Appendix

BASCOM code

$regfile "m32def.dat"

$crystal = 1000000

Config Lcdpin = Pin , Db4 = Portb.4 , Db5 = Portb.5 , Db6 = Portb.6 , Db7 = Portb.7 , Rs = Portb.3 , E = Portb.2

Config Lcd = 16 * 2

Config Adc = Single , Prescaler = Auto , Reference = Avcc

Config Portd = Output

Config Portc = Input

Dim A As Word , B As Word , C As Word , D As Word , E As Word

Dim Vwc As Single , Temperature As Single , Speed As Single , Pow As Single

Dim Voltage As Single , Voltage1 As Single , Voltage2 As Single , Voltage3 As Single , Voltage4 As Single

Dim Pow1 As String * 6 , Speed1 As String * 6 , Temperature1 As String * 6 , Vwc1 As String * 6

Const V_ref = 5

Start Adc

```
Do

Lcd "WATER LIFTING &"

Lowerline

Lcd "IRRIGATION SYS"

Wait 3

Cls

A = Getadc(1)

Voltage = A * V_ref

Voltage = Voltage / 1024

Speed = Voltage * 2

Speed1 = Str(speed)

Speed1 = Fusing(speed , "#.##")

Lcd "speed=" ; Speed1 ; "m/s"

Lowerline

Pow = 0.715 * Speed

Pow = Pow * Speed

Pow = Pow * Speed

Pow1 = Str(pow)
```

```
Pow1 = Fusing(pow , "#.##")

Lcd " power=" ; Pow1 ; " W"

Wait 2

Cls

If Pow >= 90 Then

Gosub Main

End If

Loop

Main:

B = Getadc(0)

Voltage1 = B * V_ref

Voltage1 = Voltage1 / 1024

Temperature = Voltage1 * 100

Temperature1 = Str(temperature)

Temperature1 = Fusing(temperature , "#.##")

C = Getadc(2)

Voltage2 = C * 2.3

Voltage2 = Voltage2 / 1024
```

If Voltage2 >= 0 And Voltage2 <= 1.1 Then

Vwc = 10 * Voltage2

Vwc = Vwc - 1

End If

If Voltage2 > 1.1 And Voltage2 <= 1.3 Then

Vwc = 25 * Voltage2

Vwc = Vwc - 17.5

End If

If Voltage2 > 1.3 And Voltage2 <= 1.82 Then

Vwc = 48.08 * Voltage2

Vwc = Vwc - 47.5

End If

If Voltage2 > 1.82 And Voltage2 <= 2.2 Then

Vwc = 26.32 * Voltage2

Vwc = Vwc - 7.89

End If

Vwc1 = Str(vwc)

Vwc1 = Fusing(vwc , "#.##")

```
D = Getadc(3)

Voltage3 = D * V_ref

Voltage3 = Voltage3 / 1024

If Voltage3 >= 4.5 Then

Portd.0 = 1

Lcd "  TANK FULL"

Portd.7 = 0

Wait 2

Portd.0 = 0

Cls

End If

E = Getadc(4)

Voltage4 = E * V_ref

Voltage4 = Voltage4 / 1024

If Voltage4 <= 0.5 And Voltage3 < 4.5 Then

Portd.1 = 1

Lcd "  TANK EMPTY"

Portd.7 = 1
```

Wait 2

Portd.1 = 0

Cls

End If

Lcd " TEMPER=" ; Temperature1 ; " C"

Lowerline

Lcd " VWC =" ; Vwc1 ; " %"

Wait 3

Cls

If Temperature > 35 And Vwc <= 9 Then

Portd.6 = 1

Else

Portd.6 = 0

End If

Return