

Pico

Pico LAB#3



Analog Comparators





PICO Analog Comparators

- Only available on the 24v DC models.
- Monitor voltages connected to terminals I7 and I8.
 - Resolution: 0.0 to 10.0V dc, in 0.1V steps
- Eight analog comparators available “A1” to “A8”
 - Programmed in the form of a contact.
- Six different comparator types available
 - I7 greater than or equal to I8, I7 less than or equal to I8
 - I7 greater than or equal to setpoint, I7 less than or equal to setpoint
 - I8 greater than or equal to setpoint, I8 less than or equal to setpoint



What we are going to do:

- We are going to program a 2 Analog comparators. We will then use these in our program to see how they can be used to provide unique control capabilities.
- Typical application:
 - Evaluating the analog values of sensors, e.g. to measure pressure or temperature



Steps for Today's Assignments

1. Create a new program
2. Add a 2 Analog comparator to your program
3. Monitor and test your program

Setting Analog Parameters

Analog Parameters

- **A1** – Analog input number
 - A1 - A8
- **+ -** Parameter Display
 - + - Access Enable
 - -- Access Disable
- **X** – Analog function
 - ≥ I7 greater than or equal to I8
 - ≥ I7 greater than or equal to setpoint
 - ≥ I8 greater than or equal to setpoint

 - ≤ I7 less than or equal to I8
 - ≤ I7 less than or equal to setpoint
 - ≤ I8 less than or equal to setpoint



Creating Ladder Logic

1. Create a New Program

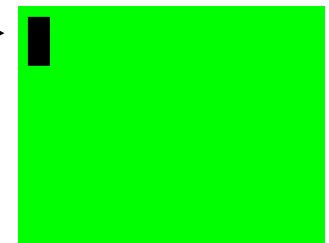
1. From the “Status Display” screen verify the mode of the PICO, STOP or RUN
2. Press “OK” to display next screen, if in RUN go to step 3, if in STOP go to step 6
3. Press “Down” arrow once to highlight “STOP”
4. Select “STOP” by pressing the “Ok” key when “STOP” is flashing. The display will change to “RUN”
The PICO is now in the STOP mode.
5. Press “UP” arrow once to select “PROGRAM”
6. Select “PROGRAM” by pressing the “Ok” key when “PROGRAM” is flashing.
7. Select “PROGRAM” again by pressing the “Ok” key when “PROGRAM” is flashing. This will enter the program edit mode.
8. If a program already resides in the PICO it will have to be deleted, go to page 7 if no program is resident go to page 8.



PROGRAM
RUN
PARAMETER
SET CLOCK



PROGRAM
DELETE PROG



Delete existing Ladder Logic

2. Delete resident Program

1. From the "Program Menu" screen. Press "OK" to display next screen.
2. Press "Down" arrow to select "DELETE PROG"
3. Press "Ok" to accept "DELETE PROG"
4. Press "Ok" to accept "DELETE?"
5. Press "Up" arrow to select "PROGRAM"
6. Press "Ok" To enter the ladder edit mode when "PROGRAM" is flashing.
7. The PICO is now ready to program.



PROGRAM...
STOP
PARAMETER
SET CLOCK...



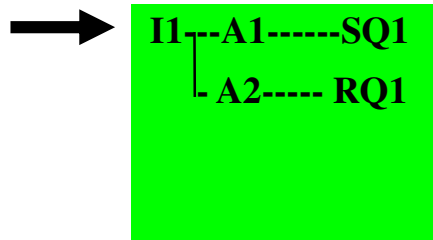
PROGRAM
DELETE PROG



DELETE ?

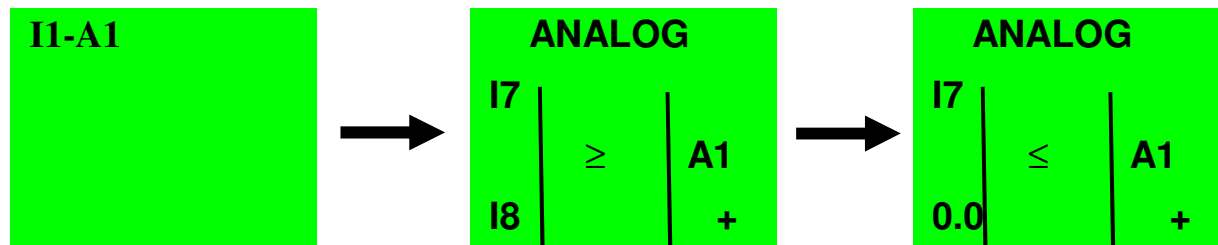
Creating the 1st Rung of Ladder Logic

Program rung 1 :



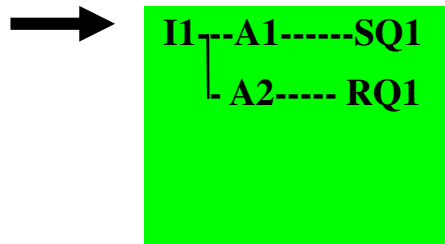
3. Add I/O instructions

- Press "Ok" to start new rung, this will insert the first input
- Press "Ok" to insert input "I"
- Press "Ok" to select the input address "1"
- Press "Ok" to select the next input
- Press "Down" arrow 3 times to select the input "A"
- Press "Ok" to accept input "A"
- Press "Ok" to accept input address "1", this will display the Analog input A1 configuration screen
- Press "Left" arrow once. This will highlight the "I7 is greater than or equal to I8" field
- Press "Down" arrow 3 times to display the "I7 is less than or equal to setpoint" configuration



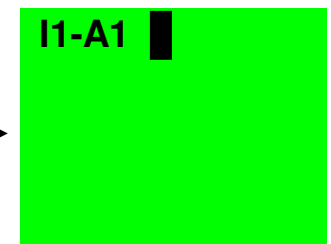
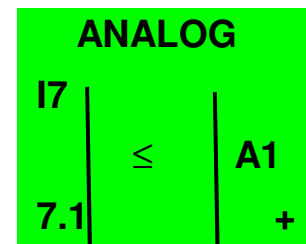
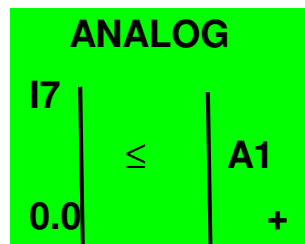
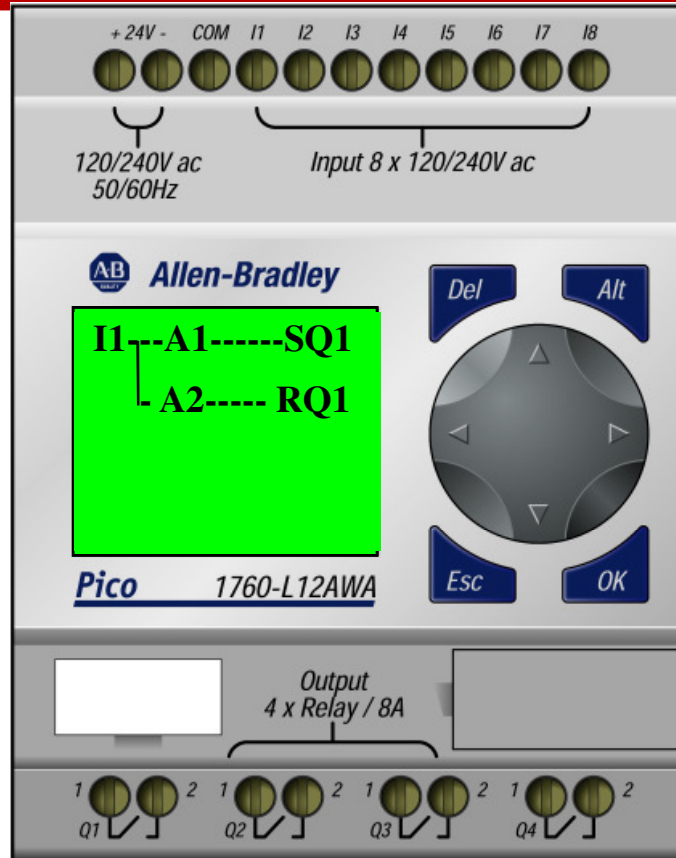
Creating the 1st Rung of Ladder Logic

Program rung 1 :



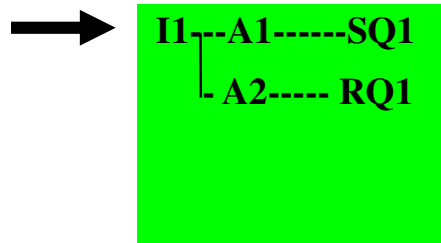
4. Analog configuration

- Press “Left” arrow two times to select the setpoint “0.0”
- Press “Up” arrow once to change the point zero value of the setpoint to point one {“0.1”}
- Press “Left” arrow once to accept the “0.1” value and move to the whole value zero {“0.1”}
- Press “Up” arrow seven times to change the value from zero to seven
- Press “Ok” twice to accept the new configuration and exit



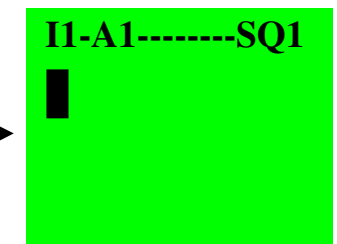
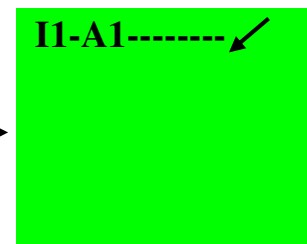
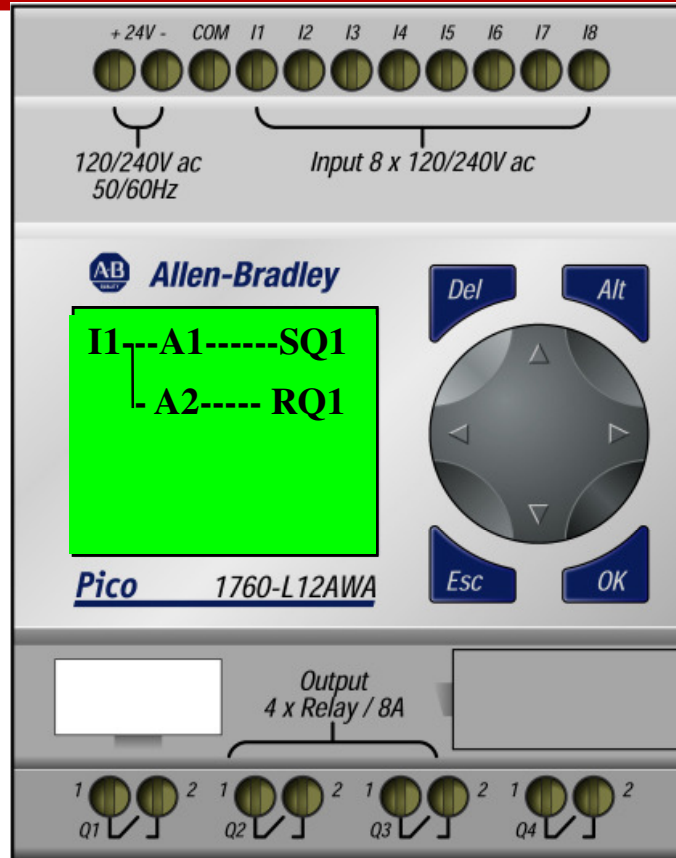
Creating the 1st Rung of Ladder Logic

Program rung 1 :



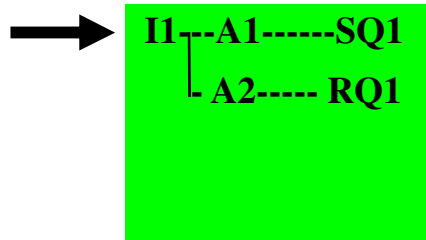
5. Add I/O instructions

- Press "Alt" to activate the draw function
- Press "Right" arrow twice to draw the connection
- Press "Ok" to insert output
- Press "Ok" to accept "Q" output
- Press "Left" arrow twice to accept output address "1" and move cursor to edit output type
- Press "Down" arrow twice to select "S" this will be used to set (latch) the output. The "S" must be paired with the "R" reset to function correctly.
- Press "Ok" three time to accept the output address "SQ1" and move to start the next rung



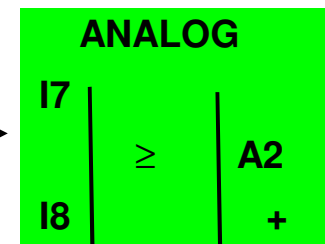
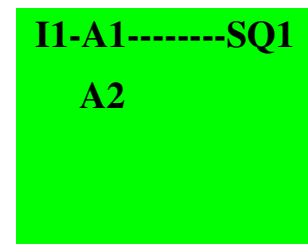
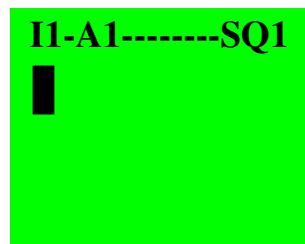
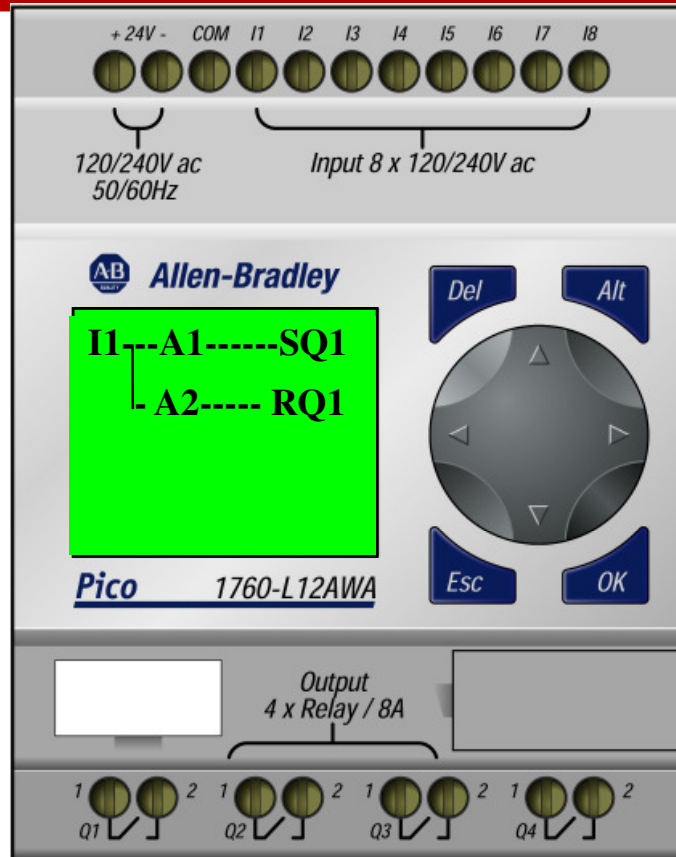
Creating the 1st Rung of Ladder Logic

Program rung 1 :



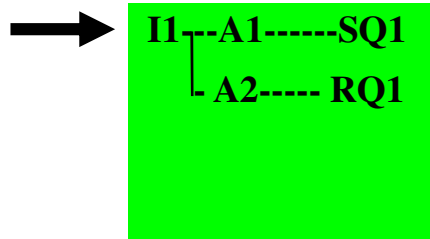
6. Add I/O instructions

- Press “Right” arrow once. This will move the cursor below “A1”
- Press “OK” to insert next input
- Press “Down” arrow three time to select “A”
- Press “Ok” to accept “A”
- Press “Up” arrow once to select “2”
- Press “Ok” to accept input address “A2” this will display the Analog input A2 configuration screen
- Press “Left” arrow once. This will highlight the “I7 is greater than or equal to I8” field
- Press “Down” arrow four times to display the “I7 is greater than or equal to setpoint” configuration



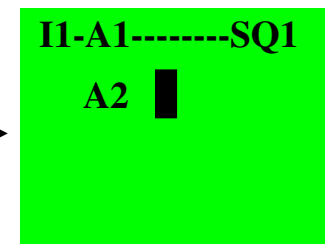
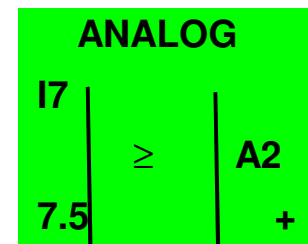
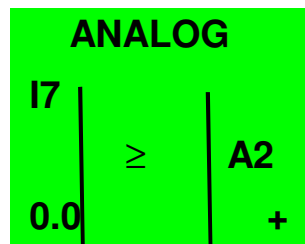
Creating the 1st Rung of Ladder Logic

Program rung 1 :



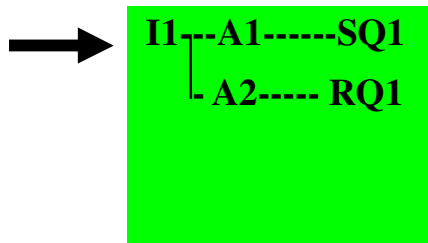
7. Add I/O instructions

- Press “Left” arrow two times to select the setpoint “0.0”
- Press “Up” arrow five times to change the point zero value of the setpoint to point five {“0.5”}
- Press “Left” arrow once to accept the “0.5” value and move to the whole value zero {“0.5”}
- Press “Up” arrow seven times to change the value from zero to seven {“7.5”}
- Press “Ok” twice to accept the new configuration and exit



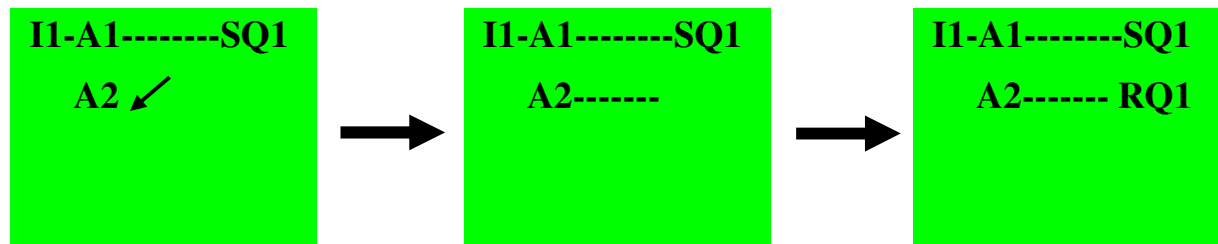
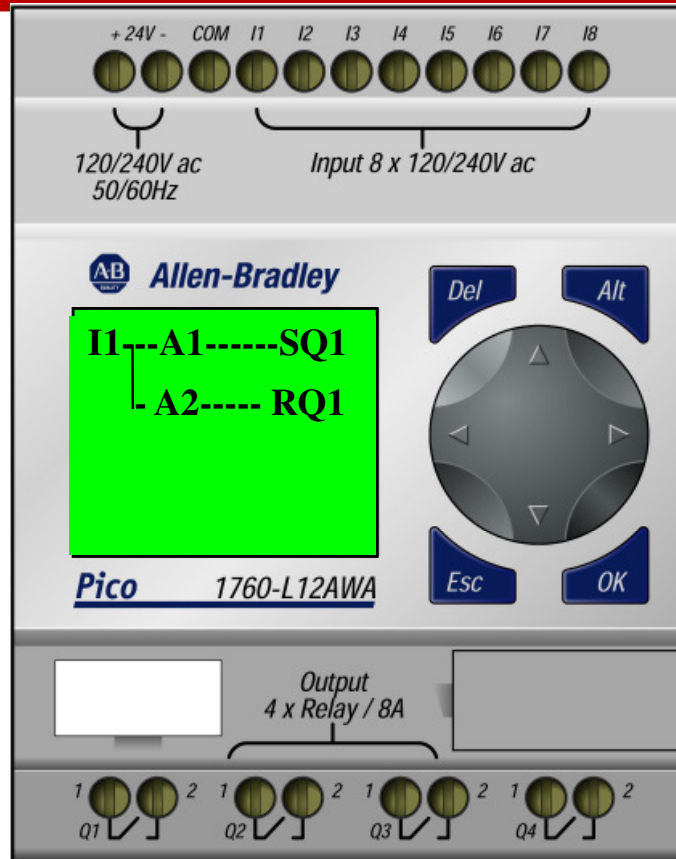
Creating the 1st Rung of Ladder Logic

Program rung 1 :



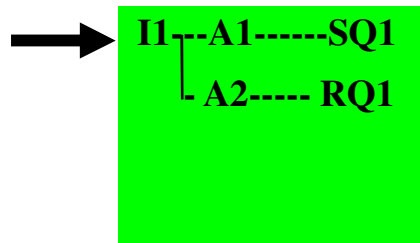
8. Add I/O instructions

- Press "Alt" to activate the draw function
- Press "Right" arrow twice to draw the connection
- Press "Ok" to insert output
- Press "Ok" to accept "Q" output
- Press "Left" arrow twice to accept output address "1" and move cursor to edit output type
- Press "Down" arrow three times to select "R" this will be used to reset (unlatch) the output. The "R" must be paired with the "S" to function correctly.
- Press "Ok" three time to accept the output address "RQ1" and move to start the next rung



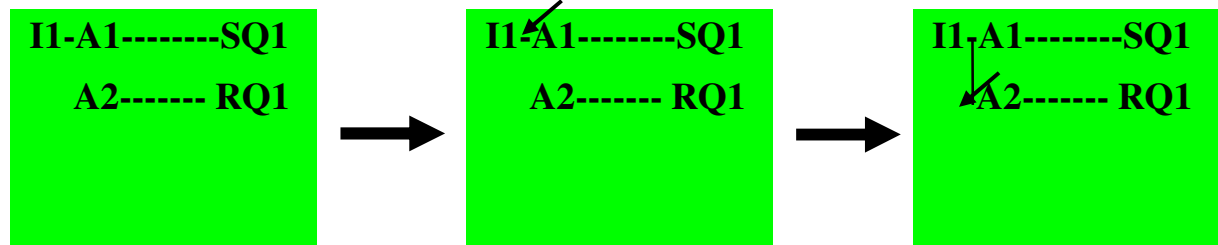
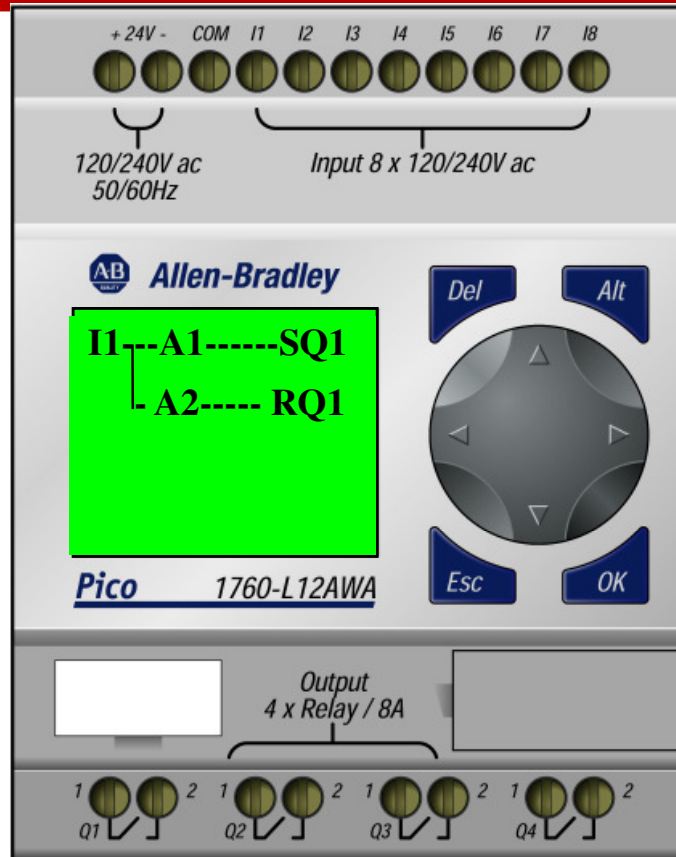
Creating the 1st Rung of Ladder Logic

Program rung 1 :



9. Creating a Branch

- Press “Up” arrow twice, to the start of the first rung
- Press “Right” arrow once, to the “A1” analog instruction
- Press “Alt” to activate the draw function
- Press “Down” arrow once to draw the branch connection
- Press “Alt” again to de-activate the draw function
- Press “Esc” to exit program edit mode



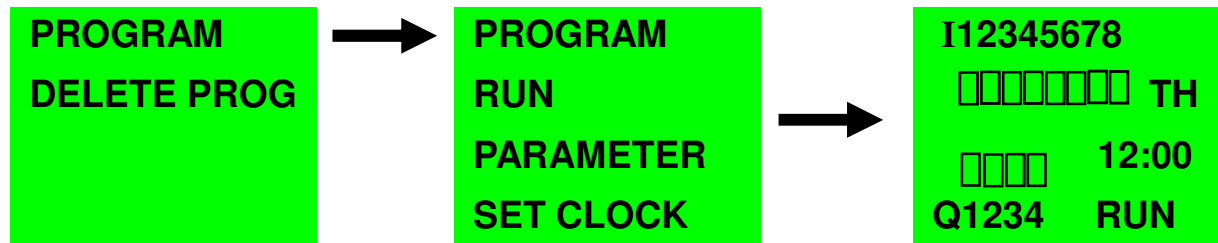
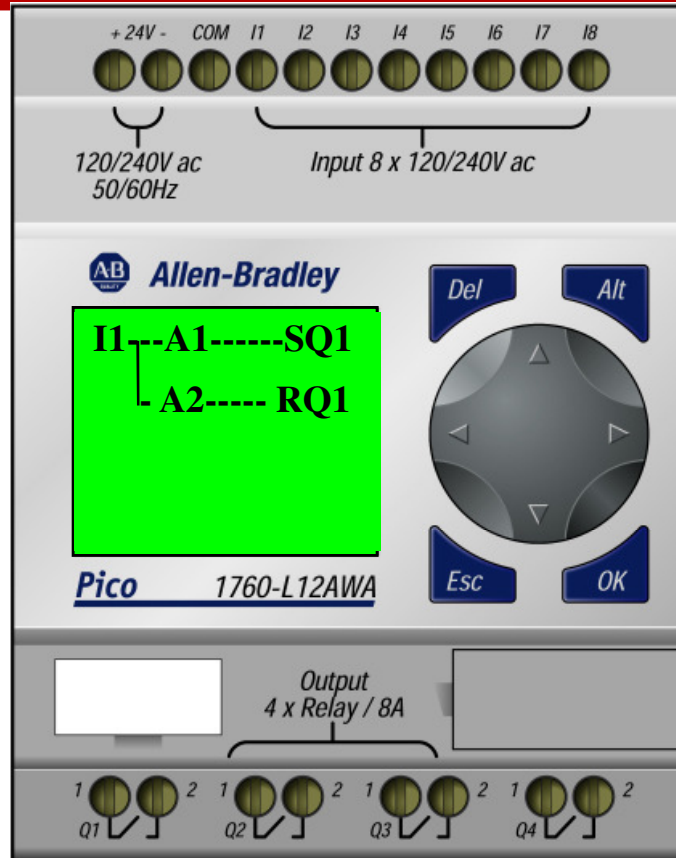
Monitor the program.

10. Change Mode

- Press "Esc" again to exit back to the "MENU DISPLAY" screen
- Press "Down" cursor to Highlight (Flashing) "RUN".
- Press "Ok" to accept the RUN mode.
- The PICO is now in the run mode
- Press "Esc" to exit back to the "Status Display. In this screen you can monitor the state of the I/O.

11. Monitor the Ladder

- Press "OK" twice to enter the ladder program



Monitor the Program

PROGRAM OPERATION

- **Rung 1-** Press pushbutton 1. The analog comparator "A1" latches (sets) relay Q1 if the actual value drops below the lower setpoint value of 7.1 V. Comparator "A2" unlatches (resets) the relay if it rises above the upper setpoint value of 7.5 V. Thus, the difference between the two voltage setpoint values is 0.4 V.
- Full Clockwise = 0.0 V.
- Full counterclockwise = 10.0 V.

