Naming & Display Conventions

Standard Engineering Practices

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Naming and Display Conventions

This document will detail how to name I/O points and program logic blocks or objects.

I/O Point Naming

In the past, I/O point naming varied from programmer to programmer. If a programmer didn't like the way the hardware I/O points were defined, she or he would name the point differently. This meant that the installing or startup technician would have to look to various documents to determine the correct ID for the I/O point. This format would also tend to hamper or slow down the creation of HMI graphics screens.

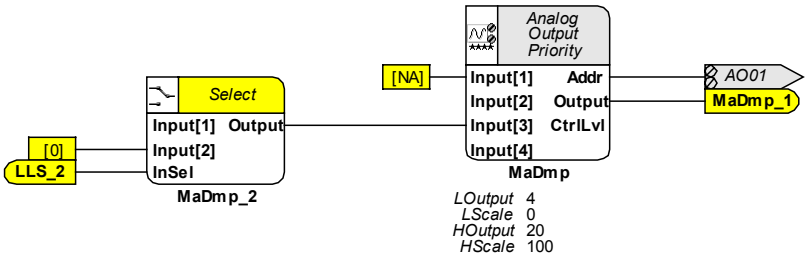
I/O point naming will now be consistent from project to project now by use of standard point names. These point names will *EXACTLY MATCH* those defined and used in Invensys standard software tagging. A list of these standard point names is available in the Invensys Standard Engineering Practices Manual. All point names will be case sensitive with the exception of GCM/LCM/LNC/SIM programs.

A few examples are as follows:

- Discharge Air Temperature will be DaT (case sensitive).
- Supply Fan Start Stop will be SfSS (case sensitive).
- Boiler 1 Alarm will be Blr1A (case sensitive).
- Face and bypass damper control will be FBDmp (case sensitive).

Block (Object) Naming

The naming for logical (programming) blocks is a very subjective area. For the most part MZ2s and I/A programs, the names do not matter to the programming application (PSI or WPTech). While not functionally important to a MZ or PEM, a name is required. Naming blocks assists the technician understand the purpose for the block. If a "Loop" block controls the discharge air temperature, then name the block DaT. WPTech doesn't allow for any two objects (or blocks) to have the same name, in the MNL-800 controller. In that case, name the block with an underscore that separates the name from the number (Ex. DaT_1). If the block functions as a safety, name it "Safety". There are no hard fast rules with regard to naming. Here are some examples of what to do in certain circumstances.



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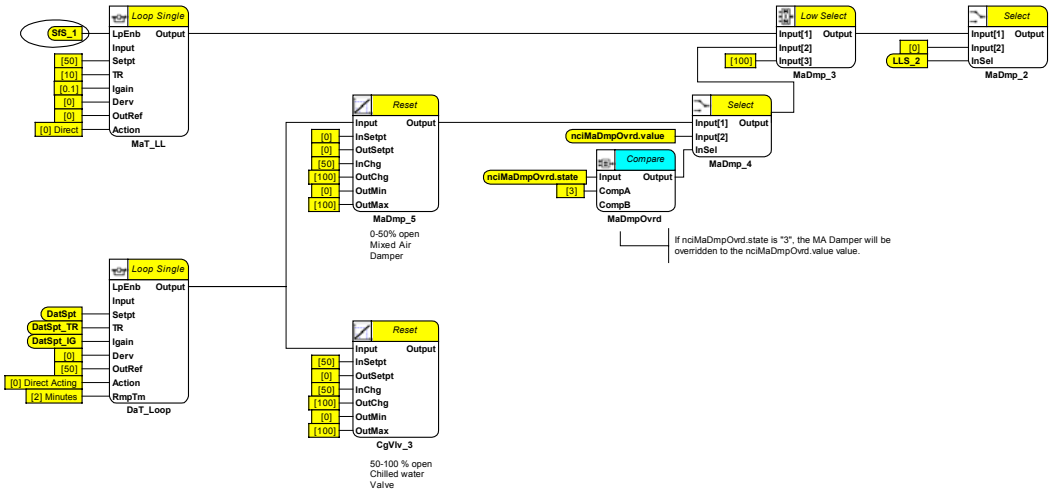
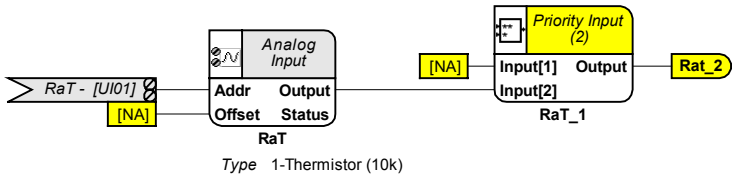
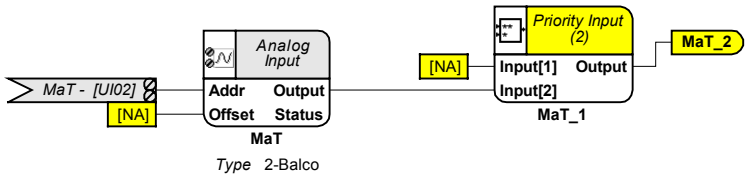
Blocks leading up to an Output, if the function is clear-cut, then name it after the Output.



The above example shows how a program splits control to two Outputs and how to apply documentation. Naming becomes confusing at this point. The preferred way is to name it per the controlled output. MNL-800s do not allow any 2 objects with the same name so an underscore is added and the object is sequentially numbered.





Analog Input blocks named after the Hardware name. The function of the priority blocks are clear enough that naming is not necessary, but you can name them per the input. Use an underscore "_" to separate the prefix name

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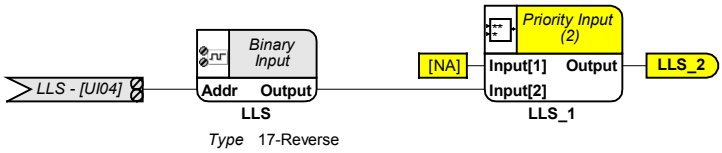
from the suffix number. A constant is added to allow for calibration of the Analog input. The priority block is used to test the software without having to alter or change the hardware.

Programming Guidelines for Binary Inputs and Outputs



In the above example, the Low Limit Safety is wired normally closed, per the engineering standard. A normal condition is a "CLOSED" or "ON" condition. The value we want to display is ON for an Alarm condition. Therefore the input is programmed for reverse action. Reverse action will allow this point to show ON whenever the Low Limit Safety is active. This would also apply to other conditions as well:

- On = Summer Off = Winter
- On = Cooling mode Off = Economizer mode
- On= Pump or fan is commanded on. Sometimes a fan or pump is specified to be failed on. You would then wire the relay logic normally closed and/or define the binary output as a "Reverse Action" type.

Programming Guidelines for Analog Outputs

A common mistake made is not configuring an analog output properly. While the native output of an analog output is 0-20mA or 4-20mA, the end device usually is not. For proper control, the output signal needs to match the end device control range.

For example, a chilled water valve has a pneumatic actuator with a spring range of 5-10 psi. A CP-8551 is being used to convert the 4-20mA signal to 3-15 psi. If left alone, too much of the control loop range is wasted and will provide poor control. The analog output needs to be scaled to match the actuator. Since the CP-8551 is 3-15 psi with a 4-20mA input, the rate of change is .75 psi output per 1mA input. Usually 0.5 psi is added above and below the actuator to provide additional close off. This makes the actual spring range 4.5 to 10.5 psi. The Low value would be set to 6.0mA (4.5 psi). And the High value would be set to 13.9 or 14.0mA (10.5 psi). This way little control loop performance is lost to lack of actuation on the controlled device.

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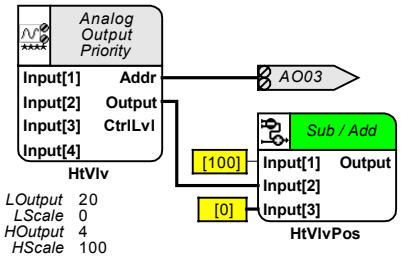
Many times, the customer prefers to have all valves and dampers show as percent open instead of mixed percent open and percent closed. An easy fix for normally open valves to show percent open is to use a math function to subtract the analog output percent from 100. Or simply use a loop invert. If the signal is 100% (closed), 100 – 100 (valve 100% closed analog output signal) = 0% open. Or 100 – 0 (valve 0% closed analog output signal) = 100% open.



Example of how to show a Normally Open Valve as %Open

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