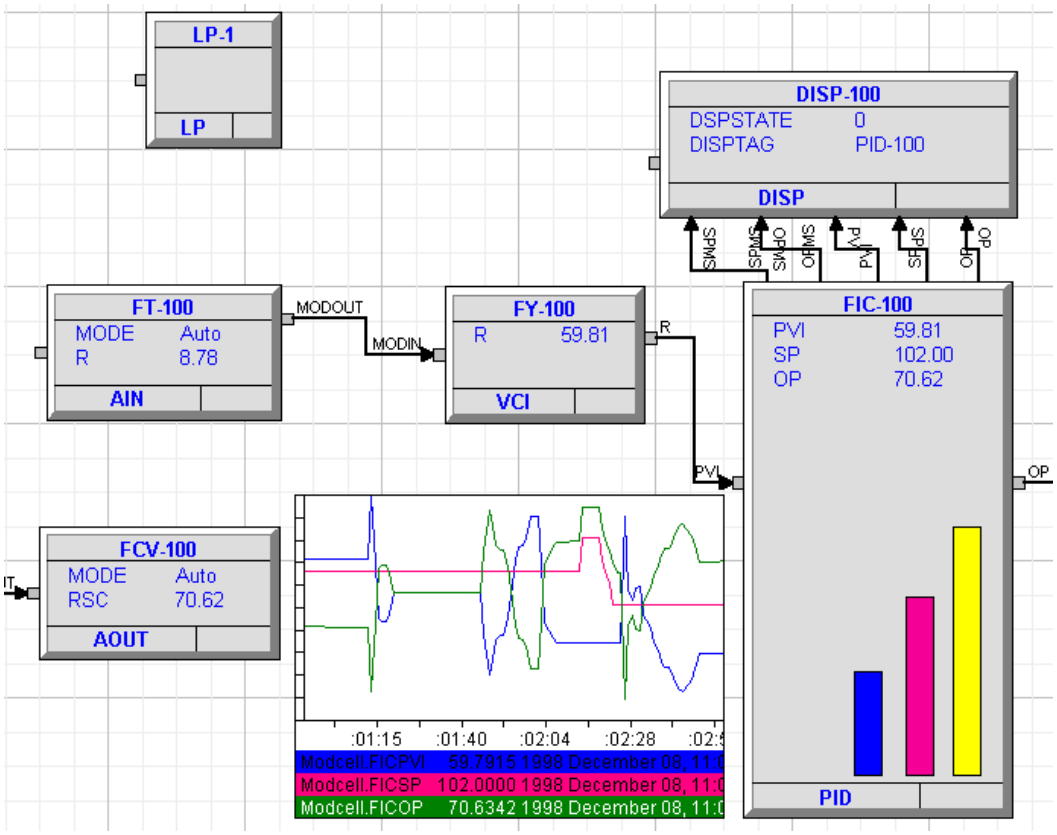
9 Debug Lab

9.1 Foreword

It is important to debug the control strategy after it is downloaded to the instrument to see if the instrument does what it is supposed to do. The ViZapp Designer provides a way to debug the control strategy by displaying the live data from the instrument on the algorithm blocks in the strategy.

ViZapp also provides a Status Viewer using which diagnostics from the instrument can be read and acknowledged. The Status Viewer can also be used to read and write instrument attributes.

Figure 9 .1.
ViZapp Debug Display

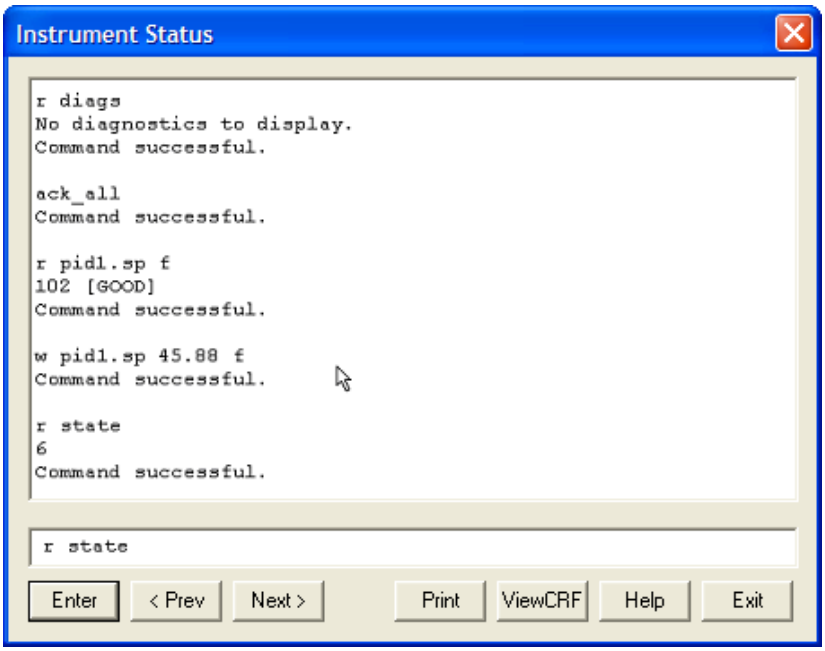


9.2 Objectives

In this lab we will run the PIDLAB document in debug mode using Vizapp Designer. We will also read diagnostics from the instrument and acknowledge them from ViZapp using the Status Viewer. After completing this lab, you should know how to:

- Run the Modcell/MOD 30ML document in debug mode by communicating with the instrument.
- Start and use the Status Viewer to read and write instrument attributes.

Figure 9 .2. Instrument Status Viewer



9.3 Instructions

9.3.1 Part A

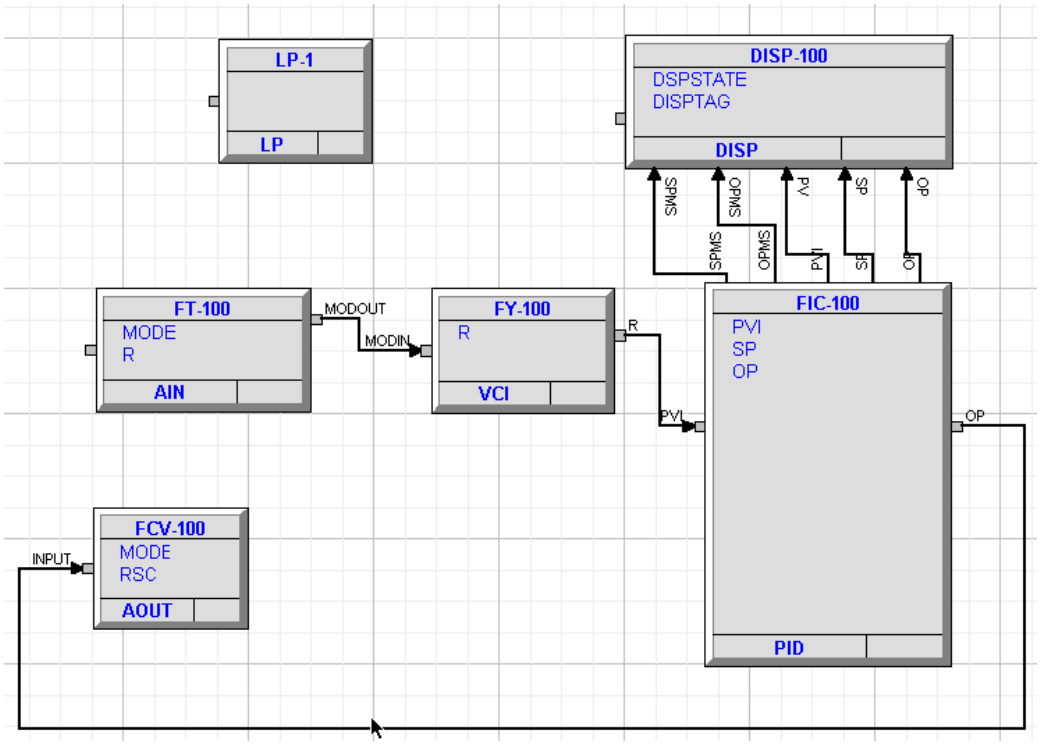
1. Launch ViZapp Designer if it was not running already. Open the PIDLAB instrument document. The document (strategy) will open as shown in the figure below: (the position and size of the blocks might be different). This is a static display.

2. Start Debug for this display:

   - Select **Project – Start Debug Mode** from the menu bar at the top.

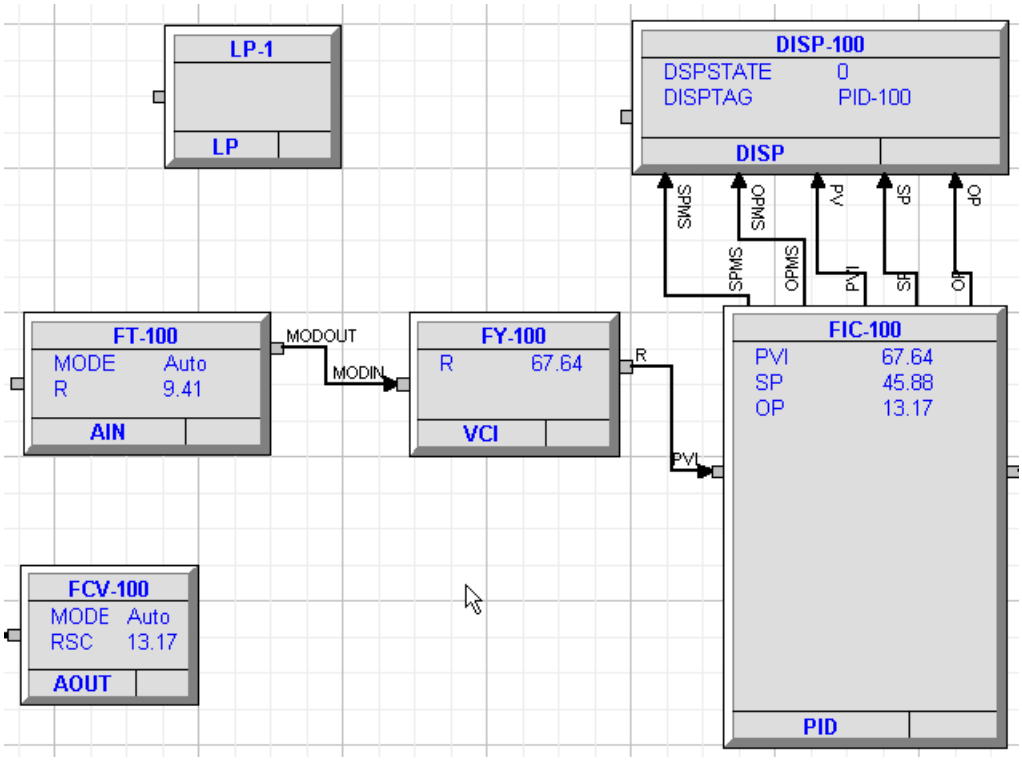
   If you get perpetual communication error boxes popping up, force the server closed, acknowledge the remaining pop-ups and correct the communication problem before launching Debug Mode again.

Figure 9 .3.
Debug



- This will start the OPC Server (XModbus or ICN) if it was not running already and minimize it to the Windows task bar.
- You should also now see live data from the instrument displayed on the algorithm blocks as shown below:

Figure 9 .4.
Debug mode



- Notice that only the standard/important attributes of the algorithm blocks such as PVI, SP, OP for PID block, Mode and R for AIN block are displayed on the blocks.

3. View details of PID block.

- Double-click on the PID block. The Algorithm Properties dialog will be displayed as shown below:

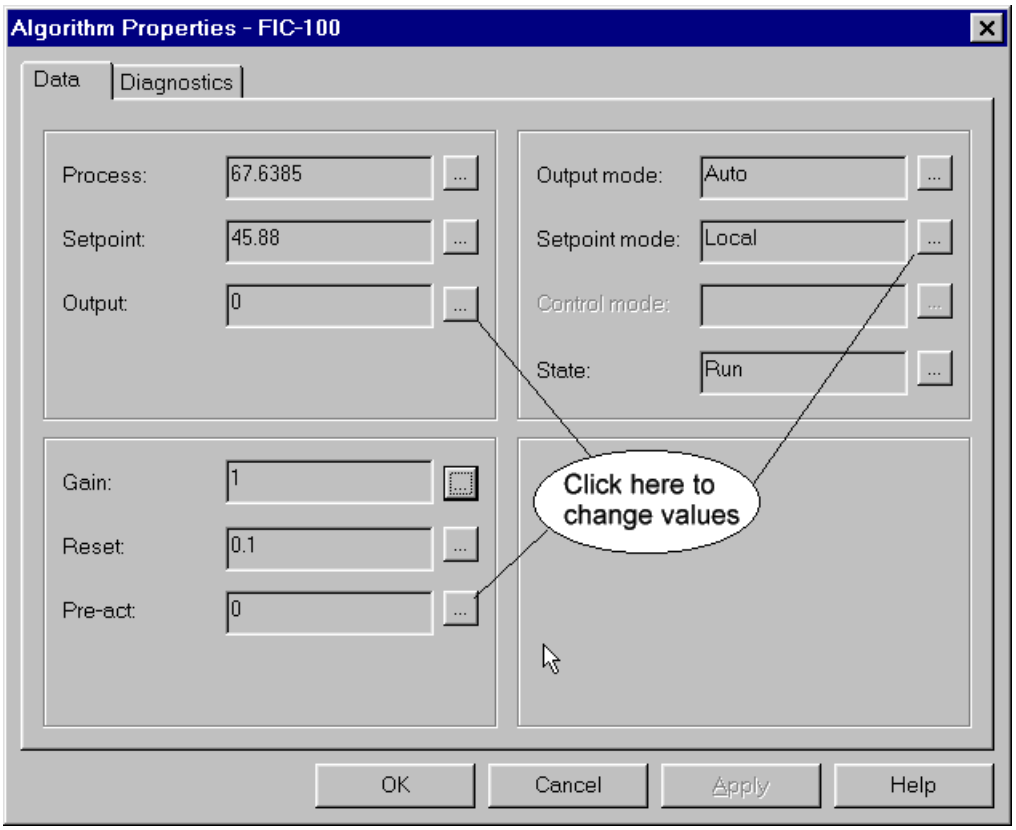


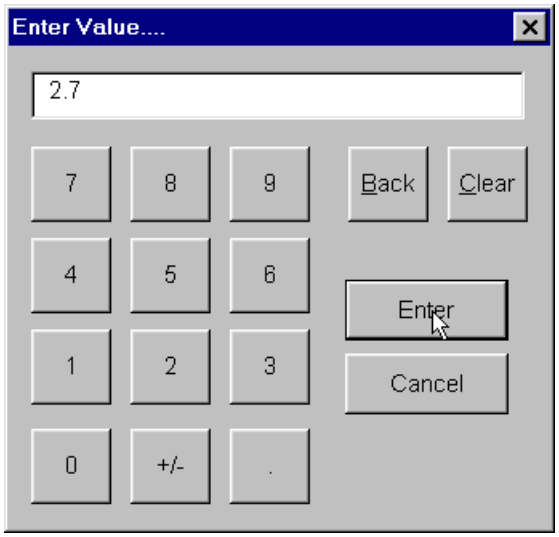
Figure 9 .5. Debug mode Algorithm Properties

- This dialog will show more attributes of PID such as Gain, Preact, Reset, mode etc.

4. Change the value of PID Gain:

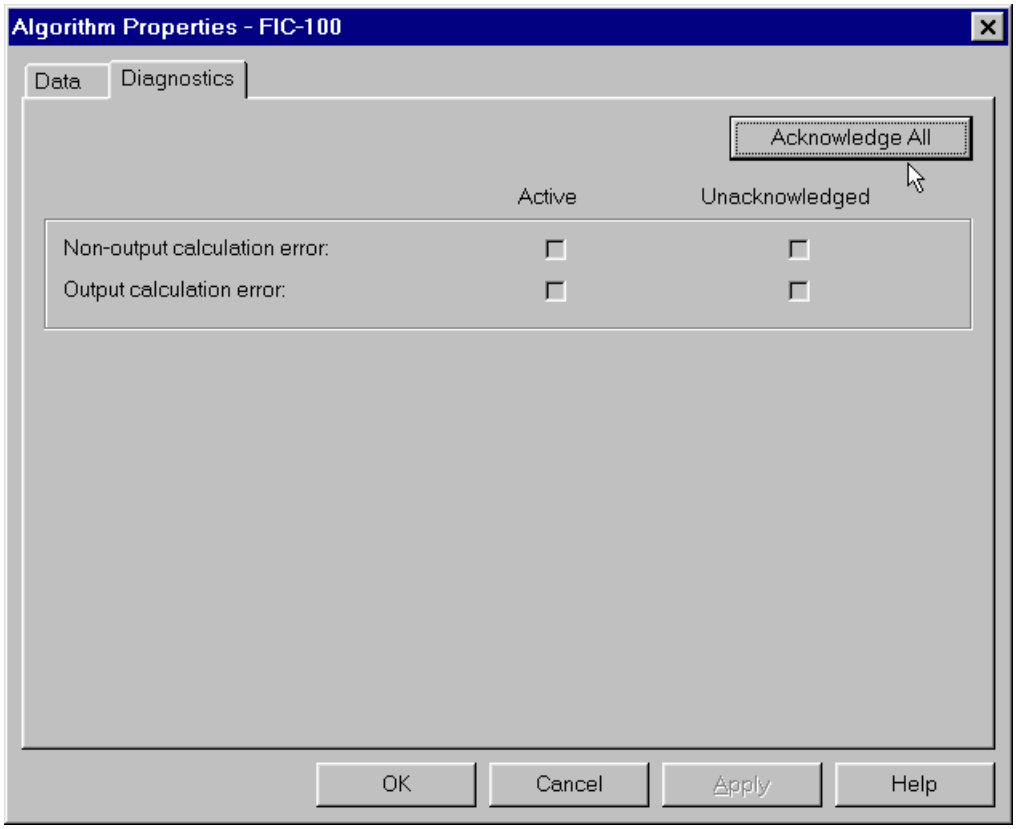
- Click on the little button next to the **Gain** field on this dialog. This will popup a key pad on the screen as shown below:

Figure 9 .6.
Enter Value Pad



- Click on the text field at the top on this pad and then type a new value for the Gain. You can either click on the number buttons on this pad or type using the number keys on your keyboard.
- Click on **Enter**. This will change the PGAIN attribute of the PID running in the instrument. Do not click on the OK button now! Click on the Diagnostics tab on the Algorithms Properties dialog.

Figure 9 .7.
Diagnostics



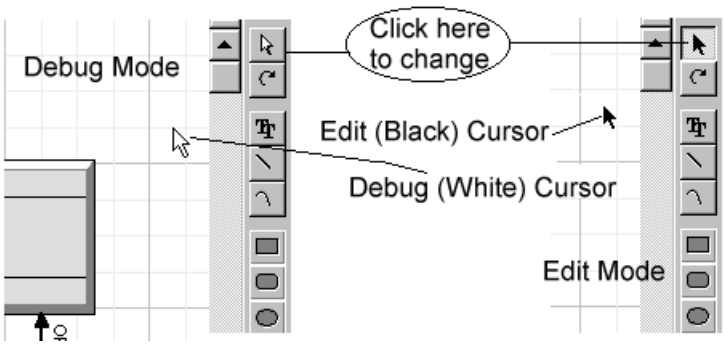
- The diagnostics tab will display diagnostics related to the PID lab. You can also acknowledge the diagnostic alarms.

- Click on OK. Try changing the Set point and Mode of the Controller in the same way.

Edit – Debug Cursor: There are two different modes for the cursor during Debug. The default cursor type after entering Debug mode is “Debug” and the cursor will be white. Refer to the following figure. During this mode, you cannot edit the document – cannot move blocks, resize them or open them etc.

To be able to edit during the debug mode, click once on the cursor/selection button on the Draw toolbar. The cursor will appear black now. Now you can edit the document, add objects, open a loop compound or close it, etc. If you now double-click on the PID block, it will display the PID block properties.

Figure 9 .8.
Edit / Debug Cursor



- Click on the cursor again to change its type to Debug mode.

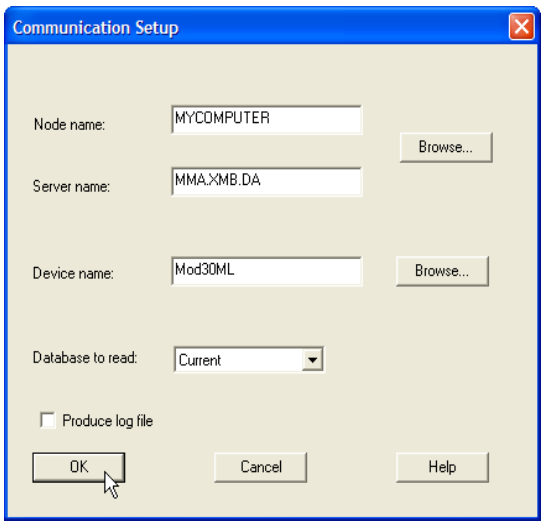
You can also add graphic objects such as bar-graphs, trends, color changes to the Modcell / MOD 30ML documents (strategy) and can animate in Debug mode. We will do that later in a different lab.

9.3.2 Part B – Instrument Status Viewer

1. **Start the Instrument Status Viewer:**

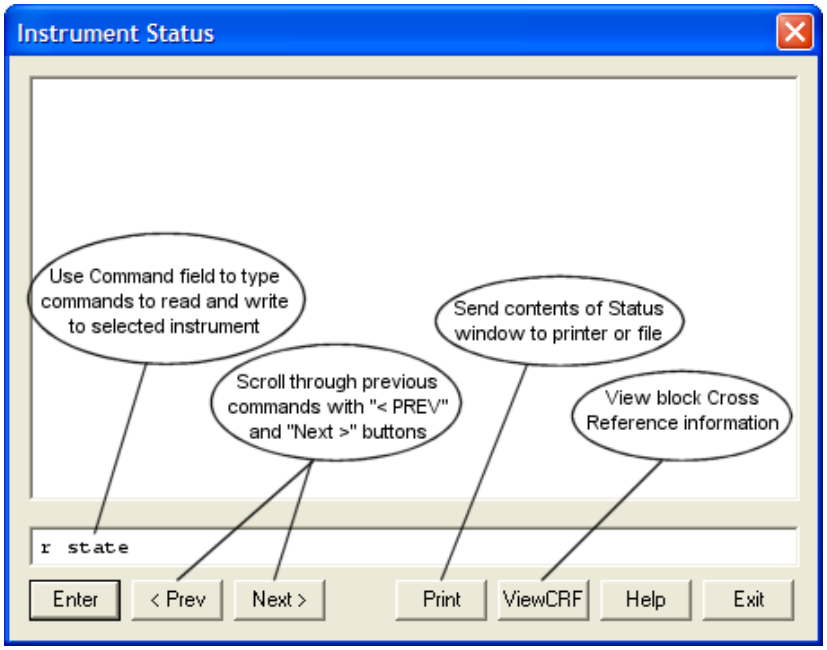
- Select **Instrument – Status** from the menu bar at the top. This will display the **Communication Setup** dialog as shown below:

Figure 9 .9. Communication Setup



- This will show the Server name and the Device name in the respective fields. Just make sure these are correct.
- Click on OK. This will start the **Instrument Status** display as shown below:

Figure 9 .10. Instrument Status

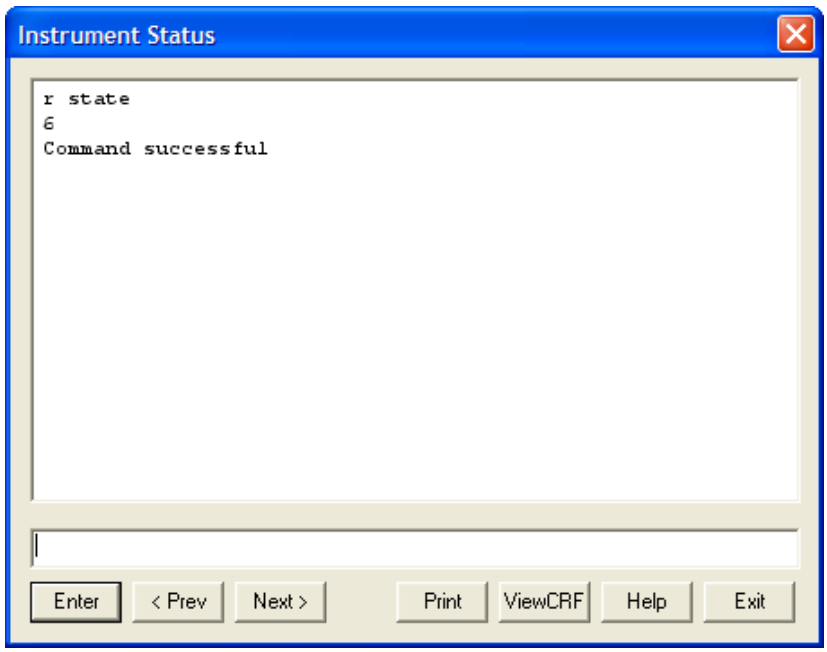


- This Instrument Status display has a text field to enter commands and a set of buttons.

2. **Read the status of the instrument**:

- Type **R STATE** in the command field and then click on the Enter button.

Figure 9 .11.
Instrument Status



- The command you entered will be echoed on the main window above, followed by the response from the instrument.

3. **Read diagnostics**:

- Type **R DIAGS** in the command field and then click on **Enter.** Instrument diagnostics will be displayed as shown in the next figure. You may get more diagnostic errors or none.

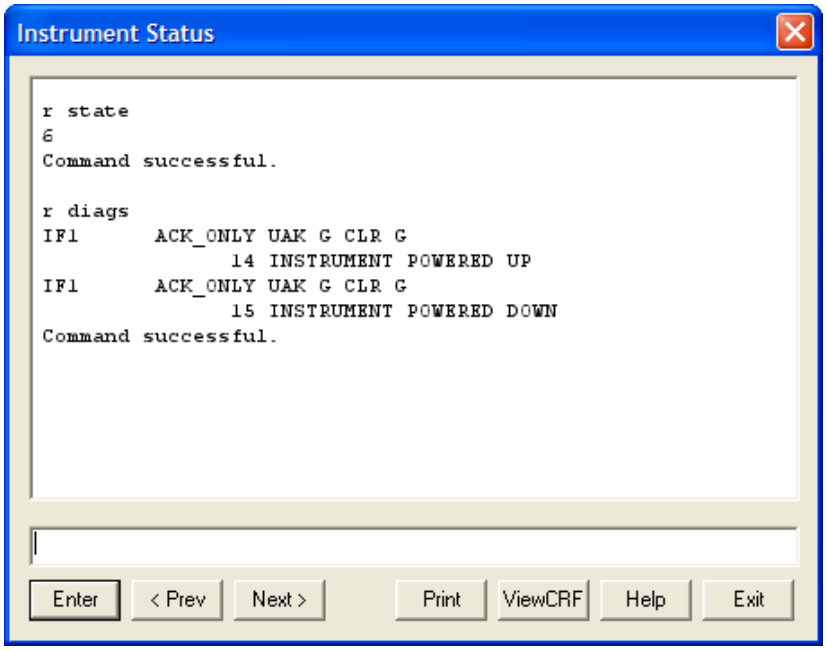
Refer to MOD 30ML / Modcell / ViZapp Designer documentation or the in-program Help for syntax, commands and readable / writeable attributes listing.

Some common commands are listed below:

ACK_SD	Acknowledge shutdown fault
CLR_Q	Clear event queue
ACK_ALL	Ack all diagnostics, process alarms & notification messages
R VERSION	Read instrument version
R Q	Read instrument event queue
R DIAGS	Read instrument diagnostics

Commands are not case-sensitive. When reading/writing attributes, use the block type with occurrence number, as shown in the CRF file.

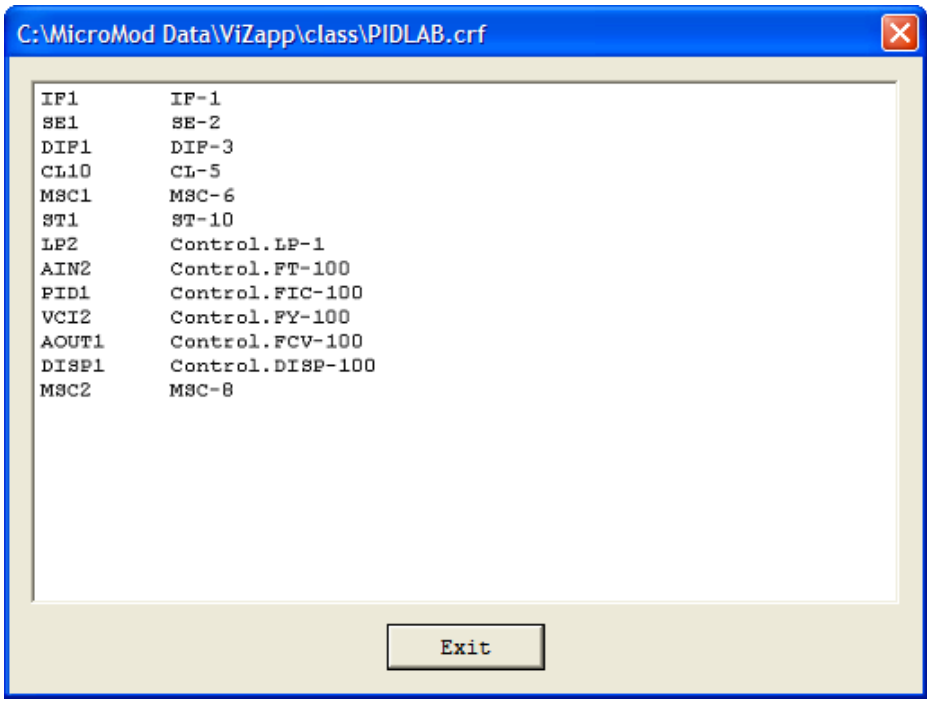
Figure 9 .12.
Instrument Status



4. **View Cross - Reference information of the control strategy**:

- Click on the View CRF button. This will display the cross reference information as shown below:

Figure 9 .13.
Cross Reference

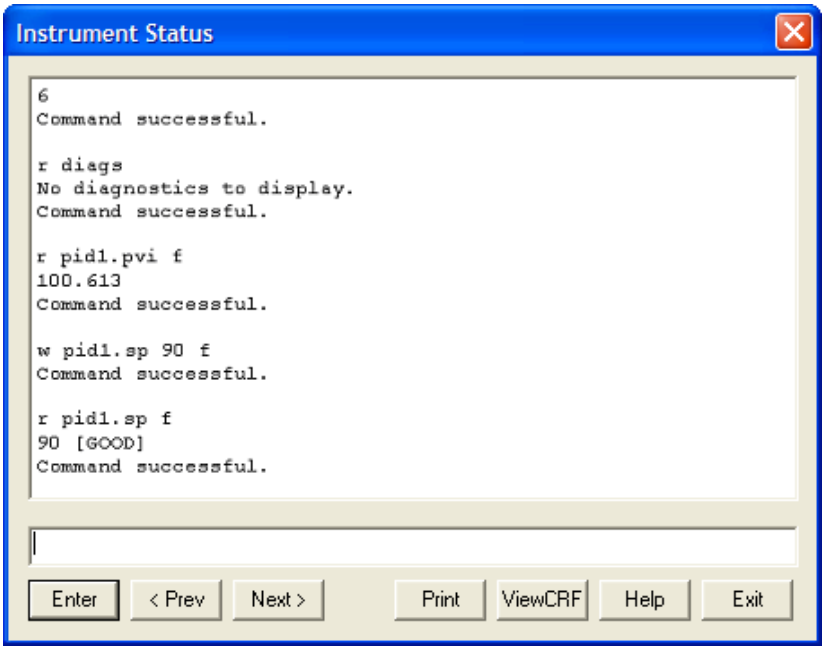


- The Cross Reference Information gives the Tag Name of each algorithm block with its path and block's Type with occurrence number.

5. **Write PID Setpoint**:

- Type **W PID1.SP 90 F** in the command line and press **Enter** to change the value of the setpoint to 90. The instrument will report the current value of the setpoint.
- Note that in this case, the "**F**" denoting floating point data type is not required, though it is required for attributes such as an expression block input, because the data type is variable. Please refer to table 2-1 in IB-23G600 for data type details.

Figure 9 .14.
Instrument Status



- Close the Instrument Status Viewer by clicking on the **Exit** button.