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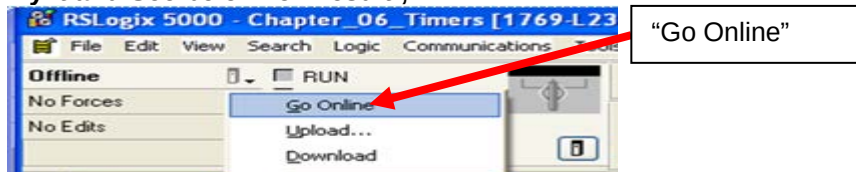
8. Monitoring, Testing & Debugging

8.1 Program Monitoring Online.

The “Go Online” function is used to Monitor a Program “Online” so as to be able to evaluate the User programs “ONLINE”.

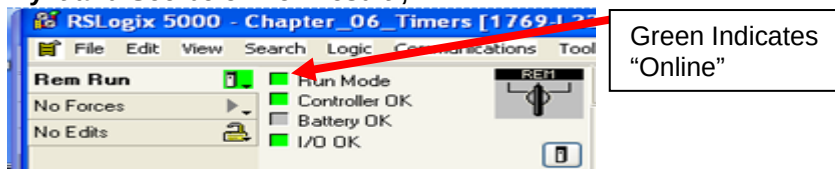
From RSLogix5000 select the **Offline** → **Go-Online** command as follows;

Try it and See below for Result;



To Go ONLINE To CPU

Try it and See below for Result;



ONLINE To CPU

Before beginning with the actual monitoring of an RSLogix Users program, you must select and open the Users program to display the program status, the following requirements must be fulfilled:

- There must be a physical and logical connection between the programming device and the PLC.
- You must have saved the block without errors and then downloaded it to the CPU.
- The Key switch on the CPU must be in REM Mode.

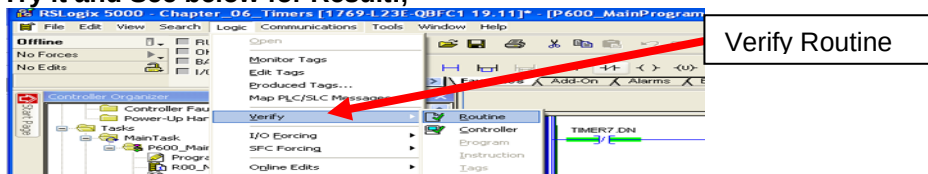
8.2 Checking For Errors in Routines

When programming using RSLogix's5000 one should always check and “Verify” the routines for errors. Using RSLogix's there are various options in selecting the “Verify” function as outlined,

Option 1;

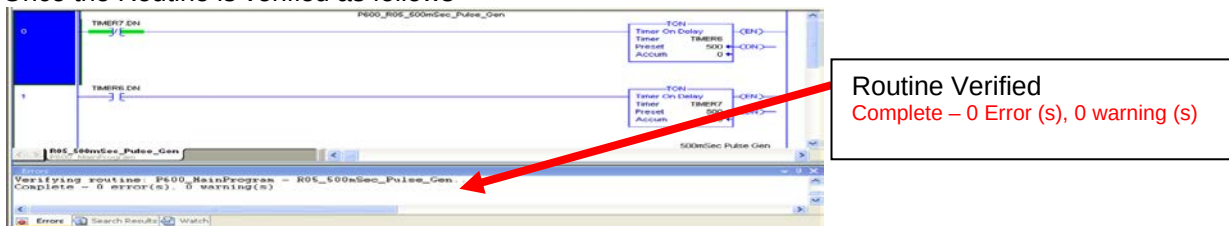
From RSLogix5000 select the **Logix** → **Verify** → **Routine** command as follows;

Try it and See below for Result;



OPTION 1 VERIFY ROUTINE

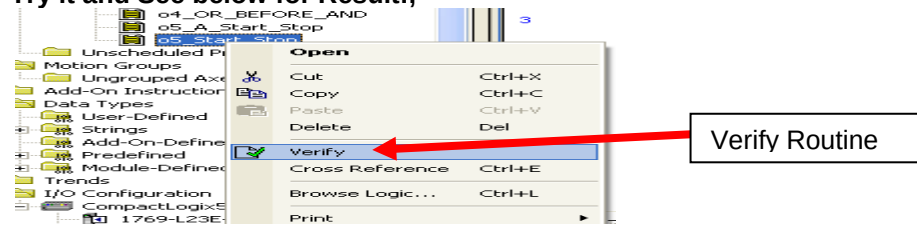
Once the Routine is verified as follows



OPTION 1 VERIFY ROUTINE WITH 0 ERROR(S)

Option 2

Use the “Verify” function to Verify a Routine as outlined below;
From RSLogix5000 select the Routine and right click “Verify” command as follows;
Try it and See below for Result;

**OPTION 2 VERIFY ROUTINE**

This will then display all the errors and warnings in the routine.

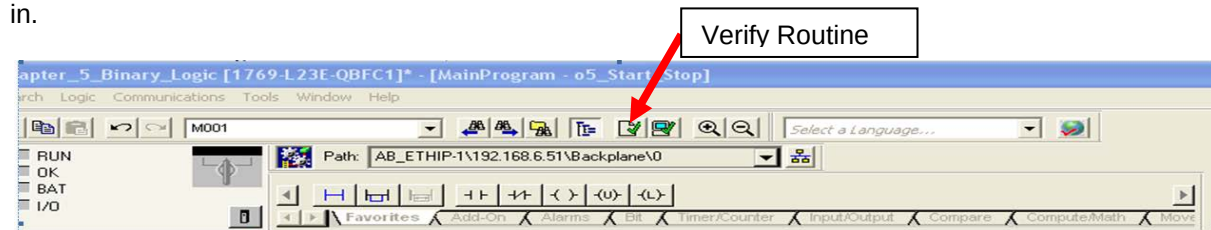
**OPTION 2 ERROR(S) WARNING(S)**

Note: If you click on an error it will bring you to the routine and rung where the error is located.

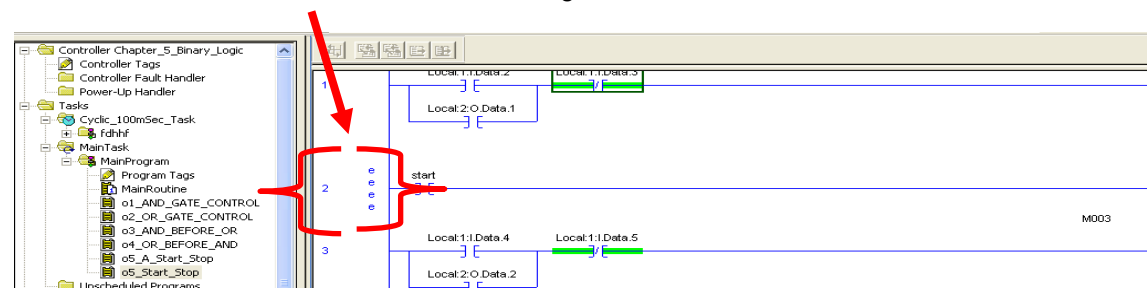
Tip: If you want to start at the top of the list and fix each error in turn click on the first error in the list. When you are done fixing it press F4 and it brings you straight to the next error. To make your way up the list just click on **Ctrl+F4**.

Option 3

You can also Verify routines by clicking on the “Verify routine” icon. This verifies the routine which you are currently in.

**OPTION 3 VERIFY ROUTINE****8.2.1 Writing Code with Errors**

Whilst writing RSLogix's PLC Code in a routine and if there is a small e's to the LHS of the Rung, as shown below, means there is an unresolved error in that Rung.

**ERROR DISPLAYED WHEN WRITING A ROUTINE**

Note: The Objective is to have “Complete – 0 Error (s), 0 warning (s)”

8.2.2 Verify Controller

To verify all the routines at once just click on the icon "Verify controller"



VERIFY ALL ROUTINES USING VERIFY CONTROLLER

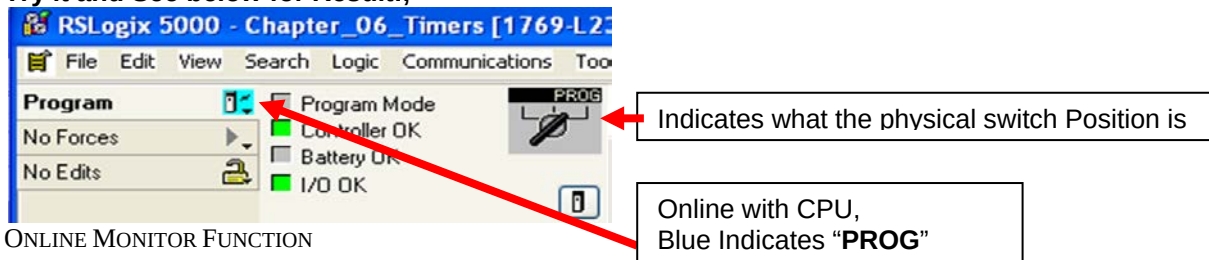
8.3 Exercise Monitor Routine Online

Establish an "Online" connection;

- From the RSLogix's Project select;
 - "Go Online"  or
 - Select Communications → Go Online,

This will activate the "Monitor" function for the block which is currently opened. The Status of the CPU will be indicated,

Try it and See below for Result;



ONLINE MONITOR FUNCTION

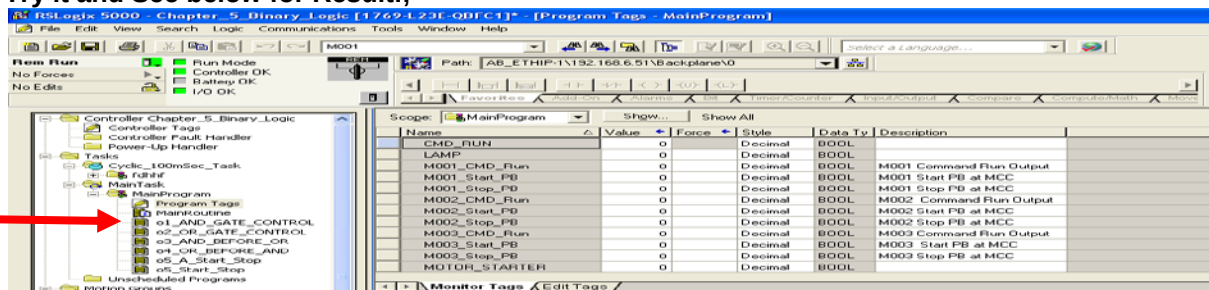
Note: In "PROG" Mode the status of a Routine cannot be "Monitored", the user can however change the User Routines code if required.

To monitor the Routine the Key Switch must be in **REM** or **RUN** Mode and the Controller must be Remote Run or Run.

8.4 Monitoring Tags

You can monitor the values of the program variables by selecting **Program Tags → Monitor Tags**

Try it and See below for Result;



PROGRAM TAG MONITORING

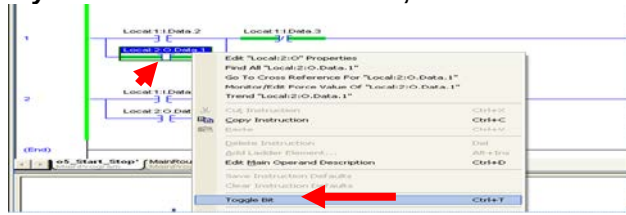
The **Value** column shows the value of each variable. You can monitor from here if the values are changing. You can also change the output values here by changing the value in the box and clicking enter.

Note: In Run Mode make sure you know what effect changing the value will have because once you change it, it takes immediate effect and may cause damage to machinery or injury to personnel.

8.4.1 Monitoring Values Directly in the main window

You can also change the values of each variable by clicking into a routine. Right click on the output element whose value you want to change and select Toggle bit as shown below.

Try it and See below for Result;



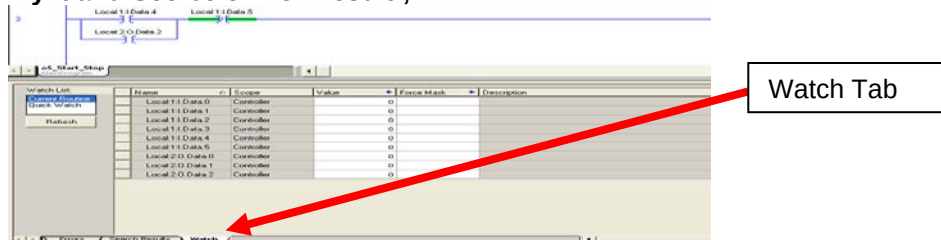
MONITOR ROUTINE & TOGGLE BITS

Note: One can also toggle the bit by clicking on the variable and then clicking **Ctrl+T**

8.4.2 Monitoring values using the “Watch” tab

Another way of monitoring the variables is when you are in a routine click on the **Watch** tab at the bottom of your screen. This allows you to change the values of your outputs and to monitor the values the same as in Program Tags

Try it and See below for Result;



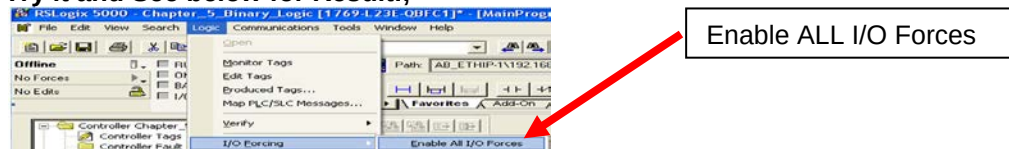
MONITOR VARIABLES USING “WATCH” TAB

8.5 Forcing Values

Whilst Online you can “Force” your inputs to values to allow you to confirm the affect the changes will have on your program. It is very important that you know what effect these changes will have as they take effect immediately and have the potential to cause injury to personnel or damage to machinery.

Step 1. In RSLogix 5000 go **Logic → I/O Forcing → Enable All I/O forces**

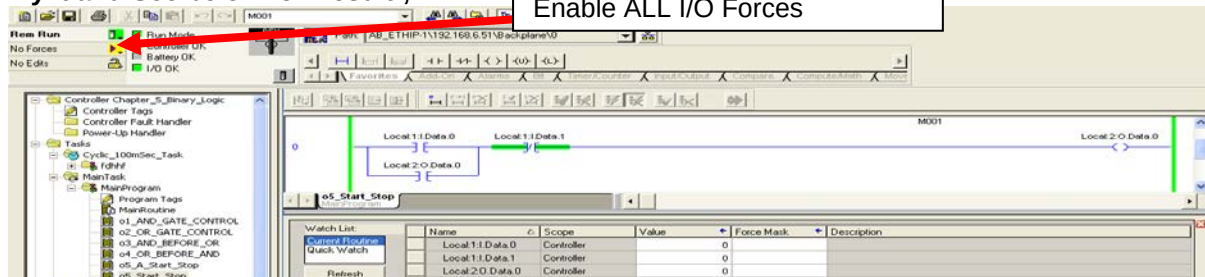
Try it and See below for Result;



ENABLE FORCING

Step 2. Go into “Program Tags” or the “Watch” tab. I am going to use the “Watch” Tab

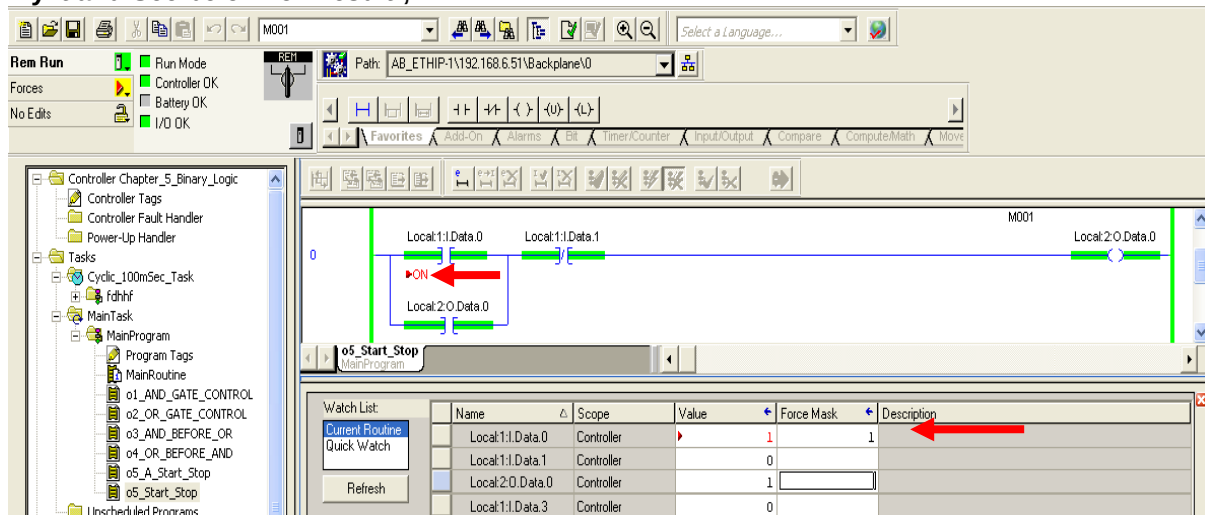
Try it and See below for Result;



ENABLE FORCING

8.6 Exercise Force Local1:I.Data.0 to Logic "1"

Force the Digital Input "Local1:I.Data.0" to a logic "1",
Try it and See below for Result:,



FORCE DIGITAL INPUT LOCAL1:I.DATA.0 TO LOGIC "1"

Note how the output turns on when the Start switch is forced on. This symbol **ON** appears below the switch to indicate that it is forced on.

Note: If the controller is in either **Run** or **Rem Run** when you are making changes these changes will come into effect immediately on the PLC

8.7 Check What You've Learnt in This Chapter.

8.7.1I Know:

- ⇒ How to “**Go Online**” function is Used for.
- ⇒ How to verify a Routine in the controller.
- ⇒ How to Debug any Error(s) or Warning(s) in a Routine
- ⇒ How to “Monitor/Modify Variables” in a Program Tags or in the Watch Tab
- ⇒ What the “**Forcing**” function is used for.
- ⇒ How to “**Force Inputs and Outputs**”.

8.7.2I Can:

- ⇒ Edit and Monitor Blocks using “**Monitor**” Blocks Online Function.
- ⇒ Verify a Users Programmed Routine and the Controller
- ⇒ Debug any Error(s) or Warning(s) in a Users Routines.
- ⇒ Monitor and modify variables.
- ⇒ Force Inputs and Outputs using “**I/O Forcing**”.