

# **OPC DA Client Driver Help**

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## OPC DA Client Driver Help

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Help version 1.015

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### Overview

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The OPC DA Client Driver provides an easy and reliable way to connect OPC DA Client devices to OPC Client applications, including HMI, SCADA, Historian, MES, ERP and countless custom applications. It can be used to consolidate data from a number of OPC servers and is made available to clients of the server through all supported interfaces (OPC DA, OPC DX, DDE, SuiteLink, NIO/PDB and so forth).

The OPC DA Client driver contains the following advantages:

- Provides a single, reliable connection point to access data from multiple OPC servers on local and remote machines.
- Optimizes performance of OPC servers through OPC groupings that may be different than those required or allowed by the clients.
- Connection monitoring and reconnect behavior can be configured for each OPC server.
- Provides connectivity to remote OPC servers for clients that do not support DCOM.
- Allows connectivity to multiple OPC servers from clients that do not support multiple connections or handle multiple connections well.
- Allows connectivity to OPC servers using different interfaces that are supported by clients, such as DDE, SuiteLink, NIO/PDB and so forth.

**Note 1:** The maximum number of channels is 128. The maximum number of devices is 256.

**Note 2:** Arrays are not supported.

### OPC Compliance

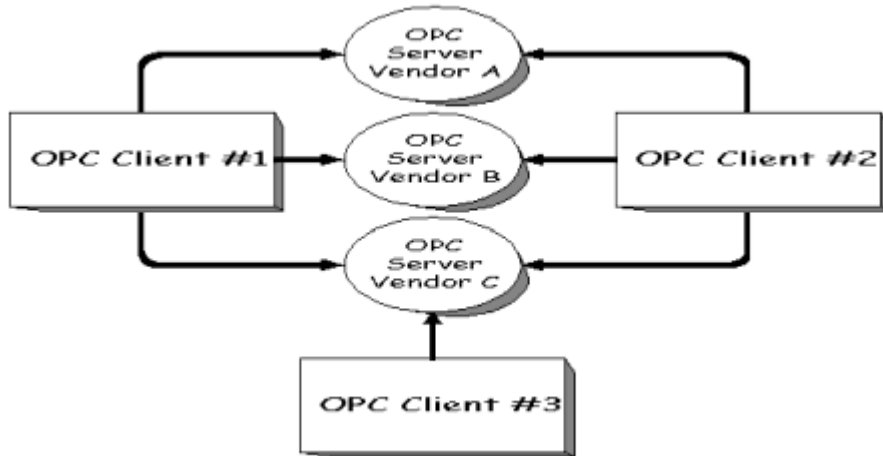
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This driver supports OPC DA 1.0 and 2.0 connections with underlying servers. The driver will use 2.0 calls if supported and will automatically fall back to 1.0 if not supported. By default, the driver will request data updates by exception (active groups and items). It can be configured to poll items (inactive groups and active items) using asynchronous reads. All writes will be asynchronous.

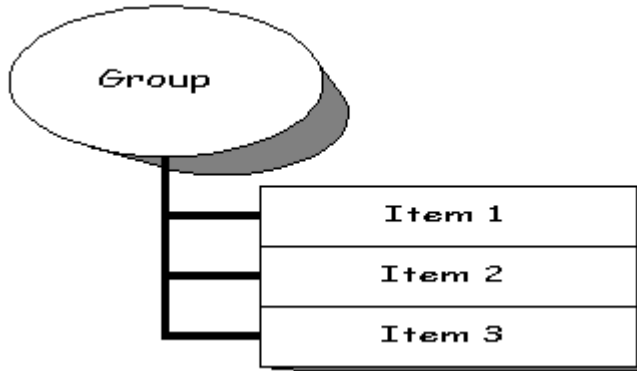
### Project Architecture

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An OPC DA Client driver channel represents a connection to an OPC server; an OPC DA Client driver device represents an OPC group. The OPC client can connect to OPC servers provided by one or more vendors. The following diagram shows the OPC client and server relationship.



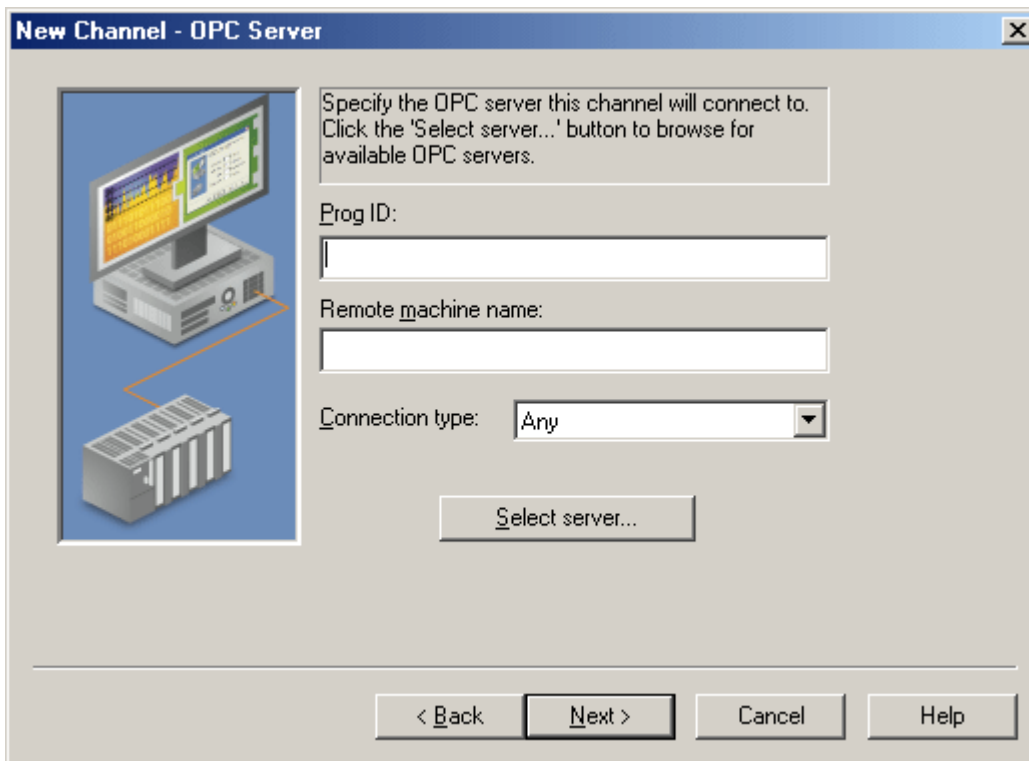
The OPC group object maintains information about itself and provides the mechanism for containing and logically organizing OPC items. The following diagram shows the group and item relationship.



### **OPC Server Channel Property**

---

This parameter specifies the OPC server to which the channel will connect.

**Prog ID**

This parameter specifies the Program ID of the OPC server to which the driver should connect.

**Remote Machine Name**

This parameter specifies the name of the machine in which the OPC server resides, as specified by the Prog ID. This field should be left blank if the server is located on the same machine as the driver.

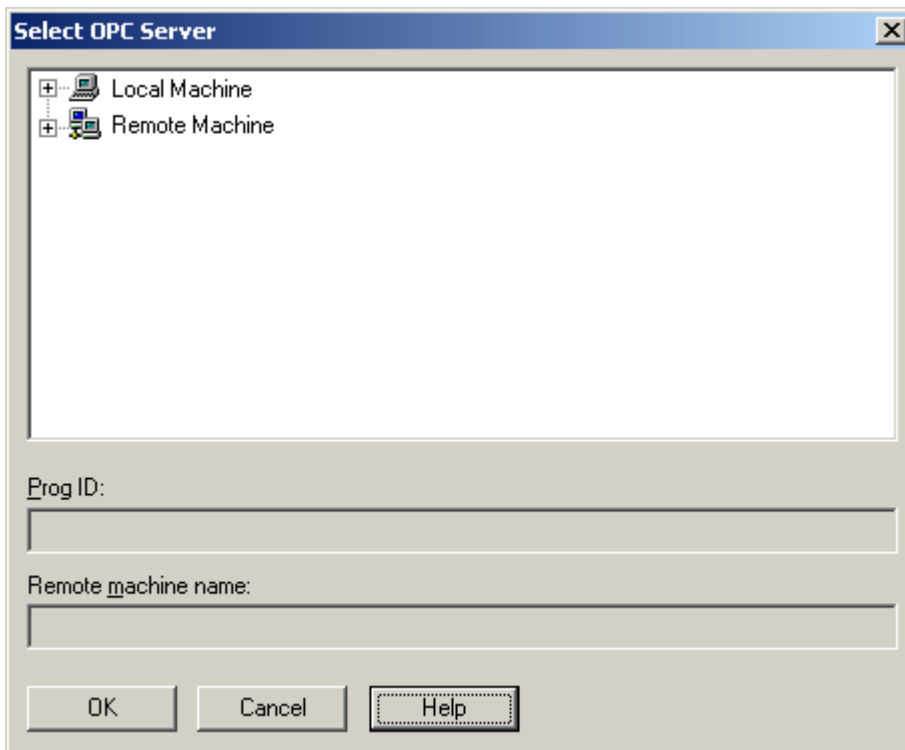
**Connection Type**

This parameter specifies the type of connection the driver should establish with the OPC server on the local machine. The options are **InProc**, **Local** and **Any**.

**Note:** When the server is registered as InProc, an InProc connection will be attempted. Otherwise, a Local connection will be attempted.

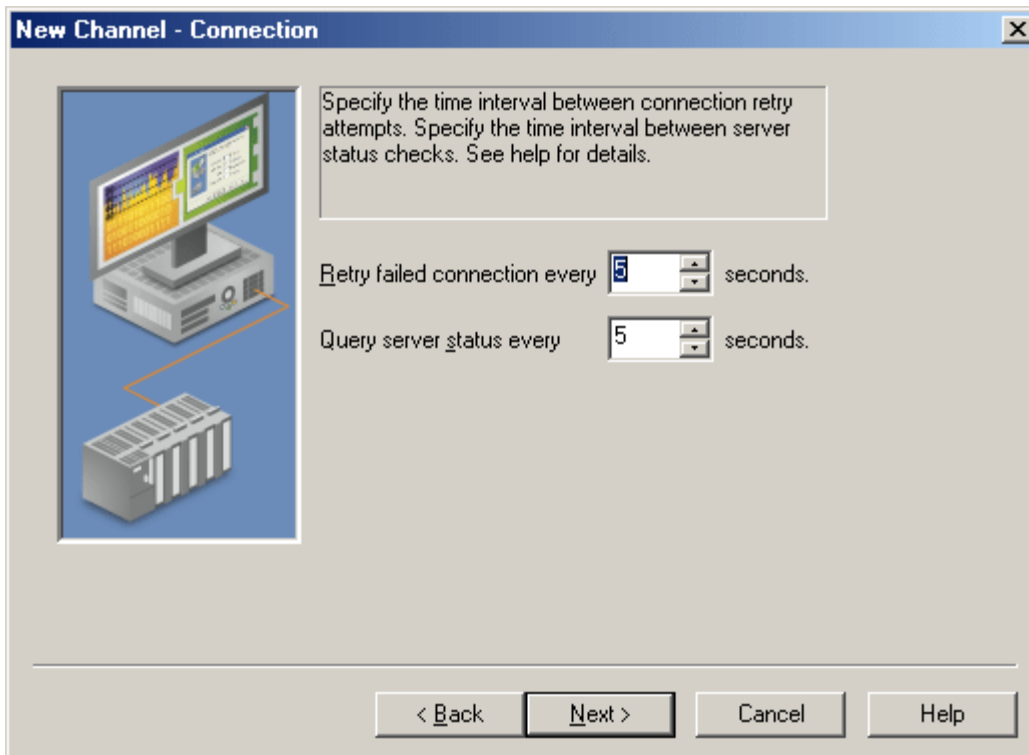
**Select Server**

This dialog is used to browse the network for an OPC server.



### Connection Channel Property

This parameter specifies the time interval between connection retry attempts and between connection integrity polls. Additional integrity checks may be configured at the group level. For more information, refer to [Watchdog Device Property](#).



### Connection Retry Interval (SEC)

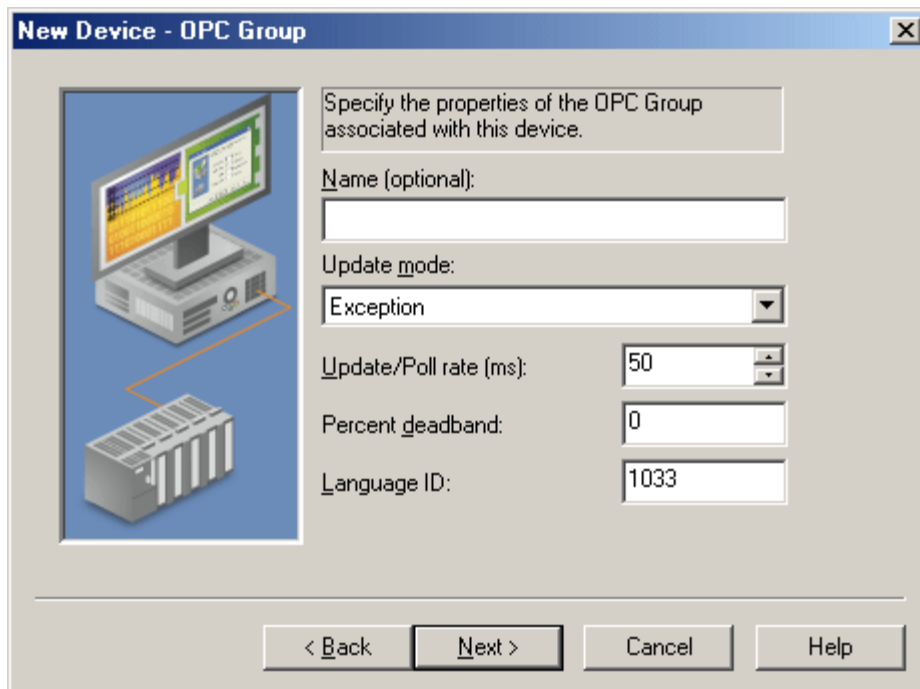
This parameter specifies the time between connection attempts. The value can range from 5 to 600 seconds. The default setting is 5.

### Query Server Status Every \_\_ Seconds

The driver will periodically test the connection to the underlying server by sending a GetStatus message. If a response is not received, the driver will automatically reconnect to the server. The time between tests can range from 5 to 30 seconds. The default setting is 5.

## OPC Group Device Property

This parameter specifies the properties of the OPC group associated with the device.



### Name

This parameter specifies a name in order to identify the group. If nothing is entered, the underlying OPC server will generate a unique name.

### Update Mode

**Exception – Group** will be added active. The server will notify driver of data value and quality changes. The driver will first try to establish an OPC 2.0 callback for the group. If that is not available, the driver will then attempt to establish an OPC 1.0 callback. **Poll – Group** will be added inactive. The driver will read all items attached to group/device at the configured update/poll rate (or as close as possible). Asynchronous reads will be used. OPC DA 2.0 asynchronous reads will be used if supported by the OPC server. If not, OCP DA 1.0 asynchronous reads will be used.

**Note:** In **Poll** mode, all tags will be added as inactive. The server will briefly set these items active during each poll cycle. Because of this, users may notice the active tag count in the server's status bar fluctuate. This is normal.

### Update/Poll Rate (MS)

If exception mode is used, this parameter specifies how often the underlying OPC server should provide updates for changing data. If poll mode is used, this parameter specifies how often the driver should read the items attached to this group. This value may range from 0 to 3600000 ms. The default setting is 50.

### Percent Deadband

This parameter specifies the percent change in data required to notify the client of a data change. This setting is used

for exception mode only.

### Language ID

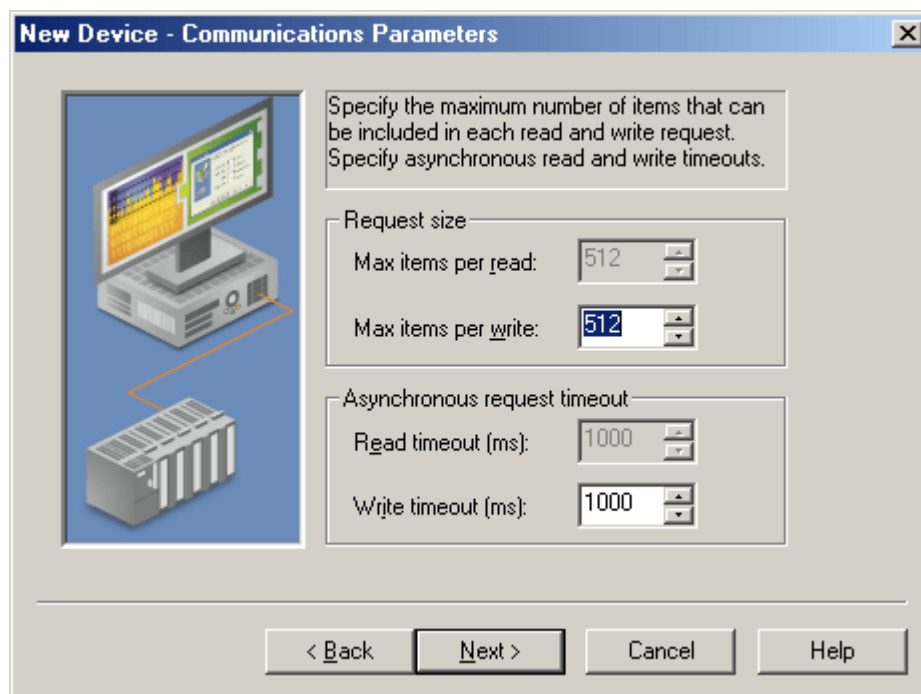
This parameter specifies the language to be used by the underlying server when returning values as text for operations on this group. The default setting is 1033 (English).

### Time Stamp

This parameter specifies the local system time of the last data change. It is the same as the clock in the PC running the OPC server and the OPC DA Client driver, regardless of whether the PC has an underlying sever (or if different clocks or different time zones are running).

## Communications Parameters

The Communications Parameters specifies asynchronous Read and Write timeouts (as well as the maximum number of items that can be included in each Read and Write request).



### Request Size

This parameter specifies the maximum number of items that can be included in each Read and Write request.

### Max Items Per Read

This parameter specifies a limit on the number of items that can be included in a single Read request. The value may range from 1 to 512. The default setting is 512.

### Max Items Per Write

This parameter specifies a limit on the number of items that can be included in a single Write request. The value may range from 1 to 512. The default setting is 512.

### Asynchronous Read

This parameter specifies the length of time a driver will wait between initiating new Reads and Writes.

### Read Timeout (MS)

This parameter specifies how long the driver will wait for a Read complete notification to be returned from the server before sending any other Read or Write request. If the expected notification is not received, the items included in the request will be set to bad quality and will remain bad until the next successful Read.

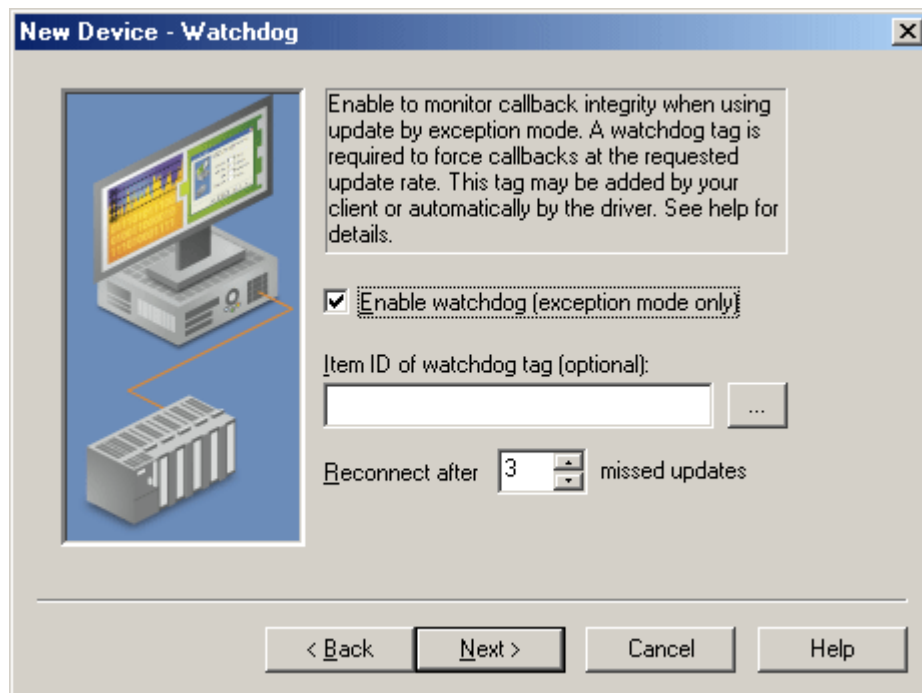
### Write Timeout (MS)

This parameter specifies how long the driver will wait for a Write complete notification to be returned from the server before sending any other Write or Read request. If the expected notification is not received, the driver will log a Write failed message on timeout.

**Note:** Read settings will be disabled when the Update Mode is in **Exception**. The driver will not be issuing Read requests to the server.

### Watchdog Device Property

When enabled, this parameter monitors callback integrity when using the Update by Exception Mode. A watchdog tag is required to force callbacks at the requested update rate. This tag may be added by the client or automatically by the driver.

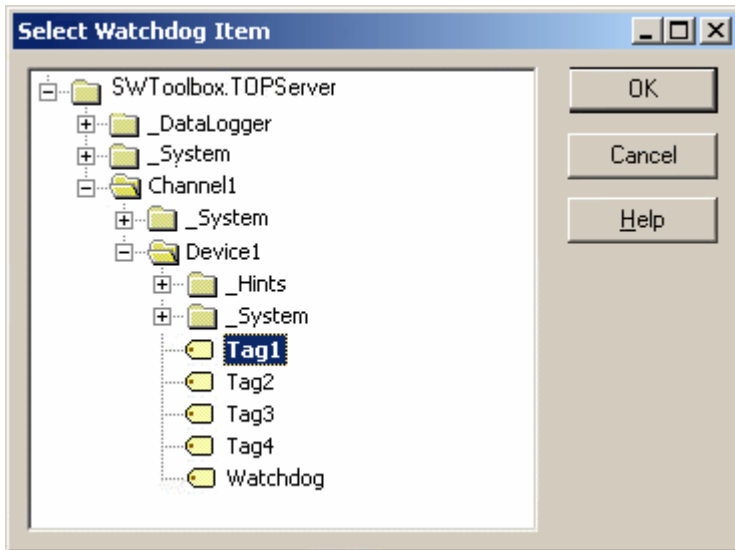


#### Enable Watchdog Monitoring

When checked, this parameter will enable the watchdog callback monitoring feature. For more information, refer to [Watchdog Callback Monitoring](#).

#### ItemID of Watchdog Tag (Optional)

This parameter specifies the Item ID of the tag that will be automatically added by the driver on connect. This field may be left blank if one or more suitable Watchdog tags will be active for the connection's duration.

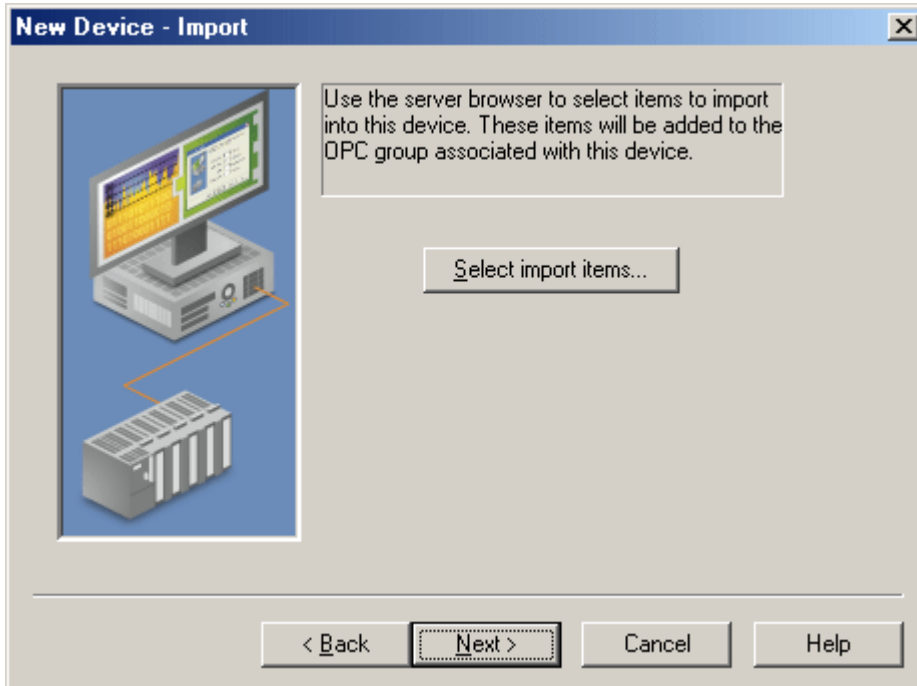


### Update Periods Before Reconnect

This parameter specifies the number of update periods that may pass without a data change notification from the underlying OPC server before the driver assumes there is a problem and reconnects. This value may range from 2 to 10. The default setting is 3.

### Import Device Property

To browse the server for tags, click **Select Import Items**.

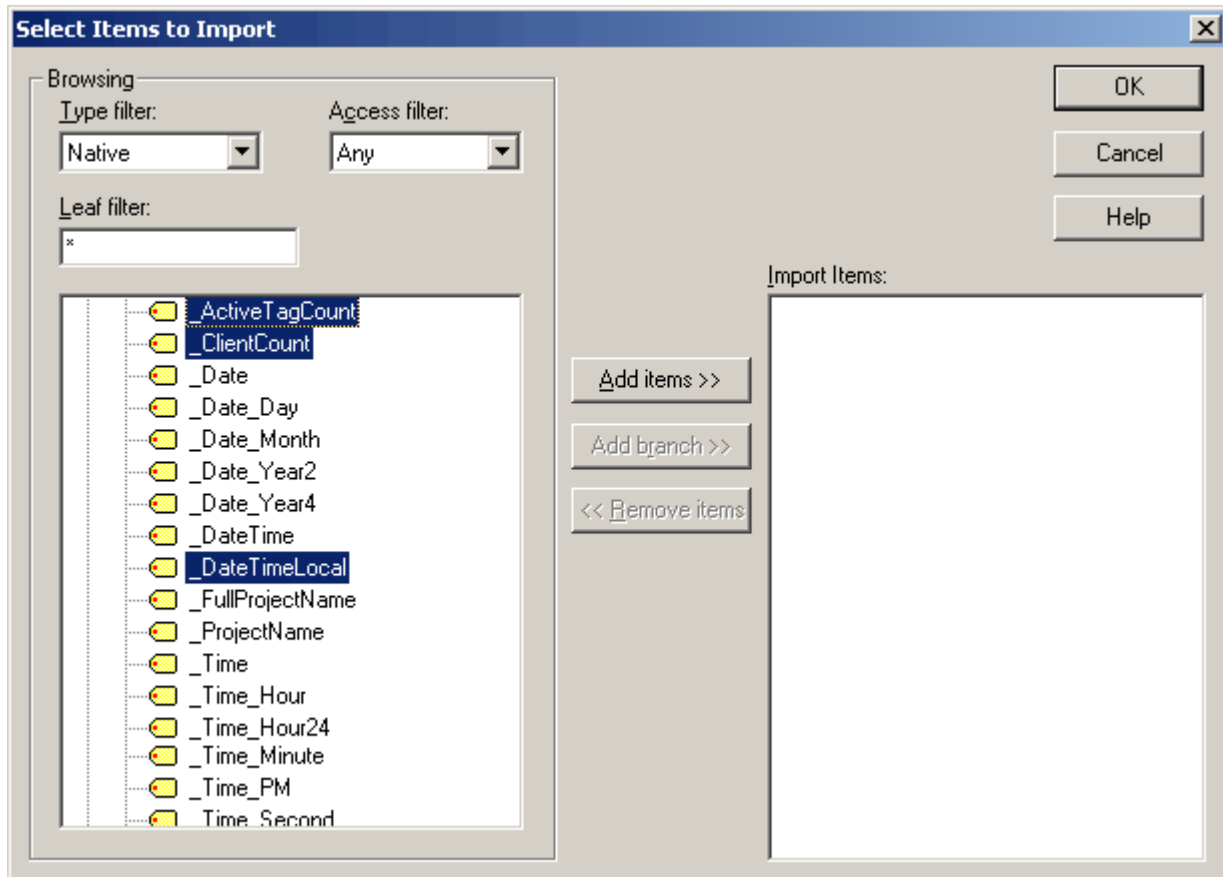


The driver adds all items to the tree and then validates them in the **Import Items** list. To add items to import, select them from the tree and click **Add Items >>**. The Import Items list will show the items that will be imported. To remove items from import, simply select and click **<< Remove Items**. Then, select **OK**.

The driver browses the server's address space and displays the results in the tree control on the left. Items selected for import will appear in the list control on the right. To populate the Import Items list, select one or more items in the

browse tree and then click **Add Items >>**. To add items under a specific branch, first select that branch and then click **Add branch >>**. To remove items from the Import Items list, simply select one or more items in the browse tree and then click **<< Remove Items**. To add the selected items to the current tag database, click **OK**.

**Note:** The Import Item list box is only a list of tags that the user would like to import. The driver will validate the tags after the device has completed configuration. Any tag found to be invalid will not be created. A message will be posted on the event log.



### Watchdog Callback Monitoring

The **Update by Exception Mode** setting is generally more efficient than polling. For example, users may not know whether a long time between update notifications is because none of the values associated with the group have remained the same or whether the underlying OPC server (or COM callback connection) has failed.

Because of this uncertainty, it is recommended that users employ a watchdog. This is an item configured in the underlying OPC server, whose value will change at least once per update period. As long as this item is referenced by the driver, it will force an update notification for every update period. When the watchdog monitoring feature is enabled, the driver will track the time since the last update. When this time exceeds a predefined limit, the driver will assume there has been a failure and will attempt to reconnect to the server.

**Note:** For more information, refer to [Watchdog Device Property](#).

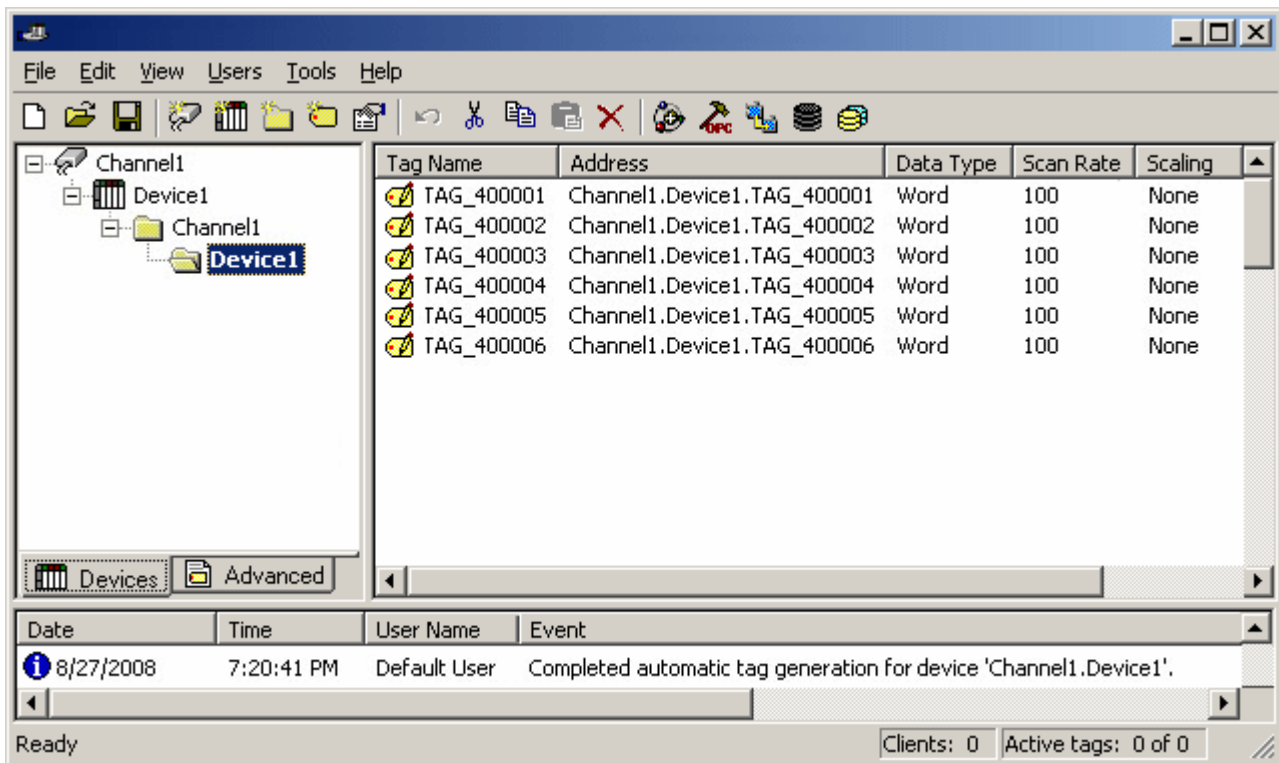
### Data Types Description

Data Type	Description
Boolean	Single bit
Byte	Unsigned 8 bit value

	bit 0 is the low bit bit 7 is the high bit
Char	Signed 8 bit value  bit 0 is the low bit bit 6 is the high bit bit 7 is the sign bit
Word	Unsigned 16 bit value  bit 0 is the low bit bit 15 is the high bit
Short	Signed 16 bit value  bit 0 is the low bit bit 14 is the high bit bit 15 is the sign bit
DWord	Unsigned 32 bit value  bit 0 is the low bit bit 31 is the high bit
Long	Signed 32 bit value  bit 0 is the low bit bit 30 is the high bit bit 31 is the sign bit
Float	32 bit floating point value.  The driver interprets two consecutive 16 bit registers as a floating point value by making the second register the high word and the first register the low word.
Double	64 bit floating point value
String	Zero terminated character array
Date	Date YYYY-MM-DDTHH:MM:SS.MMM

### **Address Descriptions**

The OPC DA Client driver address descriptions refer to fully qualified Item IDs of the server item.



## Error Descriptions

The following error/warning messages may be generated. They are listed here in alphabetical order. Click on the link for a description of the message.

[Add item failed for '<item>' on device '<device>'. Function error: <error code>](#)

[Add item failed for '<item>' on device '<device>'. Item error: <error code>](#)

[Add watchdog item failed for '<item>' on device '<device name>'. Item error: '<error code>'. '<error description>'](#)

[Array tag\(s\) were not imported for device '<device>'. Arrays are not supported by this driver](#)

[Async Write 1.0 failed for '<item>' on device '<device>'. Callback item error: <error code>](#)

[Async Write 1.0 failed for '<item>' on device '<device>'. Function error: <error code>](#)

[Async Write 1.0 failed for '<item>' on device '<device>'. Item error: <error code>](#)

[Async Write 2.0 failed for '<item>' on device '<device>'. Callback item error: <error code>](#)

[Async Write 2.0 failed for '<item>' on device '<device>'. Function error: <error code>](#)

[Async Write 2.0 failed for '<item>' on device '<device>'. Item error: <error code>](#)

[Failed to acquire item management interface for device '<device>'](#)

[Failed to add group for device '<device>'. Reason: <error code>](#)

[Failed to connect to server on channel '<channel>'](#)

[Failed to establish callback for device '<device >'](#)

[Reconnecting server on channel '<channel>' due to GetStatus failure](#)

[Reconnecting server on channel '<channel>' due to shutdown notification](#)

[Reconnecting server on channel '<channel>' due to watchdog failure on device '<device>'](#)

[Tag '<item>' on device '<device>' was not imported. Data type is not supported by this driver](#)

[Tag '<item>' on device '<device>' was not imported. Item failed OPC server validation](#)

**[Add item failed for '<item>' on device '<device>'. Function error: <error code>](#)**

**Error Type:**

Serious

**Possible Cause:**

The server rejected an add items request.

**Result:**

The driver will not be able to read or write to the associated tag(s).

**Solution:**

The solution depends on the specific error code. There is most likely a problem in an underlying server (such as resource limits).

---

**Add item failed for '<item>' on device '<device>s' Item error: <error code>**

---

**Error Type:**

Serious

**Possible Cause:**

The server failed to add the specified item.

**Result:**

The driver will not be able to read or write to the associated tag(s).

**Solution:**

Verify that the Item ID set for the tag is valid.

---

**Add watchdog item failed for ' <item>' on device '<device>'. Item error: '<error code>'. '<error description>'**

---

**Error Type:**

Warning

**Possible Cause:**

The driver failed to add the specified watchdog item. The particular reason can be determined from the error code. The driver will include an error description in this message when available from the server. The specified Item ID is not usually valid in the current server configuration.

**Solution:**

Verify the watchdog's Item ID and change it as needed.

---

**Array tag(s) were not imported for device '<device>'. Arrays are not supported by this driver**

---

**Error Type:**

Warning

**Possible Cause:**

The driver does not currently support array data.

**Solution:**

Break the array elements into individual tags in underlying server.

---

**Async Write 1.0 failed for '<item>' on device '<device>'. Callback item error: <error code>**

---

**Error Type:**

Warning

**Possible Cause:**

The server processed the write request, but failed to successfully write to the underlying device.

**Solution:**

Verify that communications to device are good and that the point is writable.

**Async Write 1.0 failed for '<item>' on device '<device>'. Function error: <error code>****Error Type:**

Warning

**Possible Cause:**

The server rejected a write request that included the indicated item.

**Solution:**

The solution depends on the specific error code. There is most likely a problem in the underlying server (such as resource limits).

**Async Write 1.0 failed for '<item>' on device '<device>'. Item error: <error code>****Error Type:**

Warning

**Possible Cause:**

This message will be logged if the item was included in a write request that was rejected because of one or more invalid items. The error code here will indicate if this was one of the invalid items.

**Solution:**

Verify that Item ID is valid and that item is valid.

**Async Write 2.0 failed for '<item>' on device '<device>'. Callback item error: <error code>****Error Type:**

Warning

**Possible Cause:**

The server processed the write request, but failed to successfully write to underlying device.

**Solution:**

Verify that communications to device are good and that point is writable.

**Async Write 2.0 failed for '<item>' on device '<device>'. Function error: <error code>****Error Type:**

Warning

**Possible Cause:**

The server rejected a write request that included the indicated item.

**Solution:**

The solution depends on the specific error code. There is most likely a problem with an underlying server (such as resource limits).

**Async Write 2.0 failed for '<item>' on device '<device>'. Item error: <error code>****Error Type:**

Warning

**Possible Cause:**

The server was unable to process a write request for this item. Other items in request may have been accepted.

**Solution:**

Verify that the Item ID is valid and that the item is valid.

**Failed to acquire item management interface for device '<device>'****Error Type:**

Serious

**Possible Cause:**

The driver was not able to obtain the item management COM interface from the server.

**Result:**

The driver will not be able to read or write to tags associated with device/group.

**Solution:**

This is a required interface. Contact Technical Support.

**Failed to add group for device '<device>'. Reason: <error code>****Error Type:**

Serious

**Possible Cause:**

Server rejected request to add specified group.

**Result:**

The driver will not be able to read or write to tags associated with device/group.

**Solution:**

The solution depends on the specific error code. Because the error may have been caused by a duplicate group name, try a different name in the OPC Group device properties page. It may also be due to a problem in an underlying server (such as resource limits).

**Failed to connect to server on channel '<channel>'****Error Type:**

Serious

**Possible Cause:**

Could not connect to server.

**Solution:**

Check the Program ID, machine name and network connection.

**Failed to establish callback for device '<device >'****Error Type:**

Serious

**Possible Cause:**

The driver was not able to establish a COM callback for the device/group.

**Result:**

The driver will not be able to read, write or receive data change notification for tags associated with the device or group.

**Solution:**

1. Verify that OPC DA 1.0 or 2.0 is supported.
2. Verify the DCOM settings (if from a remote server).

---

**Reconnecting server on channel '<channel>' due to GetStatus failure**

---

**Error Type:**

Warning

**Possible Cause:**

The driver did not receive a response to the GetStatus request. A server, network or COM failure is assumed.

**Solution:**

The driver will automatically reconnect.

---

**Reconnecting server on channel '<channel>' due to shutdown notification**

---

**Error Type:**

Warning

**Possible Cause:**

The server has sent a notification that it is shutting down.

**Solution:**

The driver will automatically reconnect.

---

**Reconnecting server on channel '<channel>' due to watchdog failure on device '<device>'**

---

**Error Type:**

Warning

**Possible Cause:**

The time that elapsed since the last data change notification was longer than the configured limit. A server, network or COM failure is assumed.

**Solution:**

The driver will automatically reconnect.

---

**Tag '<item>' on device '<device>' was not imported. Data type is not supported by this driver**

---

**Error Type:**

Warning

**Possible Cause:**

The data type that was entered is not supported by the driver.

**Solution:**

Enter a data type that is supported by the driver.

**Tag ' <item>' on device '<device>' was not imported. Item failed OPC server validation**

---

**Error Type:**

Warning

**Possible Cause:**

The item selected for import did not have a valid Item ID. Some servers provide Item IDs that are intended to give the user information, but are not themselves valid Item IDs. For example, this server provides driver address syntax hints to the browser.

**Solution:**

This error can be avoided by not selecting special purpose Item IDs in the import item browser; however, no harm is done by selecting them.

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