

Siemens **S 7**

Pocket **Reference** **Guide**

FAULT DIAGNOSTICS.....	3
ACCESSING DIAGNOSTICS BUFFER	5
LINK BETWEEN THE PC AND THE PLC.	6
BACKING UP A PROGRAM IN THE PLC.	7
ONLINE AND OFFLINE ERROR! BOOKMARK NOT DEFINED.	
COMPARE PROGRAMS	9
CLEAR MEMORY	10
MANUALLY USING THE KEYSWITCH.....	10
BY THE PG	ERROR! BOOKMARK NOT DEFINED.
MONITORING A PROGRAM.....	11
MONITORING VARIABLES.....	12
SEARCHING FOR ADDRESSES / GO TO	<u>12</u>
REFERENCE DATA	13

ALL SCREENS ARE FROM SIMATIC MANAGER V5.2

Fault Diagnostics

Rule for Fault Finding
DON'T ASSUME ALWAYS CHECK

ASSUME = ASS + U + ME

2 forms of check

1. **VISUAL CHECKS**
(Hardware, LEDs etc)

P.S. You may also like to smell it

2. **FUNCTIONAL CHECKS**
(is there a program etc)

2 categories of fault associated with PLCs

1. **Communications**
2. **PLC**

2 types of fault

1. **Hardware**
2. **Software**

**IDENTIFYING WHICH OF THE ABOVE
COMBINATIONS IS THE KEY TO
FAULT FINDING THE PLC.**

Ask yourself the following questions

Q. Do I have a Communications problem?

Comms problems :

1. Cannot establish communications link between PC and PLC.
2. Data in PLC is not being communicated to remote I/O or other PLC.

P.S. You can generally always establish communications with the PLC even if it is indicating a FAULT.

Except if the COM port on the PLC or PC is faulty.

If communications with the PLC is OK.

Q. Do I have a PLC problem?

Q. What is the job of the PLC?

Scan inputs, run program, power outputs to control machine.

1. PLC is not in RUN mode
2. PLC is in RUN but machine does not run.

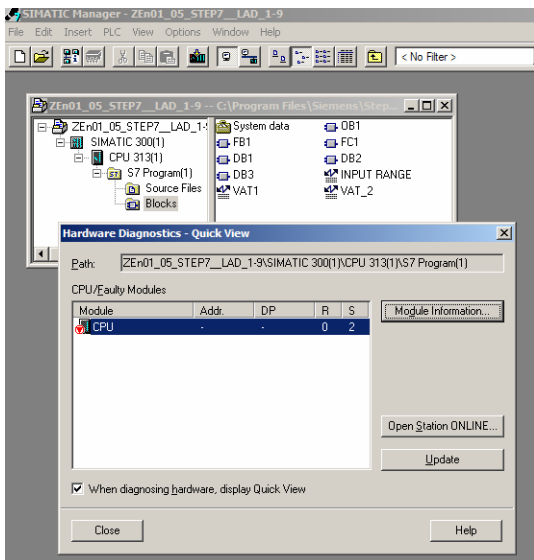
Accessing Diagnostics Buffer

If the SF LED is ON then the PLC is indicating a fault of some kind

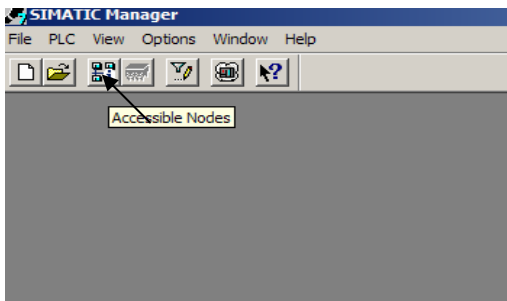
Hardware, Software, etc

Even if there is a fault you should always be able to get OnLine to the PLC and find out what is the problem.

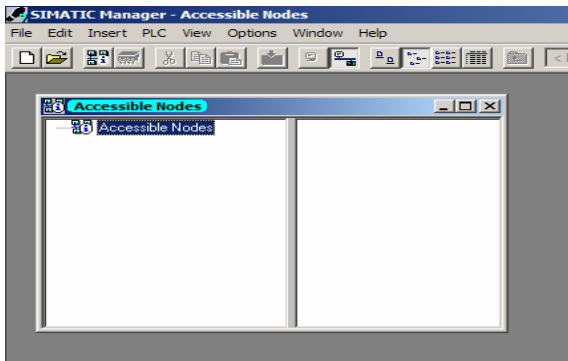
Open the Project and Select PLC/Diagnostics Settings/
Hardware Diagnostics.



Link between the PC and the PLC.



Select Accessible Nodes



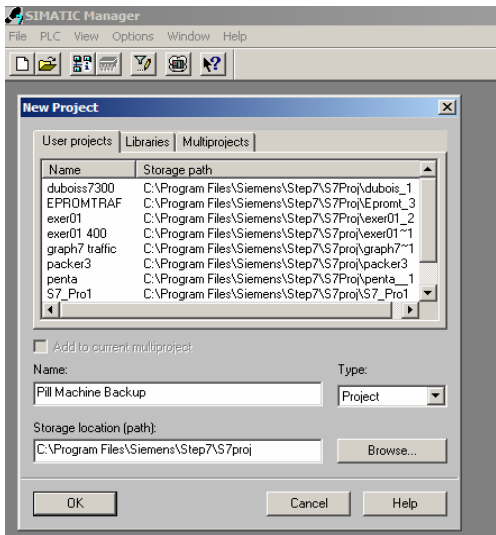
This screen show that No connection has been established with the PLC

Backing up a program in the PLC.

Step 1 Create a blank Project.

WARNING DO NOT UPLOAD A BACKUP FROM THE PLC WITH THE EXISTING PLC PROJECT OPEN.

Select File/New or click on the New File Icon



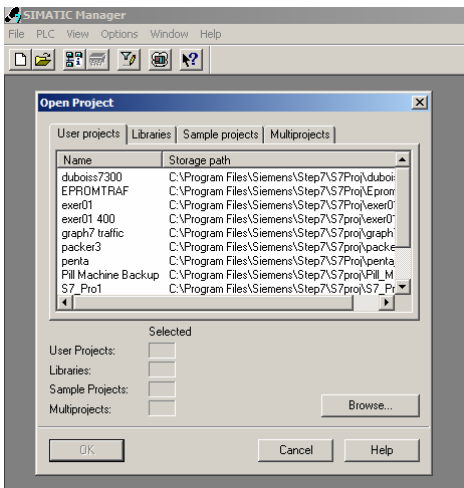
A new project is now created

Getting On Line and Monitoring.

The big issue facing PLCs up until recently has been, when I go On Line will I have any documentation?. The reason for this has been that up until recently documentation has always been stored on the hard disk of the PC. Therefore we had to open the appropriate project into the RAM of the PC and then essentially access the image files within the PLC.

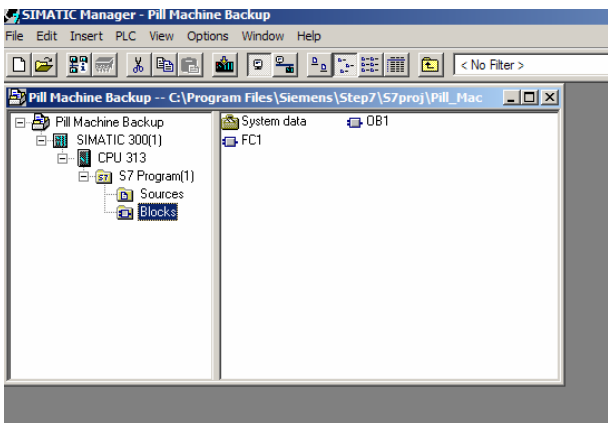
Opening a project Off Line

Select File / Open or click on the open project/library icon



Compare Programs

Siemens Software being very powerful, as per most Siemens functions we have to be very specific about what we want it to do, Compare a block, compare all the blocks, compare OnLine and OffLine, these are various options.



Select Blocks from the project menu.

Select Options / Compare Blocks

Clear Memory

Before we download a program it is important that we clear all existing blocks from the PLC.

All user data is erased(except MPI parameters)

Contents of the Diagnostics buffer is retained

If a memory card is present PLC will reload from memory card after a reset.

This can be done in 2 ways.

Manually using the Keyswitch

1. Put the **Keyswitch** into the “**STOP**” position
2. Turn **Keyswitch** to “**MRES**” position and Hold
3. **STOP LED** will flashed twice slowly
4. Release **Keyswitch** and it will return to the **STOP** position.
5. Almost **IMMEDIATELY** turn the **Keyswitch** back to the “**MRES**” position the **STOP LED** should now flash rapidly, once it has started flashing the **Keyswitch** can be release and it will go back to the **STOP** position.

IF THE STOP LED DOES NOT FLASH RAPIDLY THE MEMORY RESET HAS NOT BEEN COMPLETED.

Monitoring a Program

There are several ways to Monitor a program.

1. The first Method is as follows:

Advantage: Quickest.

Disadvantage: you do not get any documentation, but is handy if you just want to monitor power flow.

- Select Accessible Nodes an open project to block level
- Select the block you want to monitor and double click.
- The LAD/STL/FBD program is now open and you are OnLine.
- You will notice that the Windows bar at the top is a cyan colour and at the bottom of the screen a green or red block will tell you what mode the processor is in either RUN or STOP.
- However you will notice that the lines are not showing power flow. This is quite common with some PLCs. You are OnLine but NOT MONITORING.
- To start monitoring click the Monitor (on/off) Icon.



Monitoring Variables

There are various blocks within the Siemens Package that cannot be monitored directly, FCs with parameter passing and FBs. By their very nature the idea is to use the same bit of code multiple times. Therefore we can never monitor the block and know what variables its is operating at that particular moment in the scan.

Monitoring the actual program code to determine power flow is OK but there is only so many lines we can actually monitor at one time. this is further restricted if documentation is selected to be displayed.

For simple applications monitoring the code is fine but once we need to monitor different point sin the program all together we struggle. We therefore have the Monitor Variables Function, another bit of software.

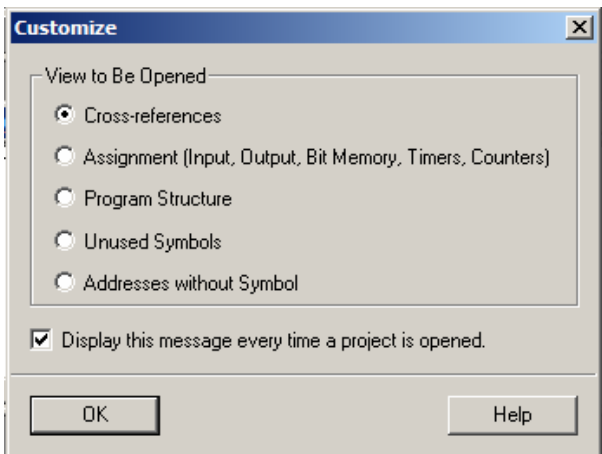
Being Windows there are multiple ways we can actually open the Monitor variables Table.

Create a Variable Table.

- From Simatic Manger, right mouse click in the blocks window
- Select insert new object
- Select Variable Table.
- The VAT number will default to the next available, also give it a description e.g. Start Up.

Reference Data

From Simatic Manager open the project to the blocks level and Select Options/ Reference Data / Display or **Ctrl + Alt +R**.



This allows us to select which display we want to open.

