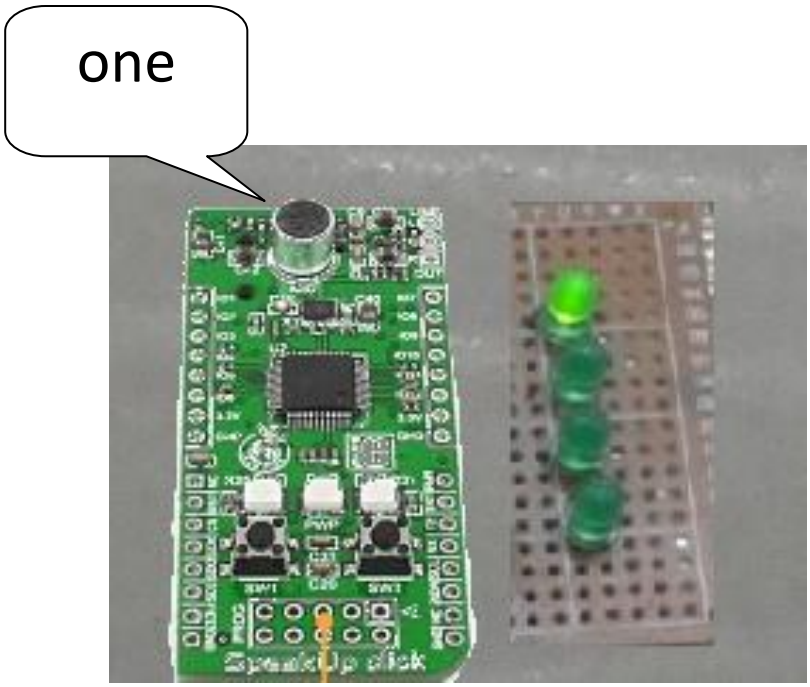

Figure 5.2: testing the voice commands

Program designed using mickoC pro compiler and Proteus simulation environment.

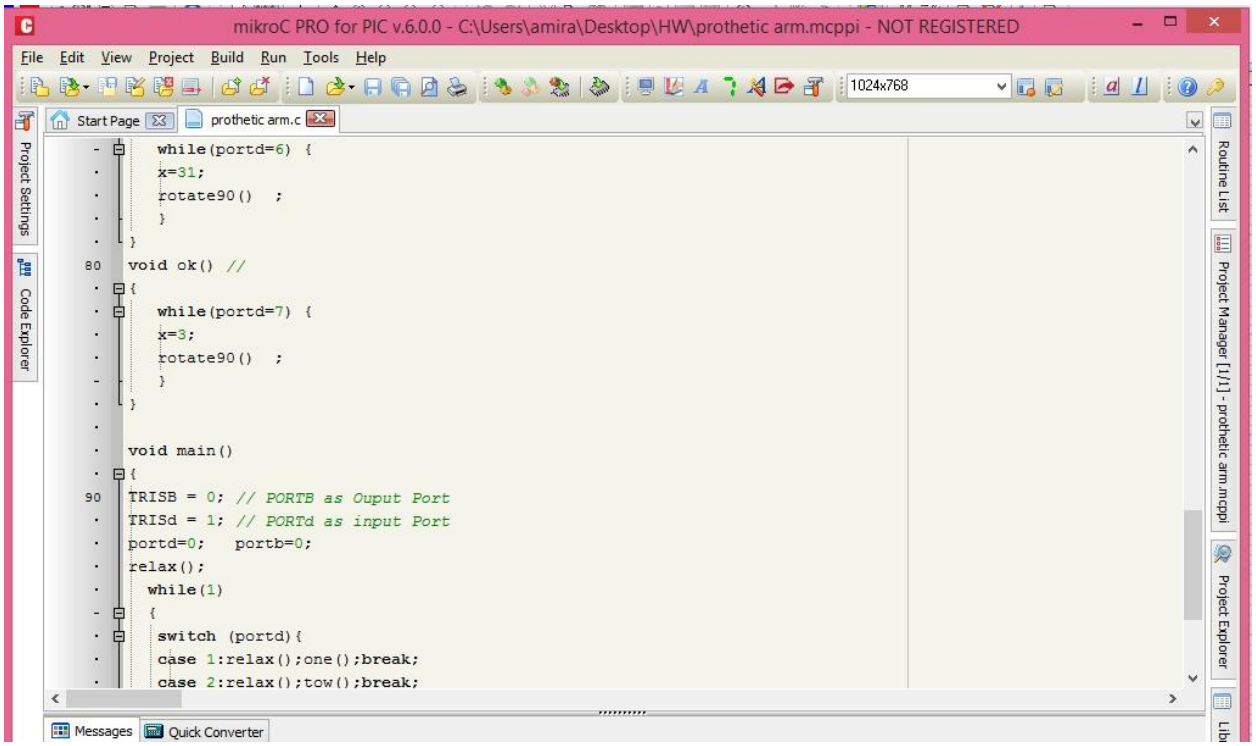

Figure 5.3: running of mikroC code

5.3 System Simulation

- testing the “one” command the equivalent code which comes out on the voice module is 0001 (presented as switches on proteus), all motor are on -90 degree exempt index motor at +90 degree.

- testing the “four” command the equivalent code which comes out on the voice module is 0100), all motor are on+90 degree exempt thumb motor at -90 degree.

- testing the “grip” command the equivalent code which comes out on the voice module is 0110), all motor are on 0.

- testing the “ok” command the equivalent code which comes out on the voice module is 1001), all motor are on +90 degree exempt thumb and index motor at 0 degree.

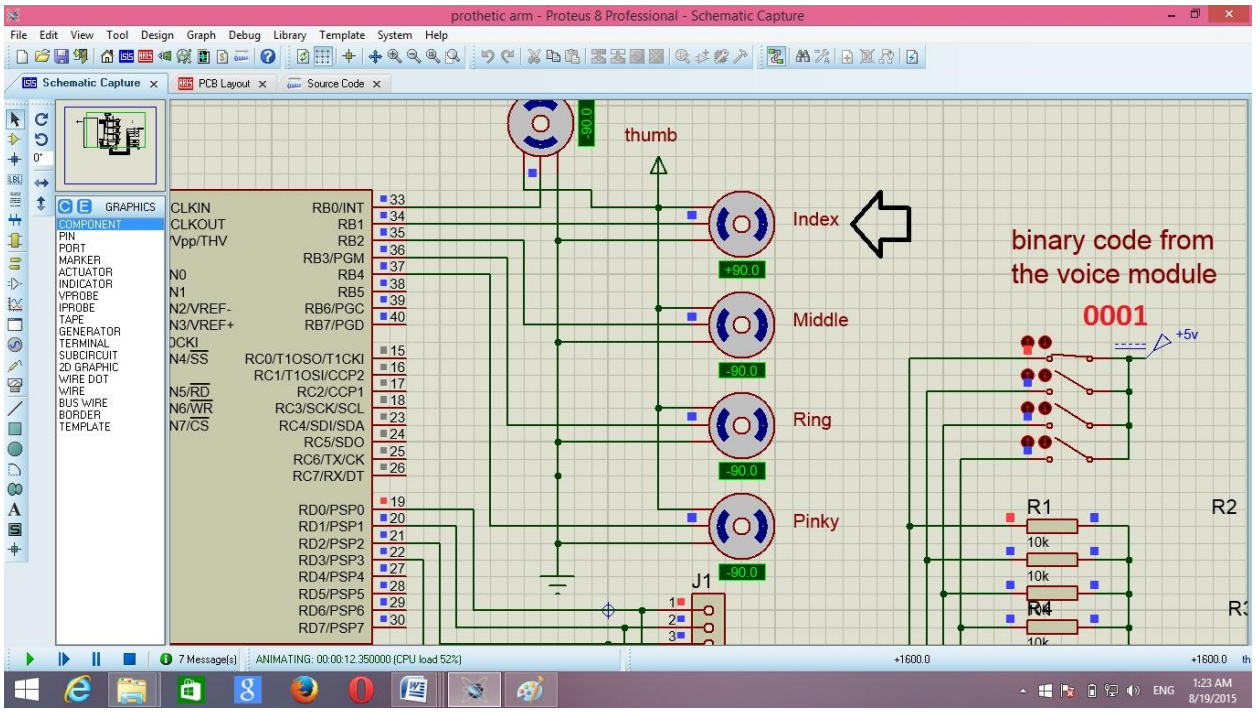

Figure 5.4 testing “one” command on proteus

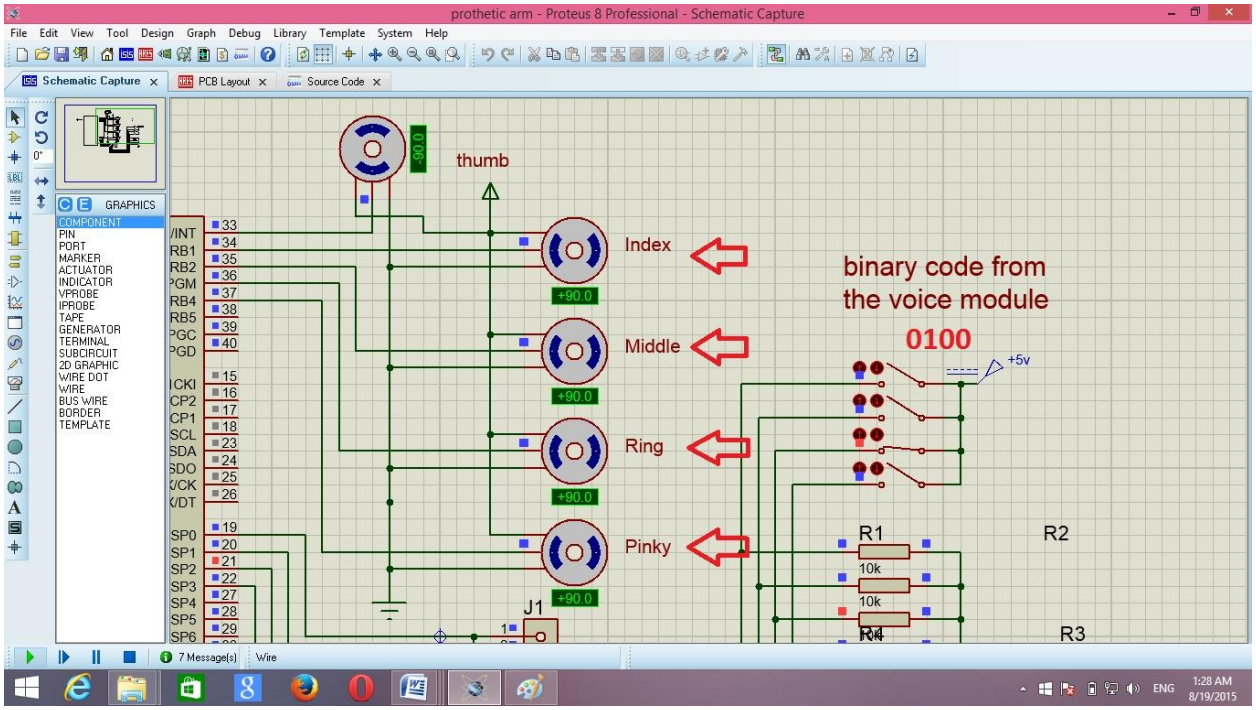

Figure 5.5: testing "grip" command on proteus

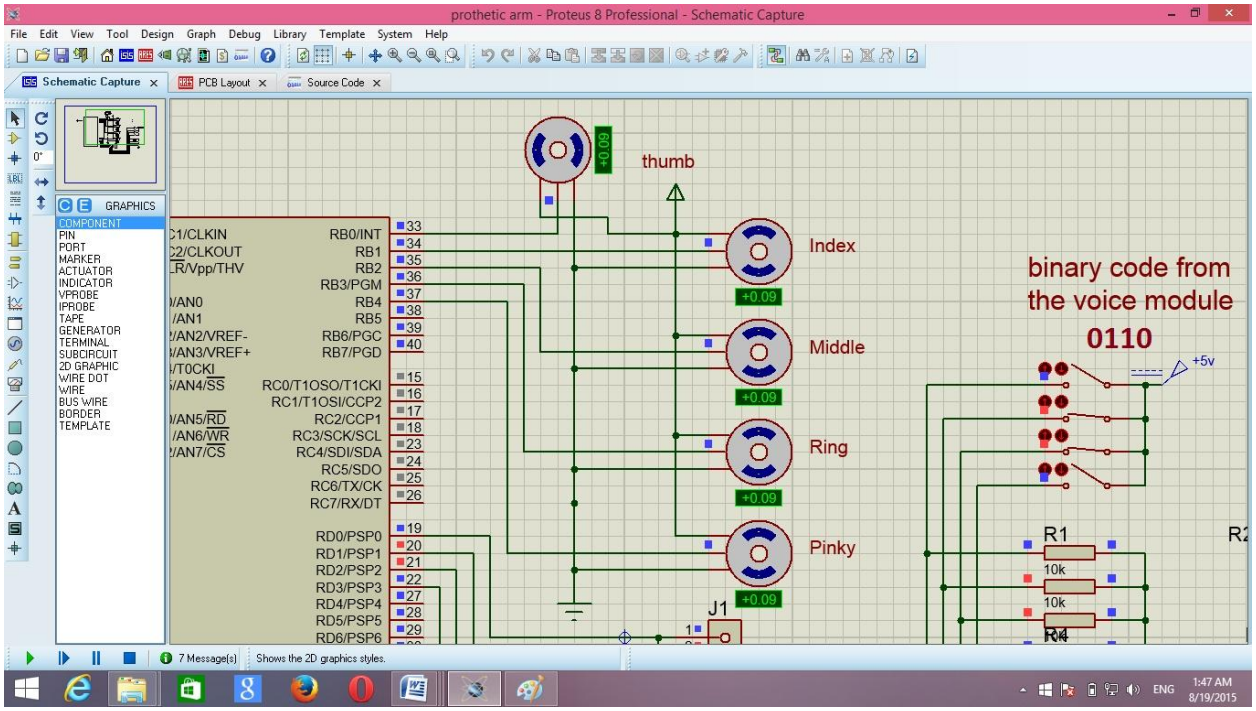

Figure 5.6: testing "four" command on proteus

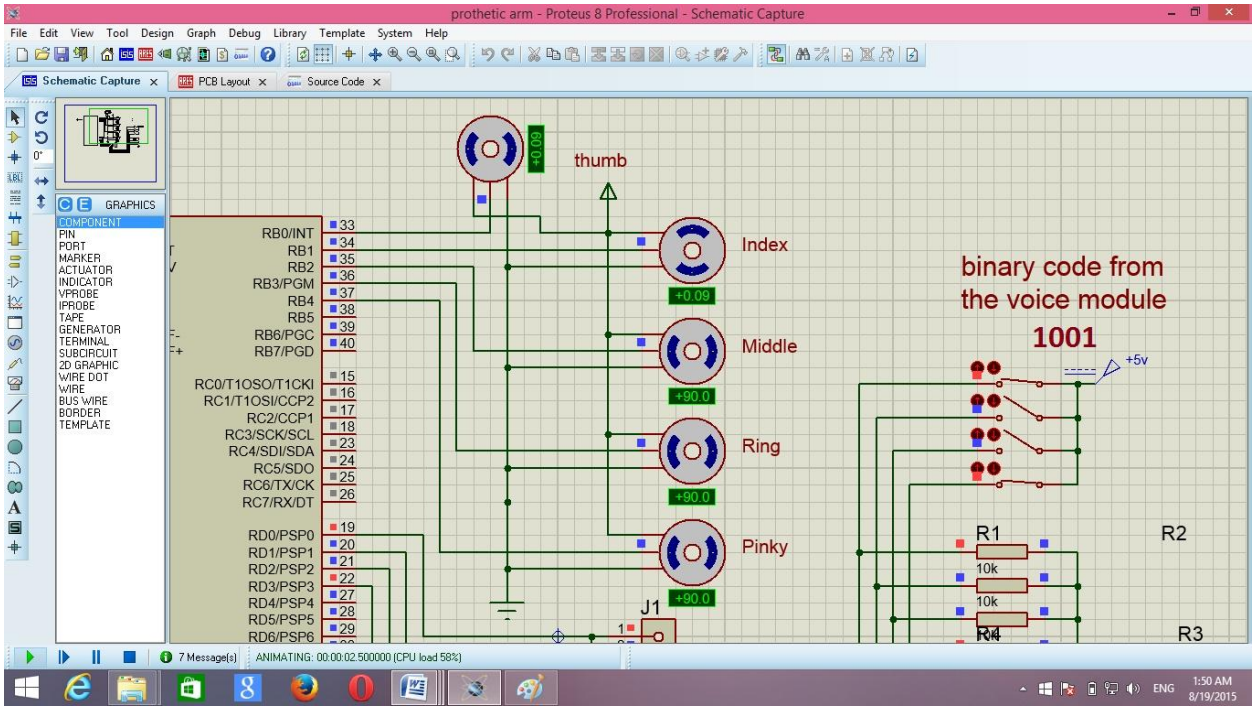

Figure 5.7: testing "ok" command on proteus

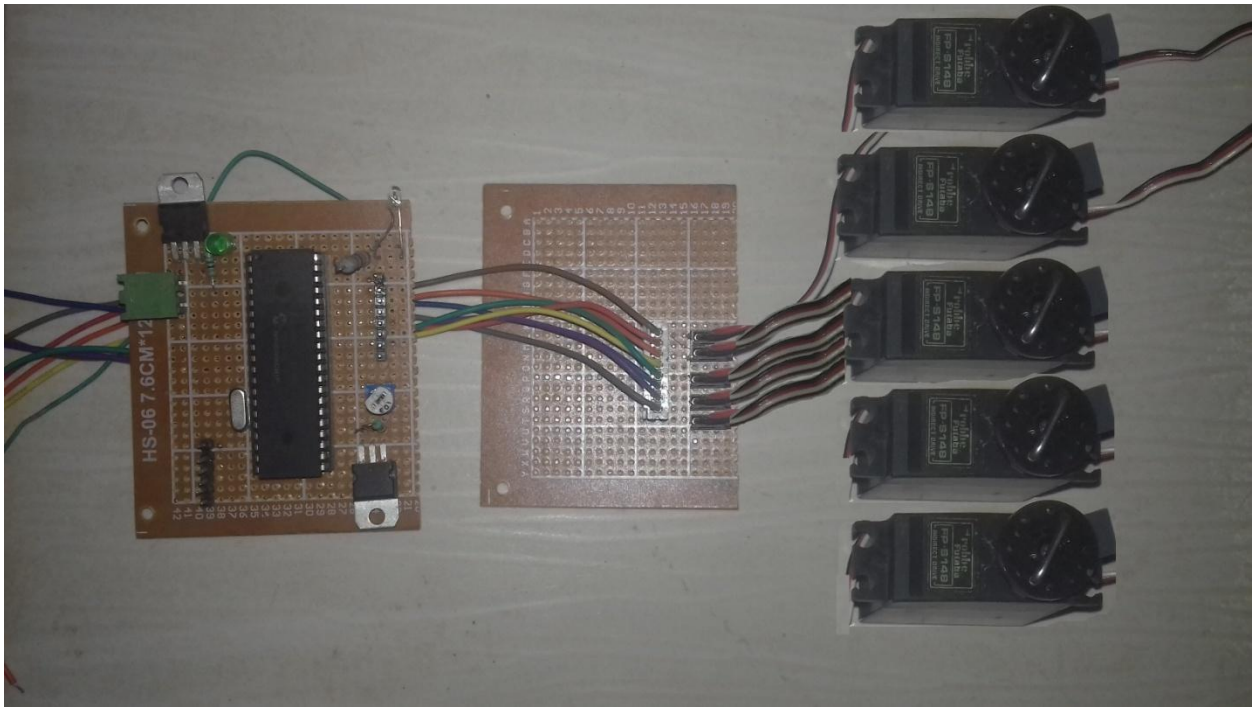

Figure 5.8: Hardware implantation results

Figure 5.9: System response after command ” four “

The user says a significant voice command to be reconditioned and translated to Specific movement of the prosthetic hand. The system is capable of recognizing the command more quickly than this arbitrary two seconds limit. Hence it is a low time consuming approach Furthermore real time recognition ratio of nearly 99% can be easily achieved. At this point, we would like to reiterate the advantages of our voice-controlled prosthetic hand design in comparison with the EMG interpretation-based hand prostheses that are widely available on the market today:

5.4 System Advantages

- No pain or fatigue involved during its use
- Safe and no need of surgical operation.
- Simple, comfortable and easy to use.
- Low cost
- Compact systems

- Flexible to users
- No need training or adaptation time.
- It takes less power to operate system.

5.5 System Disadvantages

- Sensitive to ambient noise
- Slow reactions
- No immediate response

5.6 System Applications

- Upper limb prosthesis.