System Monitor Driver Help

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System Monitor Driver Help

Help version 1.024

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Overview

The System Monitor Driver uses the Microsoft Performance Data Helper application interface to provide access to performance information on Processes, Threads and other system components on the user's system. To begin monitoring the PC's performance from the OPC Client application (including HMI, SCADA, Historian, MES, ERP, and countless custom applications) install the OPC server and the System Monitor driver on each System/PC.

Note: A redistributable version of the PDH library is required to be installed for Windows NT. It is available from Microsoft.

Driver Setup

Device Name

This parameter specifies the name that will refer to the device. Device names may be between 1 and 256 characters and can neither begin with an underscore nor contain periods or double quotations.

Import

The System Monitor Driver can select the counters for the Performance Objects and instances that will be monitored. It will automatically generate static tags in the server based on these selections. To access the Import Item dialog after device creation, right-click on the device and select **Properties**. Then, click **Import | Select Import Items**.
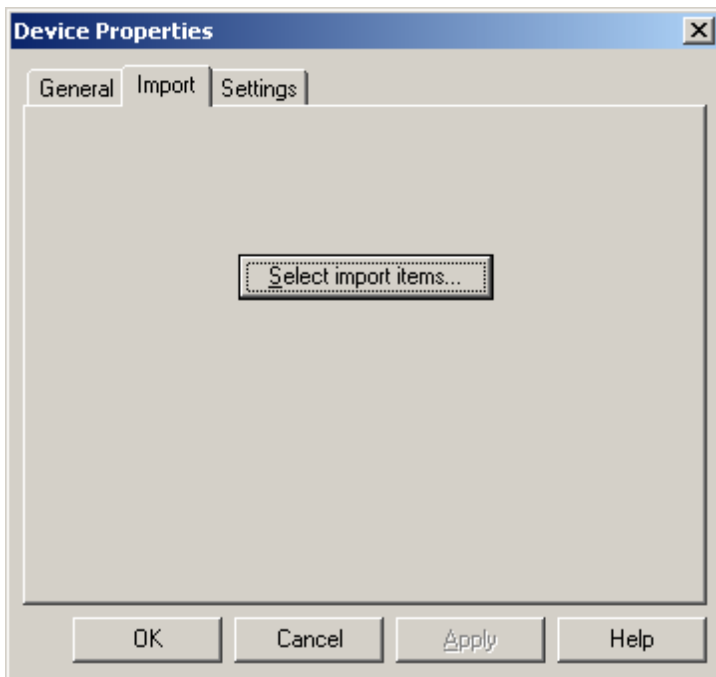
Note: The System Monitor Driver will automatically choose the best data type to use for the counter based on what the counter represents. A particular tag's data type can be manually changed in Tag Properties.

Settings

This parameter specifies how many tags the System Monitor Driver will update at once. Although the Performance Data Helper functions can be CPU intensive for large projects, it can be offset by reducing (or in some cases, increasing) the Query Size. The valid range is between 1 and 100 inclusive.
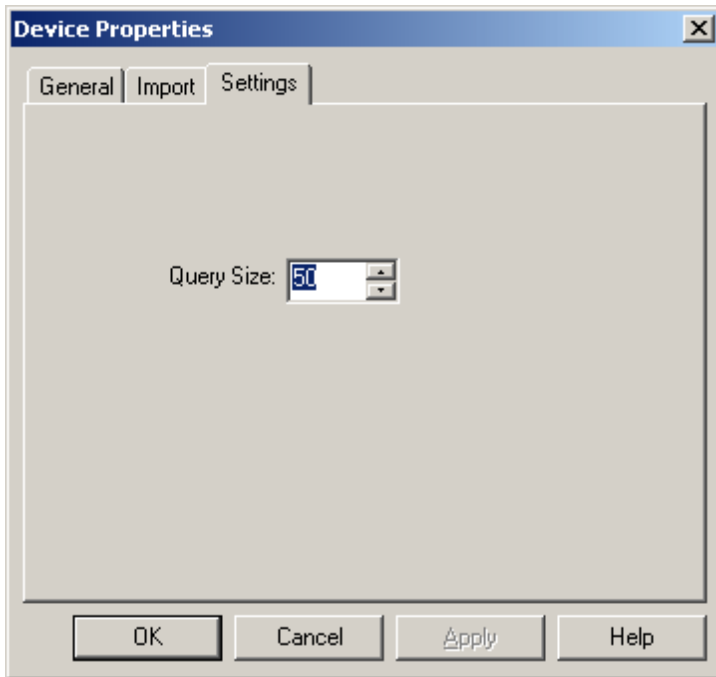
Note: This driver does not support multidropping devices. Any attempt to multidrop a device will result in the following error message: **Devices of model type 'N/A' cannot be multidropped**.

Data Types Description

The default data type is Double.

Data Type	Description
Double	64 bit floating point value
Long	Signed 32 bit value bit 0 is the low bit bit 30 is the high bit bit 31 is the sign bit

Note: Longs must either be manually created by the user or by altering the data type of an automatically gen-erated tag after it has been created.

Address Descriptions

Because of the dynamic aspect of many of the counters used by the System Monitor Driver, it is recommended that tags be automatically generated from the Import Items dialog. This ensures that the Performance Objects and instances are available and being used. If the counter address of a specific counter is known, however, tags can be manually created.

The System Monitor Driver uses the same syntax used by the Performance Data Helper library.

Object(Instance/ObjectInstance#InstanceIndex)\CounterName

Descriptions are as follows:

- **Object:** The name of the Performance Object that contains the instance or counter that will be monitored (such as Process).
- **Instance (optional):** The name of the Performance Instance that will be monitored. Some objects do not have instances.
- **Object Instance (optional):** The name or number of the object (if any). If there can be multiple instances of a particular Performance Object, this will be the name of a particular instance of that object.
- **Instance Index (optional):** For Object Instances that can have multiple instances at the same time that have the same name, this will be a zero based index specifying a particular instance.
- **Counter Name:** The actual name of the counter. Counters are specific to certain Performance Objects; meaning, a counter that appears under the Thread Object may not appear under any other object.

The Instance, Object Instance and Instance Index are optional and are only used if the instance being monitored allows for multiple instances (and/or if those instances have multiple threads). Some Performance Objects have associated tags instead of instances. For example, the simplest valid counter is of the following form:

IP\Datagrams Outbound Discarded

The most complicated addresses would resemble as follows:

Thread(svchost/7#2)\% Processor Time

This will monitor the percentage of the processor time used by the third thread of the seventh instance of the svchost thread.

Note 1: For more information on the structure of Counter Paths, refer to the MSDN documentation **Specifying a Counter Path.**

Note 2: The Wildcard character '*' is not supported for use in the System Monitor Driver.

Importing Items

The System Monitor Driver allows users to browse the available Performance Objects, instances, and counters on the machine through the Import Items dialog. From this dialog, individual counters (or groups of counters) can be selected so that tags can be automatically generated. To access this dialog after device creation, click **Device Settings | Import Items**.

The Import Items dialog is separated into two sections: the **Item Import Tree** and the **Import Item List**. Items are selected from the Import Item Tree and then added to the Import Item List. The driver will then be able to create tags based on the contents of the Import Item List. The Import Item Tree, found on the left, is a hier-archical tree view that displays all of the computer's current high-level Performance Objects, instances, and counters. Each Performance Object can be expanded to show all its associated instances and/or counters, and each instance can be expanded to display all of its counters. Counters can be added by either double-clicking on the individual counter or by selecting the counter and then clicking **Add**. If an item in the tree is right-clicked, a context menu will appear that has shortcuts for adding counters. If an object or instance is right-clicked and **Add Items** is selected, all the items below that item will be added to the Import Item list. Multiple counters can be selected by left-clicking on the desired counters while using either the **Ctrl** or **Shift** key. The Import Item List can be found on the right side of the dialog.

Once a counter or group of counters has been added to the Import Item list, they can easily be removed. To remove a specific counter, select and then click **Remove**. Alternatively, right-click on a counter and then choose the corresponding menu item in the right-click menu. To remove all counters, click **Remove All**.

To refresh the Item Import Tree, click **Refresh**. Alternatively, right-click on the base item of the tree and then select **Refresh** from the pop-up menu. This will update the entire tree to include any changes that have taken place since the tree was last updated. This is particularly important for items in the Process and Thread groups (which can change often).
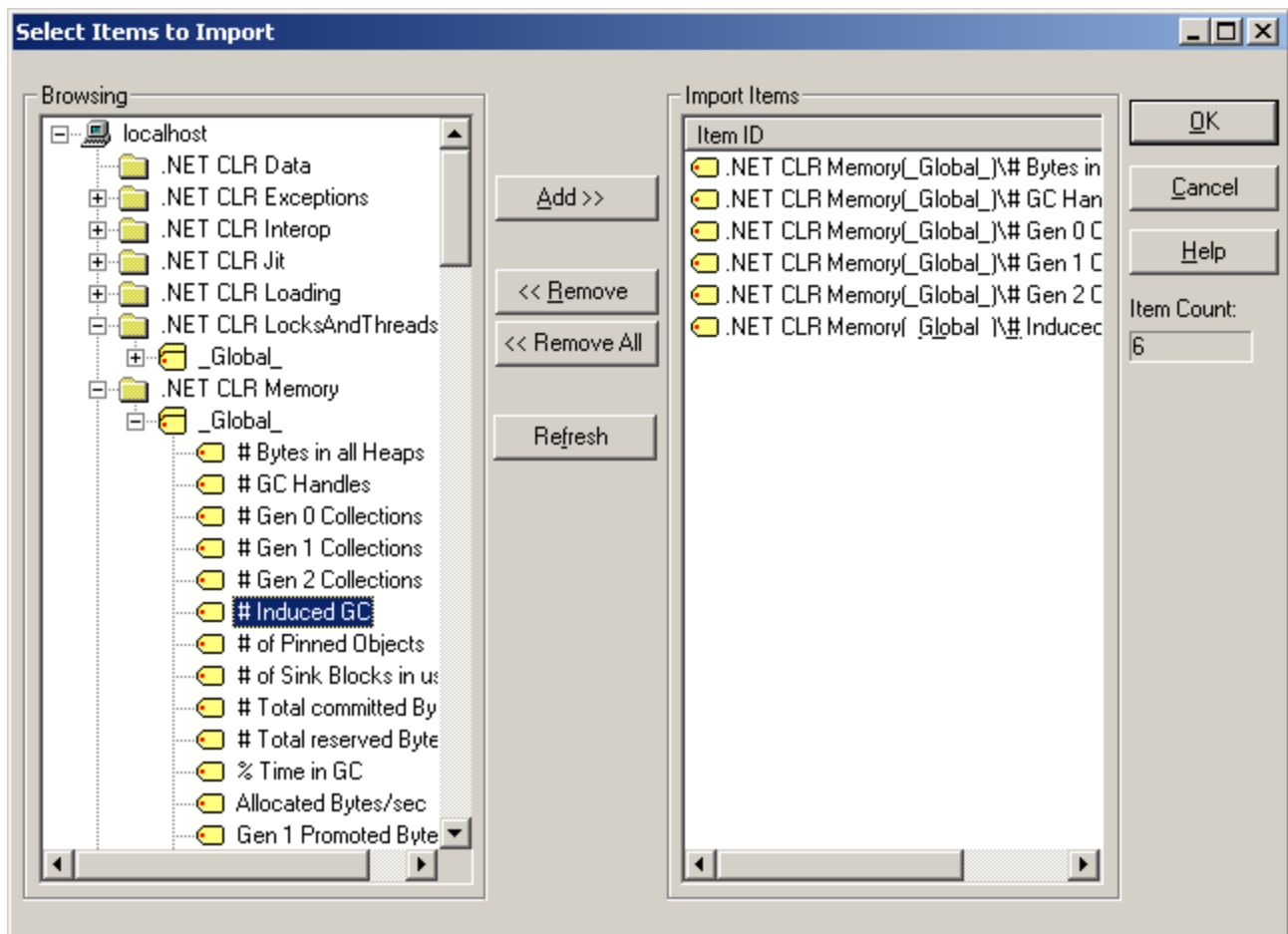
The System Monitor Driver creates a tag for each import item and then adds it to the device for which the import operation was performed. The driver also assigns proper tag names and organizes the tags into groups based on the complete item name. The counter name forms the tag name. The tag will be added to a group that derives its name from the object name. If the counter also belongs to an instance, then another group will be created

underneath the object group. This group derives its name from the instance name. For example, the following will be created under the device for the counter *?# Induced GC?* shown in the image above.

+ U_Net CLR Memory: This is the group name based on the object.
+ U_Global_: This is the group name based on the instance.
+ # Induced GC: This is the tag name based on the counter.

The tag address is the complete counter name: *.NET CLR Memory(_Global_)\# Induced GC*

During the import, the driver applies the following changes when creating tag and group names.

1. Dots ('.'), double quotes ('"') and underscores ('_') are not allowed to be the first character in the tag name. They will be replaced with "U_".

2. Dots and double quotes are not allowed anywhere in the tag name. They will be replaced with underscores.

3. Dots, double quotes, underscores and back slashes are not allowed to be the first character in the group name. They will be replaced with "U_".

4. Dots, double quotes and back slashes are not allowed anywhere in the group name. They will be replaced with an underscore.

Note: The default data type is Double. If a Long data type is needed, change the data type from the GUI.

Tag Descriptions

To view Tag Descriptions, right-click on the particular counter in the Item Import dialog and then select "**What's this?**" at the bottom of the menu. If more than one Counter is selected, the option will be disabled.

Error Descriptions

The following error/warning messages may be generated. Click on the link for a description of the message.

Counter '<counter>' contains invalid data
Counter '<counter>' has a negative denominator
Counter '<counter>' has a negative time base
Counter '<counter>' has a negative value
Counter '<counter>' is not valid
Counter '<counter>' was not found
Devices of model type 'N/A' cannot be multidropped
Failed to retrieve instances for object '<object>'
Instance '<instance>' was not found
Performance '<object>' was not found

Counter '<counter>' contains invalid data

Error Type:
Warning

Possible Cause:
This warning is most likely a problem associated with moving a project from one computer to another.

Solution:
Regenerate the tags from within the Import Items dialog.

Counter '<counter>' has a negative denominator

Error Type:
Warning

Possible Cause:
This warning is most likely caused by timing errors in the Windows kernel and usually appears when monitoring low-level information. For example, counters within the Process group.

Solution:
This can happen intermittently. It can normally be fixed by waiting until the next update or performing a Read on the counter.

Counter '<counter>' has a negative time base

Error Type:
Warning

Possible Cause:
This warning is most likely caused by timing errors in the Windows kernel and usually appears when monitoring low-level information. For example, counters within the Process group.

Solution:
Regenerate the tags from within the Import Items dialog.

Counter '<counter>' has a negative value

Error Type:
Warning

Possible Cause:
This warning is most likely caused by timing errors in the Windows kernel and usually appears when monitoring low-level information. For example, counters within the Process group.

Solution:
This can happen intermittently. It can normally be fixed by waiting until the next update or performing a Read on the counter.

Counter '<counter>' is not valid

Error Type:
Warning

Possible Cause:
1. The counter name is spelled wrong.
2. The counter is not valid for the Performance Object being monitored.

Solution:
1. Check the spelling of the counter name.
2. Try to find the counter in the Import Items dialog under the Performance Object that is being monitored to make sure it is a valid counter.

Counter '<counter>' was not found

Error Type:
Warning

Possible Cause:
1. The counter name is spelled wrong.
2. The counter is not valid for the Performance Object being monitored.

Solution:
1. Ensure that the Counter is valid for the Performance Object.
2. If a project is being used from another computer, regenerate the tags from the Import Items dialog in Device Properties.

Devices of model type 'N/A' cannot be multidropped

Error Type:
Warning

Possible Cause:
An attempt was made to multidrop a device.

Solution:
Configure a single device for this driver.

Technical Notes

Click on the links below to view the System Monitor Driver's technical notes.

Known Issues
Running Under Microsoft Windows Vista

Known Issues

The following Microsoft Knowledge Base article concerns a known issue with the Microsoft Performance API:

- KB: 248993 **Performance Object Is Not Displayed in Performance Monitor**

Running Under Microsoft Windows Vista

Due to enhanced security practices on the Microsoft Windows Vista operating system, the following suggestions should be taken into consideration in order to fully utilize the System Monitor Driver.

- If running the System Monitor Driver under a user account that does not have Administrative privileges, make sure that the user account is in the Performance Log Users and Performance Monitors groups.
- It is possible to turn off User Account Control (UAC), which will relax some of the new security policies of Windows Vista. This is not recommended.

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