



CONNECT

**Watchdogs – The source of Event
Notifications and Scoring.**

Watchdogs – The source of Templated Event Notifications and Scoring.

What is a Watchdog?

The Watchdog is a tool that provides multiple functions;

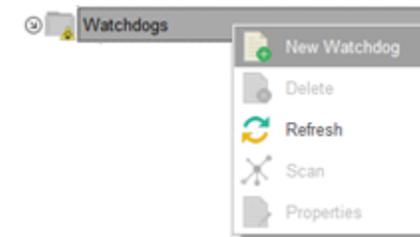
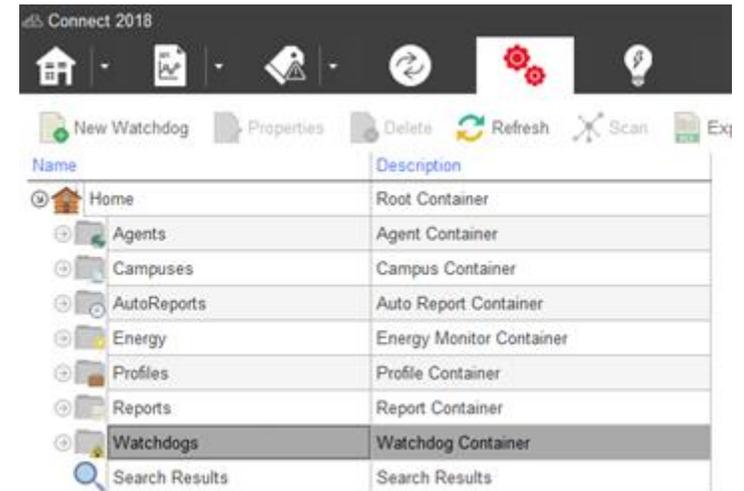
- Event Notifications; Events of many types are provided by Watchdogs. Once a Profile has been created, a Device Class assigned and Objects mapped. The Watchdog may use the Templated Events provided by Connect.
- Scoring; Device scores may be provided in the Events and Scores window, Watchdog Reports and Scorecard reports from Watchdogs.

Watchdog creation or editing is done through the *Configuration Explorer* window.



The New Watchdog toolset is opened by clicking on the *New Watchdog* icon  in the Toolbar.

A second method to open the New Watchdog toolset is to r-click on the Watchdogs folder and choose New Watchdog from the dropdown.



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Name, Description and Profile – Event Notification Library

The Watchdog Editor *General Settings* tab window opens.

Enter a **Name** and **Description** (optional) for the new Watchdog. It is a good policy to include some text to identify the Agent or Site and the device or device type.

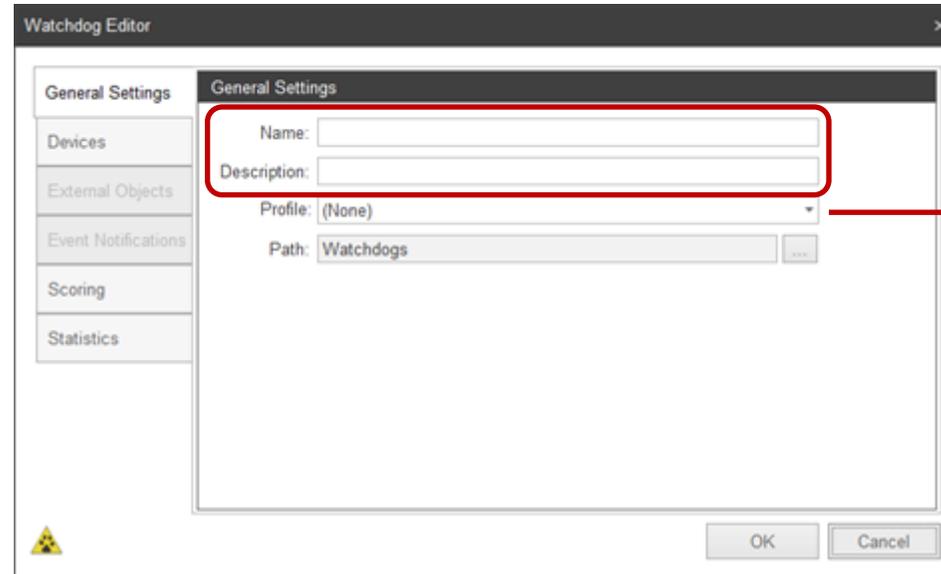
Click on the Profile dropdown arrow and select the desired **Profile**.

The Profile provides the object set, device class and object mapping which in turn identifies the correct Event Template Rules sets.

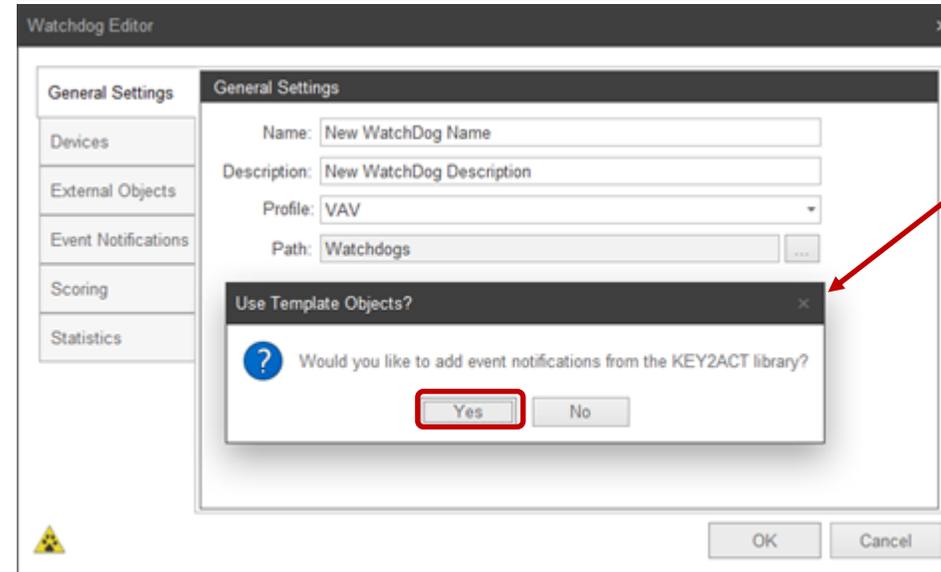
When you select a Profile that contains a Device Class and Object Mapping. Templated Events are available. If this Watchdog does not contain previously entered Event Notifications, the Use Template Objects? pop up appears. If some Event Notifications already exist then a selector pop up window is provided to choose Event triggers from template library.

Select Yes if you wish to use the templated event notifications.

Notice that the External Objects and Event Notifications tabs are greyed out until after a Profile is selected.



Name	Description
(None)	
Amlt_Lofts	Profile Container
AHU	Profile Container
CHW_System	Profile Container
HW_System	Profile Container
VAV	Profile Container
VAV	VAV



No events exist.
OR
An Event already exists.



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Using Event Triggers from the Template Library

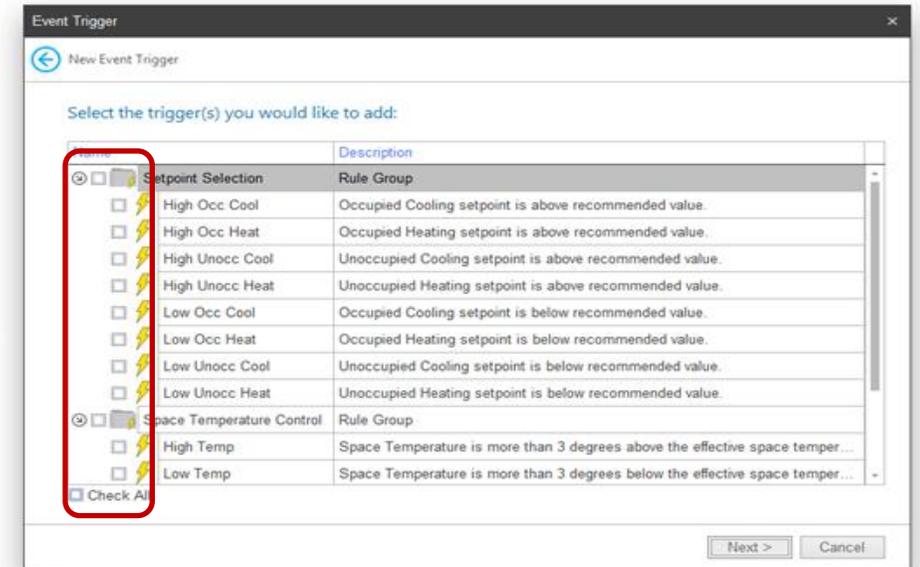
The Event Trigger window opens containing events from the Event Library as defined by the Device Class and Object Mapping selections from the selected Profile.

Click in the check box next the event triggers desired.

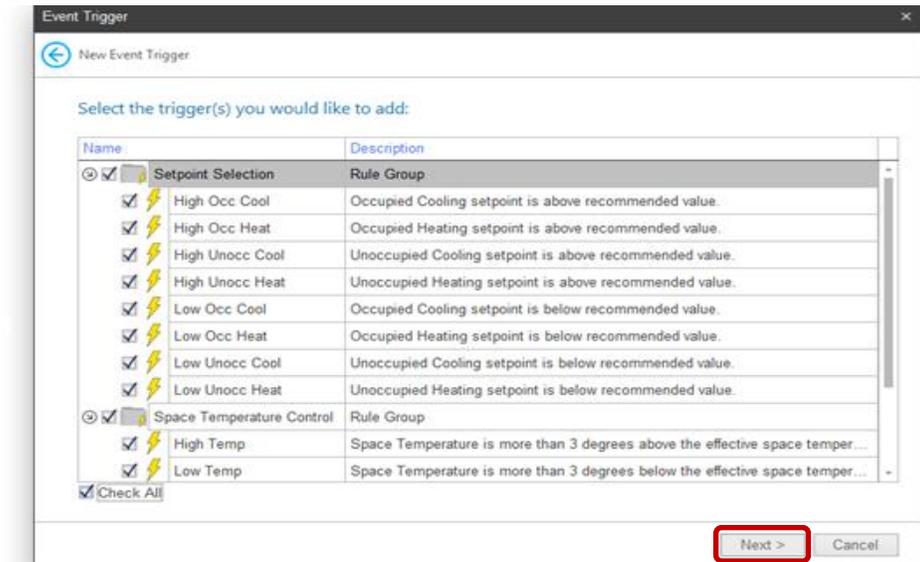
You may select the *Check All* check box if there are no invalid triggers identified in red text.

Note that if the profile does not contain a needed object, the trigger is invalid. It will be identified by red text.

Do not select a trigger with red text.



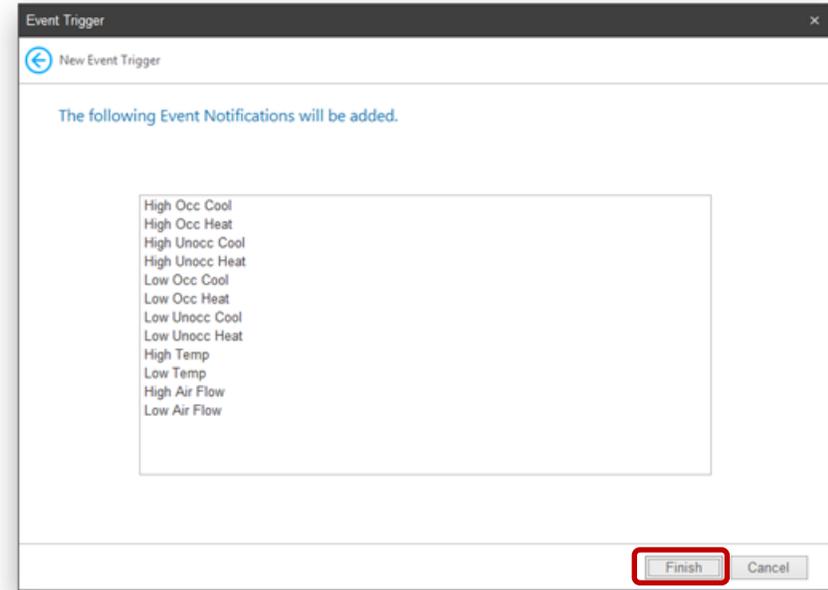
Once you have selected the desired triggers, click Next.



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Using Event Triggers from the Template Library

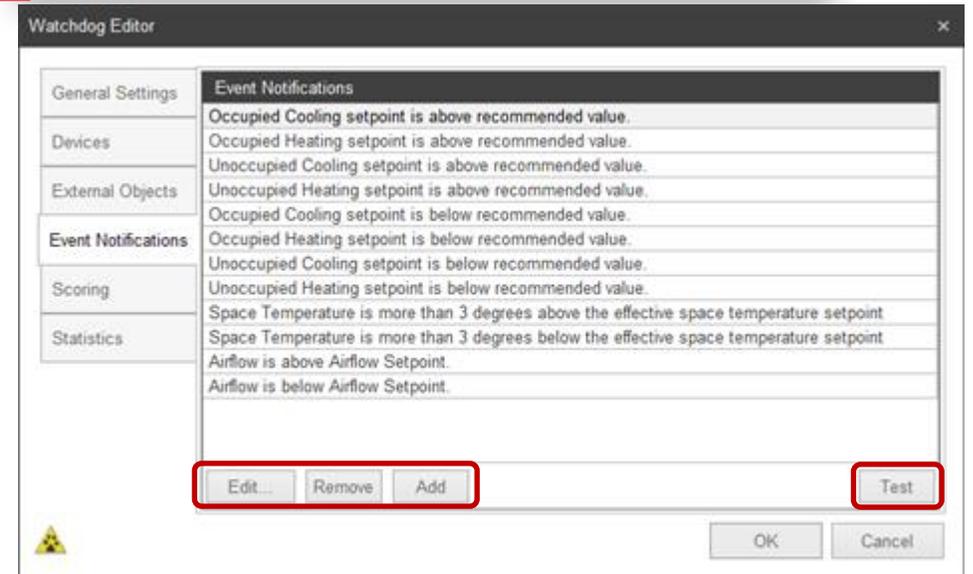
A summary of selected triggers will appear, click *Finish*.



The *Event Notifications* Tab window will appear. A user may select an Event Notification and choose to *Edit* or *Remove* a selected Event Notification or *Add* new Event Notifications.

It is important to click the Test button any time a change is made to an Event Notification. An even better test is to click *Ok*, close the watchdog and then reopen the watchdog.

If an Event Notification has an issue, a pop up window will identify the problem Event Notification. Progression is not allowed until the problem Event Notification is Removed or Edited.



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Watchdog Path

The Watchdog Path.

The default path to save a Watchdog into is the Watchdogs folder. Subfolders may be created by clicking on,  the *Navigation Button* will open the Folder Browse window. Clicking on *New Folder* to add an additional folder.

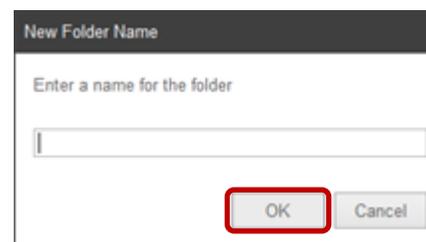
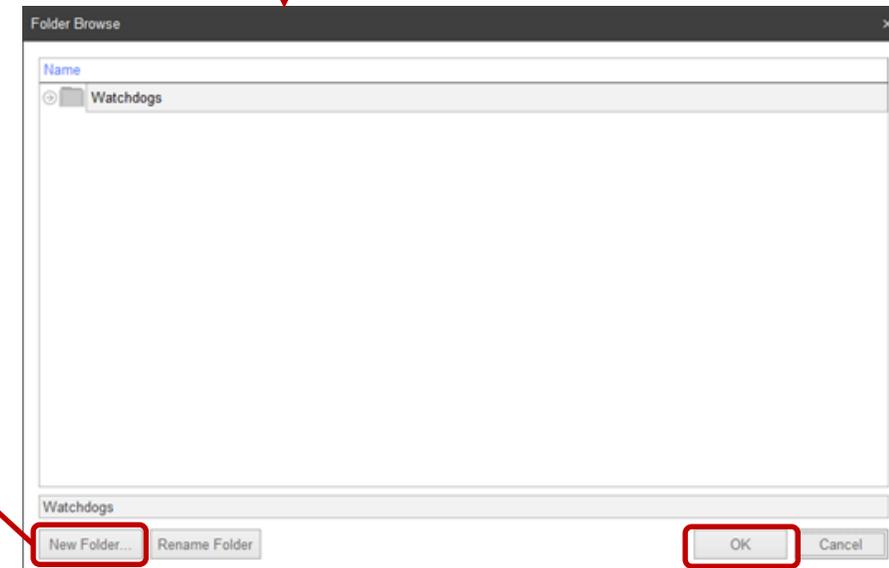
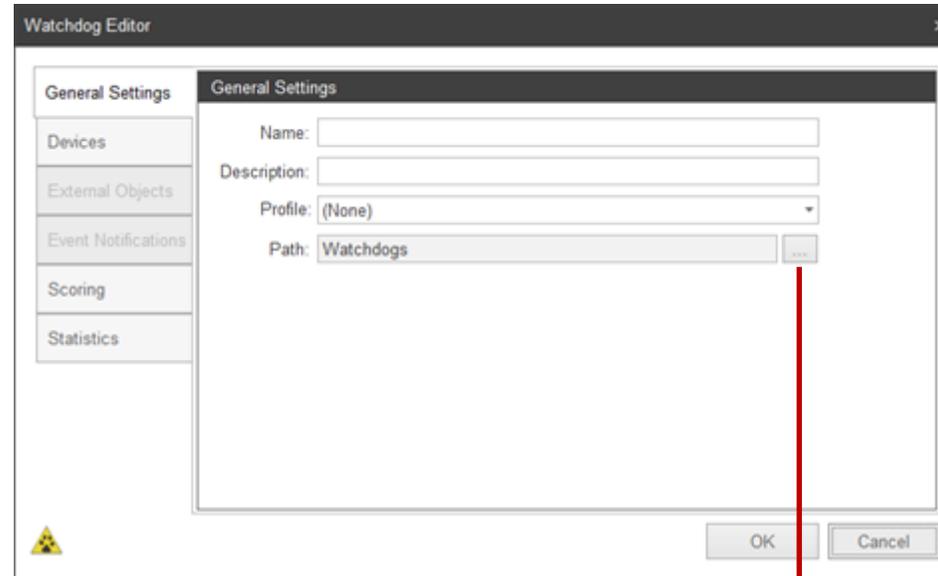
Enter the new folder name and click on *OK* to close the New Folder Name box.

The new folder name will appear as a new node under the parent Watchdogs Folder.



Select the folder you wish to save the new Watchdog into. Click on *OK* again to close the Folder Browse window.

Note that when you create a new folder, it is not auto selected. Be sure to select the new folder before clicking Ok. Otherwise the Watchdog will be saved to the parent Watchdog folder.



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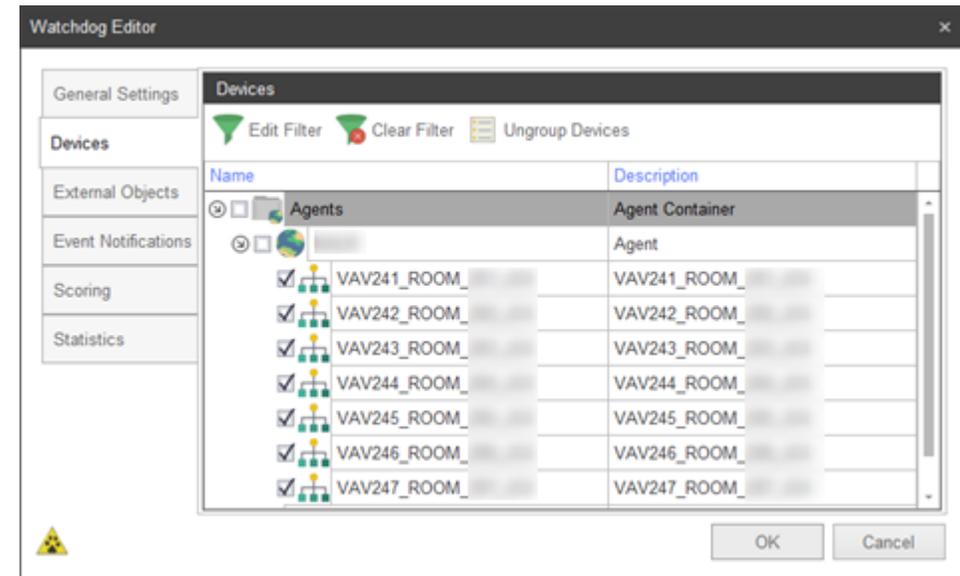
Devices

The *Devices* Tab.

The Devices listed in the Devices Tab will be determined by the Profile selected in the General Settings Tab. These devices will not be selected by default, only listed.

When the user is ready to apply this Watchdog to the listed devices they may click in the Agents box or the Agent Name box to select all the devices using the selected profile.

A user may also decide to exclude a device or number of devices from this Watchdog by deselecting them.



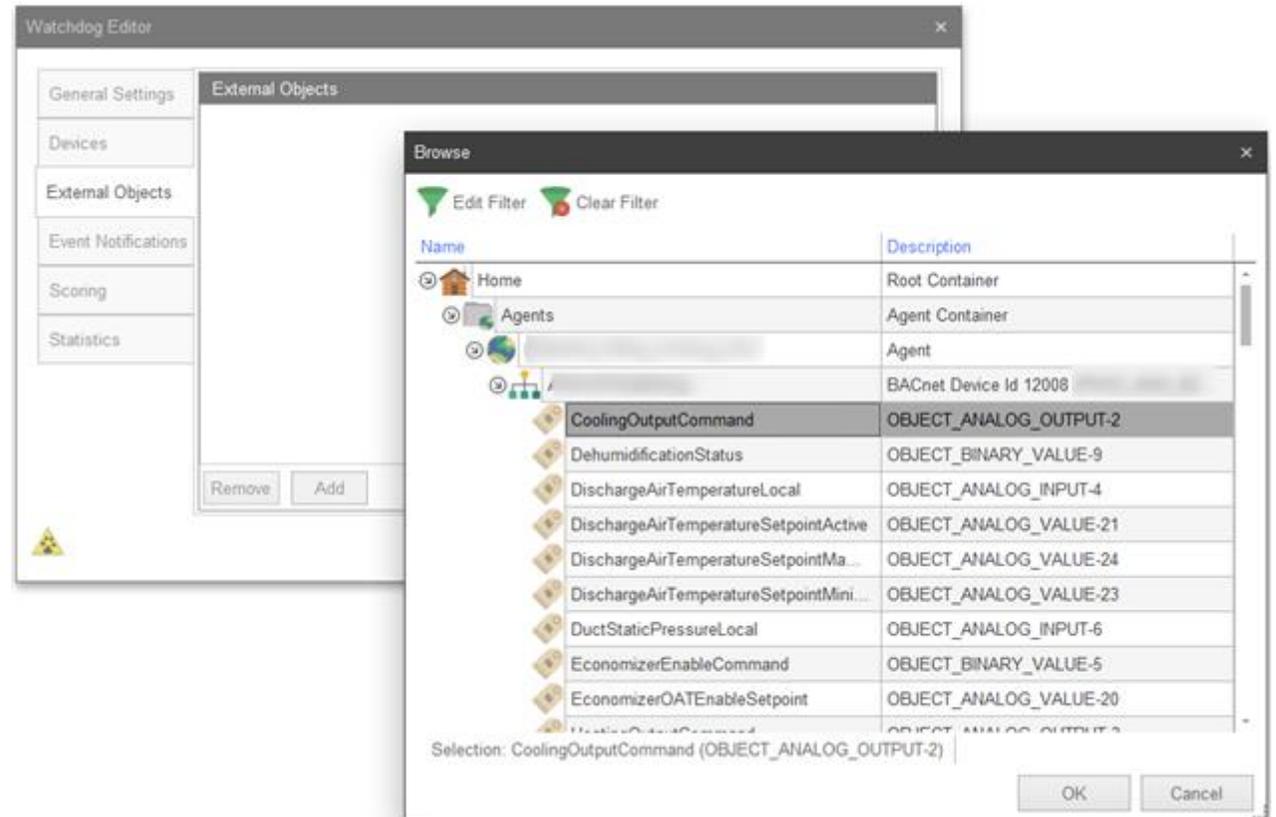
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External Objects

The *External Objects* Tab.

The External Objects Tab provides a means to add an object value from a different profile to this watchdog.

An example would be a Variable Air Volume watchdog using a Variable Air Volume profile. The user may need to get the Supply Air Temperature and or the Duct Static Pressure from the Air Handler providing the Supply Air to the Variable Air Volume devices. Those objects would not be members of this Variable Air Volume profile but would instead be members of the Air Handler profile. They would therefore be external objects from the Variable Air Volume profile.

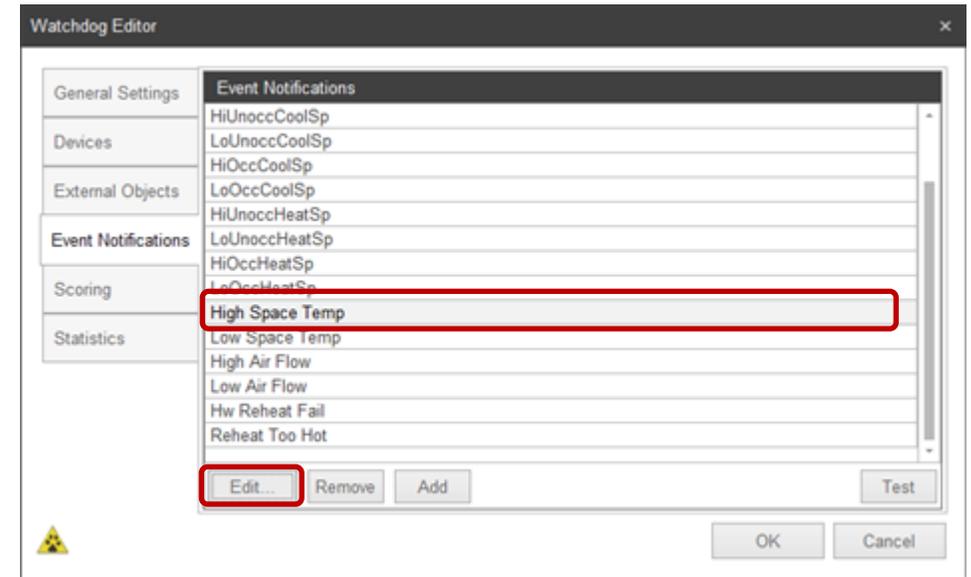


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Event Notifications Tab - Editing Event Triggers

The *Event Notifications* Tab. Editing an existing event.

Select the Event Trigger you wish to change. Click *Edit*.

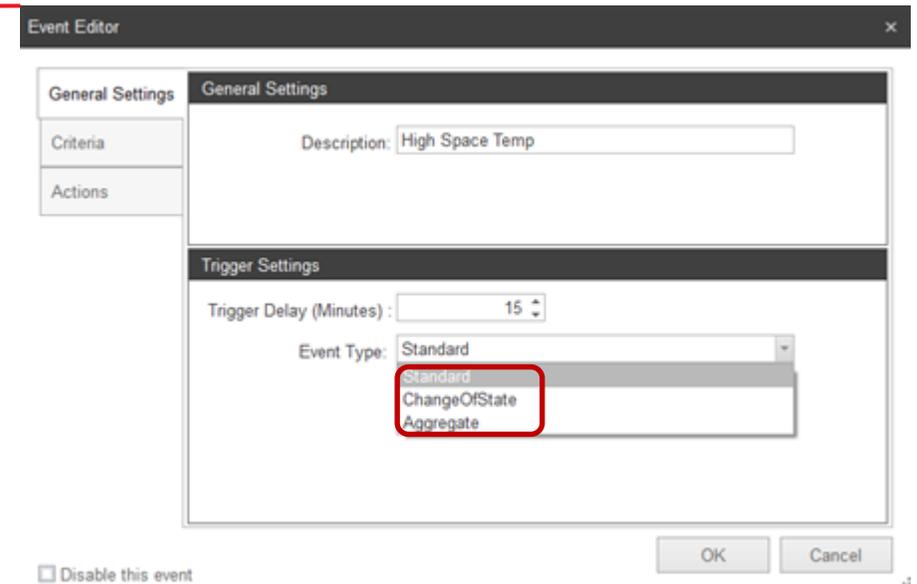


The *Event Editor General Settings* Tab window will appear.

In the General Settings section a user may change the *Description*: text.

In the *Trigger Settings* section a user may change the *Trigger Delay (Minutes)* value. Note that if the sample time is 15 minutes and the Trigger Delay is 15 minutes then the actual resulting delay will be 30 minutes as 2 samples will be required to generate an event.

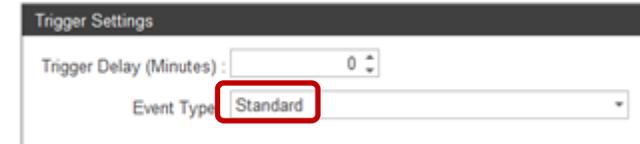
The Event Type dropdown provides the options; Standard, Change of State and Aggregate.



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Editing Event Triggers

The *Standard* option will trigger the defined Actions when the event expression result is true for the duration of the Trigger delay.



Trigger Settings

Trigger Delay (Minutes) : 0

Event Type: Standard

The *ChangeOfState* option provides a COS Threshold dropdown. This threshold defines the amplitude of change required of the Criteria expression product to trigger an event.



Trigger Settings

Trigger Delay (Minutes) : 15

Event Type: ChangeOfState

COS Threshold: 0

Example; The Criteria Expression has calculated a value of 2.1. The Change of State Threshold is set to 2.0.

If this change of value remains greater than the Change Of State Threshold for a time span greater than the Trigger Delay. Then the event Actions will trigger.

Keep in mind that the Change Of State is applied to the product value of the Event Criteria Expression. When the product of the Event Criteria Expression value is greater than the Change Of State Threshold, the event criteria is true. If a Trigger Delay spans across multiple samples. The event criteria must remain true across the required number of samples.

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A Change of State example

EXAMPLE

General Settings

Provide a Description of the event.

Trigger Settings

The Trigger Delay is set to zero.

The Event Type is set to ChangeOfState.

The COS Threshold is set to 7.

Criteria

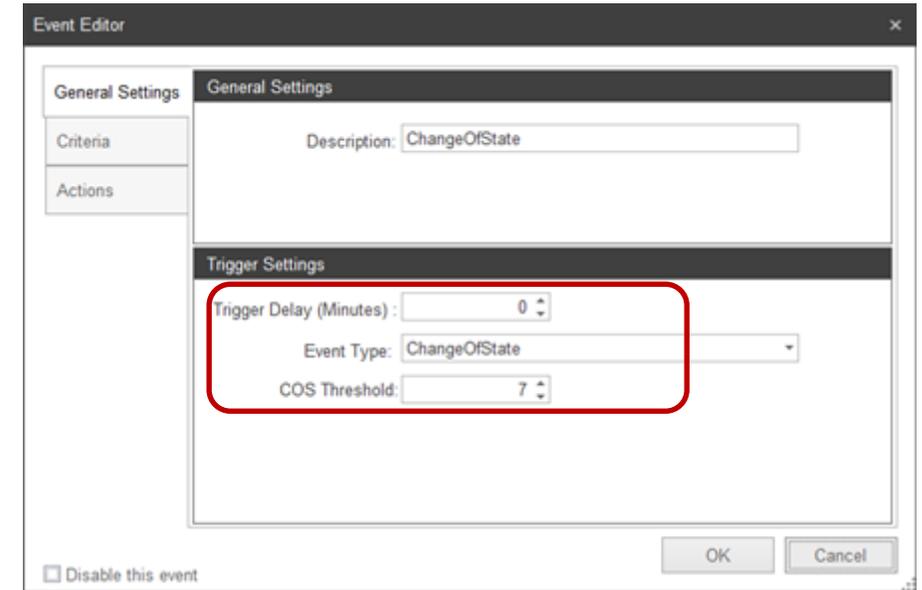
The object being monitored is an object named “Ramp_oBIX_Test”. This particular object value ramps from 0 to 100 over a time period of 1 hour. The sample time of this object is 5 minutes. That produces 12 samples per hour and results in a change of state of $100/12 = 8.33$ every 5 minutes.

Trigger Criteria

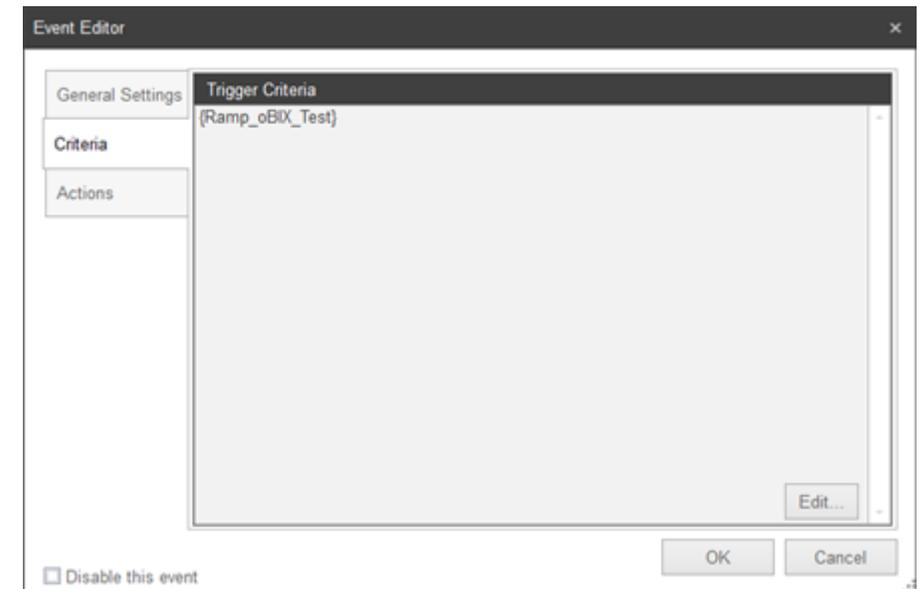
The object name is “Ramp_oBIX_Test”.

The “Ramp_oBIX_Test” value will change by 8.33 every 5 min.

Therefore an event will be recorded every 5 minutes because 8.33 exceeds the COS Threshold of 7.0.



The screenshot shows the 'Event Editor' dialog box with the 'General Settings' tab selected. The 'Description' field contains 'ChangeOfState'. The 'Trigger Settings' section is highlighted with a red box and contains the following fields: 'Trigger Delay (Minutes)' set to 0, 'Event Type' set to 'ChangeOfState', and 'COS Threshold' set to 7. At the bottom, there is a checkbox for 'Disable this event', 'OK', and 'Cancel' buttons.



The screenshot shows the 'Event Editor' dialog box with the 'Criteria' tab selected. The 'Criteria' field contains '(Ramp_oBIX_Test)'. At the bottom, there is a checkbox for 'Disable this event', 'OK', and 'Cancel' buttons, and an 'Edit...' button in the bottom right corner.

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Editing Event Triggers - Aggregate

The *Aggregate* option provides a powerful set of tools to filter for exacting conditions of alert. Notice a new side tab, *Aggregation Settings* has been provided.

The Aggregation Window defines the set of data samples that will be used in the expression.

Available aggregation types are;

Note that First through Delta aggregations return a Numeric result.

First = The first collected value in the Aggregation Window.

Last = The last collected value in the Aggregation Window.

Sum = The sum of all collected values in the Aggregation Window.

Avg = The average of all collected values in the Aggregation Window.

Min = The minimum of all collected values in the Aggregation Window.

Max = The maximum of all collected values in the Aggregation Window.

Delta = The last sample minus the first sample in the Aggregation Window.

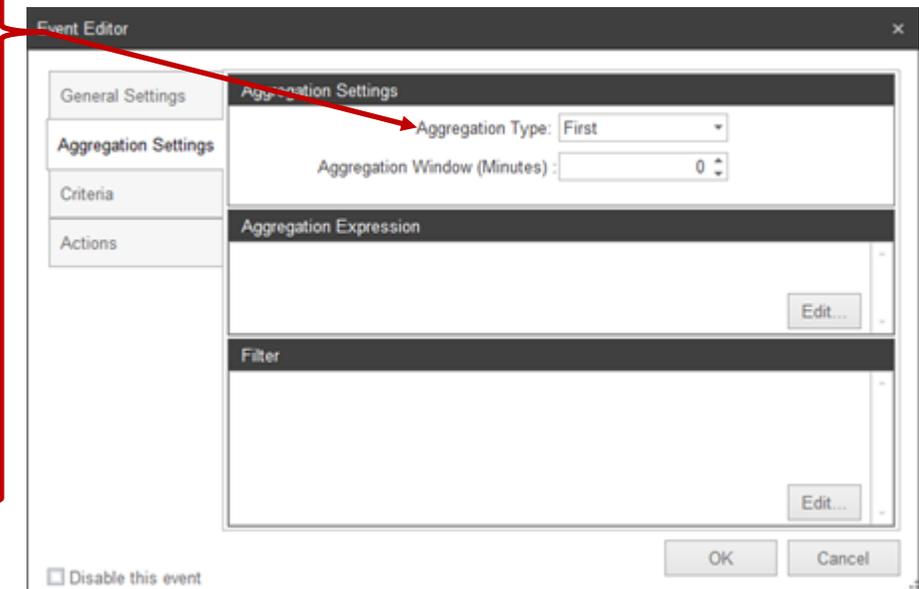
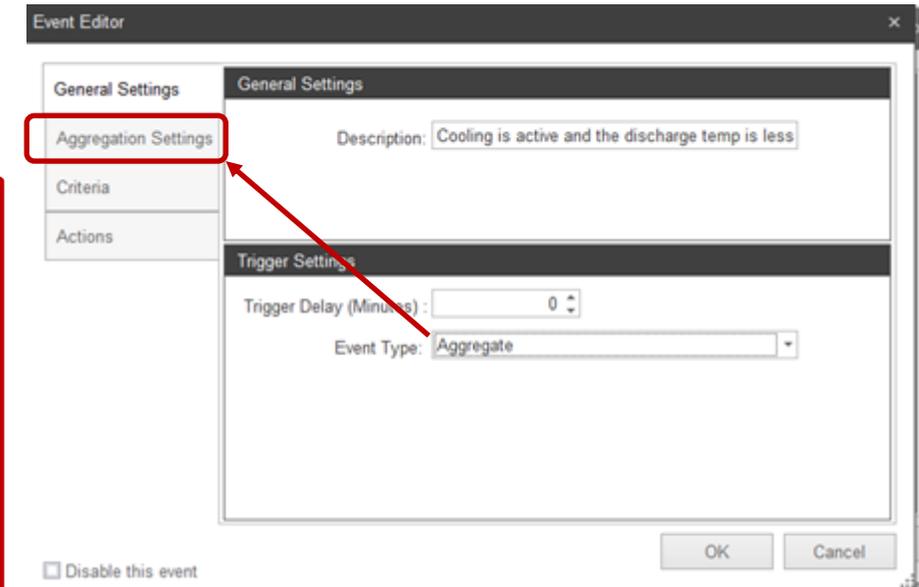
Note that to achieve a true delta, the user must apply the Absolute operator to the criteria. Example “ABS{val}”

OccurrenceCount = The sum of occurrences where the expression result value is true in the Aggregation Window.

ChangeCount = The sum of occurrences where the expression result value changed in the Aggregation Window.

PercentActive = The percentage of occurrences where the expression result is true in the Aggregation Window.

TotalDuration = The total duration of time in minutes where the expression result is true in the Aggregation Window.



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An Aggregate example

EXAMPLE

General Settings

Provide a Description of the event.

Trigger Settings

The Trigger Delay is set to zero.

The Event Type is set to Aggregate.

Aggregation Settings

Aggregation Type

A First Aggregation Type is selected.

Aggregation Window

A set of samples over 60 minutes will be monitored.

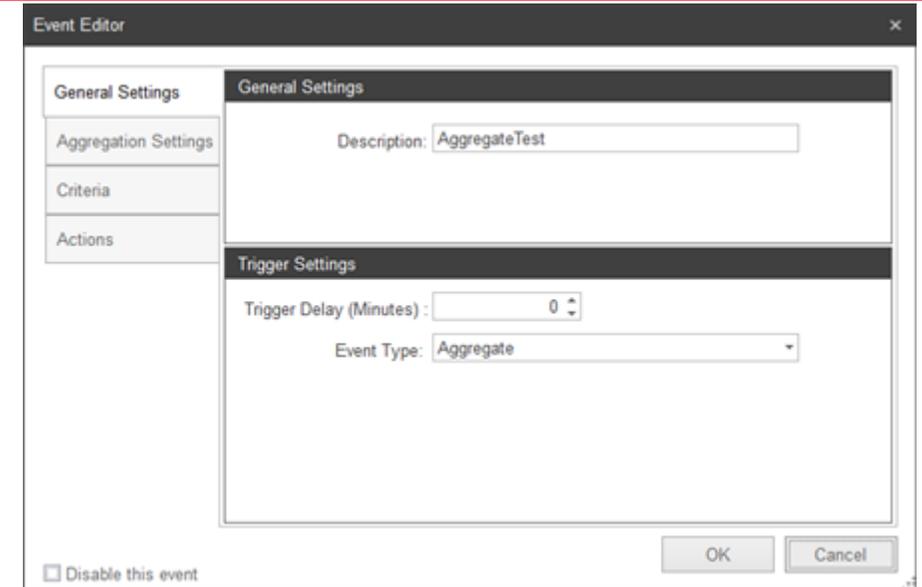
This example will then monitor the First sample from a set of samples collected over the last 60 minutes. The sample rate is set to 5 minutes. Therefore the Aggregation set will contain 12 samples. The *Criteria* will be monitoring the first member of this set. That member will have been entered into that set 60 minutes prior. The effect will be to provide a 60 minute delay in the first occurrence of this alert action.

Aggregation Expression

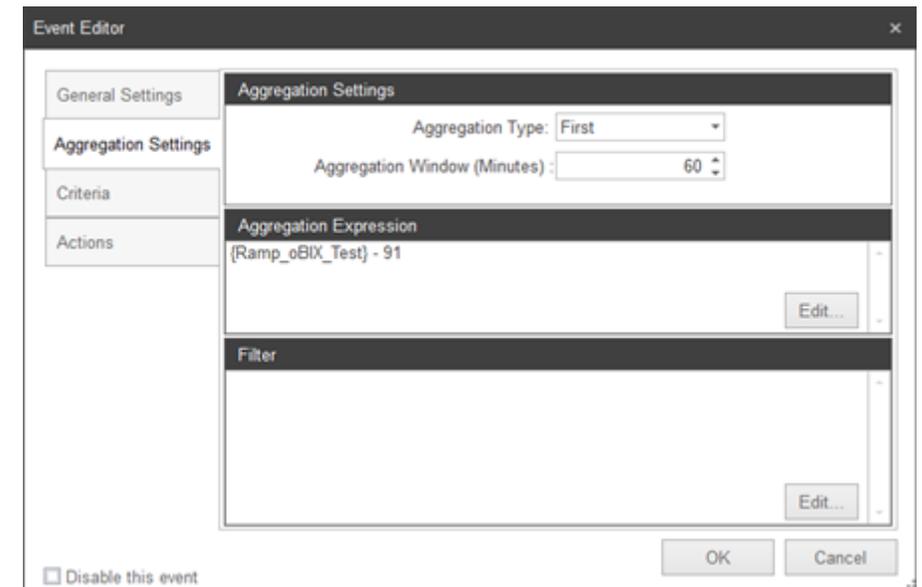
The expression of “Ramp_oBIX_Test” – 91 will produce values from -91 to 9 changing by a 8.33 every 5 min.

Filter

No filter is applied in this example. Each sample is compared to the filter before application to the aggregate set. A filter will exclude or allow the addition of a sample to the aggregation set.



The screenshot shows the 'Event Editor' dialog box with the 'General Settings' tab selected. The 'Description' field contains 'AggregateTest'. The 'Trigger Settings' section shows 'Trigger Delay (Minutes)' set to 0 and 'Event Type' set to 'Aggregate'. There are 'OK' and 'Cancel' buttons at the bottom right, and a 'Disable this event' checkbox at the bottom left.



The screenshot shows the 'Event Editor' dialog box with the 'Aggregation Settings' tab selected. The 'Aggregation Type' is set to 'First' and the 'Aggregation Window (Minutes)' is set to 60. The 'Aggregation Expression' field contains '{Ramp_oBIX_Test} - 91'. There are 'Edit...' buttons next to the expression and filter fields. There are 'OK' and 'Cancel' buttons at the bottom right, and a 'Disable this event' checkbox at the bottom left.

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An Aggregate example

EXAMPLE

Criteria

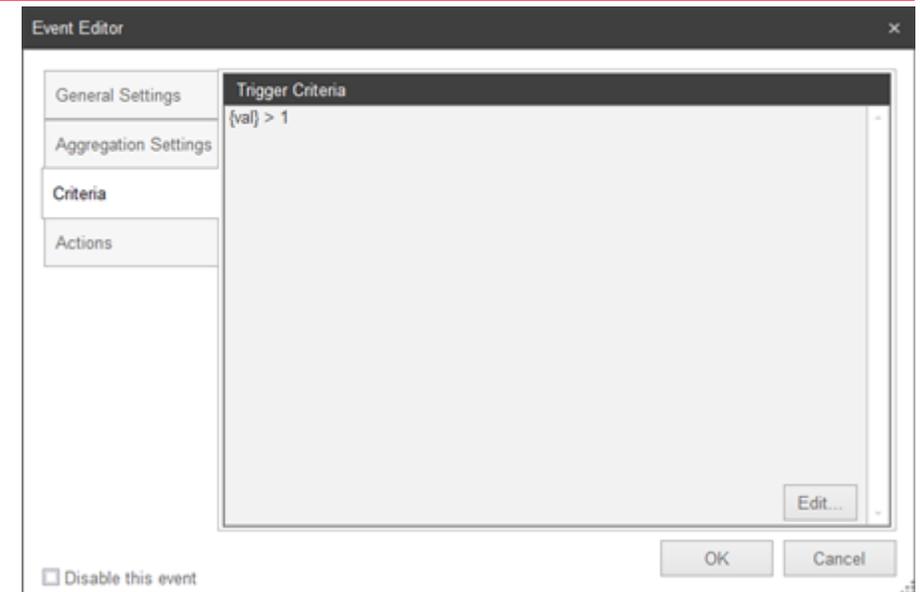
Trigger Criteria

The Trigger Criteria produces a true false result. The object {val} is the product of the *Aggregation Settings*. In this example if the *Aggregation Settings* expressions produce a {val} greater than 1, then an event is triggered.

Summary

The aggregation time is 60 min, the aggregation type is First. The aggregation expression of “Ramp_oBIX_Test” – 91 will produce values from -91 to 9 changing by 8.33 every 5 min.

The next sample will this value will become the Last entry into the aggregation set. As each subsequent sample occurs, this value will index down in the aggregate set. When the sample reaches the Last position of the set. “60 minutes later” The Trigger Criteria of the expression value being greater than 1 will occur and Event Actions will be executed.



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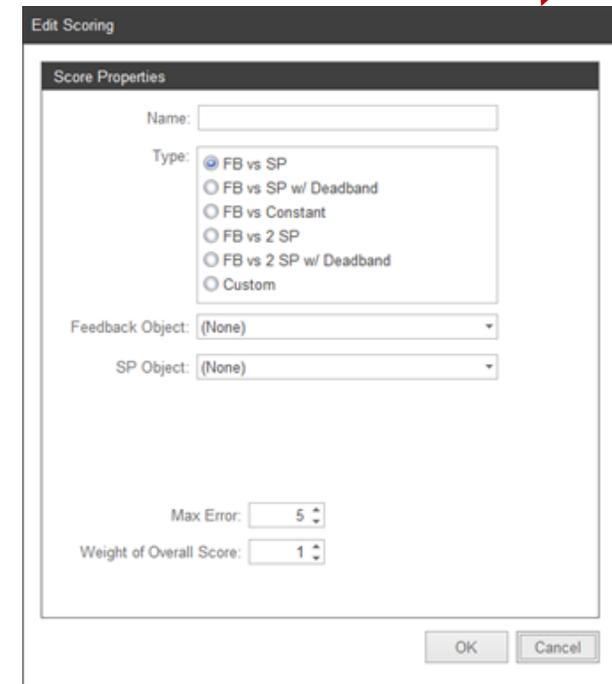
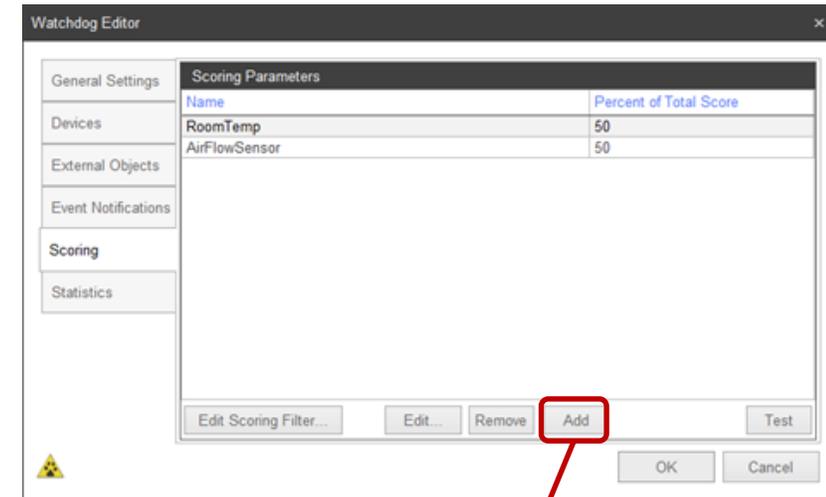
Scoring

The *Scoring* Tab.

Scoring provides a set of tools to define methods of gauging and rating the performance of a particular Control Loop.

All controllers contain Control Loops that calculate the value of an output based on the comparison of an input value to a setpoint value. The giveaway is to look for a setpoint, then find the input. Some general knowledge of the equipment design and specified sequence is helpful.

Please see the Scoring Presentation for a complete explanation of Scoring Techniques.



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Statistics

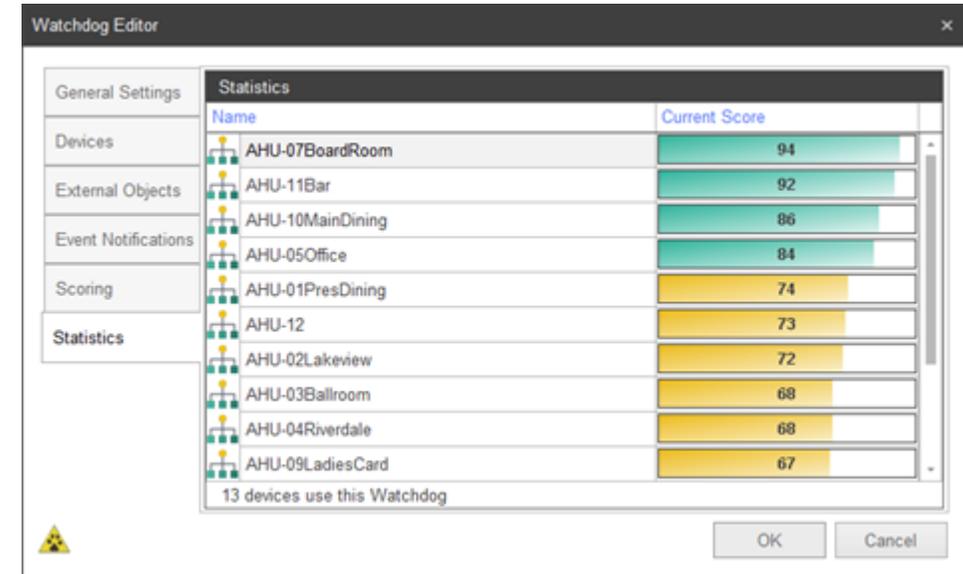
The *Statistics* Tab

This window provides a view of the scores from the devices included in the Watchdogs selected profile.

These scores are based on a set of collected data samples occurring after the creation of the scoring criteria. Therefore a few hours of data collection must occur before scores will be visible in this tab.

The Events and Scores window under the Events and Notifications main menu provide a view of scores obtained from the current Date Time range of that page. The default date range there is the Current Day.

A user may validate the result of the Watchdog scoring by opening the Events and Scores window.





THANK YOU