



**LOGIC**  
Technologies, Inc.

July 2011

"Advanced and reliable technology solutions at an affordable cost"

### Inside this Issue:

**P1** Installing a New Sensor: Part II

**P3** Defrost Operation: Schedule Skip

**P4** Critical Spares

### Ideas for Articles of Interest?

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# The Controller

LOGIC Technologies, Inc. Publication

Volume 11, Issue 6

## Installing a New Sensor Part II

by Russ Nagel

In the last issue of The Controller, May 2011, we covered the hardware aspects of adding a new sensor. We also covered some of the software steps necessary to get a new sensor up and running. This article will cover the remaining software setup to get the job completed.

I will refer to figures published in the May 2011 issue of The Controller. If you don't have that issue send us an email and we'll get it out to you.

In the last article we were adding the formula to the new sensor. Before we leave the screen that allows us to add the formula, there are other parameters that need to be covered.

**<A>veraging**-Allows the operator to compensate for electrical noise spikes that may occur on the wires going from the panel to the sensor. By clicking on <A>veraging, the operator can change the averaging level and decrease the sensitivity to any electrical noise spikes, or values that change too rapidly. A word of caution about averaging. Increased averaging levels slow the response time of the sensor.

Temperature sensors can have a higher (six or seven) averaging level if necessary. Their values aren't likely to change quickly. Ammonia sensors need to have a lower, no more than three, averaging level. A slower response on an ammonia sensor should generally be avoided.

Another issue to be considered when installing a new sensor is calibrating the sensor. This screen shows four buttons in relation to calibrating sensors. Three of them **<L>ow**, **<M>id**, **<H>igh** aren't typically used any more. We now use the **<Z>ero** Calibrate to calibrate our sensors. Before a sensor can be calibrated, you must know the actual value of the parameter the sensor is measuring. Use the mouse to select **<Z>ero**. The third line of this screen will show a highlighted field to the right of the word Zero Offset:. Ignore the value shown, and hit the Enter key. Another field will be highlighted. In this new field, enter the correct value of the parameter you want to measure. Hit the enter key and the screen will show the new zero offset value. This value should be small; no more than three or four for any sensor. If this value is five or higher, there may be an issue with that sensor that will need further investigation.

Now that the details on the formula screen have been taken care of, it's time to modify the start2 file. This will allow line three in figure three (previous issue) to show the correct signal definition. When beginning the software setup for our new sensor, we went to line two on the Analog Signal Setup Utility screen. The first step taken was to enter the I/O# on line two. You may have noticed the signal definition says 'Spare 0-1 mA Input' or 'Spare 0-20mA Input'. We need to open your start2 files and find the line to modify.

You will have to search through all your start2 files to find the correct line to modify. From the main screen, type the **s** key to get to the command prompt (Fig. 1). For more information on working with the command prompt, see the August 2009 issue of The Controller. If you don't have a copy let us know and we can send one to you.

If, at any time, you need to get back to your main screen while at the

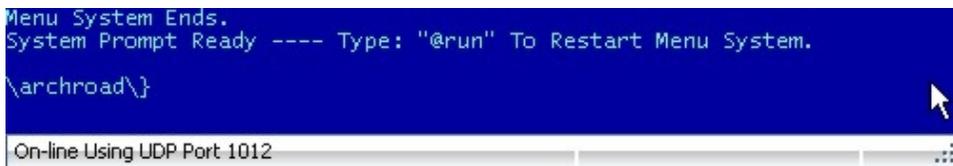


Fig. 1

command prompt, simply type:

**@run 'menu1'**

While at the command prompt type:

**@dir 'start2\*.pgm'**

Notice figure two shows the command and the response from the computer. Because we are adding an analog point, the best program to start looking in is the start2b.pgm. To view the contents of the start2b.pgm, enter the

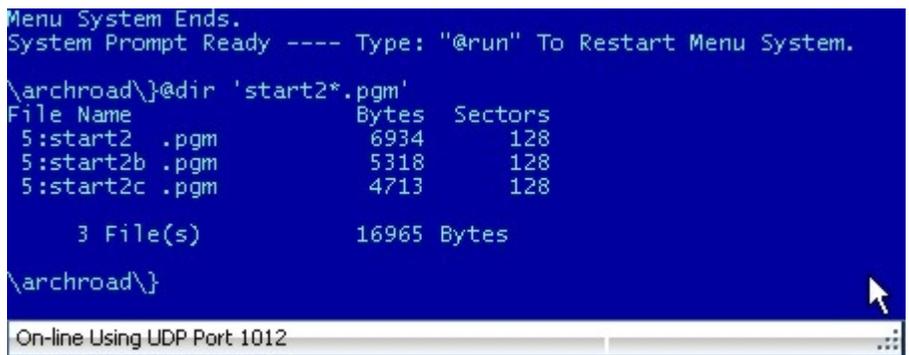


Fig. 2

following command:  
**@edit 'start2b.pgm'**

In order to leave the edit mode without making any changes, hit **Ctrl** and the **a** key at the same time. Once you open the start2b program, you will need to use the arrow keys to scroll down to the line you want to change. Refer to figure four. Notice the fourth line of the program has the description 'Spare Temp'. This description 'Spare

for where the cursor is located. You can change this description without affecting the

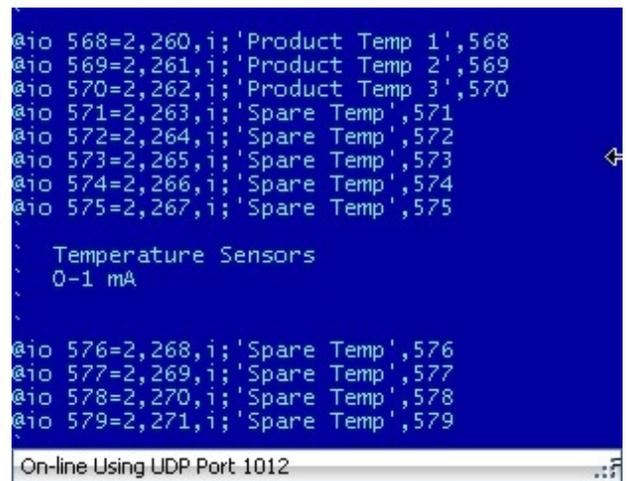


Fig. 4

start2b.pgm program. As long as nothing outside the quotation marks is changed, there won't be any problems. Once changes have been made to the description, it is time to exit and save the program. How to save and exit the edit mode depends on the version of software you have. Hitting the 'Esc' key will exit the edit mode and save the changes for older versions of our software. If hitting the exit key causes the computer to ask if you want to Exit Without Saving Changes (Y/N)?, answer **N**. Type the **Ctrl** and the **w** keys at the same time to save your changes.

Temp' is what we need to change. You will change it to a description that will tell the system operator what temperature that sensor is measuring. Using the arrow keys, move the cursor to the area within the quotation marks. Knowing exactly where the cursor is can be a bit tricky. Move the cursor to the middle of the description and hit the Back Space key a couple of times to get a feel

Now that the changes have been made and saved, it is time to implement the changes. From the command prompt enter:

**@submit 'start2'**

This will resubmit the start2 files and make your changes effective.

Navigate to the analog screen that shows the new sensor you are adding and line two should show the changes made to the start2 program. Before leaving the analog screen click on lines three and five to make the Scan Mode Flag and the Min/Max Mode Flags active. Congratulations! You have completed all the steps necessary to add a new sensor.

## Defrost Operation: Schedule Skip

by Russ Nagel

This article will cover a defrost scheme called 'Schedule Skip' that can be your most efficient method for defrosting. This technique requires the operator to keep a close eye on the air units and how quickly they frost up. Schedule skip is a combination of two different types of defrost methods. It combines run time defrost and scheduled defrost to assure a minimum of defrost cycles without risking badly timed (such as two air units next to each other) defrosts occurring.

**Run Time Defrost** - Allows the operator to set the number of minutes the air unit will spend actually cooling before the unit will defrost. The time an air unit spends not cooling does not count toward run time minutes. This method is especially useful for loading dock

## Training Info & Schedule

### Operator Level Sessions

This class session provides in-depth coverage of the use of our system to maintain the daily operations of a refrigerated facility. The class is conducted by Gordon Simpson who has many years of experience designing refrigeration control systems. In effect, the classes are taught in layman's terms by someone who fully understands the issues faced by refrigeration operators.

**Wednesday, July 13 thru Friday, June 15**

**Wednesday, Sept. 14 thru Friday, Sept. 16**

### Advanced SST Sessions

This class session provides in-depth coverage of the screen and report development tools provided by our system. These classes also briefly cover the script language used to develop control algorithms.

These classes are conducted by senior members of our engineering staff. Prior technical expertise is a pre-requisite for this course.

**Wednesday, Aug 10 thru Friday, August 12**

### Training Enrollment

**Operator training sessions are \$450 per person and advanced training sessions are \$750 per person. We provide lunch for each class day; however, all other travel expenses are your responsibility.**

Seating is limited so make your reservations early by contacting Kim Smith or Cindy Gaffney @ 770-389-4964

units or cooler units where defrosting may not be necessary at normal intervals in a 24 hour period.

Follow these steps to determine the number of run time minutes:

1. Defrost the coil and make sure it is completely clean.
2. Inhibit the defrost. This can be found in the upper left hand corner of the defrost control screen.
3. Force the air unit on.
4. Monitor the air unit closely. When it is approximately 80 percent frosted up. Note the number of run time minutes. Run time minutes can be found on the valve group screen on line nine.
5. Release the defrost inhibit.

You have now determined the run time minutes for an air unit. The weakness for run time defrosts is two air units right next to each other may go into defrost at the same time.

**Schedule Defrost** - From the main screen select F1, F2, then select the valve group of interest. Next, choose <D>efrost. This screen allows you to schedule your defrosts according to the day of the week.

You can schedule up to six defrosts in one 24 hour period. The number of defrosts in one 24 hour period depends on several factors such as time of year and location of the air unit. The main factor is how quickly the air units freeze up. This can only be determined by close observation, up to several times a day. Once a pattern of defrost times has been established, it is important to continue to monitor the frost

condition of the air units to maintain a proper defrost schedule.

Scheduled defrost is best suited for air units in freezers where two or three defrosts in a 24 hour time period may be necessary. Another key advantage to scheduled defrost is the operator can schedule defrosts during off peak power hours. The weakness for schedule defrost is a defrost will happen, even if the air unit has had very little run time since the last defrost.

**Schedule Skip** - Is a combination of Run Time Defrost and Schedule Defrost. Schedule skip eliminates the weaknesses of each type working on it's own. It ensures the coil is sufficiently frosted up to warrant a defrost, and doesn't allow two air units next to each other to go into defrost at the same time.

Schedule skip allows the air unit to

run the number of minutes configured by the run time defrost before a defrost can take place. Once the number of run time minutes has been reached, the next defrost won't happen until it's scheduled defrost time. This assures the air unit is frosted properly, and two air units in the same room, or next to each other, won't go into defrost at the same time.

### **Fuses and other Critical Spares: Check your Inventory**

All of your analog sensors have fuses. The only exception are your temp sensors. If a fuse blows, do you have replacements? Different sensors use different fuses. Refer to your system prints to determine

the correct fuse size. I'll list them for your convenience.

**NH3** - 500 mA

**Pressure** - 100 mA

**Level** - 100 mA

Does your facility have a critical spares inventory? Will your facility lose production because a digital output board goes bad? What about a bridge CPU or perhaps a spare rack? The price to have these items on hand is minimal compared to lost production or product. Make sure you have what you need in case of an electronic failure or a lightning strike.



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