PLC210 Lab Exercise 16: CompactLogix Analog Modules

Upon completion of this lab, the student should be able to:

1. Measure the voltages on the analog in and analog out
2. Determine what Tags are created for the analog IO module
3. Correlate the Tag data value for an AIn channel to the terminal voltage
4. Interpret the properties/settings of the analog I/O module
5. Change the settings on the Analog I/O module
6. Correlate the Analog output Tag value to the measured signal
7. Interpret the module wiring diagram from the module users manual

DMM required for completion of Lab

**Ensure CompactLogix demo is NOT powered-up**

Configure DMM for continuity check

Meter terminals V/I in 0- and V/I in 1-
Continuity Yes / No?________________________

Meter terminals V/I in 0- and ANGL Com, left terminal column
Continuity Yes / No?________________________

Meter terminals V/I in 0- and ANGL Com, right terminal column
Continuity Yes / No?________________________

Meter terminals V/I in 1- and ANGL Com, left terminal column
Continuity Yes / No?________________________

Meter terminals V/I in 1- and ANGL Com, right terminal column
Continuity Yes / No?________________________

Explain connections between V/I in 0-, V/I in 1-, ANGL Com, left terminal column and ANGL Com, right terminal column:
_______________________________________________________

_______________________________________________________

Power-up the CompactLogix demo
Download the project Compact_Module_8_EX1_Analog.ACD, go Online and put the CompactLogix into the Run mode to do the following lab.

The I/O tag names in this lab may need to be changed to match the addresses on your hardware trainer.

What is the Part Number of the Analog module being used?
____________________

How many analog input channels are available on the module?______
How many analog output channels are available on the module?______

Ensure SS7 switch is OFF – turned to left

1. Monitor the MainRoutine

   Turn the upper potentiometer (to the right of the PL7 pilot light) completely to the left. The top status bar on the display to the right of the upper potentiometer reads what value?_________________
Monitor the Local:3:I:Ch0.Data tag.
What is the tag’s scope? __________________________
What is the tag’s value? __________________________

Using a DMM set to DC volts.
Measure V in 0+ and V/I in 0 – terminals.
What is the DMM reading? ________________________
Measure V in 0+ and V/I in 1 – terminals.
What is the DMM reading? ________________________
Measure V in 0+ and ANGL Com – terminals, left column.
What is the DMM reading? ________________________
Measure V in 0+ and ANGL Com – terminals, right column.
What is the DMM reading? ________________________

Turn the upper potentiometer (to the right of the PL7 pilot light) completely to the right. The top status bar on the display to the right of the upper potentiometer reads what value? __________
What is the tag’s scope? __________________________
What is the tag’s value? __________________________

Using a DMM set to DC volts.
Measure V in 0+ and V/I in 0 – terminals.
What is the DMM reading? ________________________
Measure V in 0+ and V/I in 1 – terminals.
What is the DMM reading? ________________________
Measure V in 0+ and ANGL Com – terminals, left column.
What is the DMM reading? ________________________
Measure V in 0+ and ANGL Com – terminals, right column.
What is the DMM reading? ________________________
2. **Turn SS7 ON – to the right**

   Turn the upper potentiometer (to the right of the PL7 pilot light) completely to the left. The top status bar on the display to the right of the upper potentiometer reads what value? ________________

   Monitor the Local:3:I:Ch0.Data tag.
   What is the tag’s scope? ______________________________
   What is the tag’s value? ______________________________
   Using a DMM set to DC volts.
   Measure V in 0+ and V/I in 0 – terminals.
   What is the DMM reading? ____________________________
   Measure V in 0+ and V/I in 1 – terminals.
   What is the DMM reading? ____________________________
   Measure V in 0+ and ANGL Com – terminals, left column.
   What is the DMM reading? ____________________________
   Measure V in 0+ and ANGL Com – terminals, right column.
   What is the DMM reading? ____________________________

   Turn the upper potentiometer (to the right of the PL7 pilot light) completely to the right. The top status bar on the display to the right of the upper potentiometer reads what value? ________________

   What is the tag’s scope? ______________________________
   What is the tag’s value? ______________________________

   Using a DMM set to DC volts.
   Measure V in 0+ and V/I in 0 – terminals.
What is the DMM reading?________________________
Measure V in 0+ and V/I in 1 – terminals.
What is the DMM reading?________________________
Measure V in 0+ and ANGL Com – terminals, left column.
What is the DMM reading?________________________
Measure V in 0+ and ANGL Com – terminals, right column.
What is the DMM reading?________________________

3. Ensure SS7 is ON – to the right
Turn the lower potentiometer (to the right of the SS7 switch) completely to the left. The top status bar on the display to the right of the lower potentiometer reads what value?______________

Monitor the Local:3:I:Ch1.Data tag.
What is the tag’s scope?__________________________
What is the tag’s value?___________________________
Using a DMM set to DC volts.
Measure V in 1+ and V/I in 1 – terminals
What is the DMM reading?________________________
Measure V in 1+ and V/I in 0 – terminals.
What is the DMM reading?________________________
Measure V in 1+ and ANGL Com – terminals, left column.
What is the DMM reading?________________________
Measure V in 1+ and ANGL Com – terminals, right column.
What is the DMM reading?________________________
Turn the lower potentiometer (to the right of the SS7 switch) completely to the right. The top status bar on the display to the right of the lower potentiometer reads what value?___________
What is the tag’s scope?__________________________
What is the tag’s value?__________________________

Using a DMM set to DC volts.
Measure V in 0+ and V/I in 0 – terminals.
What is the DMM reading?________________________
Measure V in 1+ and V/I in 0 – terminals.
What is the DMM reading?________________________
Measure V in 1+ and ANGL Com – terminals, left column.
What is the DMM reading?________________________
Measure V in 1+ and ANGL Com – terminals, right column
What is the DMM reading?________________________

4. Enable module’s analog channels
   Hint: Click on the Properties selection for the 1769-IF4XOF2/A analog module.
On the analog module’s Properties sheet Click the Input Configuration tab.

![Image of Input Configuration wizard]

Figure 3. Click the Input Configuration.
Enable Channel 0 and Channel 1.
Click the Enable Check Boxes.

Figure 4. Verify that input channel 0 and 1 are enabled.

Click the Apply button.

Figure 5. Saving changes to the module.
Click the Yes button.

On the analog module’s Properties sheet Click the Output Configuration tab.
Enable Channel 0 and Channel 1.
Click the Enable Check Boxes.

Figure 6. Verify the output channels 0 & 1 are enabled.

Click the Apply button.
Click the Yes button.

5. Monitor the MainRoutine
   Ensure SS7 is ON – to the right

   Turn the upper potentiometer (to the right of the PL7 pilot light) completely to the left. The top status bar on the display to the right of the upper potentiometer reads what value? ________________
   The lower status bar on the display to the right of the upper potentiometer reads what value? ________________
   Monitor the Local:3:I:Ch0.Data tag.
   What is the tag’s scope? ________________________
   What is the tag’s value? ________________________
   Using a DMM set to DC volts.
   Measure V in 0+ and V/I in 0 – terminals.
What is the DMM reading?______________________
Measure V in 0+ and V/I in 1 – terminals.

What is the DMM reading?______________________
Measure V in 0+ and ANGL Com – terminals, left column.

What is the DMM reading?______________________
Measure V in 0+ and ANGL Com – terminals, right column.

What is the DMM reading?______________________

Turn the upper potentiometer (to the right of the PL7 pilot light) completely to the right. The top status bar on the display to the right of the upper potentiometer reads what value?___________
The lower status bar on the display to the right of the upper potentiometer reads what value?___________
What is the tag’s scope?________________________
What is the tag’s value?________________________

Using a DMM set to DC volts.
Measure V in 0+ and V/I in 0 – terminals.
What is the DMM reading?______________________
Measure V in 0+ and V/I in 1 – terminals.
What is the DMM reading?______________________
Measure V in 0+ and ANGL Com – terminals, left column.
What is the DMM reading?______________________
Measure V in 0+ and ANGL Com – terminals, right column.
What is the DMM reading?______________________

6. Monitor the MainRoutine
Ensure SS7 is ON – to the right
Keep the upper potentiometer turned completely to the right.

The lower status bar on the display to the right of the upper potentiometer reads what value? ________________

Monitor the Local:3:O:Ch0.Data tag.

What is the tag’s scope? ________________

What is the tag’s value? ________________

Using a DMM set to DC volts.

Measure V out 0+ and ANGL Com – terminals, left column.

Measure V out 0+ and ANGL Com – terminals, right column.

Note: All ANGL Com terminals are internally connected in the 1769(IF4XOF2)A analog module.

What is the DMM reading? ________________

Turn the upper potentiometer (to the right of the PL7 pilot light) completely to the left.

The lower status bar on the display to the right of the upper potentiometer reads what value? ________________

Monitor the Local:3:O:Ch0.Data tag.

What is the tag’s scope? ________________

What is the tag’s value? ________________

Using a DMM set to DC volts.

Measure V out 0+ and ANGL Com – terminals, left column.

Measure V out 0+ and ANGL Com – terminals, right column.

Note: All ANGL Com terminals are internally connected in the 1769(IF4XOF2)A analog module.

What is the DMM reading?
What causes the lower status bar on the display to follow the upper status bar of the display?

Explain: _____________________________________________
__________________________________________

What causes numbers to appear in the value column of the Channel 0’s Input and Output tags?

Explain: _____________________________________________
__________________________________________

What is the range of values for Channel 0’s Input Tags and Output tags? ________________________________

What is the Data Type of the Local:3:I:Ch0.Data tag?________
What is the Data Type of the Local:3:O:Ch0.Data tag?_______

7. Monitor the MainRoutine

Ensure SS7 is ON – to the right

Turn the lower potentiometer (to the right of the SS7 switch)? Which display is being changed with the lower potentiometer?

__________________________________________

Which module tags are being changed by the lower potentiometer?

__________________________________________

__________________________________________

Turn SS7 OFF – to the left.
Turn the upper potentiometer
Turn the lower potentiometer
Which tag values are not changing?
___________________________________
___________________________________

Explain:___________________________________
____________________________________

8. Monitor the MainRoutine
Ensure SS7 is ON – to the right
Turn the upper potentiometer until the upper status bar on the upper display is at half scale.

Monitor the Local:3:I:Ch0.Data tag.
What is the tag’s value?_____________________________
Using a DMM set to DC volts.
Measure V in 0+ and V/I in 0 – terminals.
What is the DMM reading?______________________

Explain the voltage reading of the DMM vs. the tag value of the Local:3:I:Ch0.Data tag.
______________________________________________________
______________________________________________________
______________________________________________________


How are the Analog Input Channels wired?
Differential or Singled –Ended

How are the Analog Output Channels wired?
Differential or Singled –Ended
Hint: See Chapter 3 - 1769-IF4XOF2 User Manual

How many bits make-up the Channel Data tags?_______

Which bits of the Data tags for Input and Output Channels are used to represent Channel values?________
Hint: See Chapter 4 - 1769-IF4XOF2 User Manual
What is the range of the Voltage signals used by the 1769-IF4XOF2 module?________________________

How can the module be configured to use mA signals?_______
____________________________________________________
____________________________________________________

What is the range of Current signals used by the 1769-IF4XOF2 module?________________________

Hint: See Chapter 1 - 1769-IF4XOF2 User Manual
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