

Chapter 15

Working with Signal Select Objects

Introduction

The Signal Select feature allows you to create objects that either calculate the average, high, and low values from a set of analog points, or process values from multiple zones to adjust various setpoints.

This chapter describes how to:

- add a Signal Select object
- edit a Signal Select object
- add input entries to a Signal Select object
- delete input entries from a Signal Select object
- command a Signal Select object
- delete a Signal Select object

Key Concepts

Signal Select

The Signal Select feature works with either analog or binary points, and in Multi-Zone applications where values from multiple zones are processed and used by the Air Handling Unit (AHU) to adjust various setpoints.

With Signal Select, you can:

- determine the highest, lowest, and average values of a set of analog input points.
- command analog points to the average, highest, or lowest values calculated from a set of analog input points.
- calculate the state of a set of binary input points (using AND and OR logical operations) and use the calculated value to command a binary output point.

Analog Signal Select

For Analog point types, the Signal Select object computes (one or more of) average input, highest input, and lowest input values for use in updating an attribute value of another object.

This computation occurs each time the input points change value. Immediately after the computation, the Signal Select object commands each (of up to three) referenced output objects to their respective values (average output, highest output, and lowest output). If a binary type attribute is defined as an input, the input value is converted to analog before each computation. Any other input type forces the Signal Select object to classify the input as unreliable.

Binary Signal Select

For Binary point types, the Signal Select object computes average state, logical OR state, and logical AND state values for use in updating an attribute value of another object.

This computation occurs each time one or more of the input points changes state. Immediately after the computation, it commands each (of up to three) referenced output objects to their respective states (Average Output, Logical OR Output, and Logical AND Output). If an analog type attribute is defined as an input, the input value is converted to binary before each computation. Any other input type forces the Signal Select object to classify the input as unreliable. Table 15-1 describes the various types of computations.

Table 15-1: Computation Types for Binary Signal Select

Computation Type	Description
Average Output Computation	If the majority of inputs are at State 1 or the inputs are evenly split between State 1 and State 0, the Average Output is commanded to State 1. If the majority of inputs are at State 0, the Average output is commanded to State 0.
Logical OR Computation	If any input is at State 1, the Logical OR output is commanded to State 1. If all inputs are at State 0, the Logical OR output is commanded to State 0.
Logical AND Computation	If all inputs are at State 1, the AND output is commanded to State 1. If any input is not at State 1, the AND output is commanded to State 0.

Attributes

The values of an object's attributes determine how the object operates. The Signal Select object attributes described below are listed in the order that they appear on the screen. Entry requirements for these attributes are in Table 15-3.

For additional information about the Signal Select object and its attributes, refer to the *Object Dictionary*.

Object Name

Identifies the object on the user interface.

Description

Provides optional information to further describe the object.

Object Type

Indicates the kind of object, such as Schedule, N2 Analog Input, or Signal Select.

Object Category

Determines the general classification of an object to help define user access capability and message routing.

Enabled

Indicates if the object is active and executing an operational condition.

Input List

Lists attributes of objects used in the Signal Select calculations. If an analog type is added to this list but the Point Type attribute indicates binary, this analog type is converted to a binary value before each computation and vice versa.

If one or more of the objects in the input list is disabled, the output objects' values are calculated using only the remaining inputs' values.

Average Output

Indicates the object attribute updated using the calculated average of all of the inputs of the Signal Select object.

High OR

Indicates the object attribute updated using the highest input of all of the inputs in the Signal Select object for analog point types. For point types specified as binary, the value is updated using a logical OR condition of all inputs of the Signal Select object.

Low AND

Indicates the object attribute updated using the lowest input of all of the inputs in the Signal Select object for point types specified as analog. For point types specified as binary, the value is updated using logical AND condition of all inputs of the Signal Select object.

Point Type

Indicates the type of input values (analog or binary) the Signal Select monitors.

Procedure Overview

Table 15-2: Working with Signal Select Objects

To Do This	Follow These Steps:
Add a Signal Select Object	Browse to and highlight the Programming container. Press the F3 (Add) key. Highlight Signal Select and press Enter. Fill in the fields using Table 15-3. Move the cursor to Input List. Press Enter. Type in an object and attribute name. Press the F3 (Add Item) key to add a blank entry. Press F4 (Back) key to return to the previous screen. Fill in the remaining fields using Table 15-3. Press the F3 (Save) key. Check the User Assistance area of the screen to verify if the save was successful or if there were errors. Press any key to continue. Press the F4 (Cancel) key to return to the container hierarchy.
Edit a Signal Select Object	Browse to and highlight a Signal Select object. Press Enter to open the object. Press the F3 (Edit) key. Edit the fields using Table 15-3. Press the F3 (Save) key. Check the User Assistance area of the screen to verify if the save was successful or if there were errors. Press any key to continue. Press the F4 (Cancel) key to return to the container hierarchy.
Add Input Entries to a Signal Select Object	Browse to and highlight a Signal Select object. Press Enter to open the object. Press the F3 (Edit) key. Move the cursor to Input List. Press Enter. Press the F3 (Add Item) key to add a blank entry. Type in an object and attribute name. Press the F4 (Back) key to return to the previous screen. Press the F3 (Save) key to save the changes. Check the User Assistance area of the screen to verify if the save was successful or if there were errors. Press any key to continue. Press the F4 (Cancel) key to return to the container hierarchy.
Delete Input Entries from a Signal Select Object	Browse to and highlight a Signal Select object. Press Enter to open the object. Press the F3 (Edit) key. Move the cursor to Input List. Press Enter. Highlight the input to be deleted and press F2 (Del Item) key. Press the F4 (Back) key to return to the previous screen. Press the F3 (Save) key to save the changes. Check the User Assistance area of the screen to verify if the save was successful or if there were errors. Press any key to continue. Press the F4 (Cancel) key to return to the container hierarchy.
Command a Signal Select Object	Browse to and highlight a Signal Select object. Press the F2 (Command) key. Use the spacebar and the Backspace key to cycle through the list until the desired command appears. Press Enter.
Delete a Signal Select Object	Browse to and highlight a Signal Select object. Press Enter to open the object. Press the Delete key. Press the Tab key to confirm the deletion.

Detailed Procedures

Adding a Signal Select Object

To add a Signal Select object:

1. Browse to and highlight the Programming container.
2. Press the F3 (Add) key. The Add Object list appears.
3. Highlight Signal Select and press Enter. The Signal Select object attribute screen appears (Figure 15-1).

Dean: ADMIN		Mon 20 Sep 1999 14:06 CDT
=====		
ADMN.Programming.Signal Select		
=====		
<u>Object</u>		
Object Name	[REDACTED]	
Description		
Object Type	SIGNAL SELECT	
Object Category	HVAC	
Enabled	True	
<u>Engineering Values</u>		
Input List	[0] Items	
Average Output		
High OR		
Low AND		
Point Type	Analog	
F3-Save F4-Cancel		
Enter an alphanumeric string		

Figure 15-1: Signal Select Object Attribute Screen

4. Fill in the fields using Table 15-3.

Table 15-3: Attribute Entry Requirements

Screen Area	Attribute	Required	Default	Options/Range
Object	Object Name	No	Blank	Maximum 32 characters Invalid characters: @ . ? * \$ # : ' [] If not completed, the system assigns a name.
	Description	No	Blank	Maximum 40 characters
	Object Type	Yes	Signal Select	The default is preset and cannot be changed.
	Object Category	Yes	HVAC	Use the spacebar and the Backspace key to view and select options: HVAC, Fire, Security, Services, Administrative.
	Enabled	Yes	True	Use the spacebar and the Backspace key to view and select options: True, False.
Engineering Values	Input List	Yes	0	Enter the exact object and attribute reference. Present Value appears as the default attribute. Minimum number of Inputs in list = 2 Maximum number of Inputs in list = 12
	Average Output	No	Blank	Enter the exact object and attribute reference. Present Value appears as the default attribute.
	High OR	No	Blank	Enter the exact object and attribute reference. Present Value appears as the default attribute.
	Low AND	No	Blank	Enter the exact object and attribute reference. Present Value appears as the default attribute.
	Point Type	Yes	Analog	Use the spacebar and the Backspace key to view and select options: Analog, Binary.

5. Move the cursor to Input List.
6. Press Enter. The Signal Select object Input List appears (Figure 15-2).

```
Dean: ADMIN                               Mon 20 Sep 1999 14:07 CDT
=====
ADMN.Programming.Signal Select
=====
Input List []
  1: [REDACTED]

F2-Del Item F3-Add Item F4-Back
Enter object and attribute name
```

Figure 15-2: Signal Select Object Input List

7. Type in an object and attribute name.
8. Press the F3 (Add Item) key to add a blank entry.
9. Repeat Steps 7 and 8 for each input being added.
10. Press the F4 (Back) key to return to the previous screen.
11. Fill in the remaining fields using Table 15-3.
12. Press the F3 (Save) key.
13. Check the User Assistance area of the screen to verify if the save was successful or if there were errors. If errors were detected, correct them and resave the entries. Once the save is successful, continue with Step 14.
14. Press any key to continue.
15. Press the F4 (Cancel) key to return to the container hierarchy.

Editing a Signal Select Object

To edit a Signal Select object:

Note: To delete or add Input entries, refer to the appropriate sections of this chapter.

1. Browse to and highlight a Signal Select object.
2. Press Enter to open the object.

Note: Additional attributes appear. Refer to the *Object Dictionary* for more information.

3. Press the F3 (Edit) key. The Signal Select object attribute screen appears (Figure 15-1).
4. Edit the fields using Table 15-3.
5. Press the F3 (Save) key.
6. Check the User Assistance area of the screen to verify if the save was successful or if there were errors. If errors were detected, correct them and resave the entries. Once the save is successful, continue with Step 7.
7. Press any key to continue.
8. Press the F4 (Cancel) key to return to the container hierarchy.

Adding Input Entries to a Signal Select Object

To add Input entries to a Signal Select object:

1. Browse to and highlight a desired Signal Select object.
2. Press Enter to open the object.
3. Press the F3 (Edit) key. The Signal Select object attribute screen appears (Figure 15-1).
4. Move the cursor to Input List.
5. Press Enter. The Signal Select object Input List appears (Figure 15-2).
6. Press the F3 (Add Item) key to add a blank entry.
7. Type in an object and attribute name.
8. Repeat Steps 6 and 7 for each input being added.
9. Press the F4 (Back) key to return to the previous screen.
10. Press the F3 (Save) key to save the changes.
11. Check the User Assistance area of the screen to verify if the save was successful or if there were errors. If errors were detected, correct them and resave the entries. Once the save is successful, continue with Step 12.
12. Press any key to continue.
13. Press the F4 (Cancel) key to return to the container hierarchy.

Deleting Input Entries from a Signal Select Object

To delete Input entries from a Signal Select Object:

1. Browse to and highlight a Signal Select object.
2. Press Enter to open the object.
3. Press the F3 (Edit) key. The Signal Select object attribute screen appears (Figure 15-1).
4. Move the cursor to Input List.
5. Press Enter. The Signal Select object Input List appears (Figure 15-2).
6. Highlight the input to be deleted.
7. Press the F2 (Del Item) key.
8. Repeat Steps 6 and 7 for each input to be removed from the list.
9. Press the F4 (Back) key to return to the previous screen.
10. Press the F3 (Save) key to save the changes.
11. Check the User Assistance area of the screen to verify if the save was successful or if there were errors. If errors were detected, correct them and resave the entries. Once the save is successful, continue with Step 12.
12. Press any key to continue.
13. Press the F4 (Cancel) key to return to the container hierarchy.

Commanding a Signal Select Object

To command a Signal Select object:

1. Browse to and highlight a Signal Select object.
2. Press the F2 (Command) key. The Signal Select Command field appears.
3. Use the spacebar and the Backspace key to cycle through the list until the desired command appears. The Signal Select object supports the commands described in Table 15-4.

Table 15-4: Supported Commands

Command	Description
Enable	Ensures that the object reacts to any changes it may have missed while it was disabled and returns it to normal operation.
Disable	Locks out all outputs and prevents the Signal Select functionality.

4. Press Enter.

Deleting a Signal Select Object

To delete a Signal Select object:

1. Browse to and highlight a Signal Select object.
2. Press Enter to open the object.
3. Press the Delete key.
4. Press the Tab key to confirm the deletion.