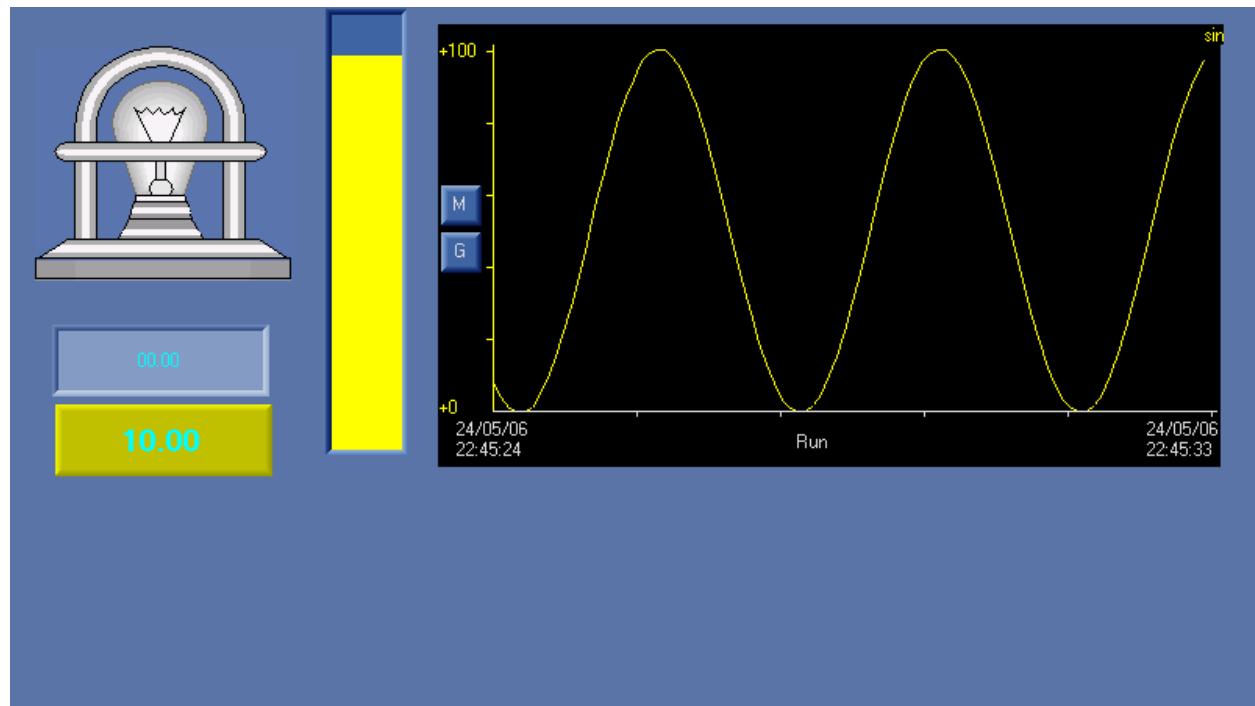


Instruction Manual

Create this Demo application in a few short steps!

8/30/2012

Unitronics



Reference Diagrams (These Diagrams will be referenced in the document below.) We recommend printing this page for reference.

The first is a description of **main menu icons** that will be used, specifically Ladder, HMI, and Data Table.

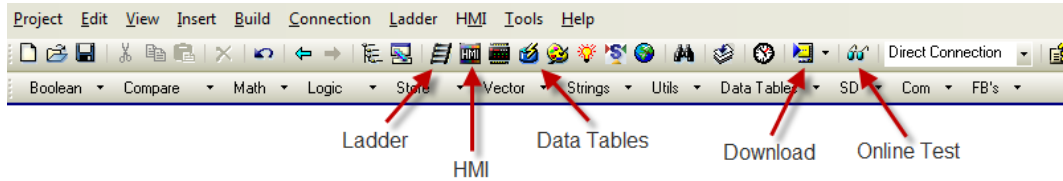


Figure 1- Main Menu

The second is a description of toolbar icons in the **ladder editor** that will be used.

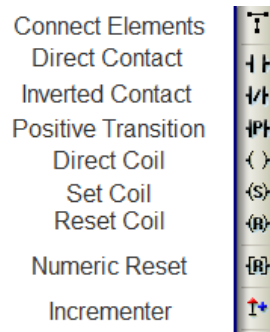


Figure 2- Ladder Tool Bar

The third is a description of toolbar Icons in the **HMI editor** that will be used.

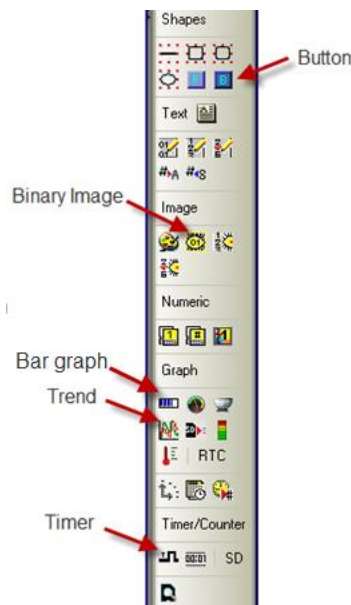


Figure 3- HMI Tool Bar

Toggle Light (Here the goal is to create a toggle light that will turn on with one touch, off with a second touch)

Step 1: Open VisiLogic. *Hardware Configuration* window opens, shown below. Choose the controller you will be working with from the menu on the left. In the example, we have chosen a **V1210**. Click **OK**.

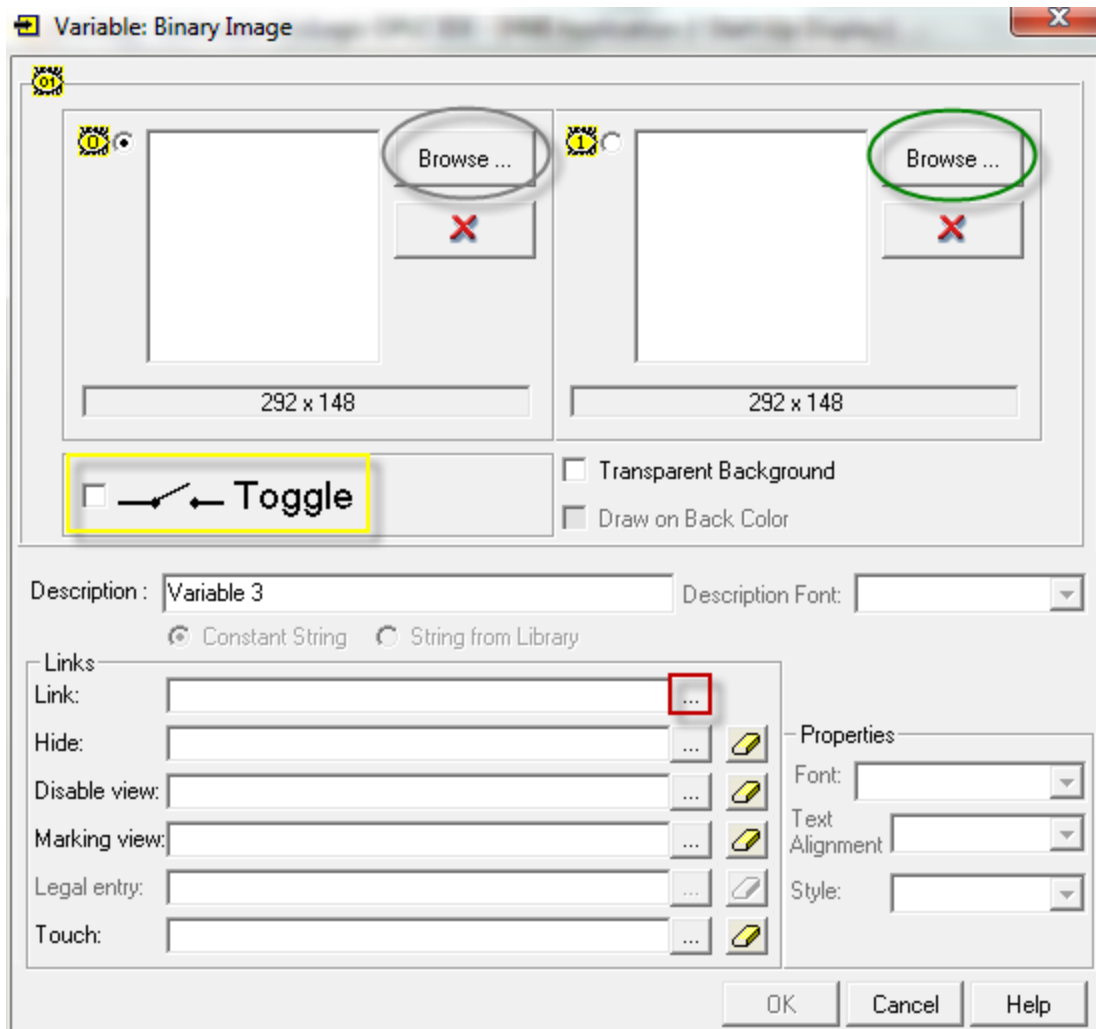


Step 2: Select the **HMI** icon from the main menu (Figure 1). This brings us to the *HMI screen*.

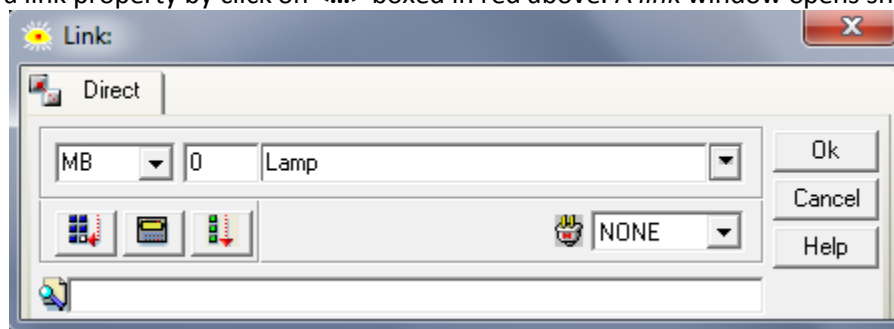
Step 3: Select **Binary image** icon from the HMI Tool Bar (Figure 3). Then click, hold, and drag a rectangle on the top left of your screen, shown below.



This space will be designated for a light. It can be modified later if necessary. Once the rectangle is placed, *Variable: Binary Image* window appears on screen (shown below).

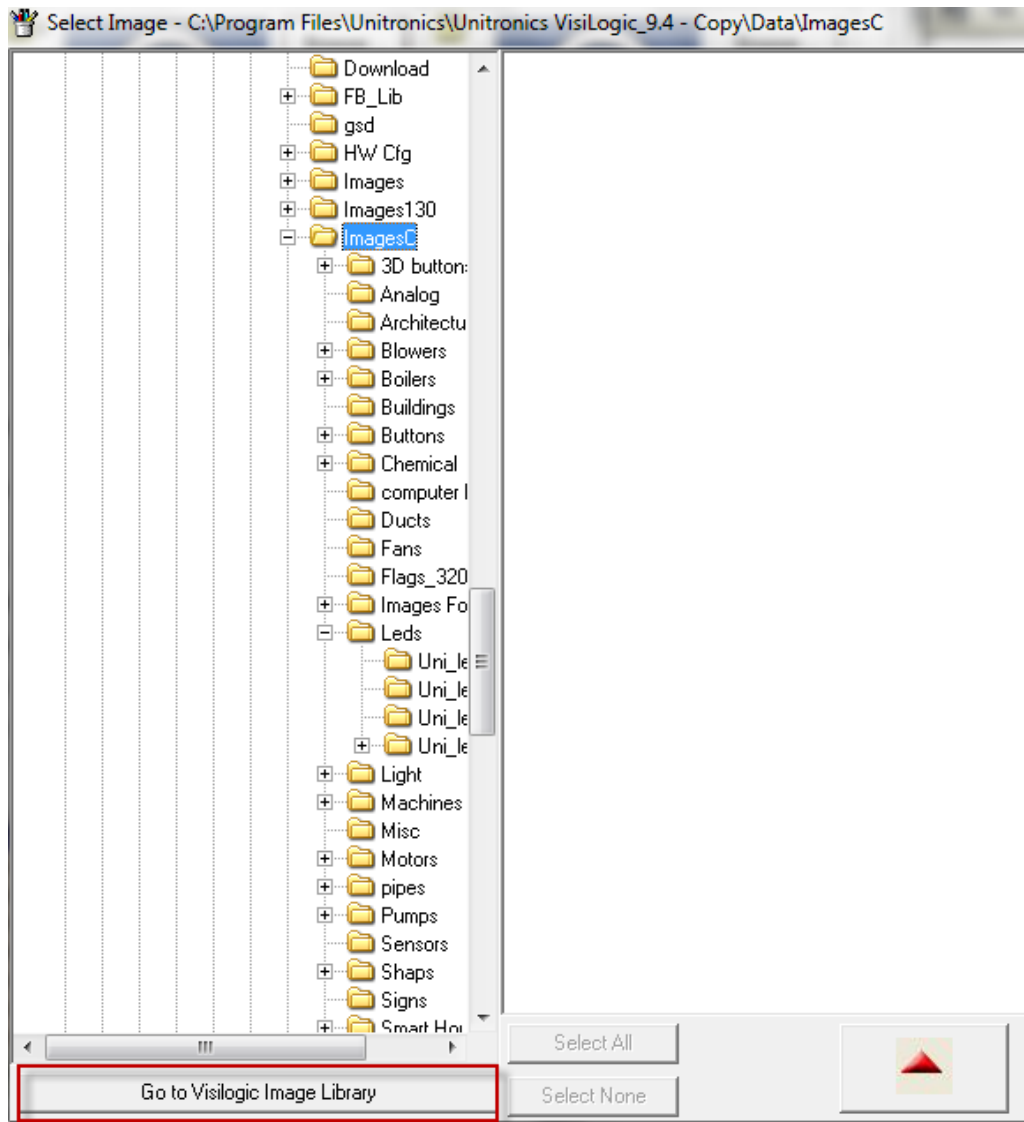


Step 4: Assign a link property by click on <...> boxed in red above. A *link* window opens shown below:



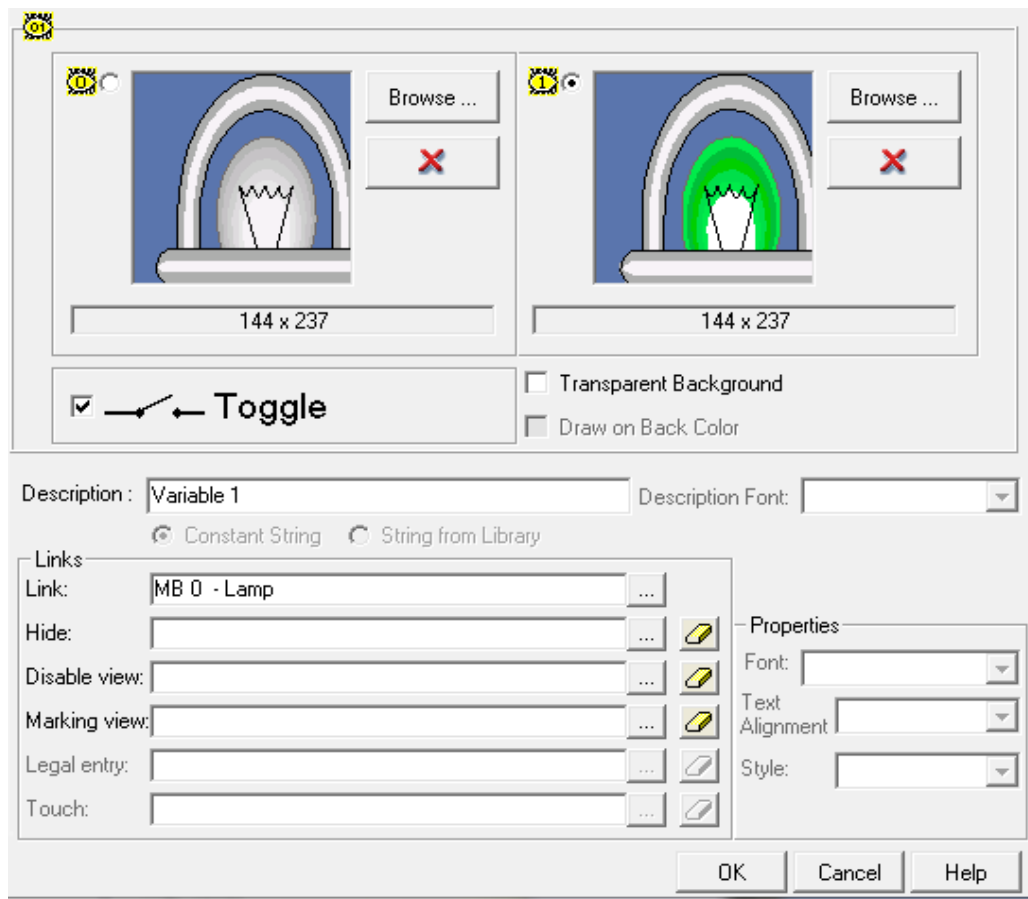
Select **MB** from the dropdown menu. Enter **0** and type **Lamp** as shown above. Select **OK**.

Step 5: Select the left **Browse** from the *Variable; Binary Image* window circled in Gray above. A *Select Image* Window will appear. Next, click **Go to VisiLogic Image Library** (boxed in red below) and select Light>Uni light 1. Choose a grey light by double clicking.



Step 6: Select the right **Browse** and select “Green” folder instead of “Grey” in the process. Choose a Green light by double clicking.

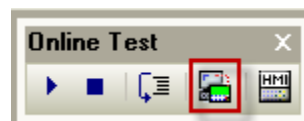
Step 7: Check the **Toggle Checkbox** boxed in yellow above. Once this is complete, your Variable should look similar to the image below. If this is not the case, please adjust.



Step 8: Download the application to the controller. This is accomplished by selecting the **Download** icon from the main menu toolbar (figure 1). The download process will begin. Once the download is complete, a *Visilogic will send RUN command to the OPLC* message will appear. Click **OK**.

The application is now downloaded. Touch the light on the PLC and watch as it turns on and off with each touch.

To view the controller's HMI screen on the PC, there is a tool named *Remote Access*. From the Main tool bar (figure 1) select the **Online test** icon. This will open the tool bar featured below:

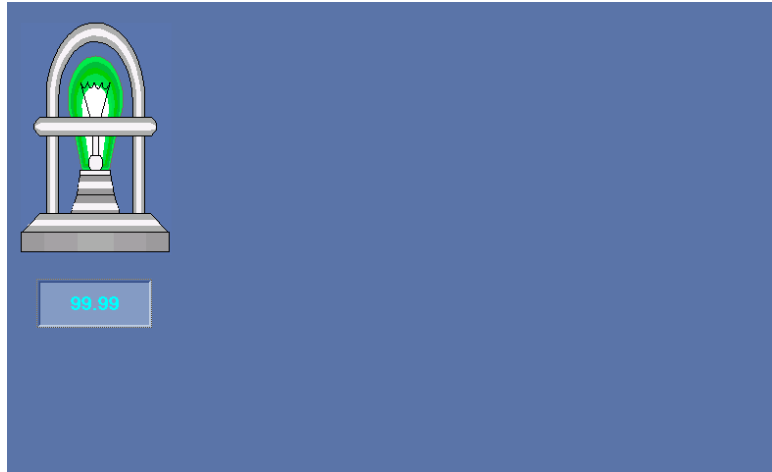


Select the icon boxed in red. This is **Remote Access**. A window will appear that mirrors the HMI display on the controller (shown below). This will allow use of a mouse to control the HMI screen (A click is the same as a touch).

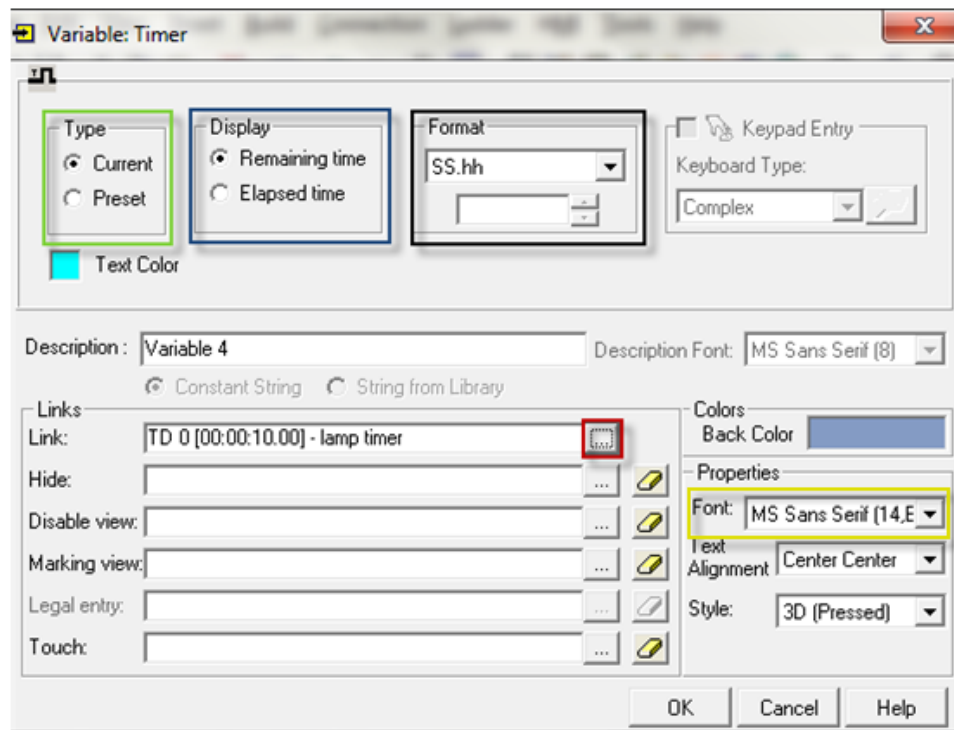


TIMER (Here, there goal is to create a timer that starts when the light is turned on, and will turn the light off after a set period of time)

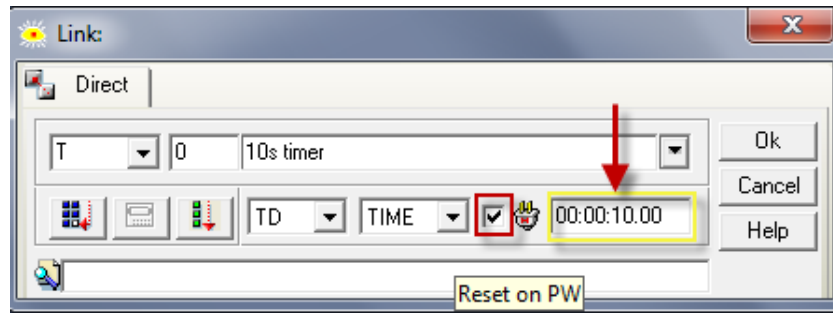
Step 1: Select the **Timer** icon from the HMI Tool Bar (Figure 3). Click, hold, and drag a rectangle under the lamp in the space shown below.



This will be a timer value. A *Variable:Timer* window appears upon release (bellow).



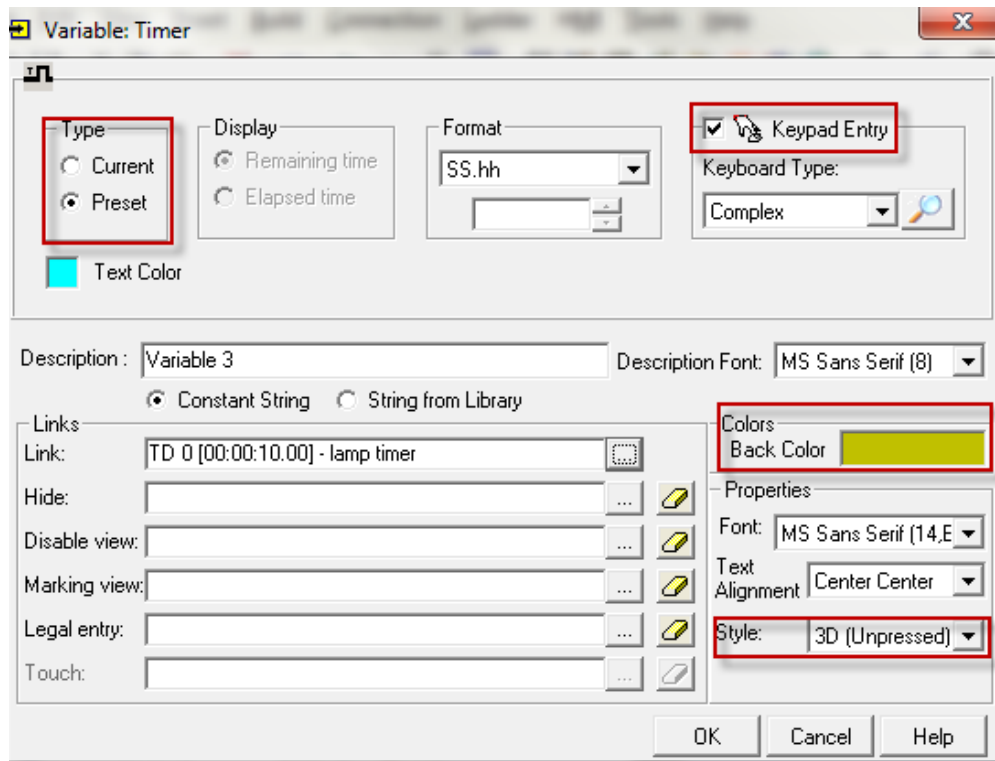
In this window, select <...> highlighted in red above to assign a link value. The *link* window will open, shown below. Enter **0** and **10s timer** as shown. Also, select the check box (in red below), and enter **00:00:10:00** (this represents 10s, hours:minutes:seconds:hundreds of seconds). The window should look like the one below.



Select **OK**

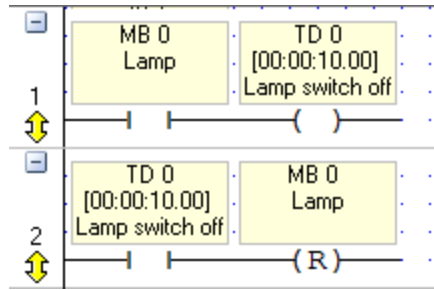
Next in the *Variable:timer* window, select Type- **Current (green)**, Display-**Time Remaining (blue)**, and Format- **SS:hh(black)**. Finally, boxed in green above, change the font from size 8 to **14**. Once this is complete, the window should look like the *Variable:timer* window above. Select **OK**.

Step 2: Right click on the timer and select copy. Then drag the timer down so that the space it occupied is completely empty. Then right click and paste. A replica of the timer will be placed in the space where it was copied. Double click on the lower timer. *Variable:timer* window appears. Here, select Type- **Preset** and select the checkbox **keypad entry** shown below. Next, from the Style drop down menu, select **3D (Unpressed)**. Finally, change the font from size 8 to **14**. In colors, select Yellow. Select **OK**.

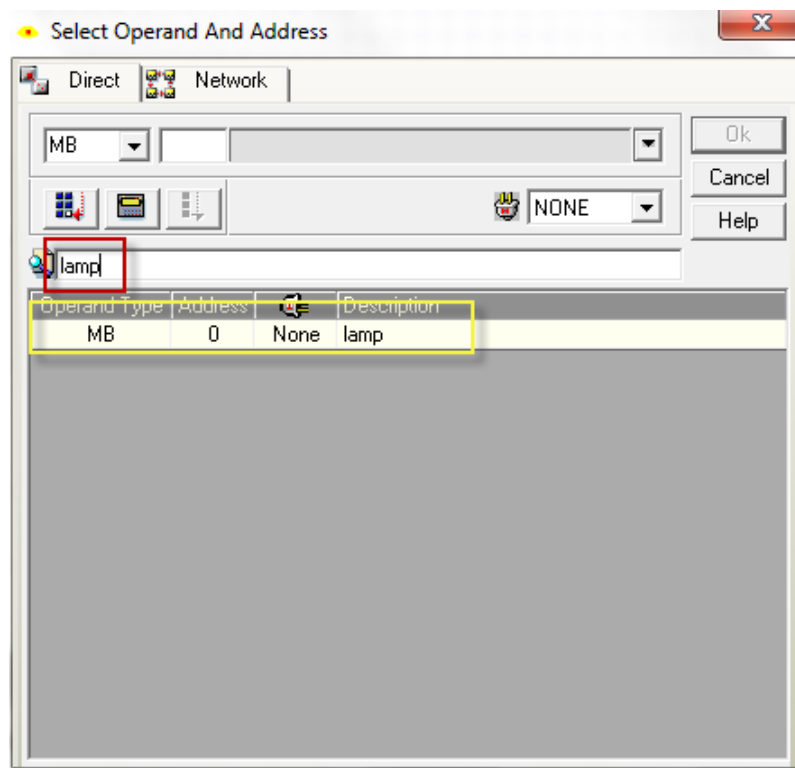


Step 3: Now, select the **ladder** icon in the main menu (figure 1). This will open the ladder logic.

Step 4: Using the Ladder Tool Bar (figure 2) build the following Ladder Logic.



Step 5: Click on **Direct contact** icon (figure2). Drop the direct contact on the left rail. Once dropped, the familiar *Select operand and Address* window appears.



Here, we can search for the bit LAMP. Type **LAMP** into the tab at the bottom (red above). All operands with the name *lamp* in the definition will appear in the box. Select **MB0** (Yellow above).

Step 6: Click the **Direct Coil** icon (figure 2). Place the direct coil to the right of the Direct contact. The *Select operand and Address* window appears. In the drop down menu, select **T** to replace MB. Type **0** to the right. The definition 10s timer should appear. This is the definition given to TD0 earlier. Click **OK**.

This completes this statement, "If the lamp is on, start 10s timer".

Step 7: Select a **Direct Contact** icon (figure 2). Drop the contact on the left rail. The *Select Operand and Address* window appears. Here, select **T** in the drop down menu to replace MB. Type **0** to the right. The definition 10s timer should appear. This is the definition given to TD0 earlier. Click **OK**.

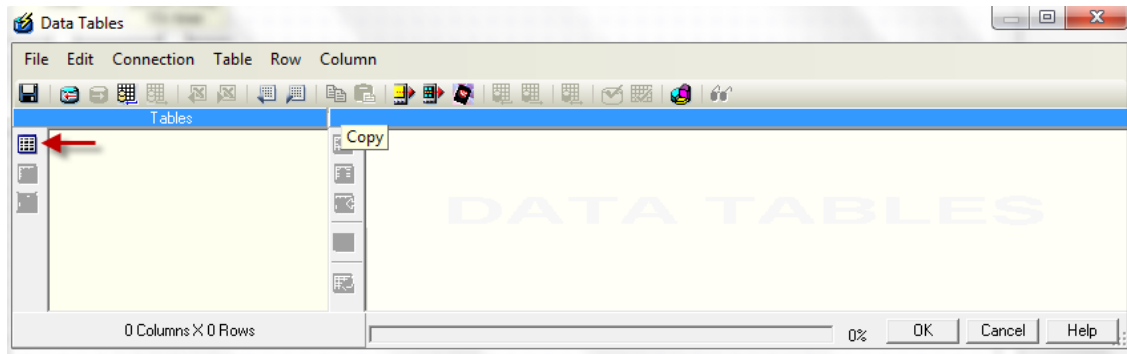
Step 8: Click the **Reset Coil** icon (figure 2). Drop the coil to the right on the Direct Contact. The *Select Operand and Address* window appears. Here, type **0**. The definition “Lamp” should appear. This is the definition given to MBO earlier. Click okay.

This completes this statement, “ if the timer is complete, turn the lamp off”.

Step 9: Download the application to the controller using the **download** icon from the main menu toolbar (figure 1). Once downloaded, touch the lamp on the PLC and watch the top timer count down from 10s. To change the 10s value, click the lower timer (yellow) and a keypad will appear. Enter the timer value desired.

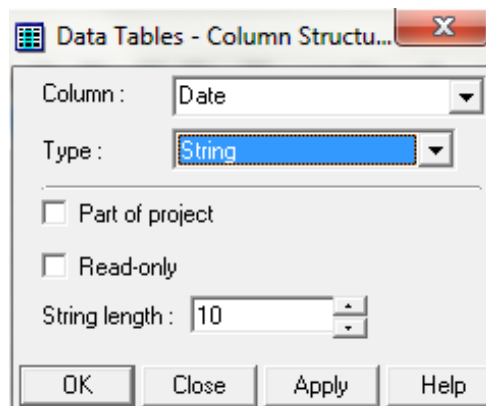
Data Table Store (Here, each time the lamp changes state, the date and time will be logged to a data table)

Step 1: Select the **Data Table** Icon from the main menu toolbar (figure 1). The *Data Tables* window will appear. Now, click the **Add Table** icon, indicated below by a red arrow.

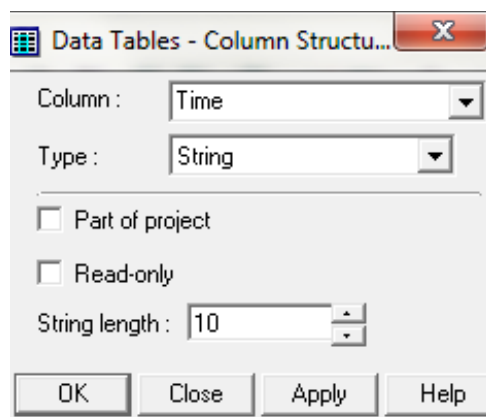


A *Data Table structure* window will appear. Rename table 1 with **Lamp Log**. For a table size, select **3 columns and 10 rows**. Click **OK**. The data table should appear to the right.

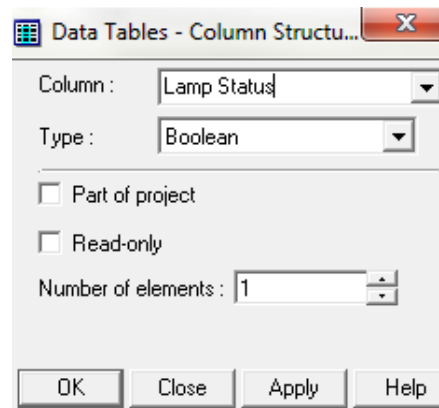
Double click on **Column 0**. Rename **Date**. For type, select **String**. Click **OK**. (shown below)



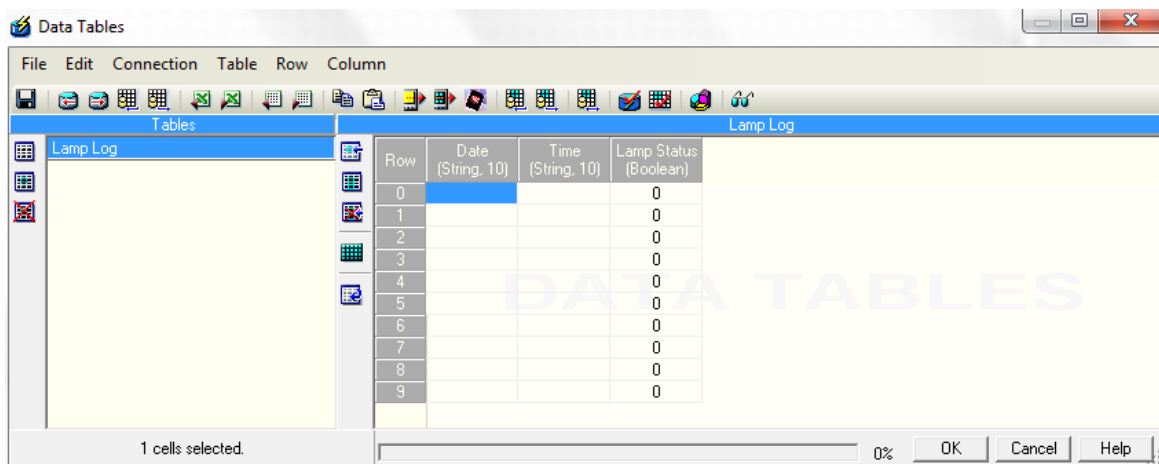
Double click on **Column 1**. Rename **Time**. For type, select **String**. Click **OK**.



Double click on **Column 2**. Rename **Lamp Status**. For type, select **boolean** . Click **OK**.

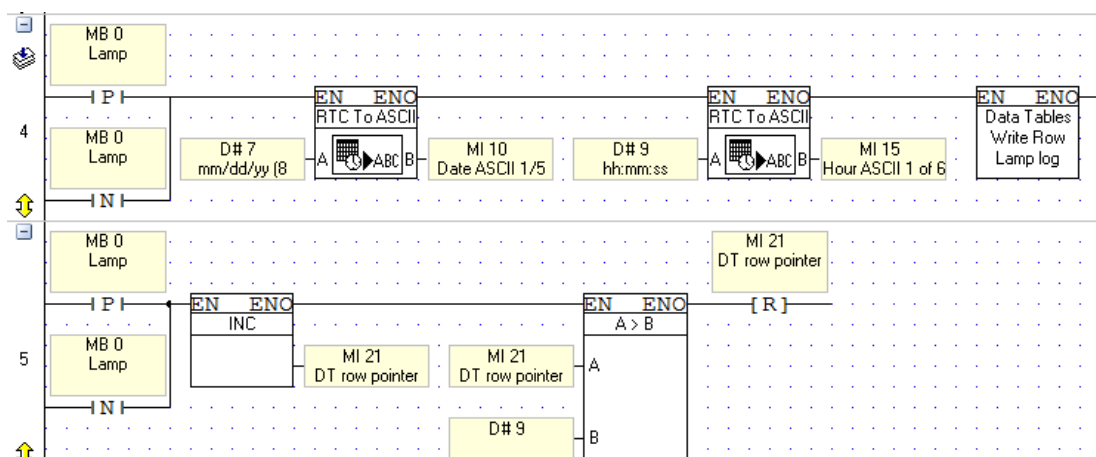


The data table should look like the image below:



Select **OK**.

Step 2: Construct the following Ladder Logic in rungs 3 & 4:

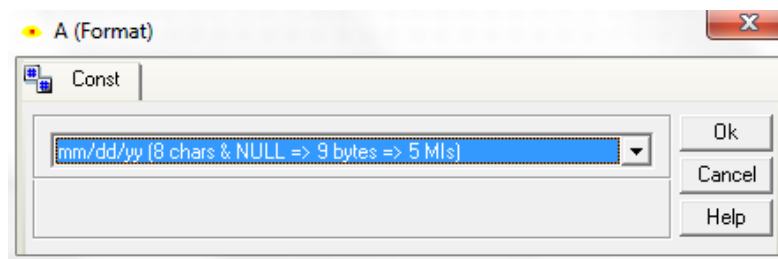


Step 3: In the main menu (figure 1), select **Boolean>Contacts>Positive Transition Contact**. Place the Contact on the left rail. The *Select Operand and Address* window opens. Type **0**. Description Lamp will appear. Select **OK**.

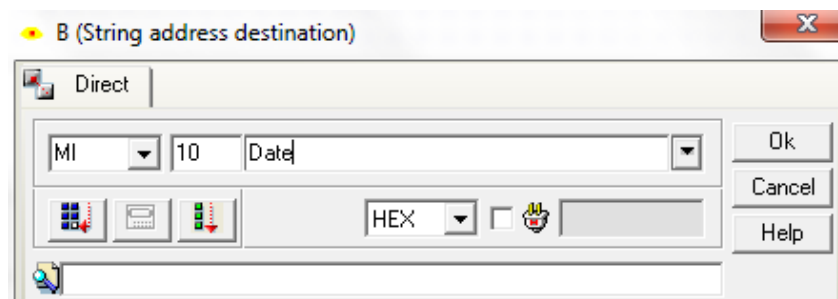
Step 4: In the main menu (figure 1), select **Boolean>Contacts>Negative Transition Contact**. Place the contact below the Positive Transition Contact (shown above). The *Select Operand and Address* window opens. Type **0**. Description Lamp will appear. Select **OK**.

Step 5: Select **Connect Elements** in the Ladder Tool Bar (figure 2). Draw a line connecting the 2 Contacts.

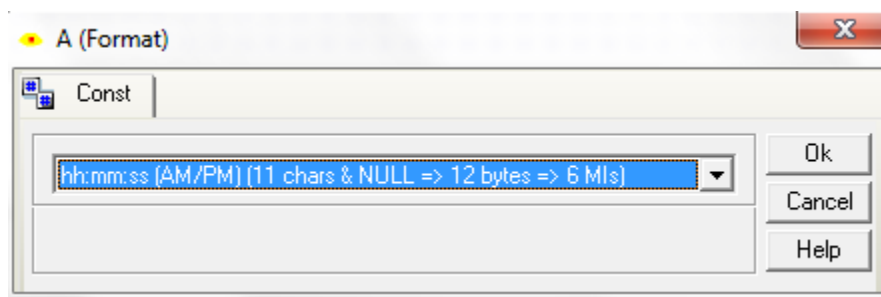
Step 6: In the main menu, Select **String>RTC to ASCII**. Place the RTC to ASCII block to the right of the Pos and Neg transitions. Once placed, the *A(Format)* window will appear shown below. Select **mm/dd/yy** from the drop down menu. Select **OK**.



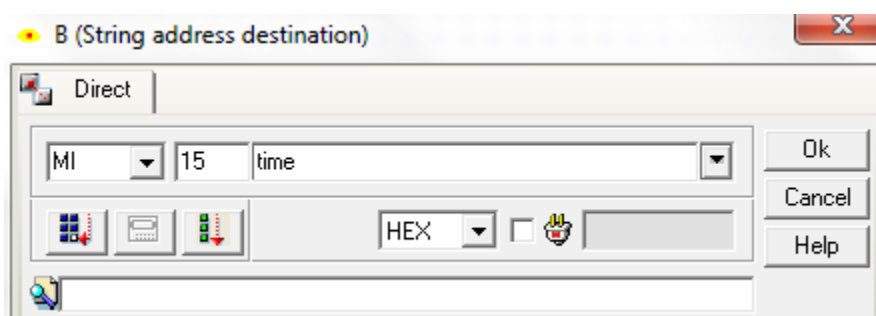
Next, *B (String address destination)* window appears, shown below. Enter **MI, 10**, and type **Date** into the window (below). Click **OK**.



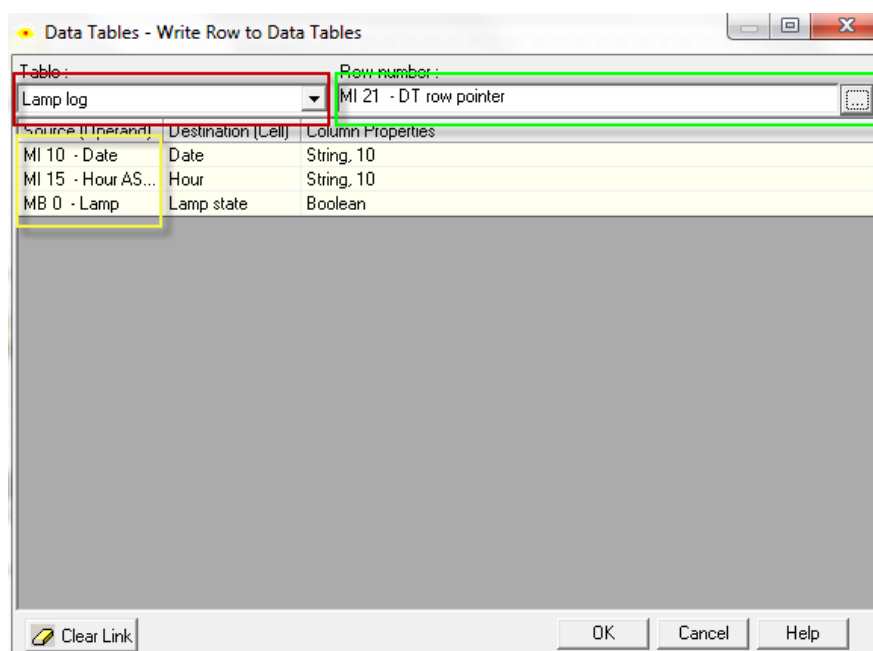
Step 7: Select **String>RTC to ASCII**. Place the function block to the right of the DATE RTC to ASCII. Once placed, the *A(Format)* window will appear shown below. Select **hh:mm:ss(AM/PM)** from the drop down menu shown below. Select **OK**.



Next, *B (String address destination)* appears, shown below. Enter **MI, 15, Time** into the window. Click **OK**



Step 8: From the main menu toolbar (figure 1) select **Data Tables>Data Tables Write Row**. Place the function block the right of the RTC to ASCII time. Once placed, a *Data Tables-Write Row to Data Tables* window appears. The screen shot below shows the values that must be entered into the window.



Select the table dropdown menu boxed in red above. Select the **Lamp Log** table. Next, boxed in yellow, there are 3 operands that must be linked to the data table. Select **<...>** for each space. First, enter **MI, 10** for the date (top), **MI, 15** for the time(middle), and **MB, 0** for the lap Status (bottom). Finally, boxed in green, select **<...>** and enter **MI, 21, DT row pointer** to represent the row number.

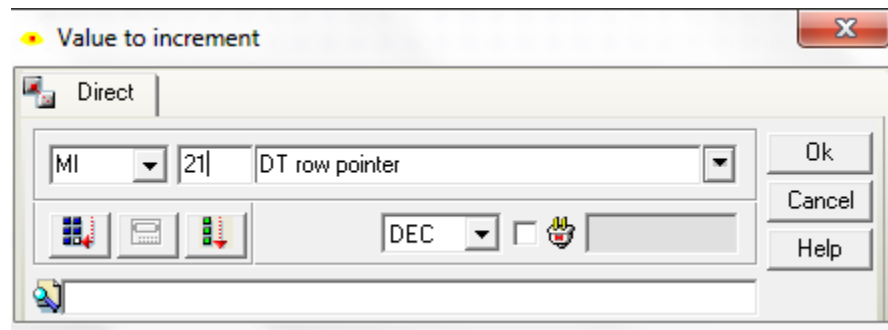
Once the window is complete, click **Ok**.

Step 9: In rung 4, in the main menu toolbar(figure 1), select **Boolean>Contacts>Positive Trasition Contact**. Place the Contact on the left rail. The *Select Operand and Address* window opens. Type **0**. Select **OK**.

Step 10: In the main menu toolbar (figure 1), select **Boolean>Contacts>Negative Transition Contact**. Place the contact below the Positive Transition Contact (shown above). The *Select Operand and Address* window opens. Type **0**. Select **OK**.

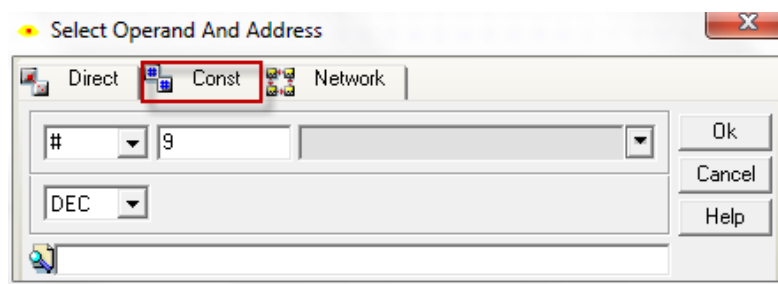
Step 11: Select **Connect Elements** icon in the Ladder Tool Bar (figure 2). Draw a line connecting the 2 Contacts.

Step 12: Select the **incrementer** icon from the Ladder tool bar (figure 2). Place the incrementer to the right of the pos and neg transition contacts. A value for increment window will appear, shown below. Enter **MI, 21**. The description *DT row pointer* will appear. Click **OK**.



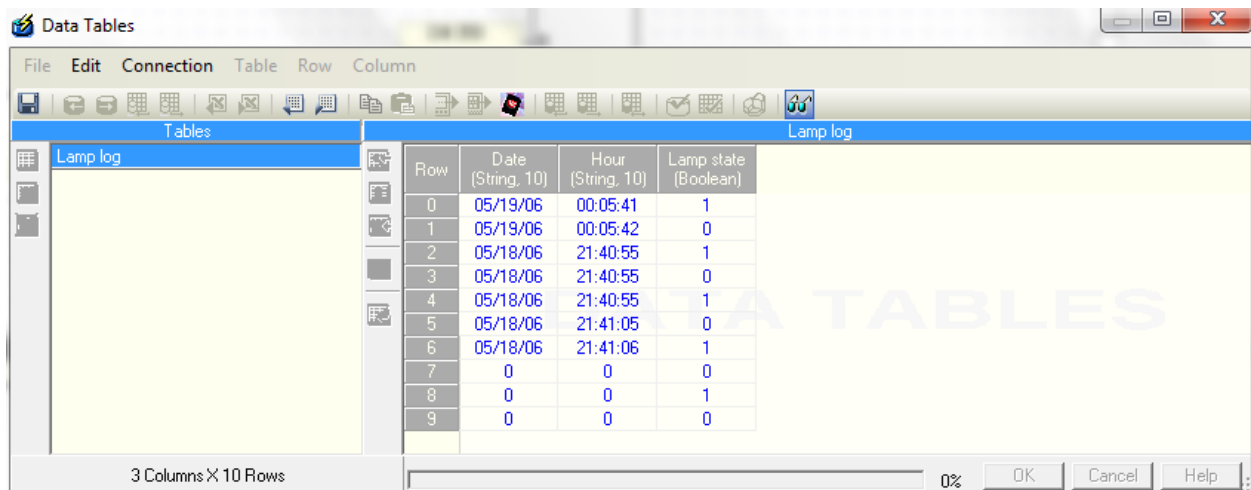
Step 13: From the main menu toolbar (figure 1) select **Compare>Greater than**. Place the greater than function block to the right of the incrementer. A *select operand and address* window appears. Enter **MI, 21**. Select **OK**.

Another *Select Operand and Address* window appears. Here, select **Const** (boxed in red below) and enter the value **9**. Click **OK**.

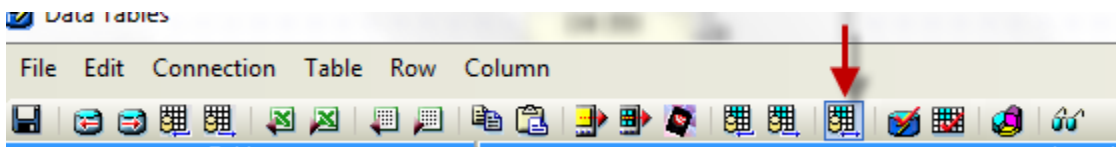


Step 14: Select a **Numeric reset** icon from the Ladder tool bar (figure 2). Place the numeric reset to the right of the *greater than* function block. When placed, a *Select operand and address* window appears. Enter **MI, 21**. Click **OK**.

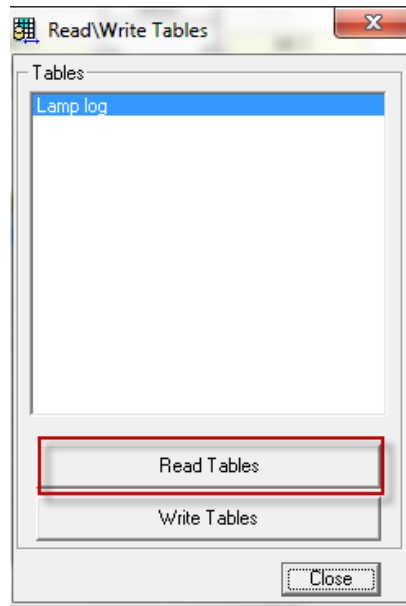
Step 15: Download the application to the controller using the **download** icon from the main menu. Once downloaded, select the **Data table** Icon in the main menu toolbar (figure 1). This will open the *Data Tables* window. Select the **Online test** in the main menu of the *Data tables* window. Once online, toggle the lamp by pressing it on the PLC. Notice that with each press, a new row is created in the data table.



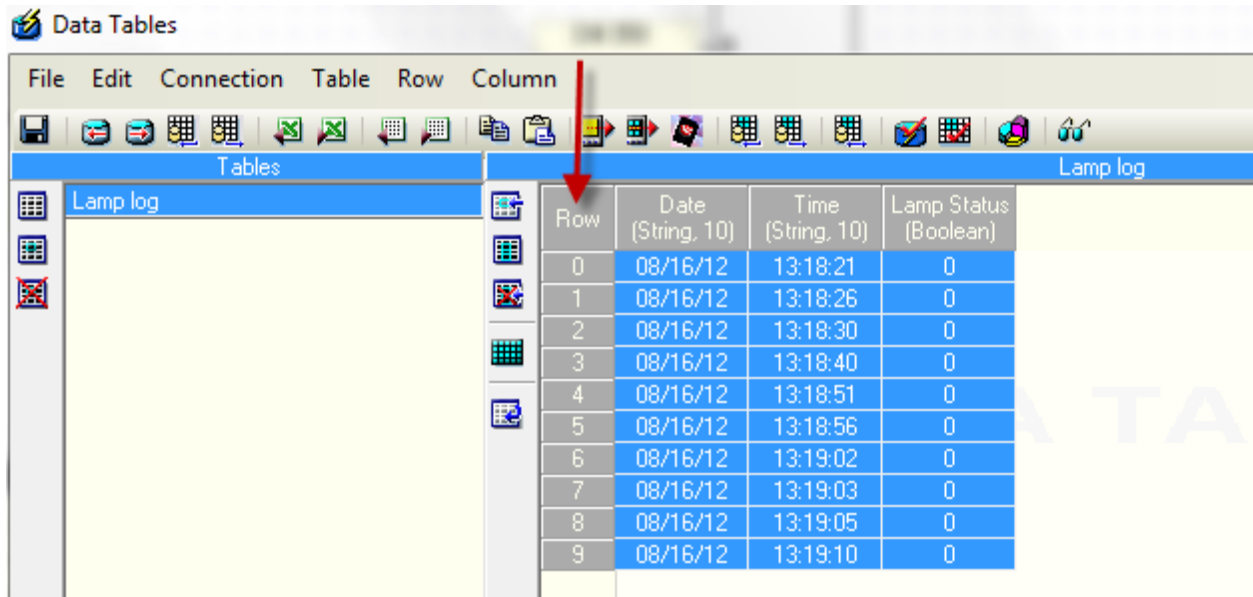
Once the data table is created, you can export the data to excel. To accomplish this, click the **read/write table** icon from the data table tool bar (shown below, red arrow)



Once selected, the *Read/Write Tables* window below will appear:



Select the **Read Tables** option. Once the tables have been read click **close**. Next, Click on **ROW** shown with a red arrow below. This will highlight all cells in the data table (as shown below).

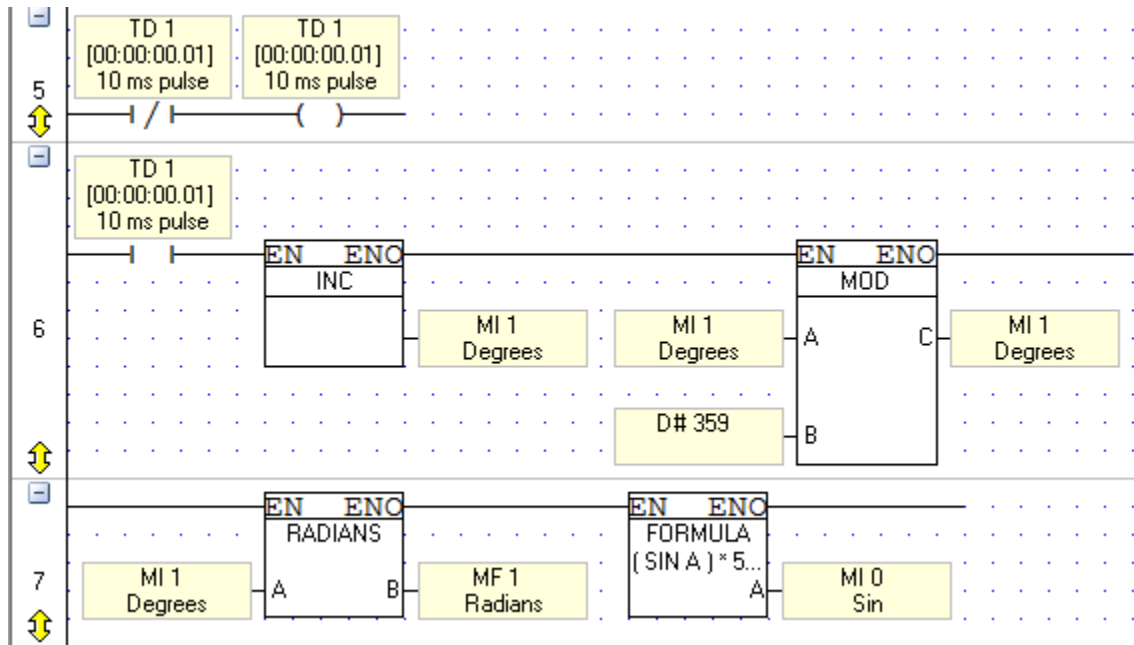


Next, click **Export file to excel** icon shown by a red arrow below. Save the file, and the data table is now available as Excel file.

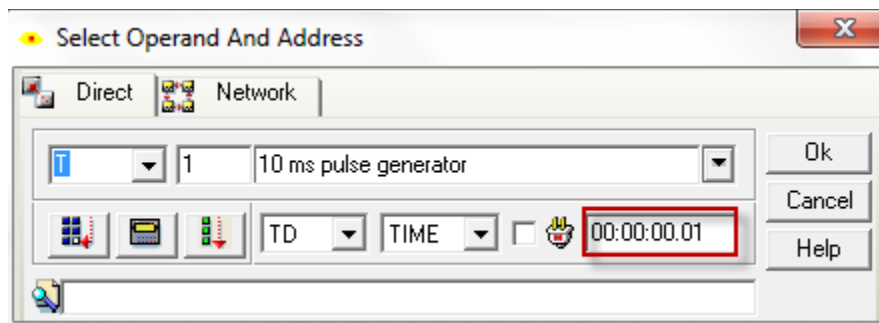


Trends (Sin Wave) (Here, create a sin wave in ladder logic, and display it on the HMI screen as a bar graph and trend)

Step 1: In rungs 5-7 build the following logic:



Step 2: From the Ladder Logic toolbar (figure 2), select the **inverted contact** icon. Place the inverted contact on the rail as shown above in rung 5. Once placed, define a new timer (shown below). From the drop down menu, select **T**, type **1**, **10ms pulse generator**. Enter the value **00:00:00.01** shown in red below. Select **OK**.

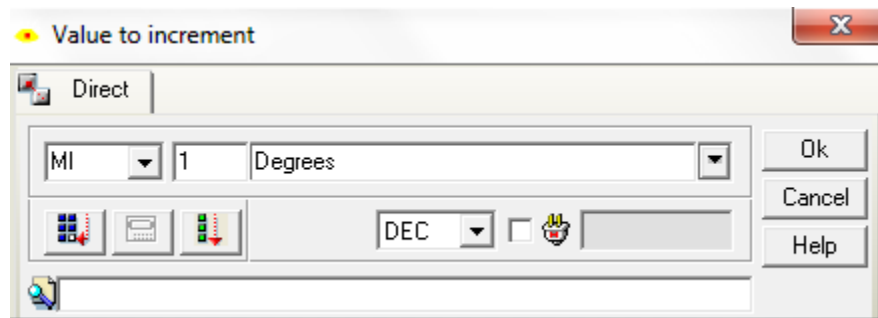


Step 3: From the Ladder logic toolbar (figure 2), select the **direct coil** icon. Place the direct coil to the right of the inverted contact as shown above in rung 5. Once placed, the *Select operand and address* window will appear. From the dropdown menu, select **T** and type **1** to the right. The definition will appear as 10 ms pulse generator. Select **OK**.

Step 4: From the Ladder logic toolbar (figure 2), select the **direct contact**. Place the direct contact on the rail as shown above in rung 6. Once placed, the *Select operand and address* window will appear. From

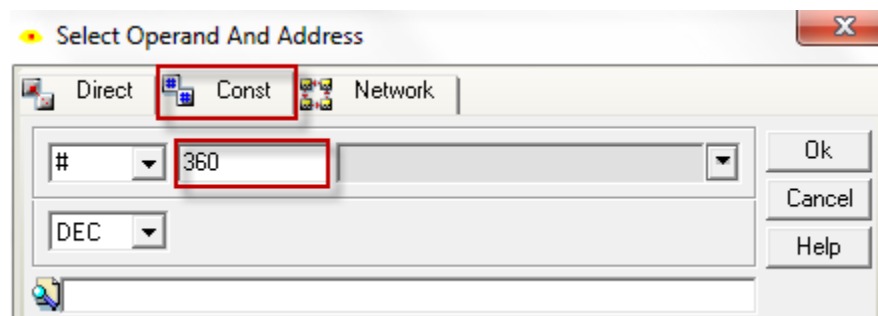
the dropdown menu, select **T** and type **1** to the right. The definition will appear as 10 ms pulse generator. Select **OK**.

Step 5: From the ladder logic toolbar (figure 2), select **increment** icon. Place the increment block to the right of the direct contact as shown above in rung 6. Once placed, the *Value to increment* window will appear. From the drop down menu, Select **MI**. Type **1** and **degrees** to the right (shown below). Select **OK**.



Step 6: From the main menu toolbar (figure 1), select **Math>MOD**. Place the MOD function block to the right of the Incrementer. Once dropped, the *select operand and address* window will open. Select **MI** from the drop down menu, type **1** to the right. The definition degrees with appear. Select **OK**.

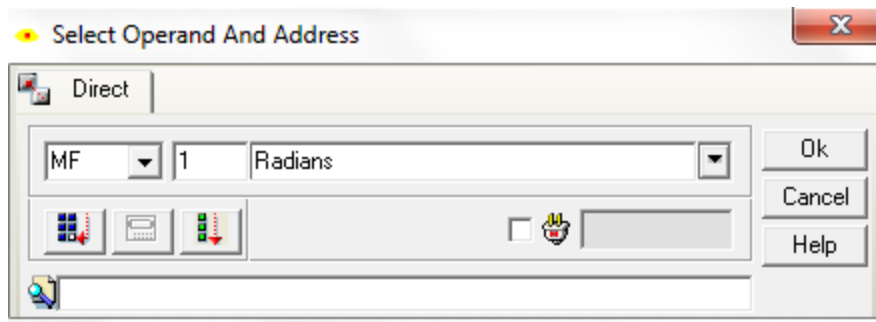
A 2nd select operand and address window will appear. Select the tab **Const** and type **360** (shown below). Select **OK**.



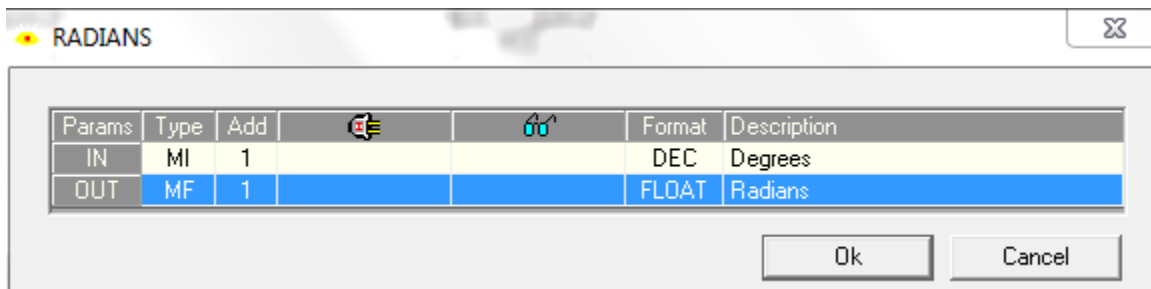
A 3rd *Select operand and address* window will appear. Select **MI** from the drop down menu, type **1** to the right. The definition degrees with appear. Select **OK**.

Step 7: From the main menu, select the drop down **Math>Float>Trig>Radians**. Place the Radians function block on the rail in rung 7 (shown above). A *select operand and address* window will appear. Select **MI** and type **1**. The definition degrees with appear. Select **OK**.

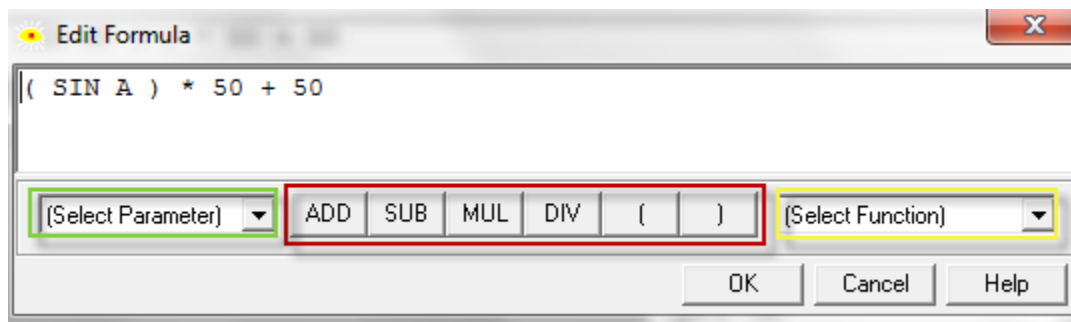
A 2nd *select operand and address* table will appear. Here, select **MF** from the drop down menu, type **1** and **Radians** (shown below). Select **OK**.



The *Radians* window should look like the window below. If this is the case, select **OK**.

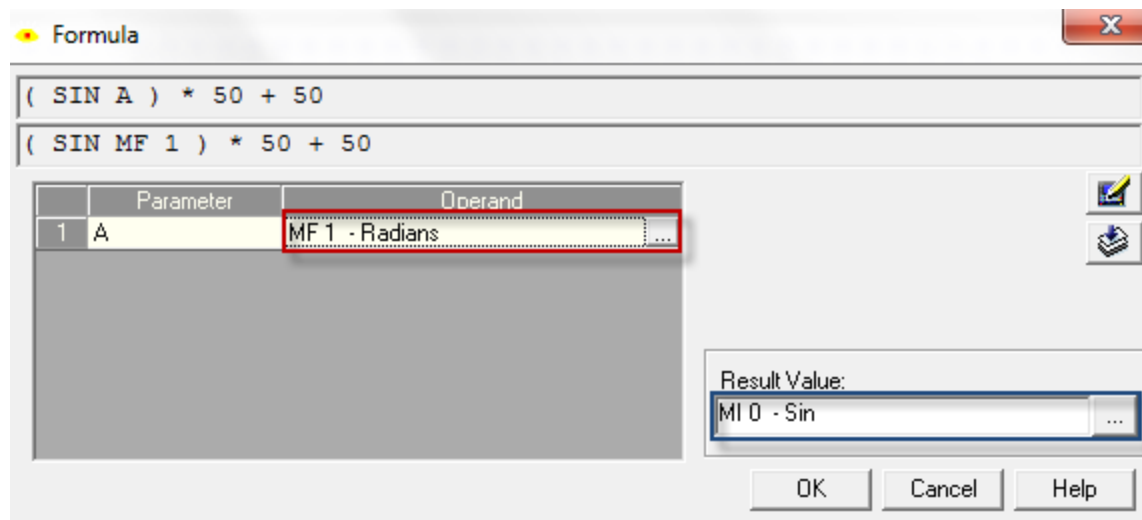


Step 8: From the main menu toolbar (figure 1) select the **Math>Formula**. Place the Formula function block to the right of the Radians function block as shown above. Once placed, the *Edit formula* window will appear. Enter the fomula **(SIN A) * 50 + 50**. Use the **Math functions in red below to enter addition, subtraction, and parentheses**. Use the select function drop down menu to select **SIN**, and use the **Select Paramterers** to enter the variable **A**. Enter 50 using your keyboard. Select **OK**.

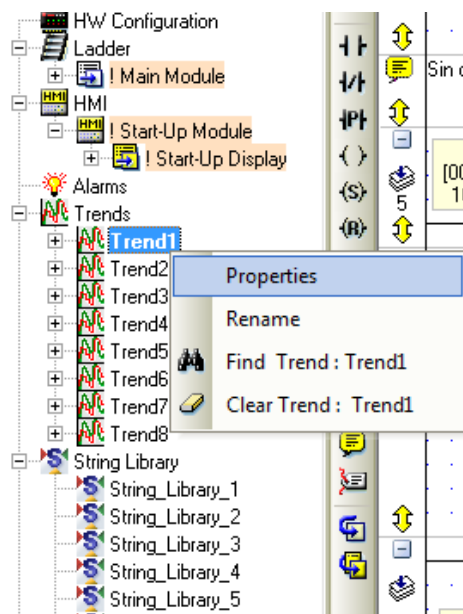


The *Formula* window will be open (see below). Boxed in red below, select the **<....>** A *select operand and address* window will open. Select **MF** from the drop down menu, and type **1**. Radians will appear in the description. Select **OK**.

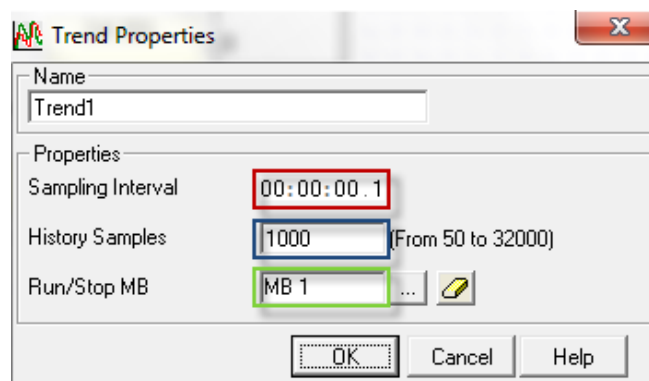
Next, select the ... boxed in blue below. A *select operand and address* window will appear. Select **MI** from the drop down menu, type **1** and **sin** to the right. Click **OK**.



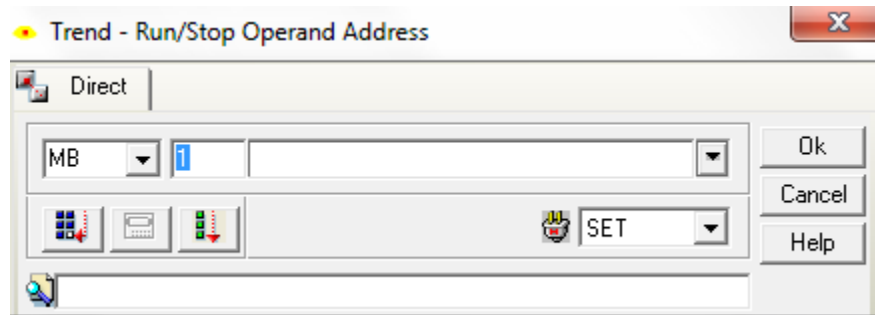
Step 9: From the left outline, right click on **Trend 1** and select **properties** (shown below).



The *Trend properties* window will appear (shown below).

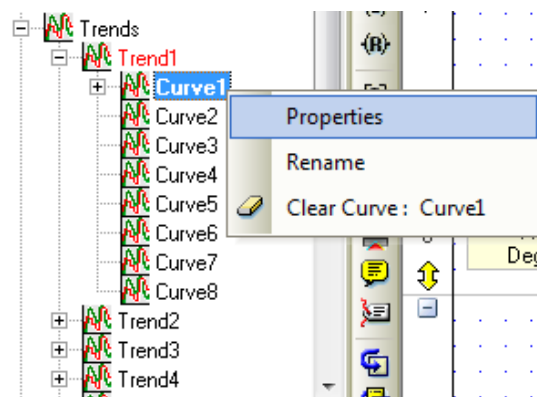


In sampling interval enter **00:00:00:1**. For history Samples enter **1000**. For Run/Stop, click <...> A **select operand and address** window will appear. From the drop down menu select **MB**, enter **1** to the right. Finally, from the drop down menu in the bottom left, select **set**. The window should look like the one below:

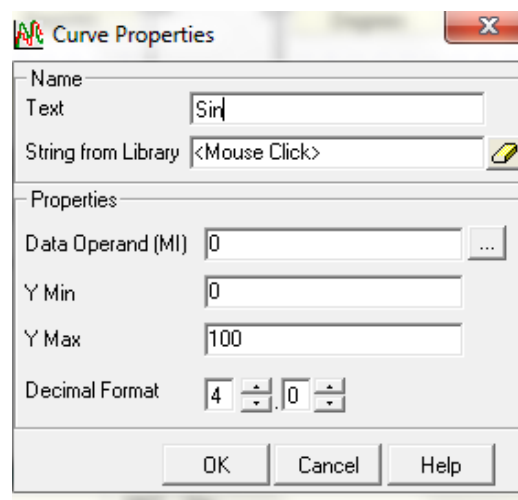


Click **Ok** to close *select operand and address*. Click **Ok** to close *Trend properties*.

Step 10: Right click on **Curve1** and select **properties** (shown below)

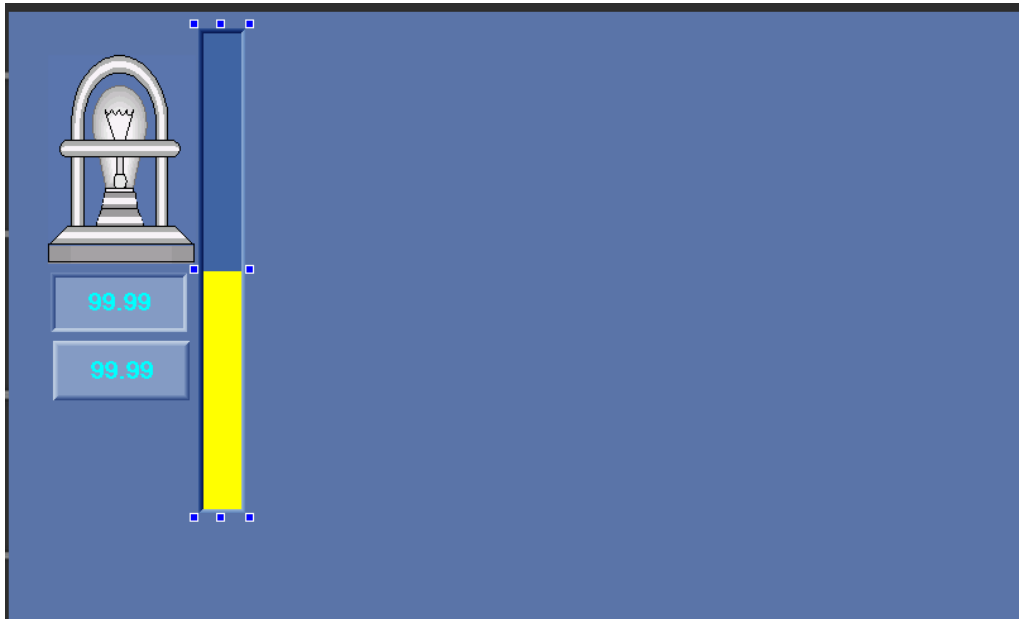


The *Curve Properties* window will appear (shown below)

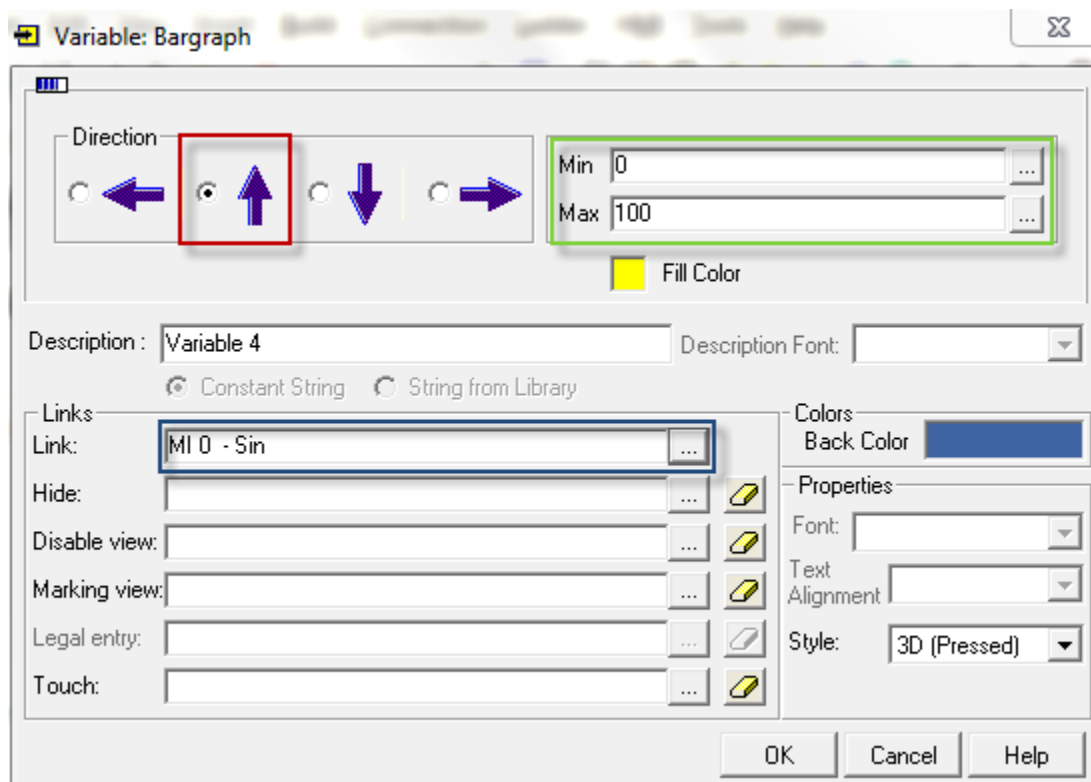


In text, enter **Sin**. In Data Operand (MI), click <....> The *select operand and adresss* window will appear. Enter **0**. Sin will appear in the description. Click **OK**. In Y Min enter **0**. In Y max enter **100**. Click **OK**.

Step 11: In the Main menu toolbar, Select the **HMI** icon. The HMI screen will appear. From the HMI Toolbar (figure 3) select the **bar graph**. Draw a bar graph (rectangle) on screen as shown below:

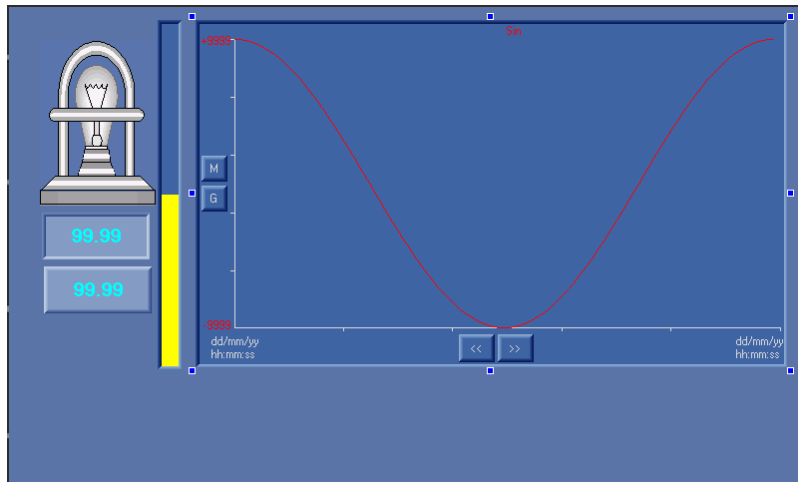


Once the graph is placed the *Variable:Bargraph* window will appear (shown below)



Select the **up arrow** (boxed in red). Enter **0 for min value** and **100 for max value** (boxed in green). Finally, select the <...> (boxed in blue) and the *select operand and address* window will appear. Enter **0**. The description Sin will appear. Click **OK** to close the *select operand and address* window. Click **OK** to close the *Variable:Bargraph* window.

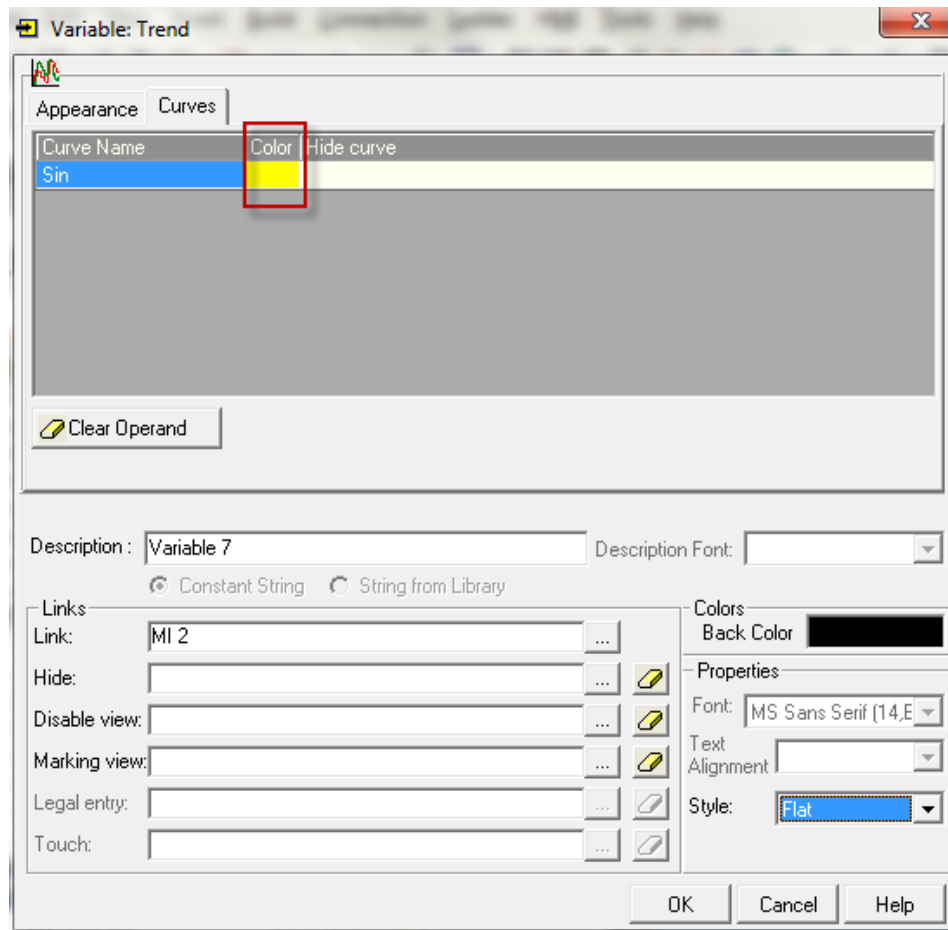
Step 12: From the HMI toolbar (figure 3) select the **trend** icon. Draw a trend (rectangle) on the HMI display as shown below.



Once the trend is placed, the *Variable: Trend* window appears.

Select <...> boxed in red. The *select operand and address* window will appear. From the drop down menu, select **MI**. Enter **2**. Click **OK**. Next the Style drop down menu (boxed in blue), select **flat**. Finally in colors (boxed in black) select **black**.

Next select the **Curve** tab at the top of the window. Here, under color, select the **color yellow**. Click **OK**.



Step 13: Download the application using the **Download** Icon from the main menu toolbar (figure 1). Once the download is complete, the bar graph will be fluctuating between 0-100, and the trend will show a Sin wave.

We hope that you found this manual helpful. If you have any questions about any steps taken please contact us at **Support@unitronics.com**