How to build a HMI screen by using ISaGRAF?

Download FAQ-003 Demo.

Spotlight is a simple HMI coming with ISaGRAF which allows user to build **Boolean Icon, Bar Graph, Trend Curve, Value Text, Bitmap Picture** to make application more friendly.

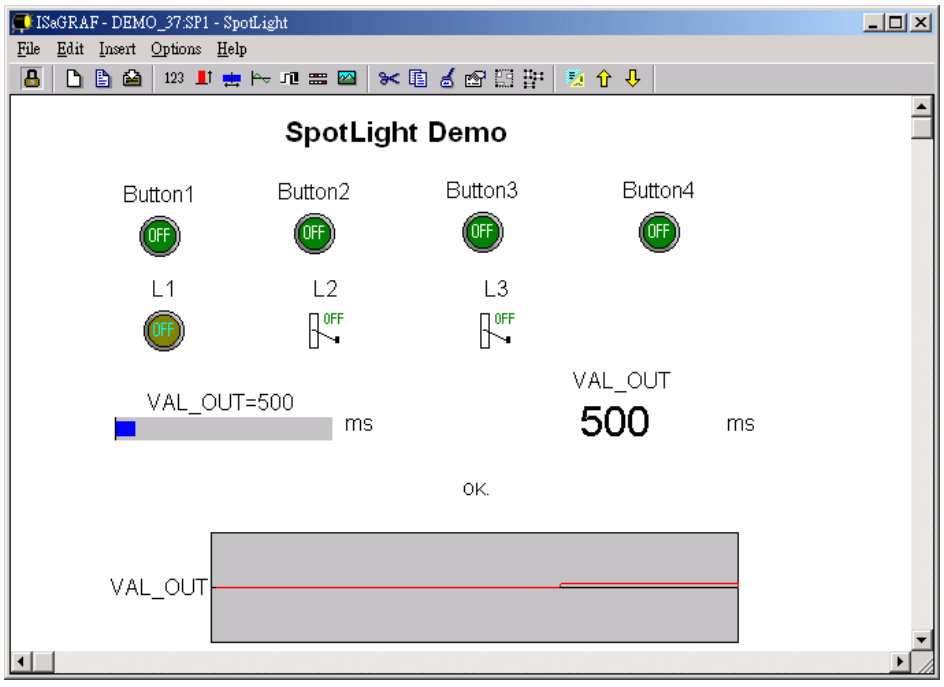
14.1 A Spotlight Example

Download the demo (demo_37) at https://www.icpdas.com/en/faq/index.php?kind=280#751 FAQ-003. Please refer to Chapter 11 of ISaGRAF user's manual to restore it.

Variables used in the example:

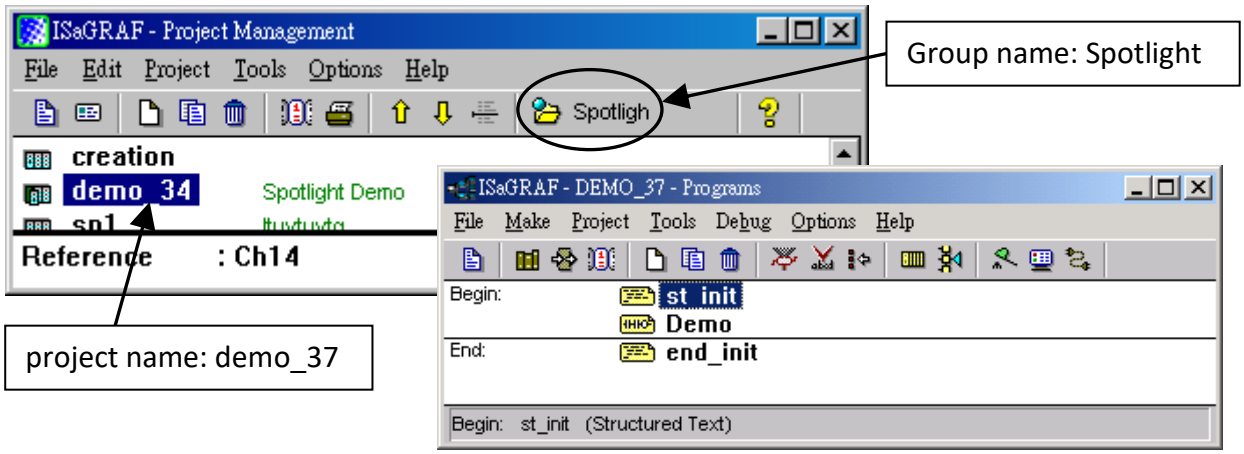
Name	Type	Attribute	Description
INIT	Boolean	**Internal**	Only = TRUE at the 1st scan cycle, **INIT value is TRUE**
L1	Boolean	**Output**	Output 1, connect to Ch1 of "show3led"
L2	Boolean	**Output**	Output 2, connect to Ch2 of "show3led"
L3	Boolean	**Output**	Output 3, connect to Ch3 of "show3led"
Button1	Boolean	**Input**	Input 1, connect to Ch1 of "push4key"
Button2	Boolean	**Input**	Input 2, connect to Ch2 of "push4key"
Button3	Boolean	**Input**	Input 3, connect to Ch3 of "push4key"
Button4	Boolean	**Input**	Input 4, connect to Ch4 of "push4key"
VAL_OUT	Integer	**Internal**	to set blinking period, **initial value is set at 500 (unit: ms)**
OLD_VAL_OUT	Integer	**Internal**	Old value of VAL_OUT
T1	Timer	**Internal**	Time Period of blinking
MSG1	Message	**Internal**	Status report, please set its Maximum Length to 48

HMI screen outline:



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Project architecture:



ST Program "**st_init**" in the "**Begin**" area:

```
(* Do some init action *)
if     INIT=TRUE     then
   T1 := TMR(VAL_OUT) ;     (* Convert integer:VAL_OUT to Timer:T1 in ms *)
   MSG1:='OK.' ;
   OLD_VAL_OUT := VAL_OUT ;    (* init OLD value *)
end_if ;

(* if set a new value to VAL_OUT *)
if VAL_OUT <> OLD_VAL_OUT then

   (* VAL_OUT is acceptable *)
   if    (VAL_OUT>=200) & (VAL_OUT<=5000)    then
      T1 := TMR(VAL_OUT) ;     (* Convert integer:VAL_OUT to Timer:T1 in ms *)
      MSG1 := 'OK.' ;
   else         (* VAL_OUT out of range *)
      MSG1 := 'VAL_OUT should be between 200 and 5000 .' ;
   end_if ;

   OLD_VAL_OUT    :=    VAL_OUT ;    (* update OLD value *)

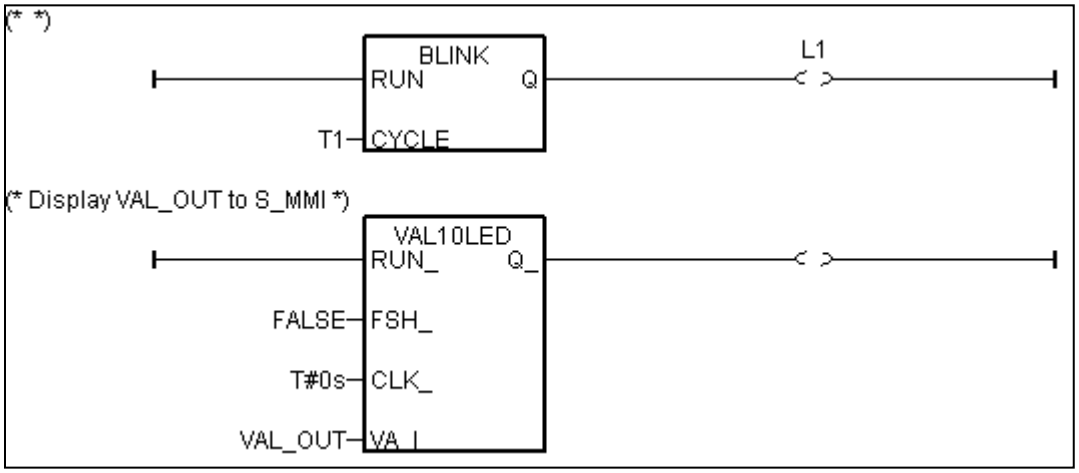
end_if ;
```

ST Program "**end_init**" in the "**End**" area:

```
INIT := FALSE ;
```


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LD Program "**Demo**" in the "**Begin**" area:



Operations:

The status of four push buttons will be displayed on the HMI screen.

The first output will be blinking with the period defined by "VAL_OUT" in ms.

Value of "VAL_OUT" can be modified from the HMI screen.

The second and third output "L2" & "L3" can be controlled by the HMI screen.

The Value of "VAL_OUT" will also be displayed on the front panel of the controller.

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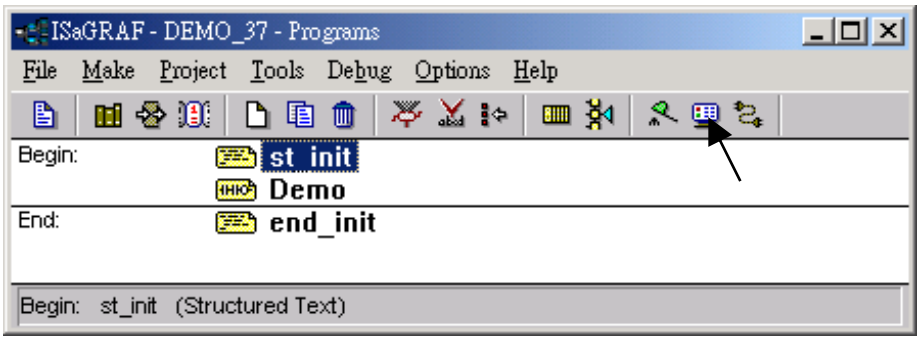
Steps to build a Spotlight: HMI screen:

Complete this Demo project as described above. After you finish it. Compile it to make sure there is no error. Copy all files inside “ICO” folder to the associate directory of your project.

The “ICO” folder contains some Boolean icon files already built by ICP DAS. They can be found from the http://www.icpdas.com/en/faq/index.php?kind=280#751 FAQ-003

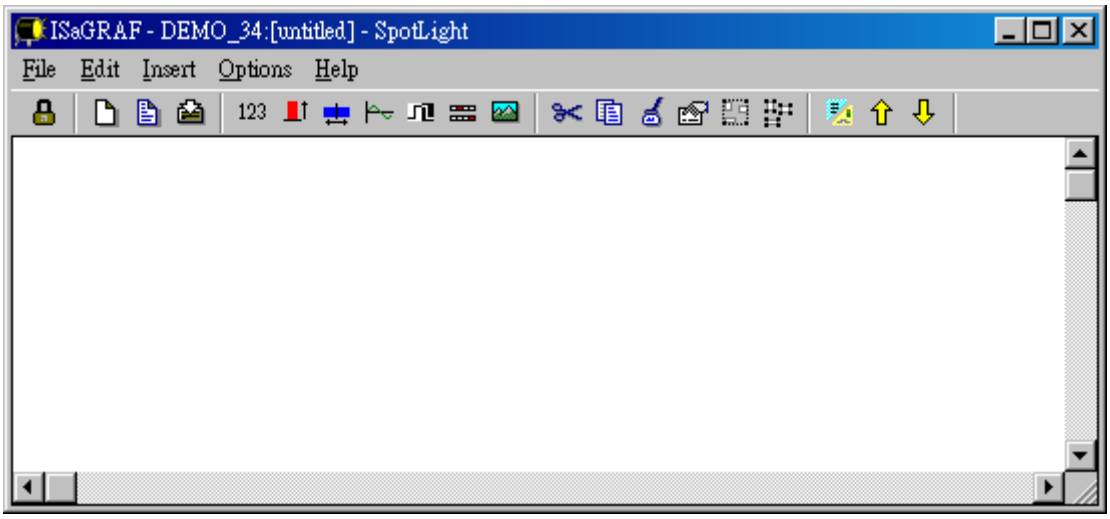
For example, this demo project is inside group “spotlight” and the project name is “demo_37”, then copy the “ICO” folder to c:\isawin\spotligh\demo_37\

Get into the Spotlight editor. Click on “Simulate”, then click on “Spotlight” to open spotlight editor.





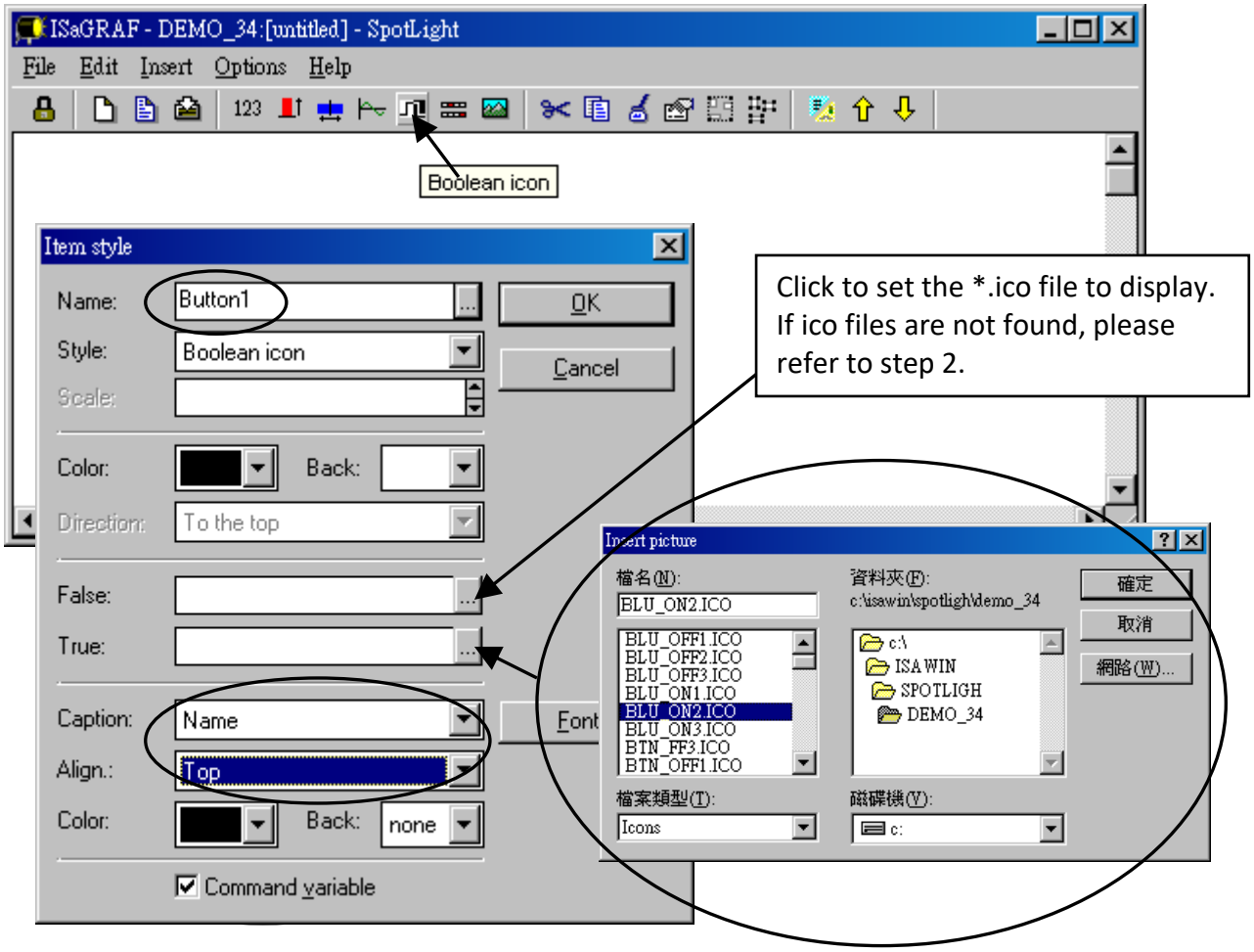
A “Spotlight” window will appear as below.



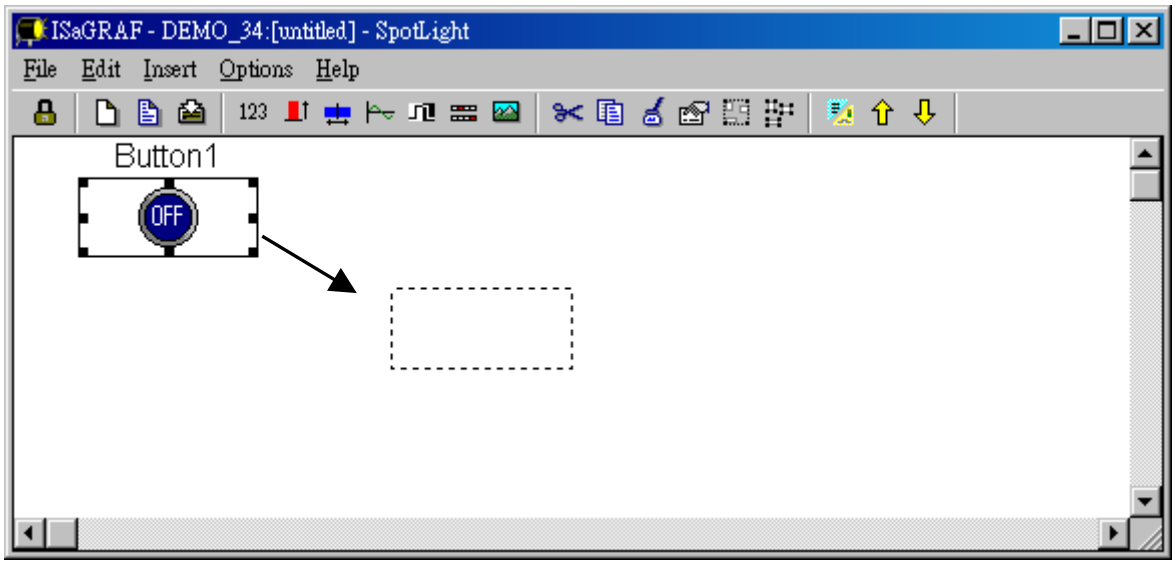
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Add "Boolean Icons"

Click on "Boolean icon", then set the associated Name as "Button1", Caption as "Name", Align as "Top" and then set the preferred *.ico file to display with "FALSE" and "TRUE", and un-check "Command variable".

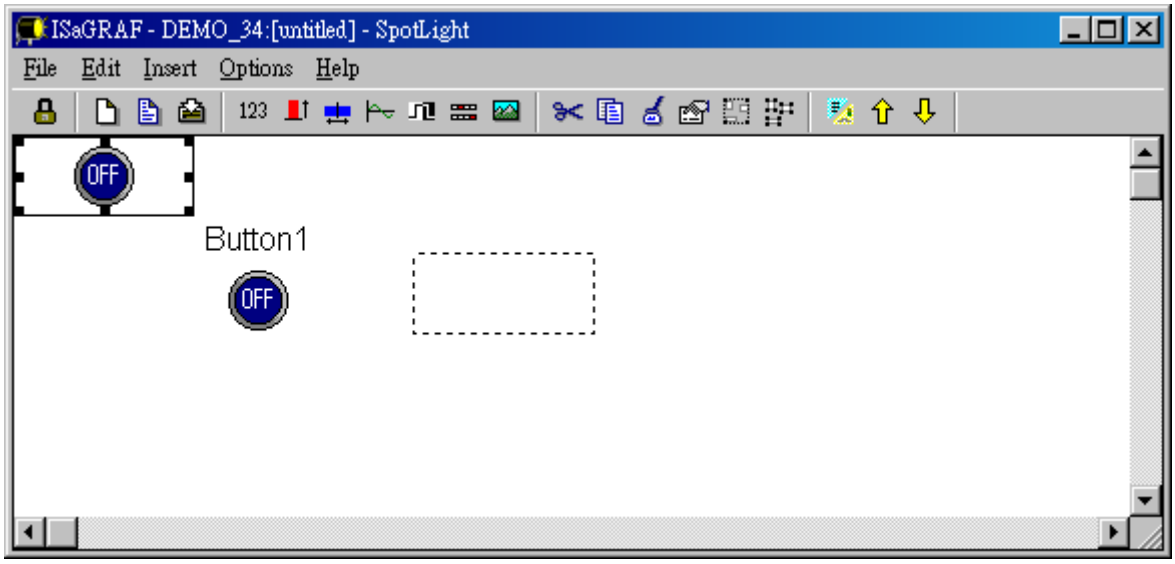


Then drag the Boolean icon to appropriate place.

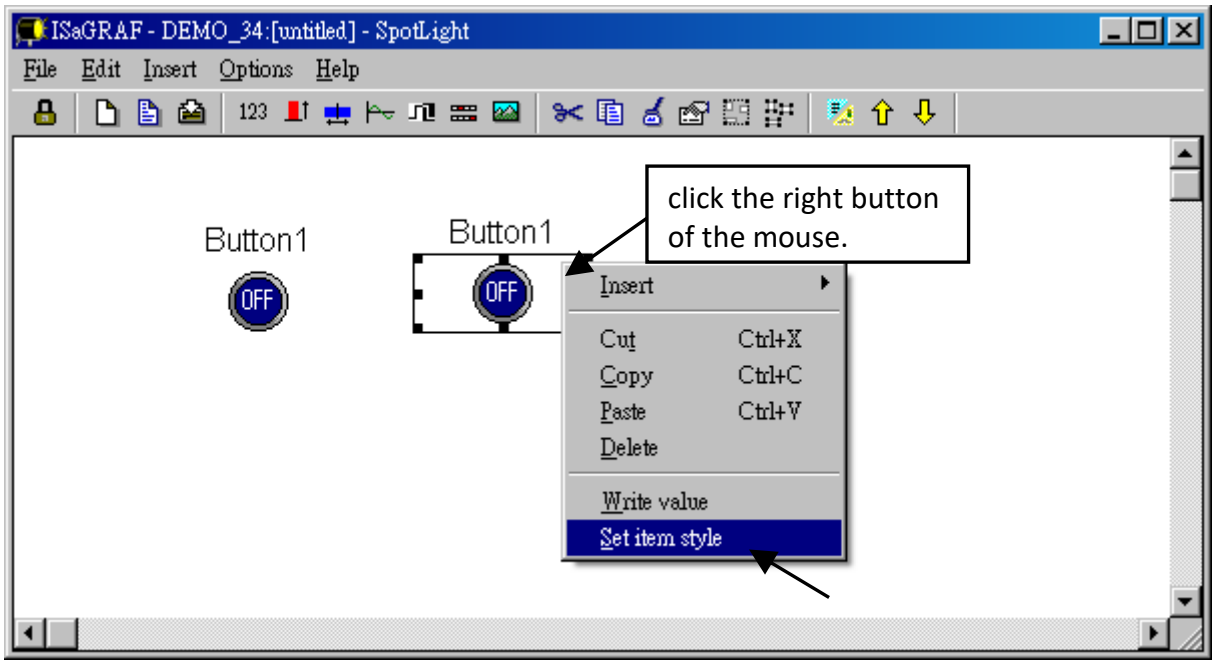


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Check on the new created Boolean icon, copy it (Ctrl+c) and then paste it (Ctrl+v) to reproduce one another Boolean icon. Then drag it to the preferred place.

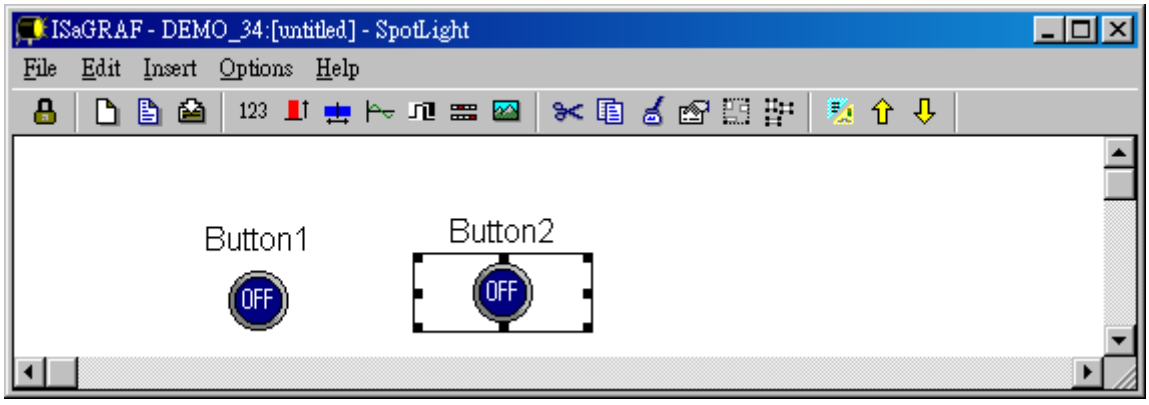


Check on the new created Boolean icon, then click the right button of the mouse, select “Set item style” to modify the name to “Button2”.

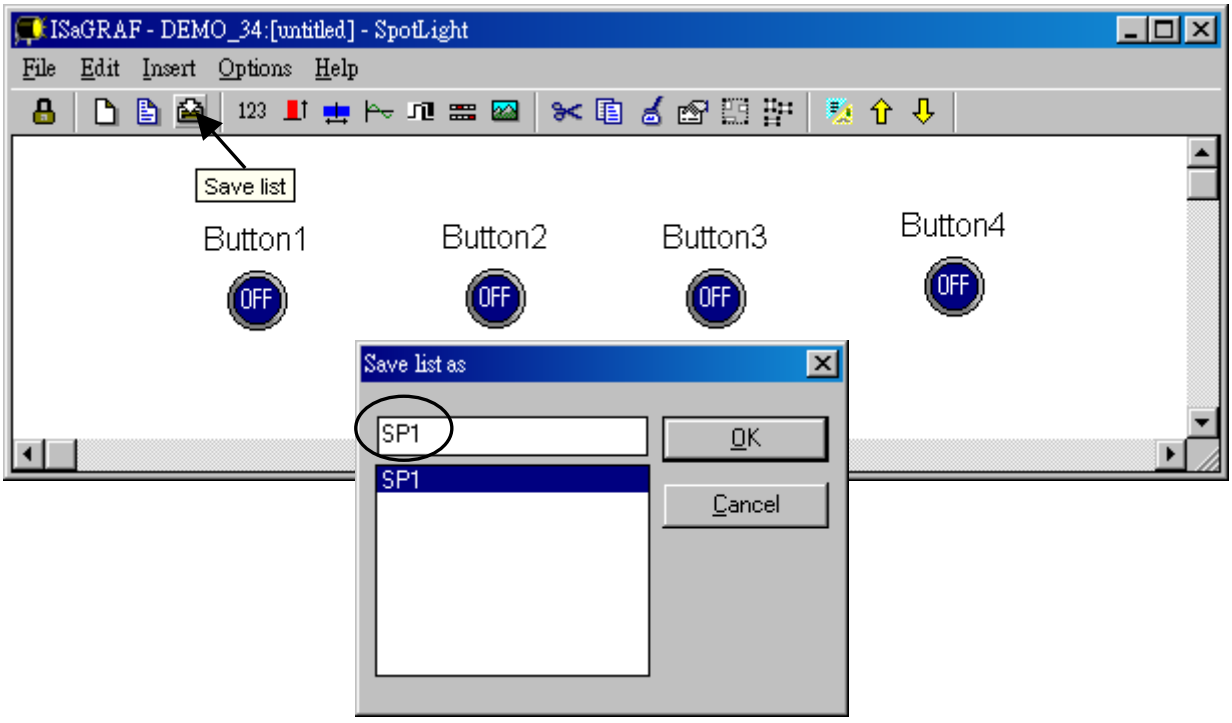


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Then we have …

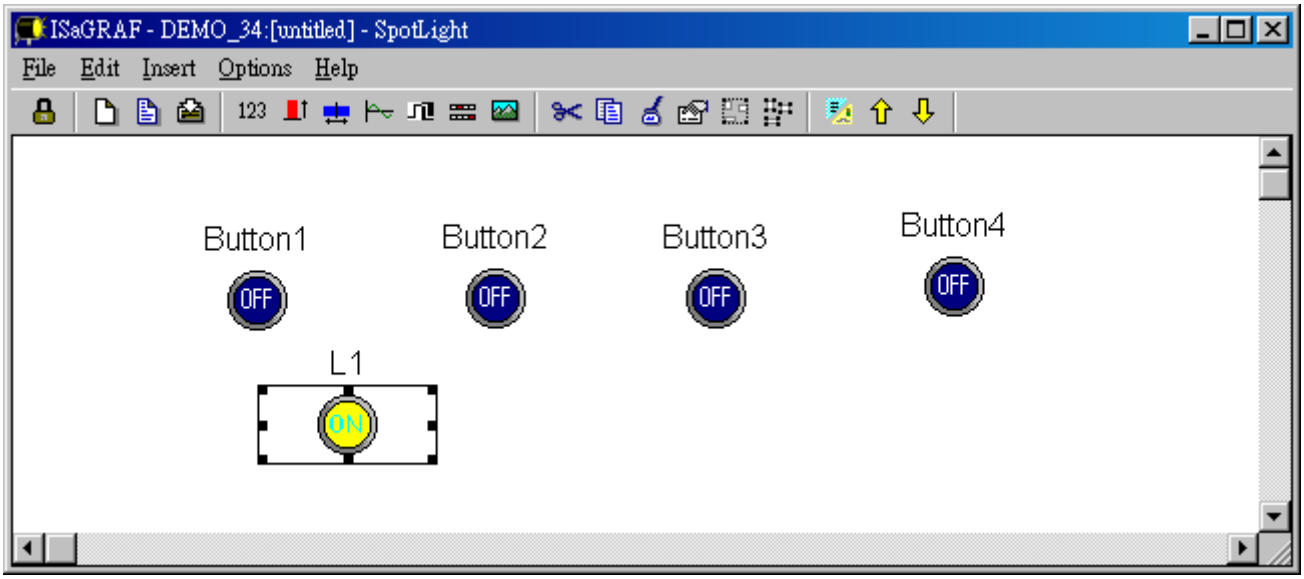


Follow the same method to create 4 Boolean icons as below. Recommend to save it anytime for safety. Given a name to this screen.

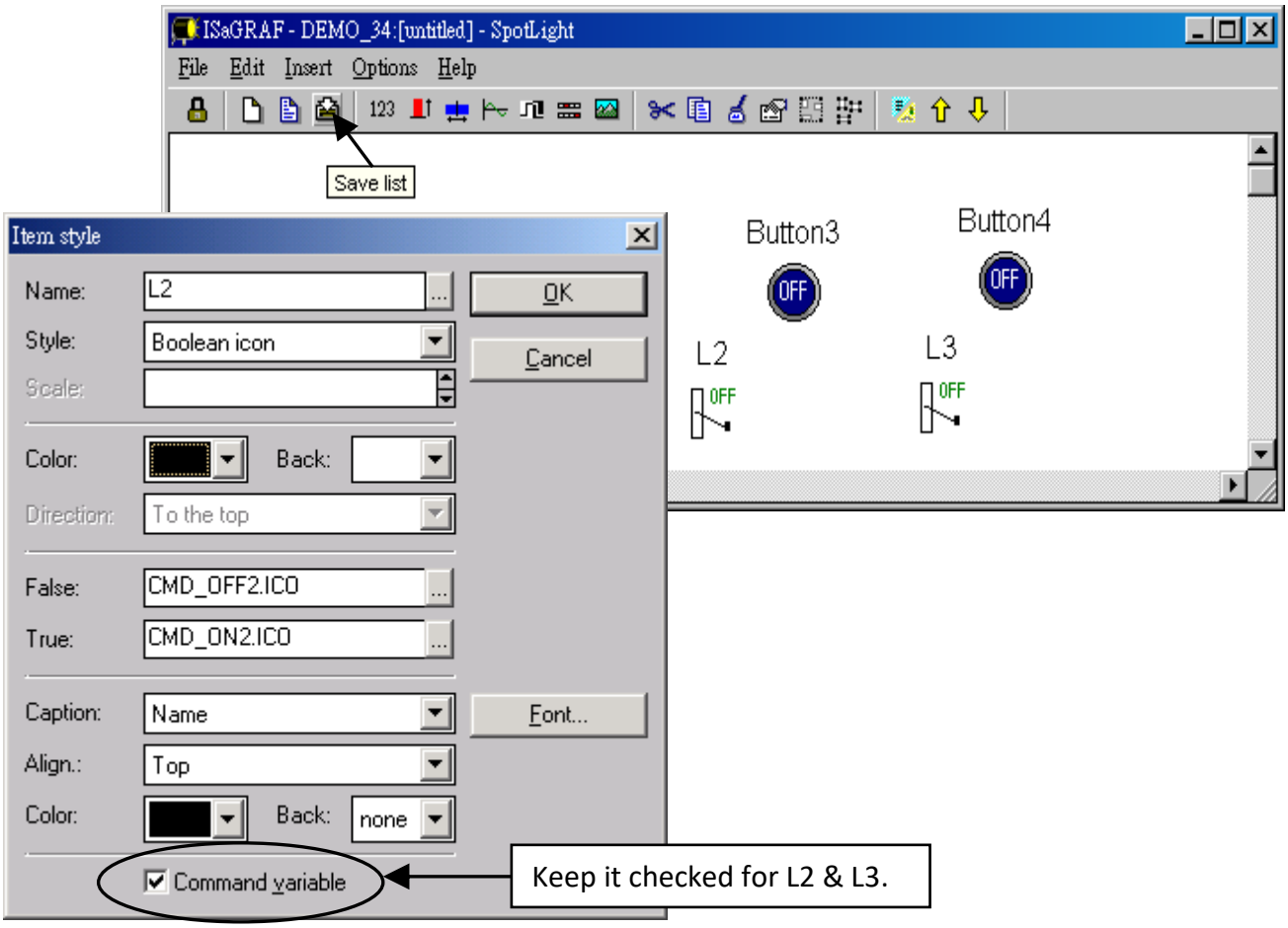


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We need one another Boolean icon to display the status of “L1”. Create it with a different color (TRUE : “YEL_ON2.ico” , FALSE : “YEL_OFF2.ico”).



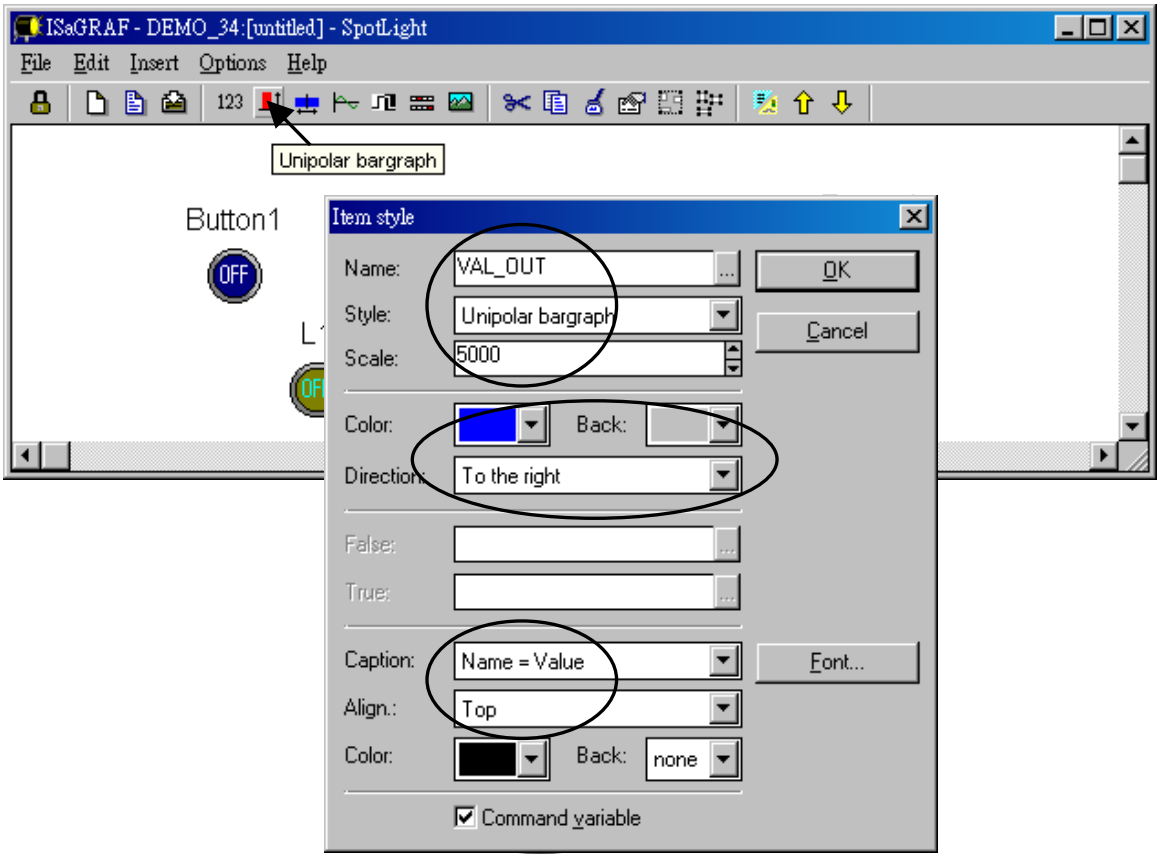
And then create L2 & L3 with TRUE: “CMD_ON2.ico” and FLASE: “CMD_OFF2.ico” as below.
Save it anytime, **L2 & L3 should not un-check “Command variable”**.



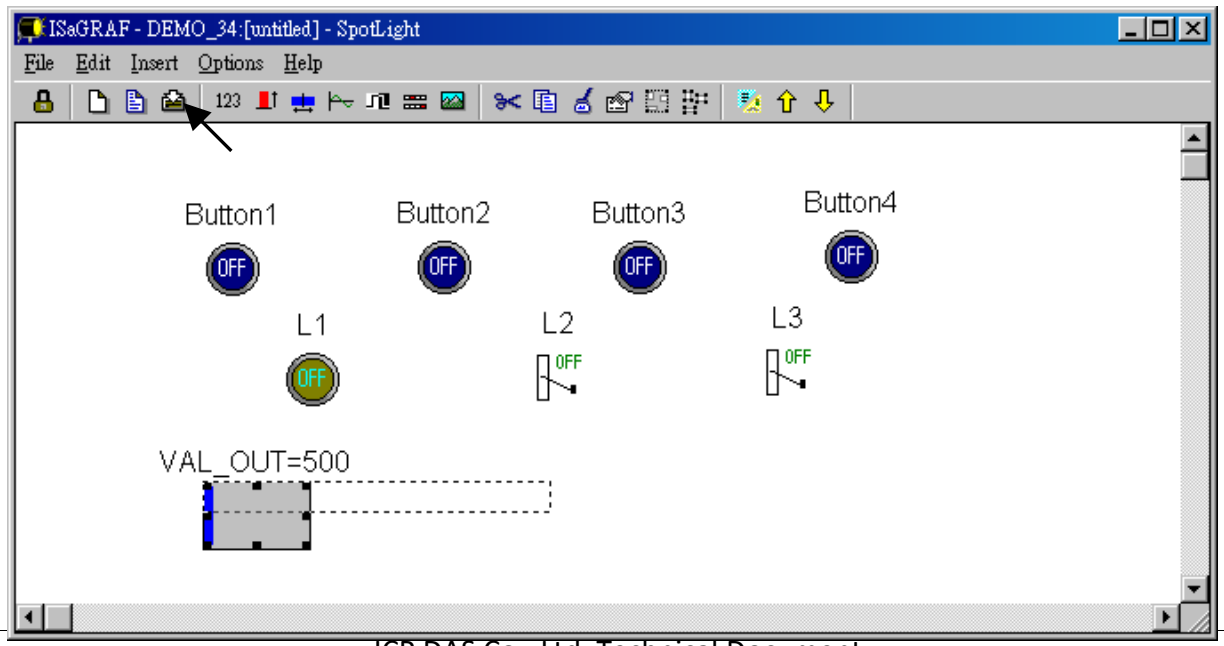
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Add "Unipolar bargraph"

Click on "Unipolar bargraph", set the associated Name as "VAL_OUT", Scale as "5000", Color as blue, Back as gray, Direction as "To the right", Caption as "Name=Value", Align as "Top", and un-check "Command variable"



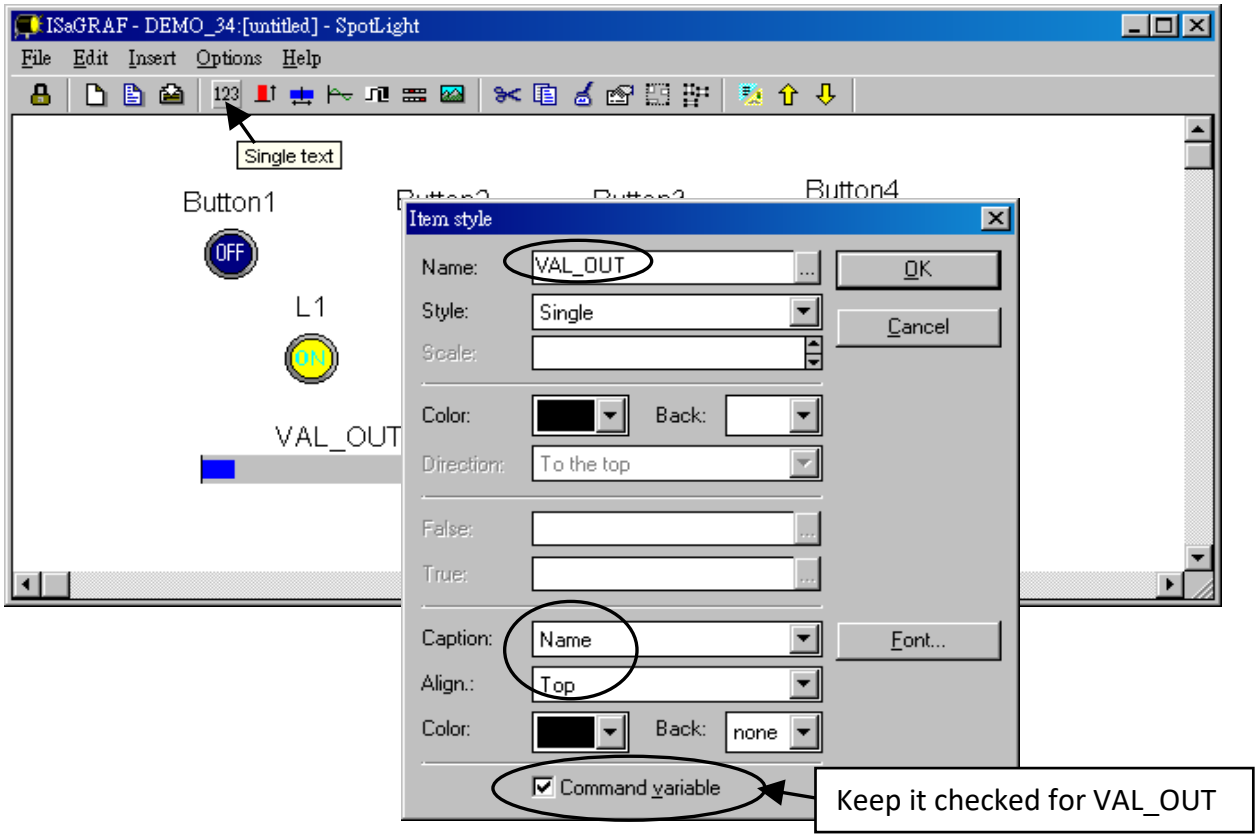
Click and hold on the left button of the mouse to change to the preferred shape as below. Save it anytime.



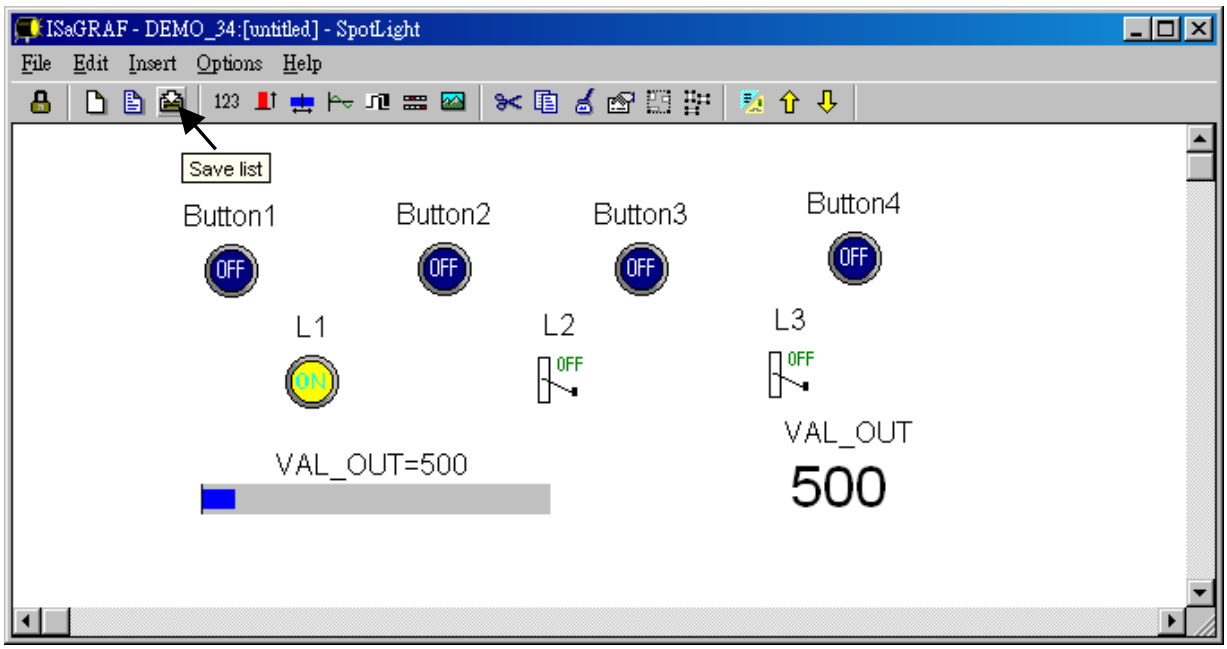
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Add "Single text"

Click on "Single text", set the associated Name as "VAL_OUT", Caption as "Name", Align as "Top"

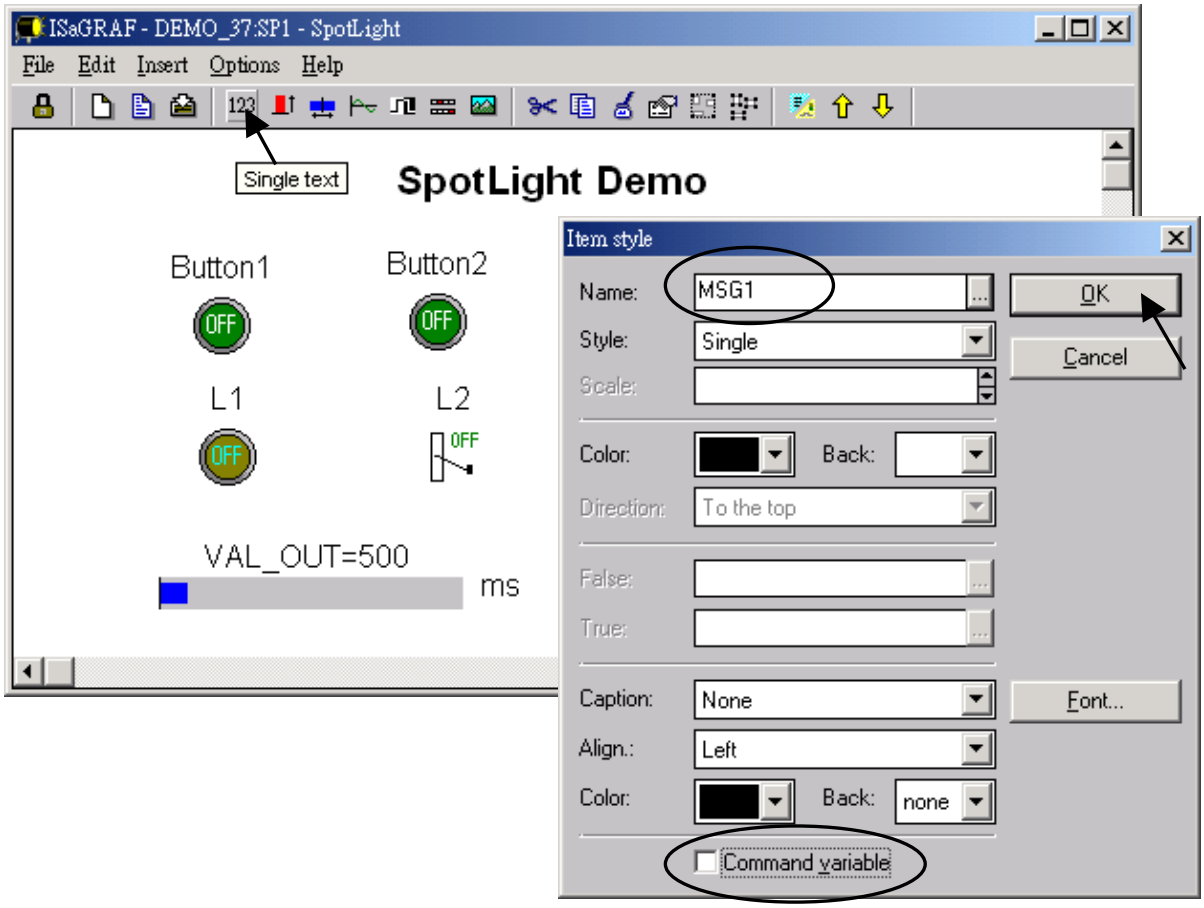


Move it to the preferred place and save it.

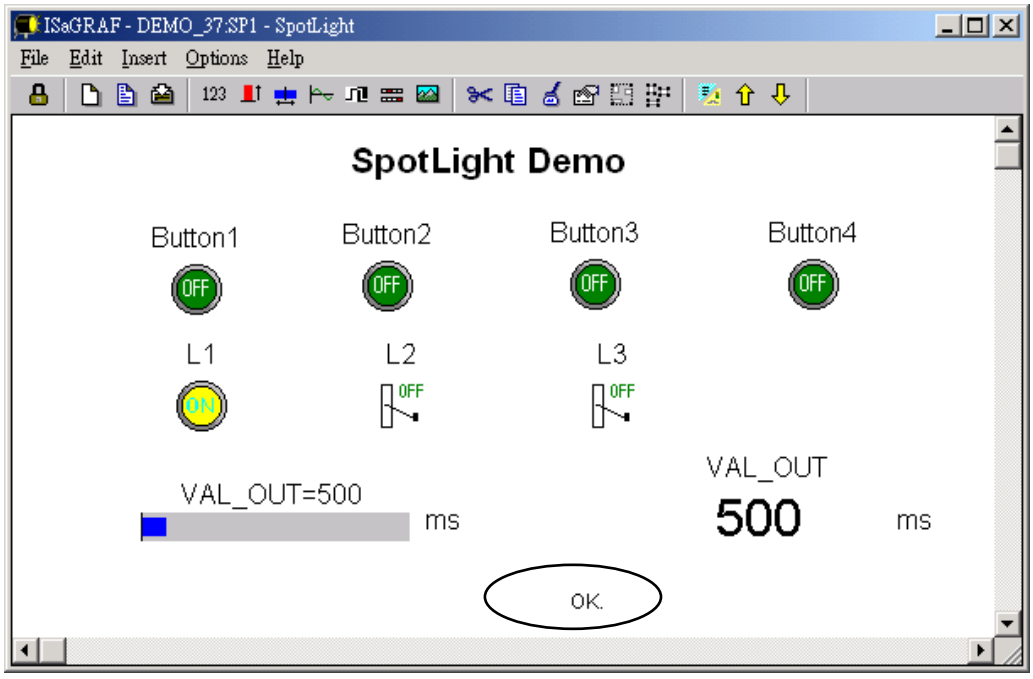


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Click on “Single text” again, set the associated Name as “MSG1”, Caption as “None”, Align as “Left” and un-check “Command variable”.



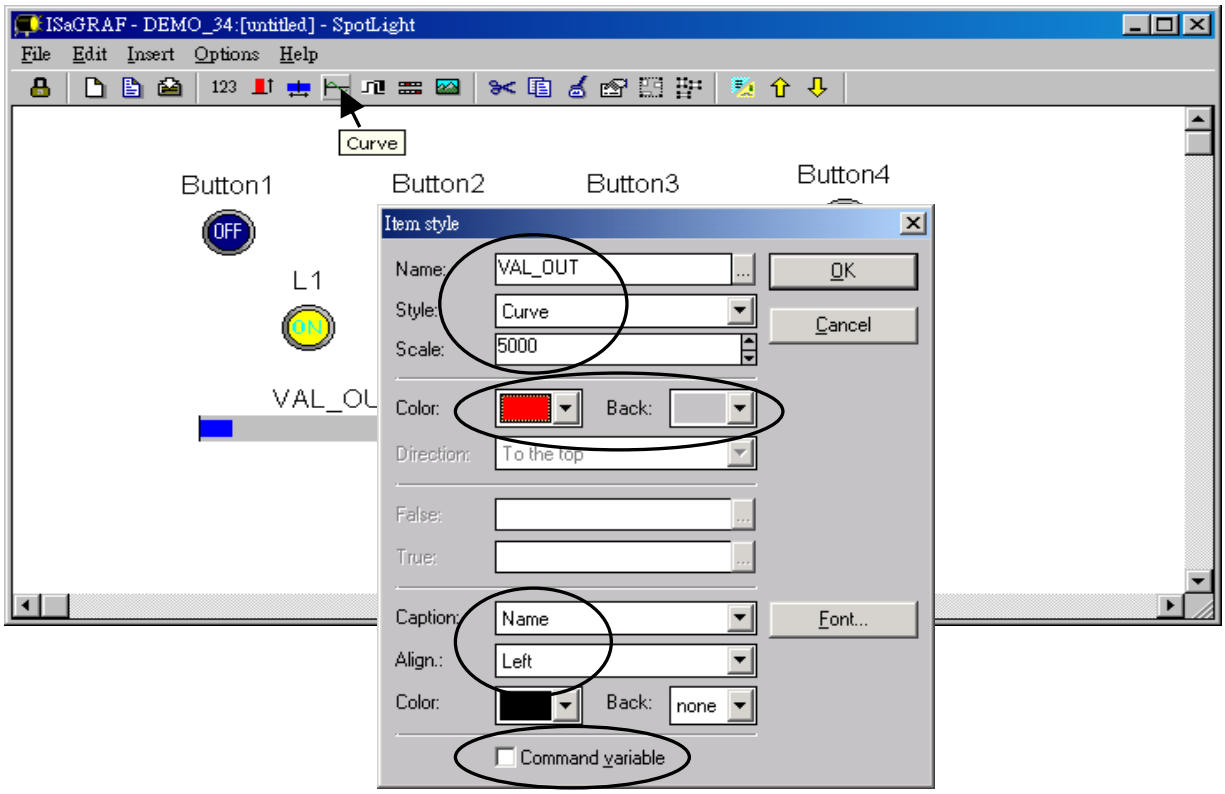
Move it to the preferred place and save it.



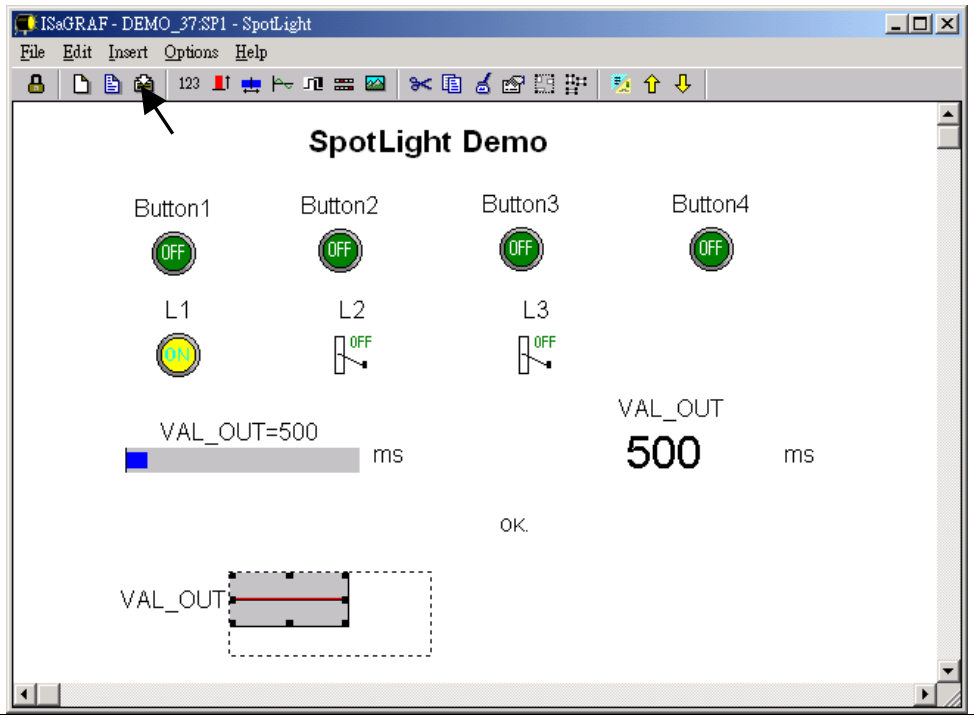
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Add "Curve"

Click on "Curve", set the associated Name as "VAL_OUT", Scale as "5000", Color as red, Back as gray, Caption as "Name", Align as "Top", and un-check "Command variable"



Click and hold on the left button of the mouse to change to the preferred shape as below. Save it anytime



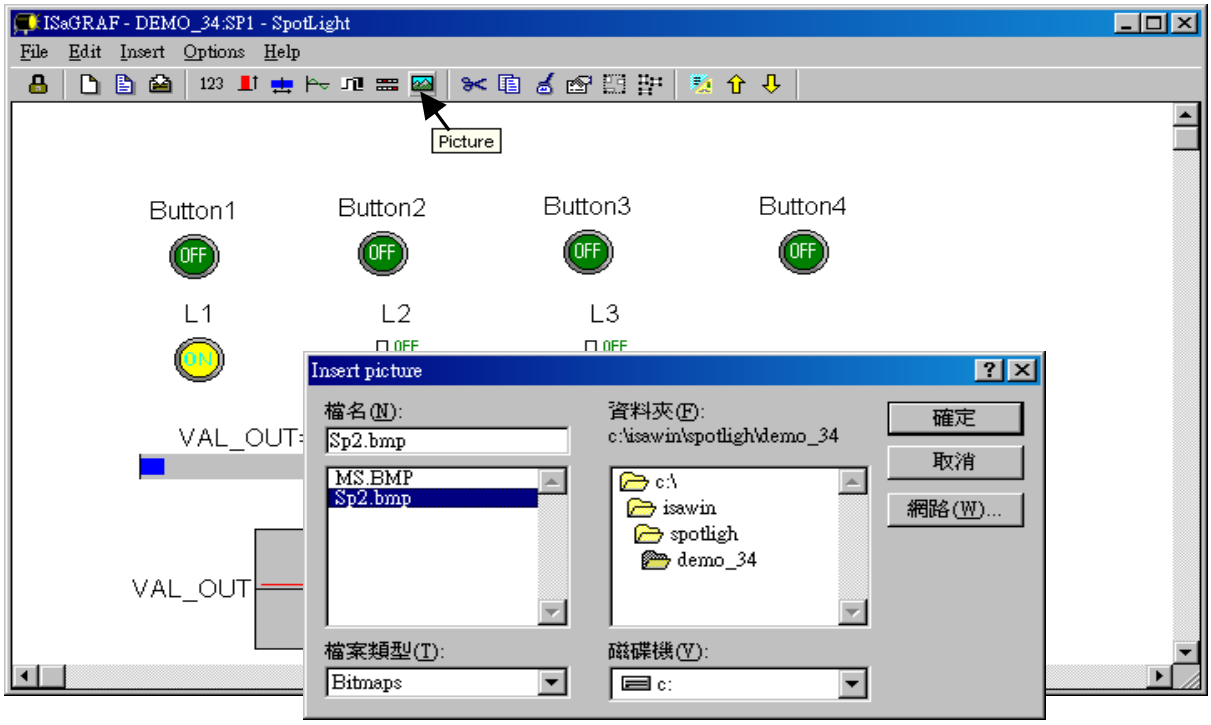
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Add “picture”

Please build 2 bitmap pictures by MS painter as below. Then save them respectively with file names of “sp2.bmp” & “ms.bmp” to the associate project directory.
(For this example “c:\isawin\spotlight\demo_37\”)

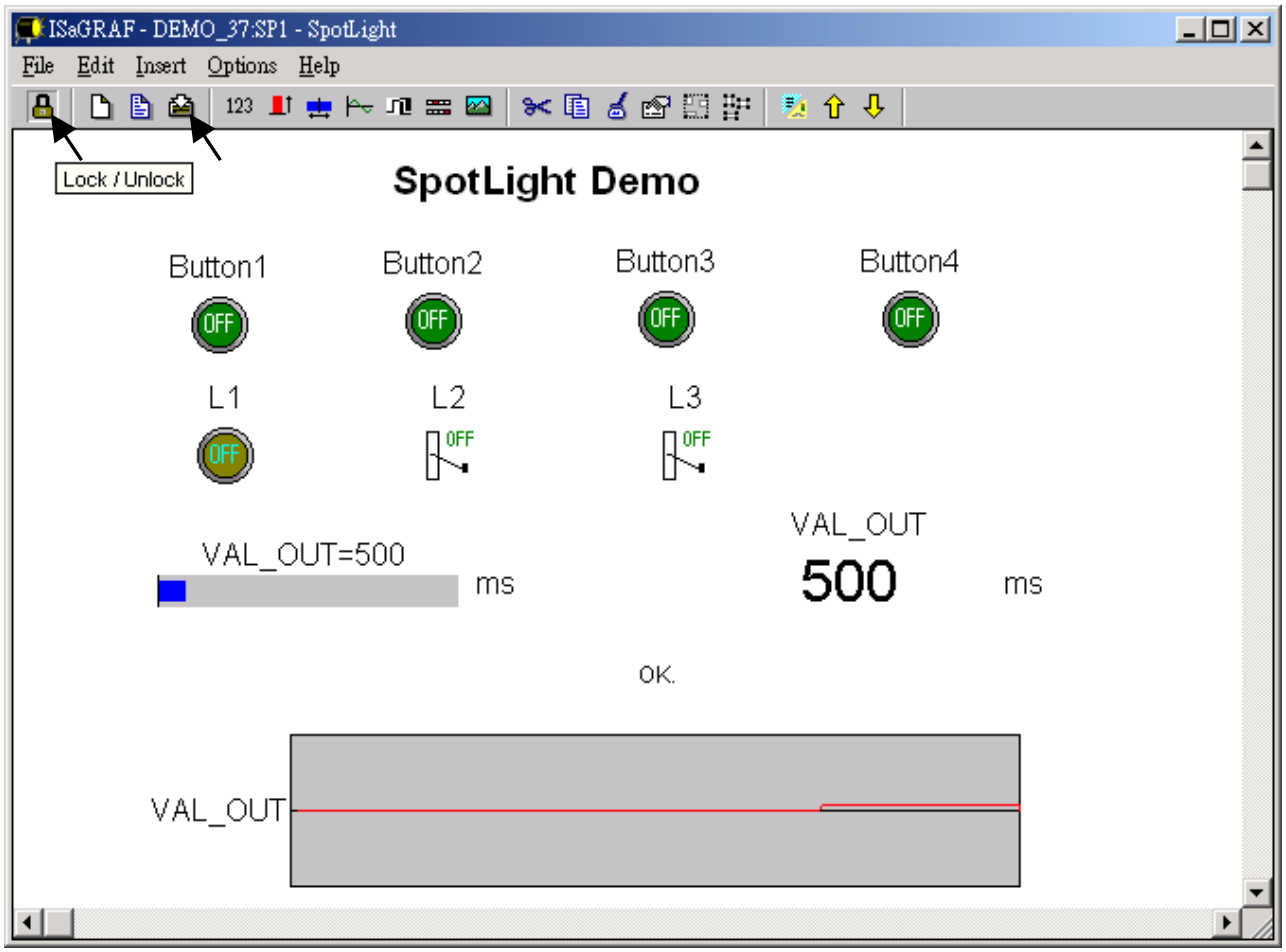


Click on “Picture”, Select the associate bmp file name.



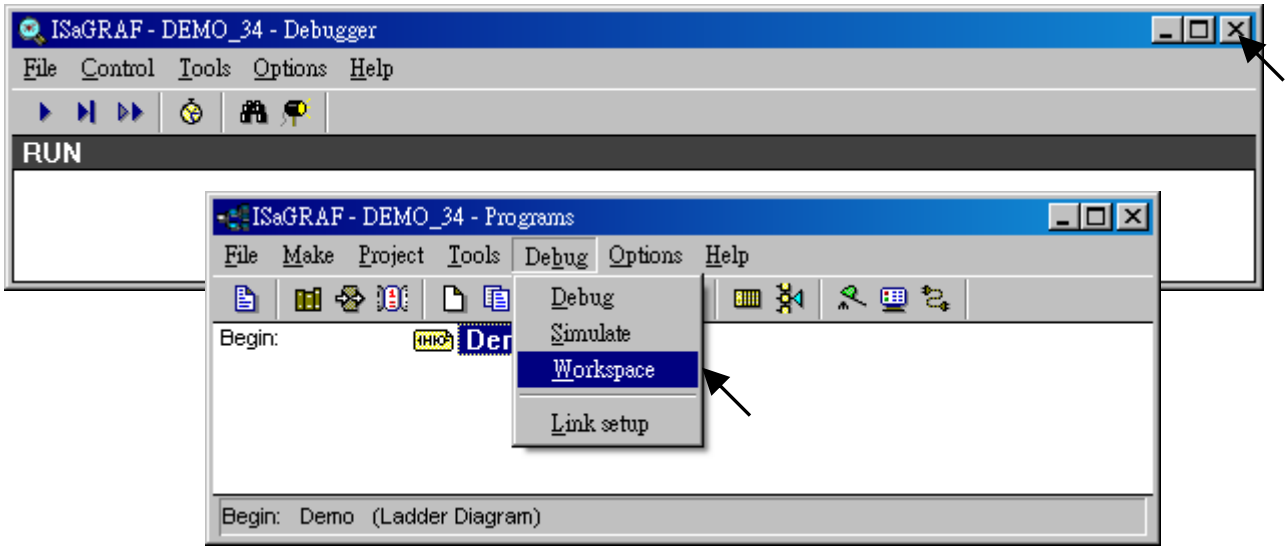
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Add 2 pictures “sp2.bmp” and “ms.bmp” to the preferred place, then we got the below window. Click on “Lock” to protect it (No modification allowed). Save it anytime.



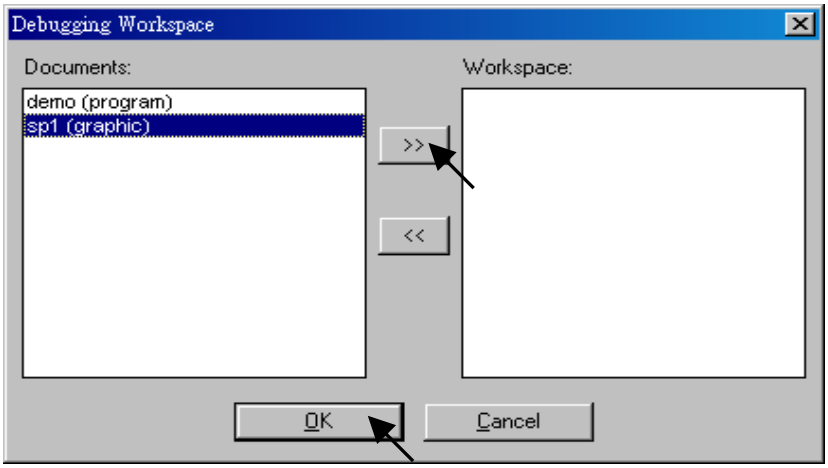
Add the HMI screen to the “Workspace”

Quit “simulation”, then run “Debug”- “Workspace”.



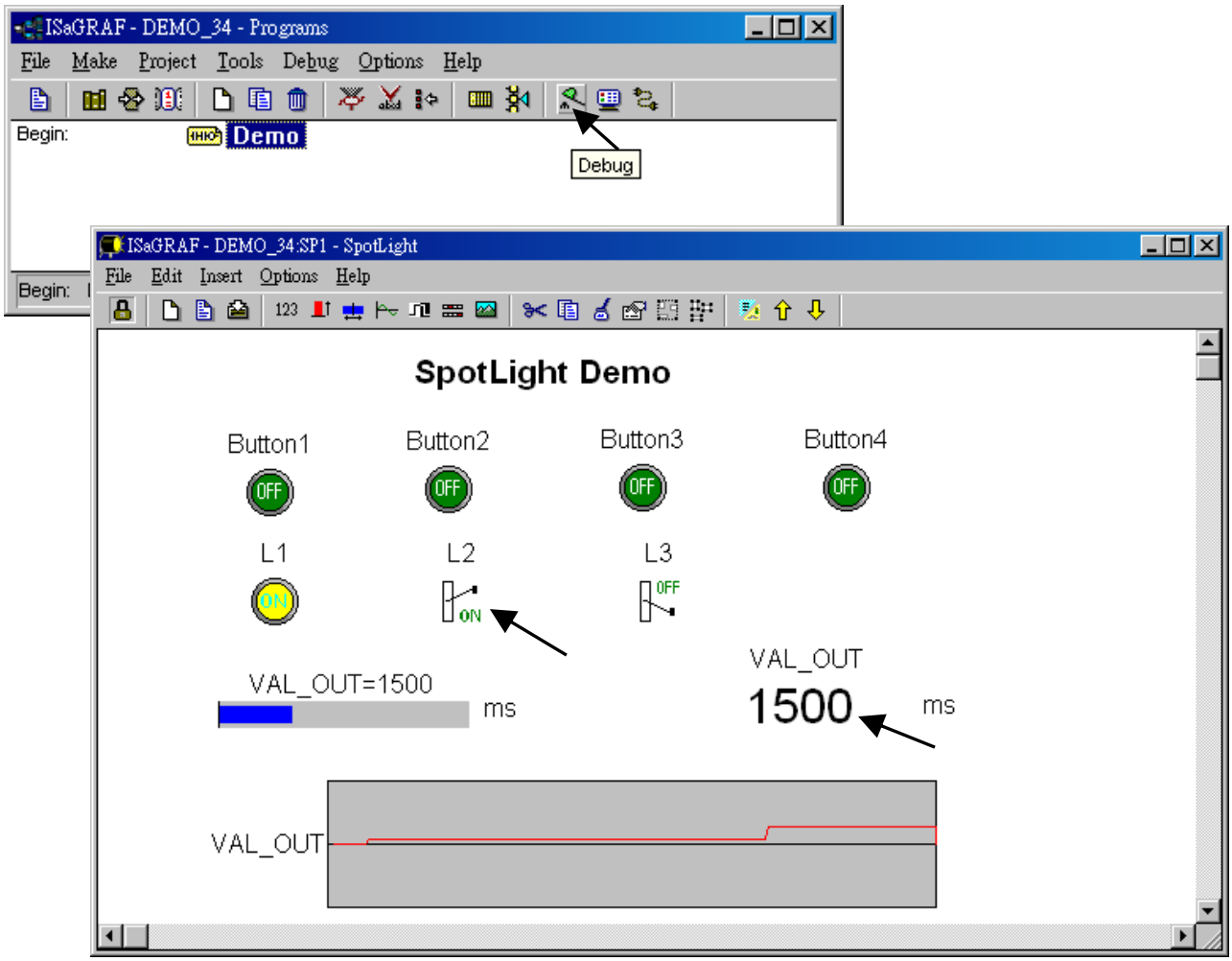
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Move the HMI screen to the right (Workspace).



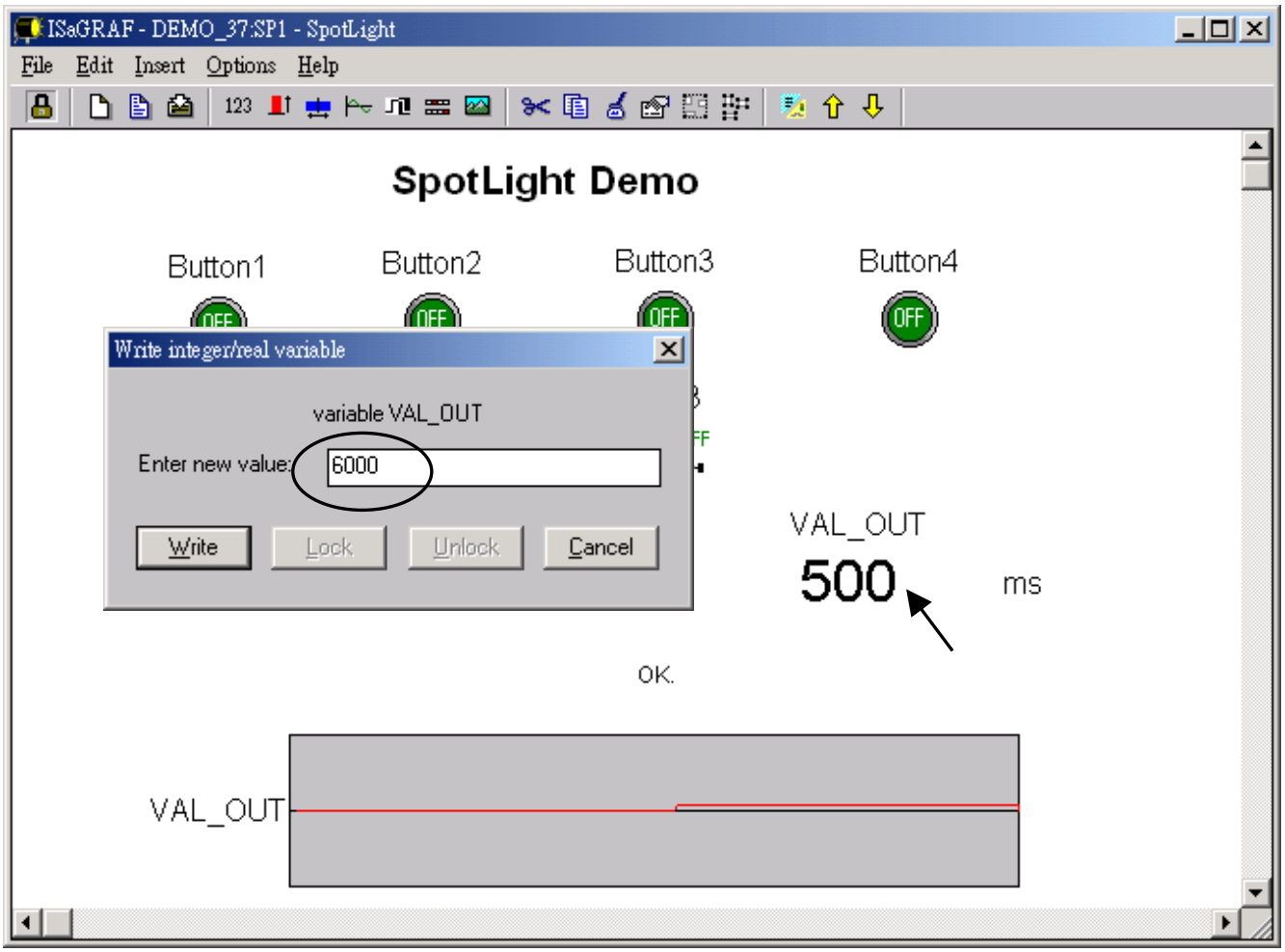
Time to download to the controller and test

Click on “Debug” to download the project to the controller and test it. You may double click on “L2”, “L3” or “VAL_OUT” to modify the value and see what it happens on the controller. And also you can press the 4 pushbuttons on the controller.

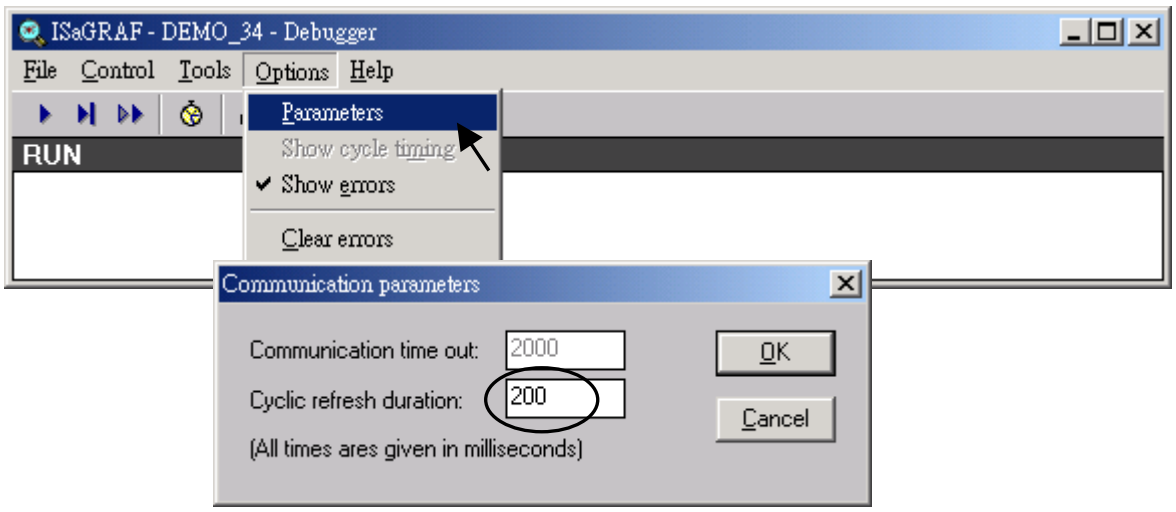


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You may double click on “VAL_OUT” and give a value large than 5000 to see what it happens.



Note: For quick response, user may click on “Options” – “Parameters”, and then set the “Cyclic refresh duration to a smaller value. (Recommend not to set below 200 ms)



Click the link for more ISaGRAF FAQ.

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