As mentioned in the previous chapter section 3.1 the overall project has two part proteus simulated system and GUI

The connection between the two parts has been introduced through a virtual serial communication.

4.1 PROTUSE DESIGN

When the user hit the simulation button an introduction welcoming message will appear in the graphical LCD for 2 second duration as Shown in Figure 4,1
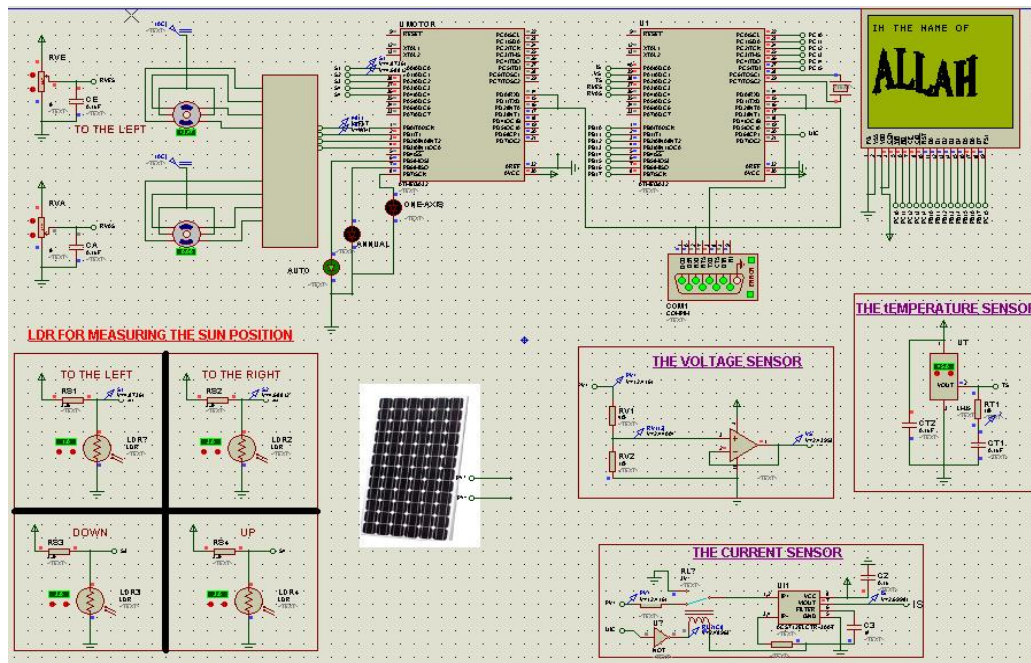

Figure 4.1 the beginning of the system

then message contain the author name and the MSc program name for 3 second duration as Shown the LCD in Figure 4,2
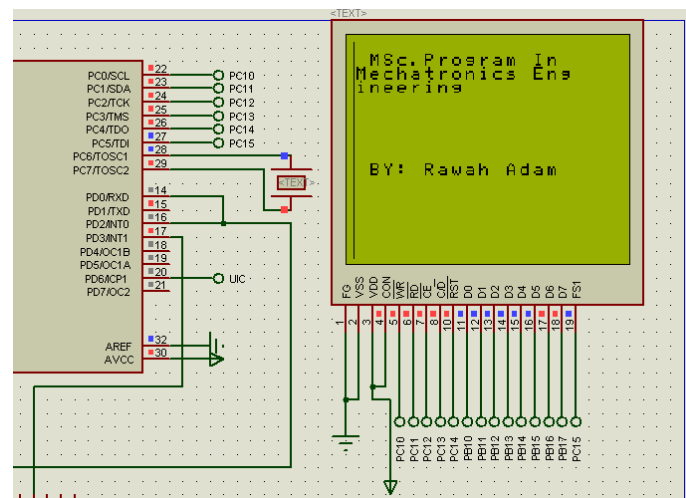

Figure 4.2 introduction for the system

After that 3 seconds a message contain the program logo as Shown the LCD Figure 4,3.
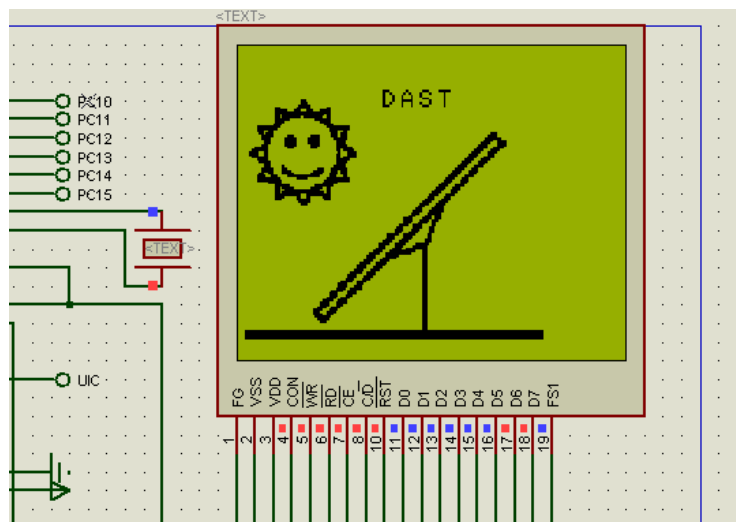

Figure 4.3 System LOGO

The tracking system will be Dual –axis by default indicated in the auto lamb (The Green one) as Shown in Figure 4,3; and the graphical LCD will show real clock and measuring data.
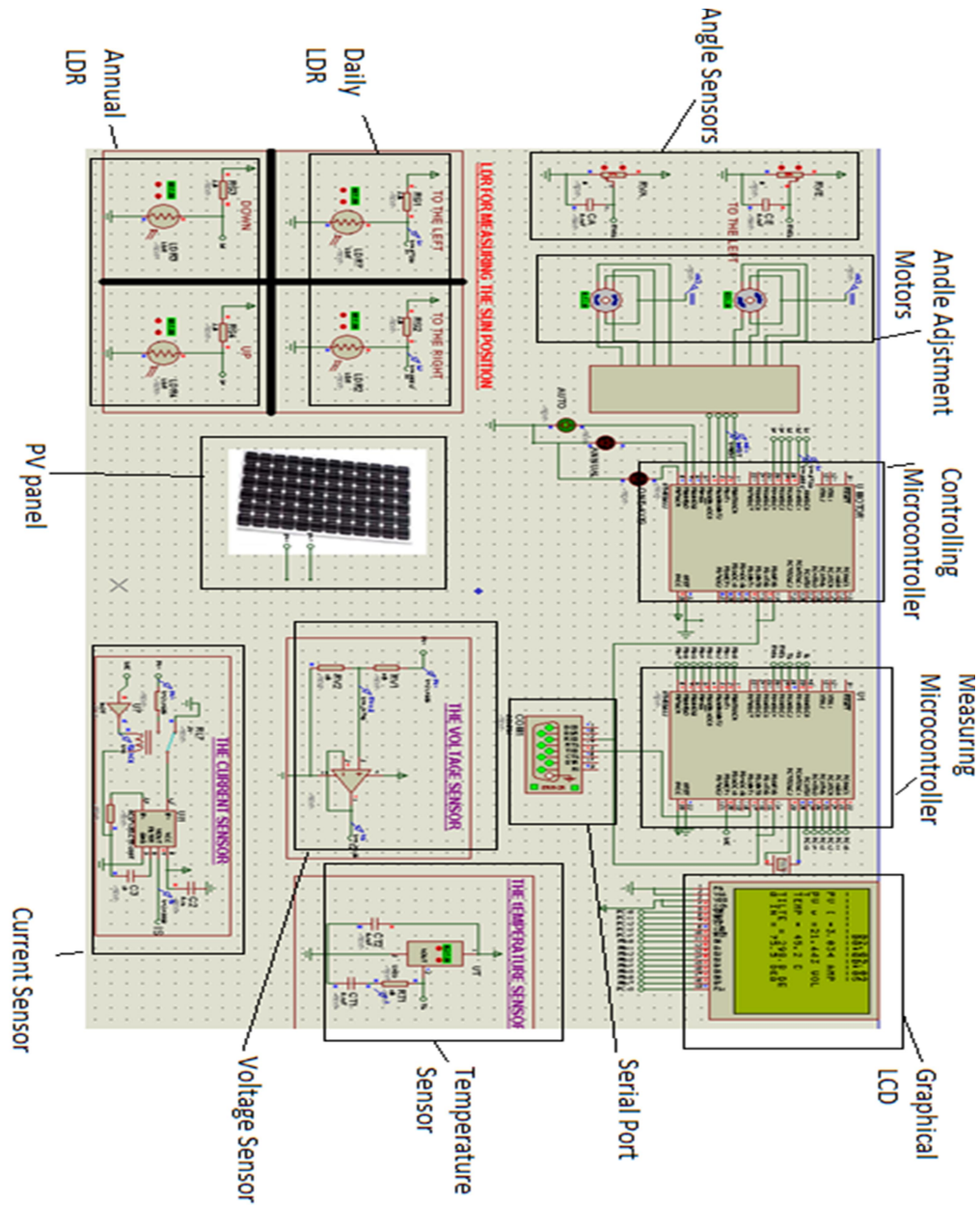

Figure 4.4 Measurement

4.2   MATLAB GUI DESIGN

The interface implemented using the tool GUIDE. The MATLAB graphical user interface development environment, provides a set of tools for creating graphical user interfaces (GUIs). These tools simplify the process of laying out and programming GUIs.

At the beginning an introduction letter will appear as Shown in Figure 4,5.
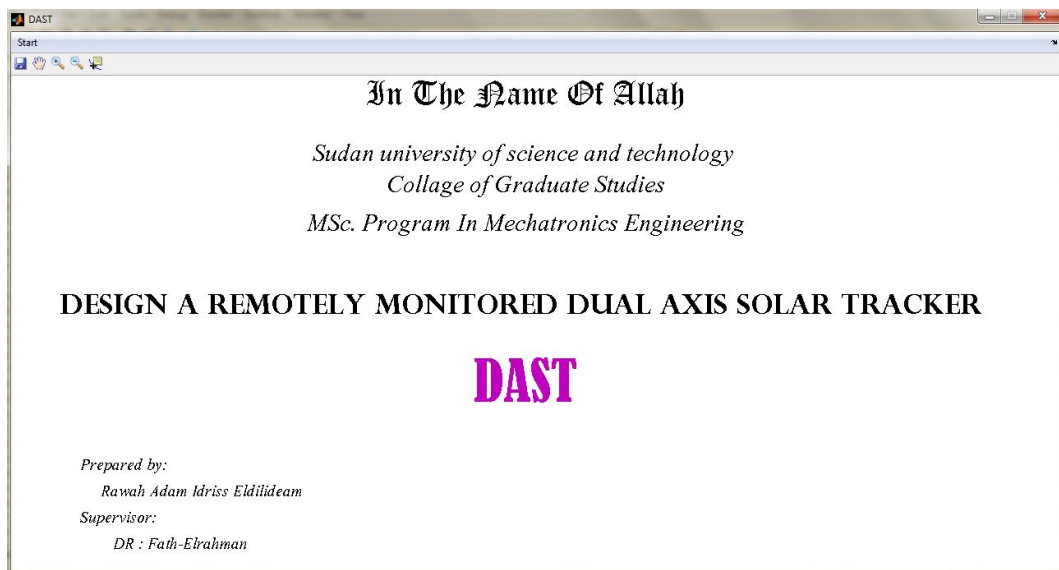

Figure 4.5 the beginning of the GUI

To enter the user must hit the start button in the toolbar which will lead him to another page ask in Figure 4.6a ask him to enter his name and his password and then he must hit the login button
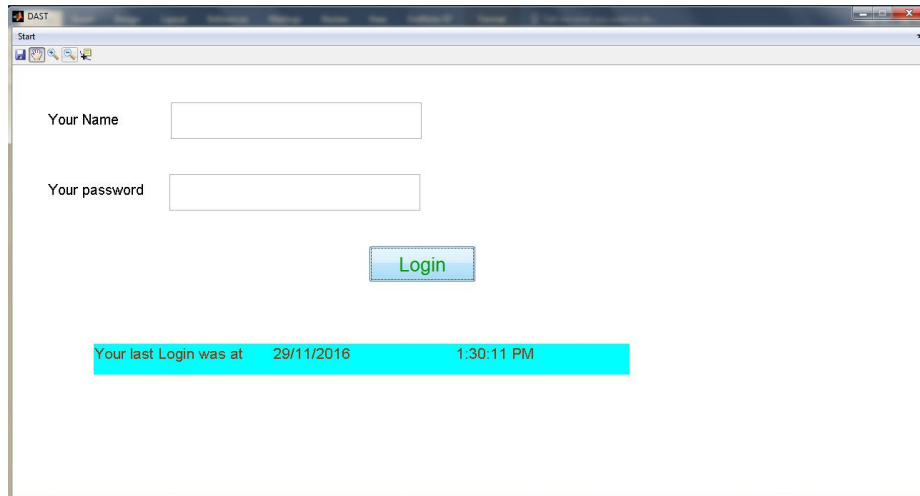
Figure 4.6a Login Interface

If he enters those wrongly a message will appear in Figure 4.6b; but it was right the login button will lead him to the action panel.
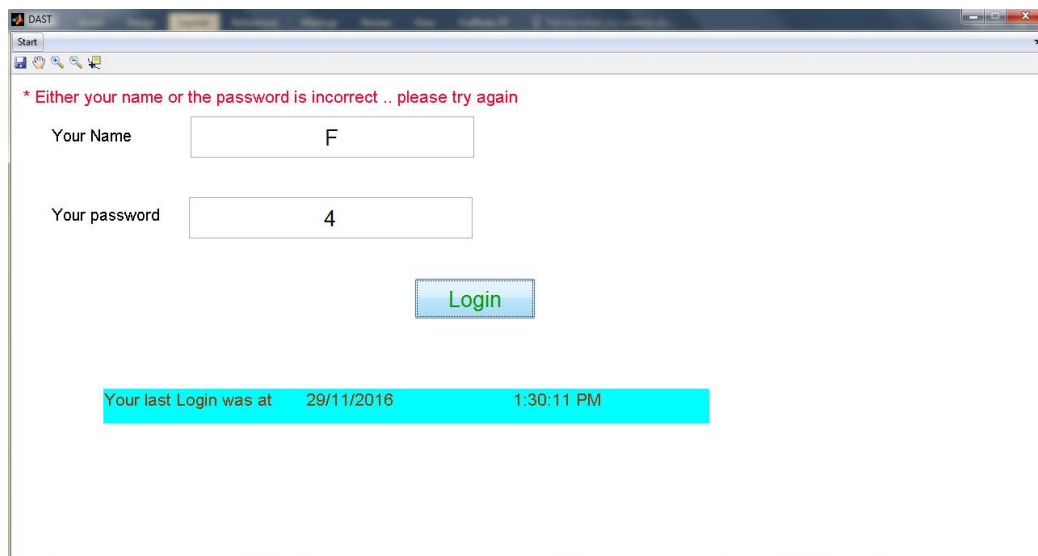

Figure 4.6b in case of Bad name or password

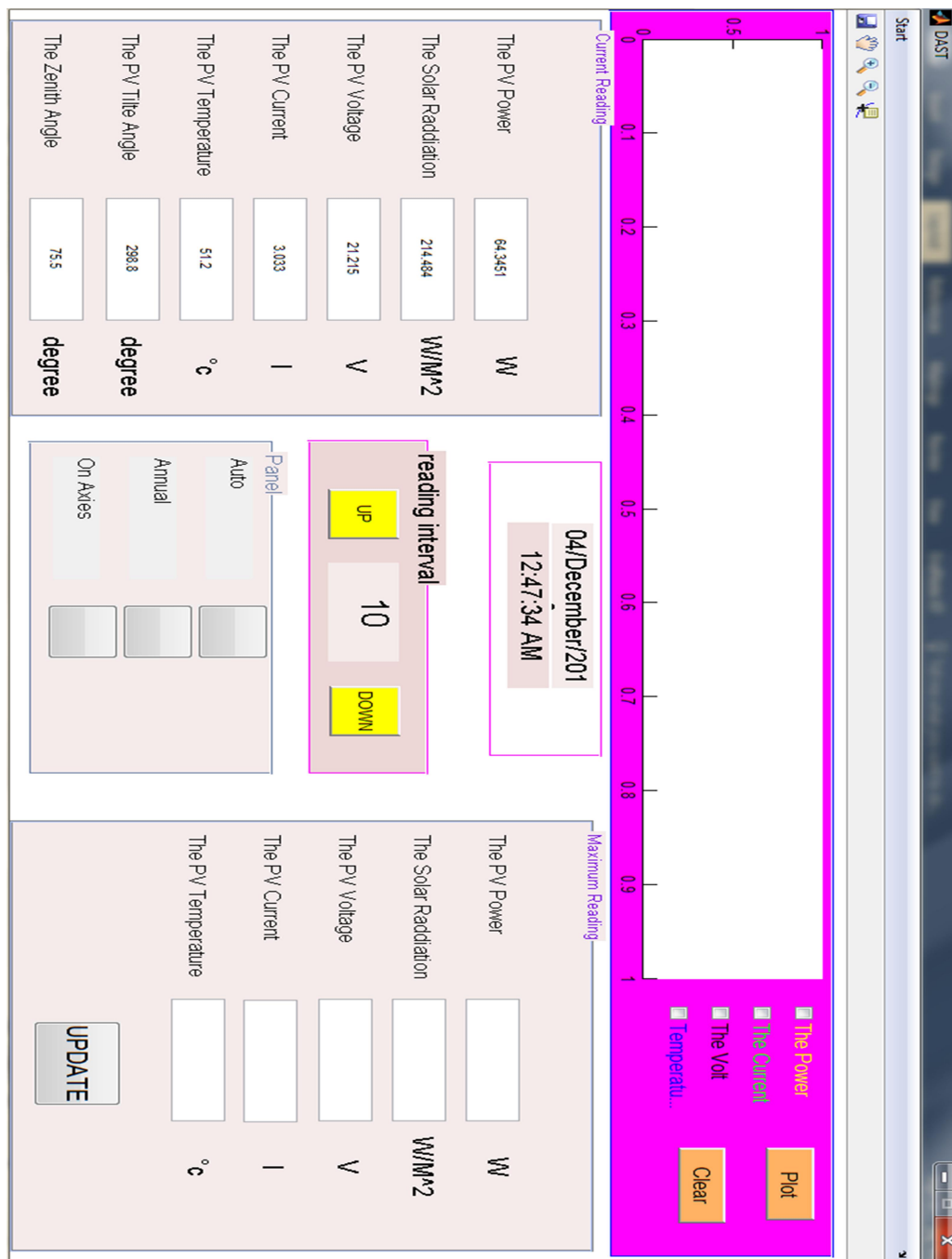The main interface Given in Figure 4.7, contain 6 panel

Figure 4.7 The Main Interface

Panel one contain the measuring reading which will be updated every time interval according to the user preference as shown in Figure 4,8.
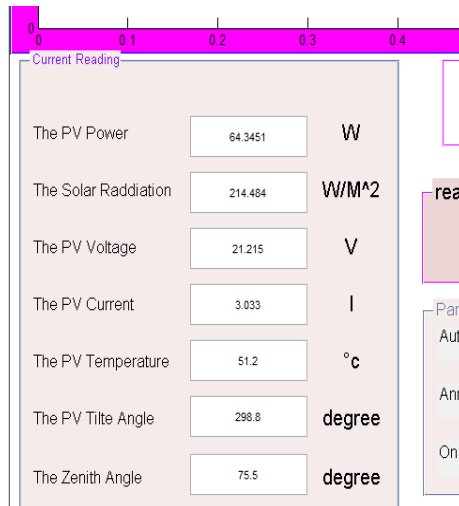

Figure 4.8 Current Reading Panel

Panel two contain the system real time calendar shown in Figure 4,9a.

Panel three contain the time interval reading period, it can be change according to the user [10 , 20 , 30 , 40 , 50 , 60] minutes shown in Figure 4,9a.
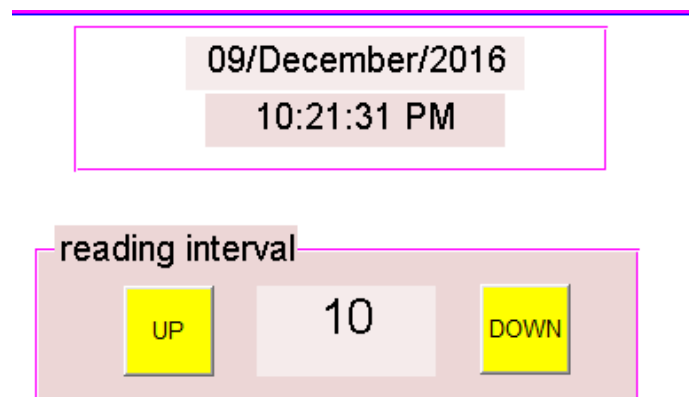

Figure 4.9 a Interval time Control

❖ If the user hit the Down button after reaching the number 10 a warning massage like the one in Figure 4,9b will be reviled

❖ If the user hit the Up button after reaching the number 60 a warning massage like the one in Figure 4,9c will be reviled
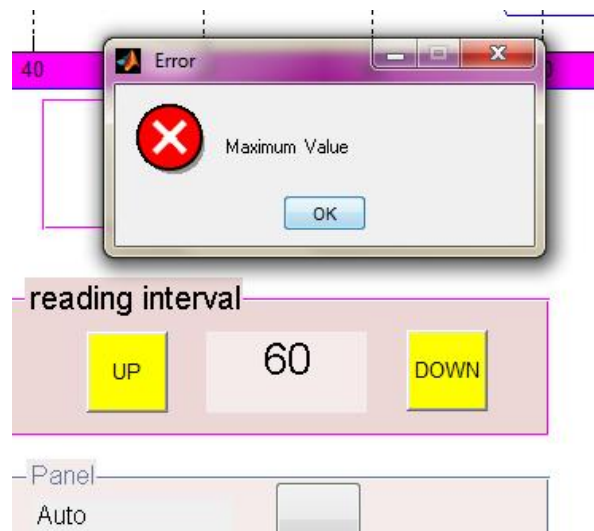

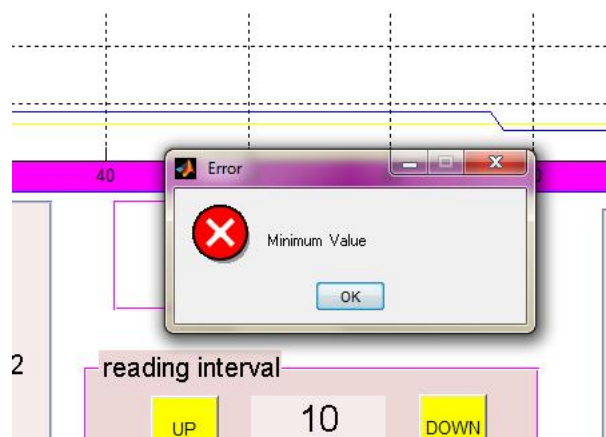Figure 4.9 b Interval time Control maximum value

Figure 4.9 c Interval Time Control minimum value

Panel four contain control action panel where the user can select Auto control, Annual control or One Axis control as shown in Figure 4,10
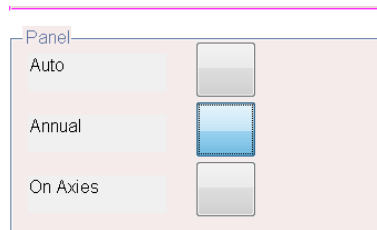

Figure 4.10 Action Control Panel

Panel five in this panel the user using the plot button can plot any combination of the power, current, volt or the temperature; from the data stored in the data base as shown in Figure 4,11a. and he can clear the plot axis using the clear button as shown in Figure 4,11b-
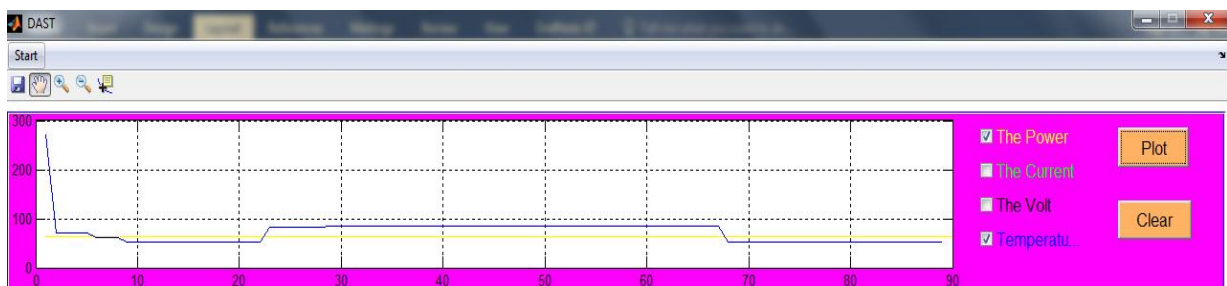

Figure 4.11 a Plot Interface

Figure 4.11 b Plot Interface

Panel six in this panel the maximum system reading stored in the data base will be visualized using the Update button as shown in Figure 4,12
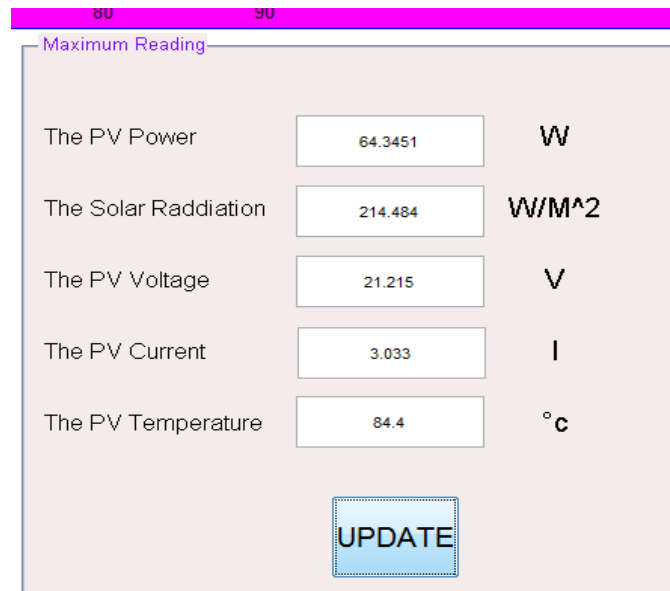

Figure 4.12 The Maximum value in the data base

4.3 CONTROL ACTIONS SCENARIOS

❖ Two axis case shown in figure 4.13

In the GUI the user will chose auto button in the action panel as shown in Figure 4,10. In proteus a Green-Led will light up and the motors will follow the procedures in the algorithm shown in Figure 3,2. Any change in the LDR1 and LDR2 will make motor1 to change in position, and that change will be presented in zenith angle in the GUI. Any change in the LDR2 and LDR3 will make motor2 to change in position, and that change will be presented in tilte angle in the GUI.
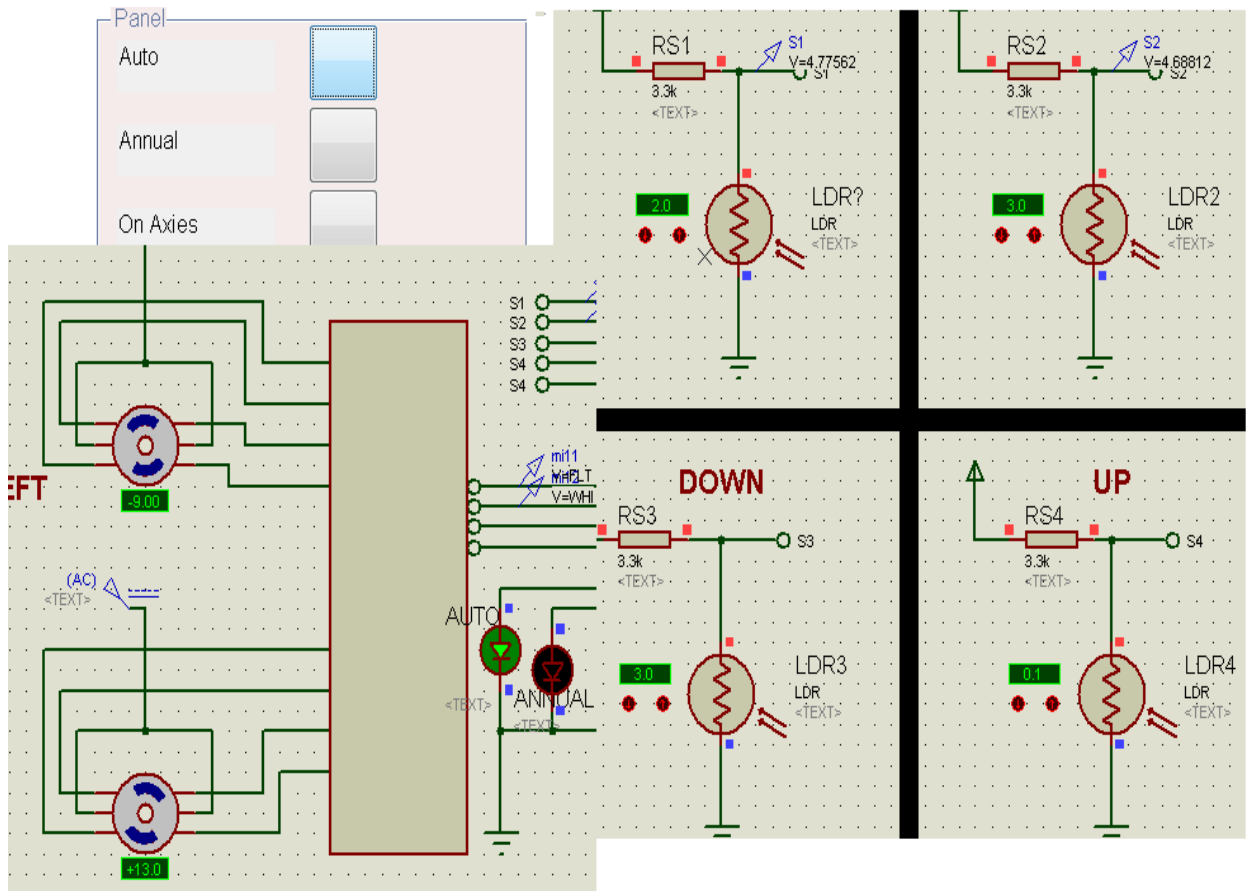
Figure 4.13 Two axis case control scenario

❖ Annual

In the GUI the user will chose annual button in the action panel shown in Figure 4,10. In proteus the Yellow-Led will light up. In the day one from each month a signal will be sent to the system to adjust the tilte angle through motor2 according to the reading of LDR3 and LDR4. Any change in the LDR1 and LDR2 will make motor1 to change in position, and that change will be presented in zenith angle in the GUI.

❖ One Axis demonstrated in Figure 4.14

In the GUI the user will chose annual button in the action shown in Figure 4,10. A signal will be sent from the GUI to the system. In proteus the Red-Led will light up. Motor1 position will be up dated. Motor2 position will be maintained.
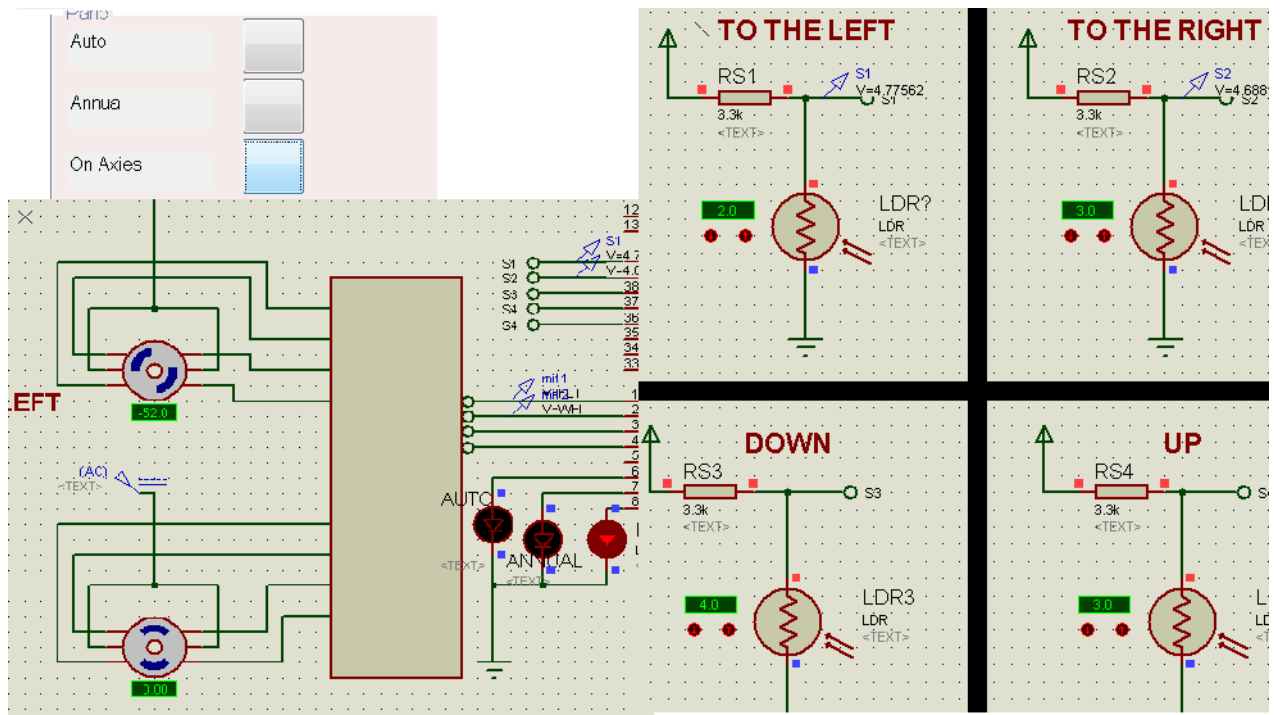

Figure 4.14 One Axis Control Scenario