

# **Advanced Simulator Driver Help**

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## Advanced Simulator Driver Help

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Help version 1.006

### CONTENTS

#### [Overview](#)

What is the Advanced Simulator Driver?

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### Overview

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The Advanced Simulator Driver was designed specifically for use with 32 bit OPC server products running on Intel microprocessor based computers. For operating system (OS) requirements, please refer to the OPC server help documentation.

This driver provides single-point access to multiple ODBC data sources via ODBC. The driver simulates live data by traversing through all the records in the selected table at a rate set by the user. Using the power and speed of OPC, the server is able to offer ODBC data to any OPC/DDE enabled client.

**Note:** This is the specific help file for the Advanced Simulator Driver plugin. Please refer to the main OPC server help file for information on general OPC server topics.

### Supported ODBC Data Sources

Supports any ODBC compliant data source including the following:

- Microsoft Access
- Microsoft SQL
- Oracle
- Sybase
- MySQL

#### Also includes and supports:

- Multiple connection sessions to multiple ODBC data sources
- Auto tag generation from your ODBC data source
- OPC DA
- Drag and drop editing, and CSV import and export for manipulating large numbers of tags easily
- New tags that can be added to your application at any time - even at runtime
- Running as a Windows NT Service

### Driver Setup

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#### Supported ODBC Data Sources

Supports any ODBC-compliant data source, including the following:

- Microsoft Access
- Microsoft SQL

- MySQL (see "MySQL Notes" below)
- Oracle
- Sybase

**Also includes and supports:**

- Multiple connection sessions to multiple ODBC data sources
- Auto tag generation from your ODBC data source
- OPC DA
- Drag and drop editing, and CSV import and export for manipulating large numbers of tags easily
- New tags that can be added to your application at any time - even at runtime
- Running as a Windows NT Service

**If the project uses a MySQL data source:**

- Select **MySQL** from the **Model** drop-down list when creating a device. The driver will accommodate the data handling requirements specific to MySQL.
- Install MyODBC driver on the PC that is running this OPC server.

**Communication Protocol**

ODBC API

**Requirements**

MDAC - Microsoft Data Access Components (it consists of several core components that provide various database technologies; including ODBC and its drivers.)

**Maximum Channels and Devices**

The maximum number of channels supported by this driver is 100. The maximum number of devices is 4096 per channel.

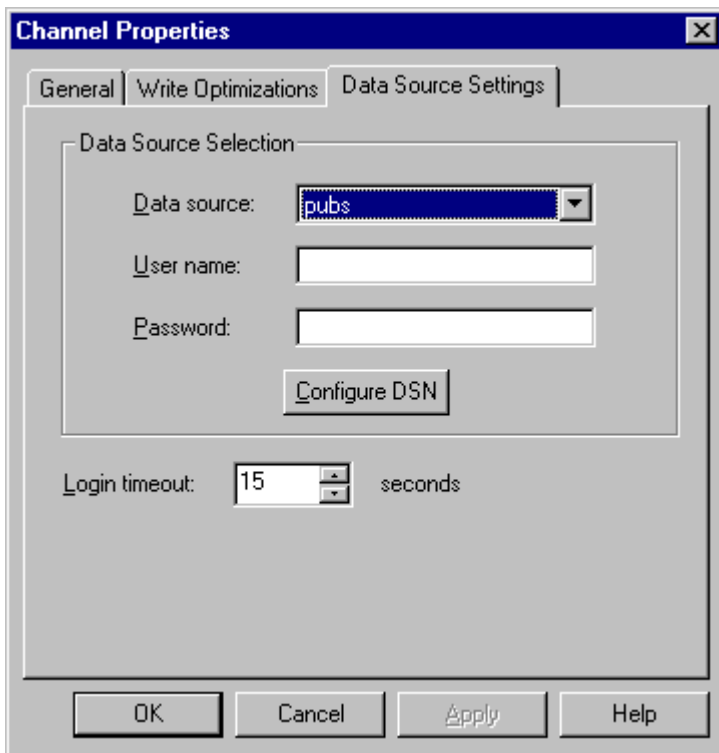
**General**

The first step in creating a server project is to create a channel. Select Advanced Simulator from the list of available device drivers in the Channel Creation Wizard. In the case of this driver, the channel corresponds to the Advanced Simulator driver and its particular ODBC data source.

**Data Source Settings**

---

The data source settings page located under channel properties allows you to configure various data source settings.



### Data Source

The data source drop down allows you to select a Data Source Name (DSN) from a list of DSNs. You will need to create and configure a DSN for your data source before it will appear in the drop down menu.

### Create and Configure a DSN

Follow the instructions below for information on how to create a DSN.

**Note:** A DSN must be configured before you can access your particular ODBC database.

1. Click **Configure DSN** to open the **ODBC data source administrator**.
2. Select either the **User DSN** or **System DSN** tab from the ODBC data source administrator. Data source types are local to the computer: the User DSN is user-dedicated, whereas the System DSN can be accessed by any user with privileges.
3. Map an ODBC data source to a data source name.
4. Once you have successfully setup a DSN, it should appear in the data source drop down.

**Note:** For more details on setting up an ODBC data source, see [Data Source Setup](#).

### User Name and Password

The User Name and Password settings are needed only if the data source requires it. For example, if you were to use SQL server authentication then you would use these fields.

**Note:** Some data sources allow you to use Windows NT Authentication to gain access to the data source. If your data source is set up to use Windows NT Authentication, the data source will ignore the User Name and Password under the data source settings page and will use the network Login ID. For more information, refer to [Data Source Authentication](#).

### Login Timeout

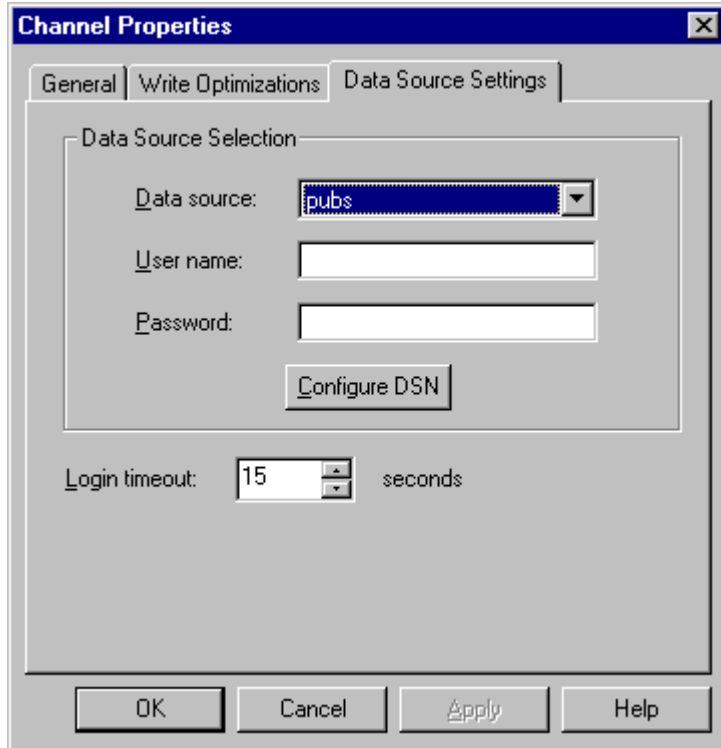
The number of seconds the server will wait for a response before timing out when attempting to connect to the ODBC data source. The default 5 seconds. The range is 1-99999 seconds.

## Data Source Setup

The following directions instruct on how to set up a data source in the OPC server using the Advanced Simulator driver.

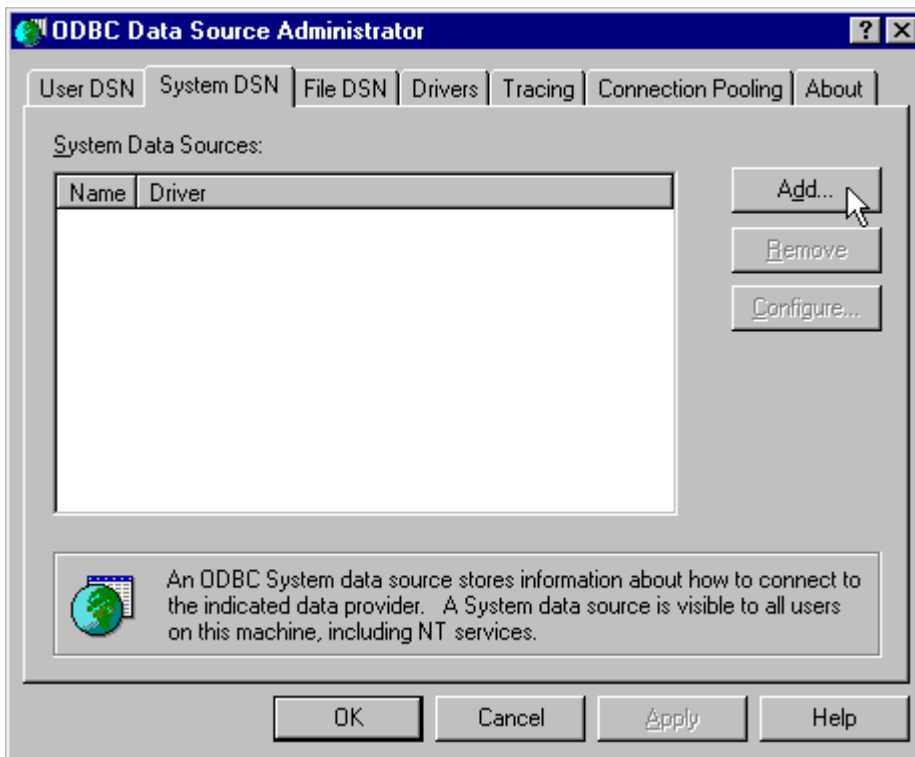
**MySQL Users Note:** If you are using MySQL, the MyODBC driver must be installed on the PC that is running this OPC server.

1. Create a channel in the OPC server project. Then, right-click and select **Properties** on an existing channel in the OPC server application to setup the **ODBC data source**.
2. In the **Data Source Settings** section of the Channel Wizard or property page, click **Configure DSN**.

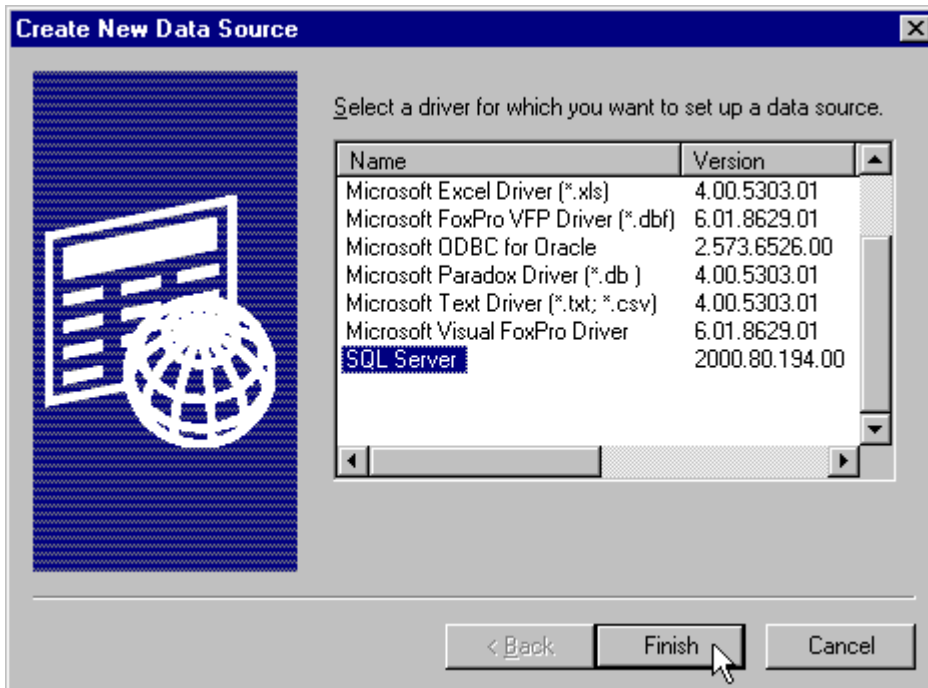


3. In our example, **System DSNs** are used. System DSNs are local to the computer but not user-dedicated; any user with privileges can access a system DSN. You may choose **User DSN**, which is local to a computer and accessible only by the current user.

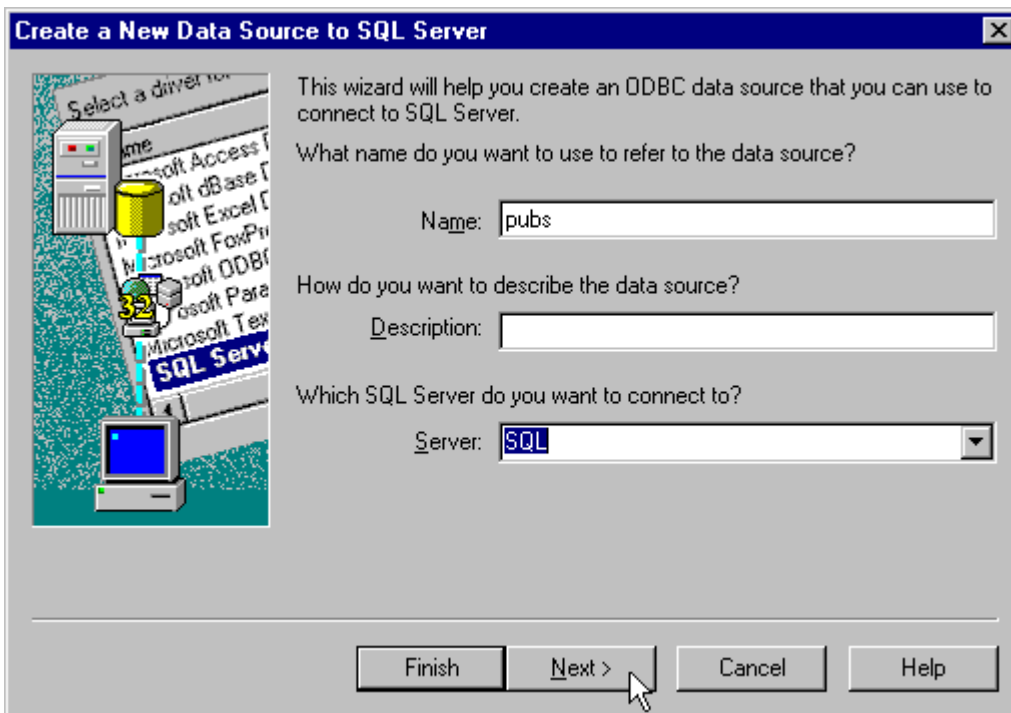
4. Click **Add**.



5. Select the desired data source. In our example, we have used the SQL Server Data Source.

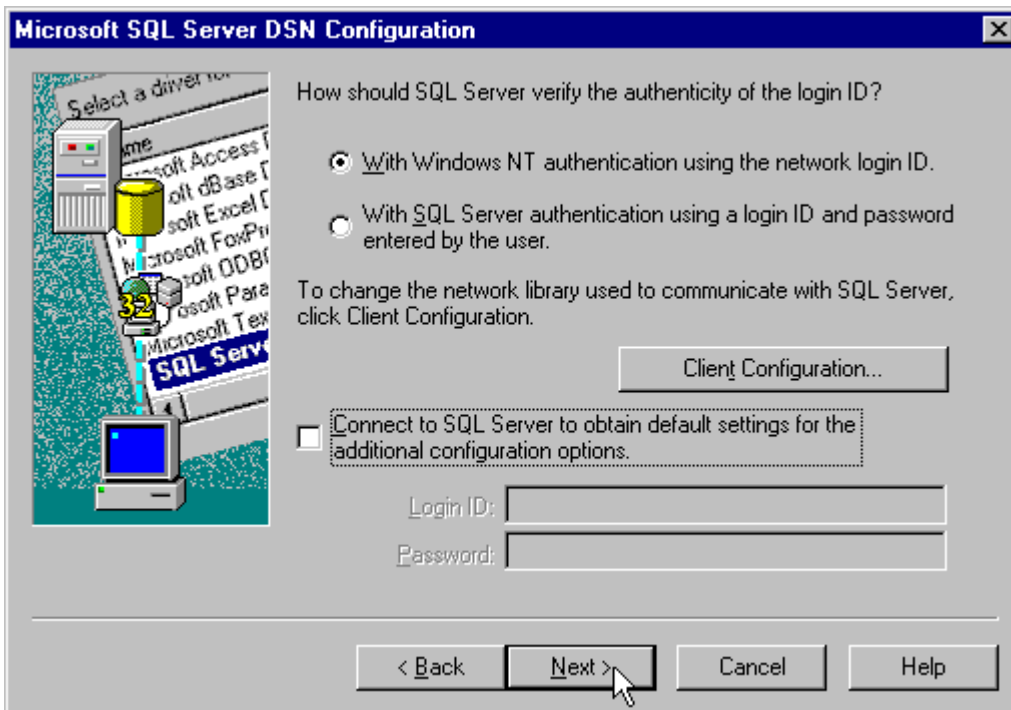


6. Name the ODBC data source and select the **SQL database** to connect it to. Then, click **Next**.

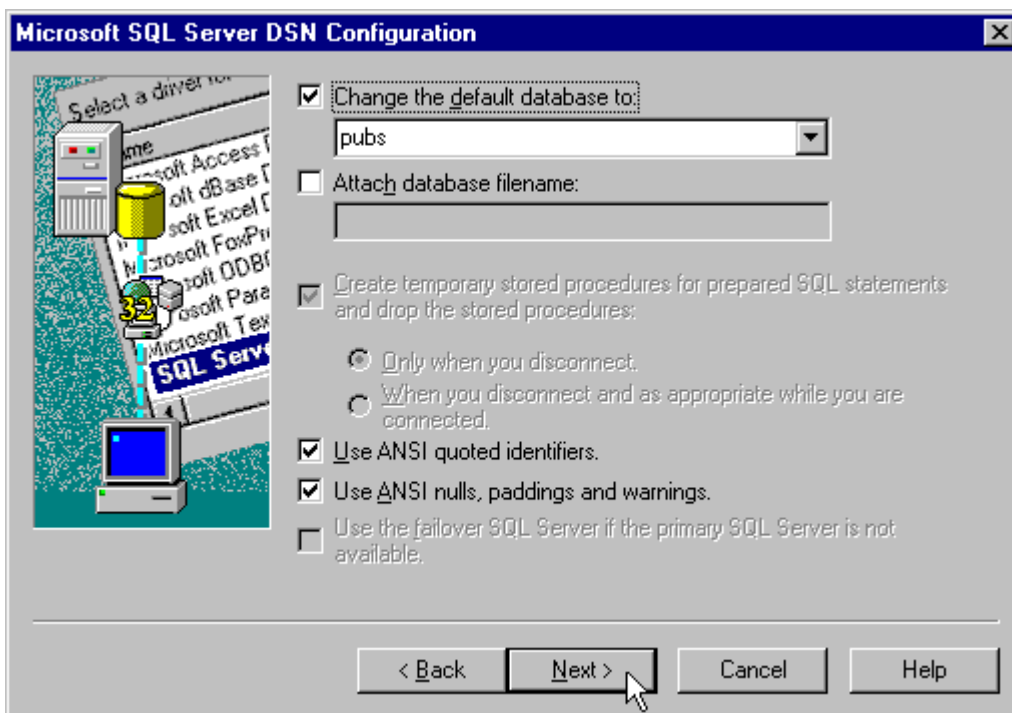


7. Make sure the **Windows NT Authentication** default is selected. Then, click **Next**.

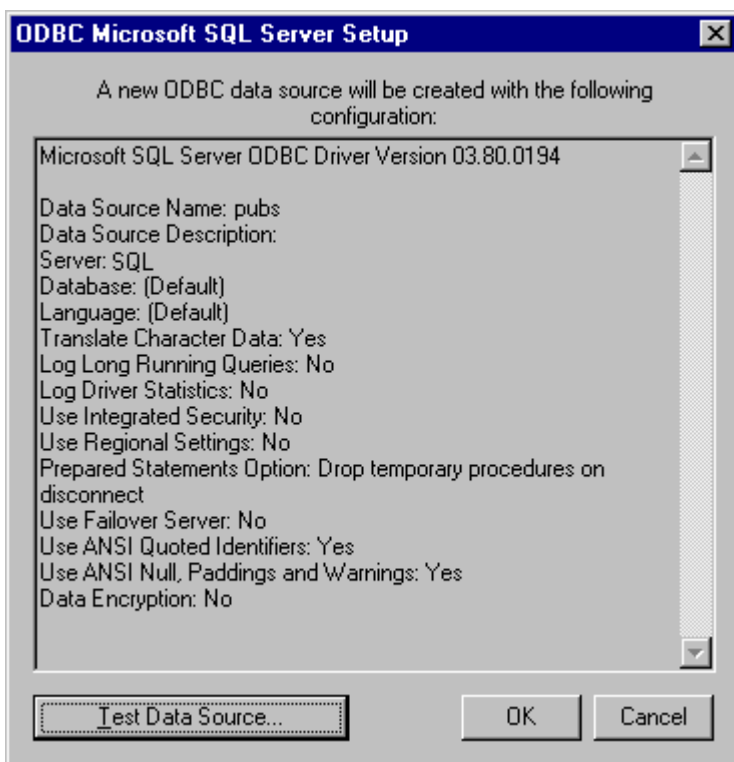
**Note:** If you plan to use the OPC server in NT Service mode see [Running as an NT Service](#).



8. Change the default database to the one you will be connecting to. If the database is unavailable, select the default.



9. Continue through the Wizard, keeping the defaults as the remaining settings. Test the data source connection at the end by selecting **Test Data Source**. If the connection is good, you will receive the message **Test Successful**.



## Tables

### Selecting Tables

Select a table from which data will be accessed. All table names available from the ODBC data source are available for selection.

Table selection:

Categories

A number of tags are automatically generated in the server's tag database depending on the number of fields in the selected table. An internal control tag is also generated, in order to access data.

Internal Control Tag	Read/Write Access	Description
MoveTo	Read/Write	Move to a specified record number

The 'MoveTo' internal tag moves (forward or backward) to the specified record number and continues updating the tags from this new position (at the specified record selection interval.) For more information, refer to [Timing](#).

## Timing

The driver simulates live data by traversing through all the records in the selected table at a rate set by the user. The tags are initialized to the data contained in the first record. The driver automatically selects the next record in the table at the set interval. The tags contain the data from the selected record. When the last record in the table is reached, the user has the option to automatically start with the first record.

### Record Selection Interval

You can set the time interval for the driver to read the next record from the selected table. The driver updates the tags at these intervals. The valid range is 100 milliseconds to 99999999 milliseconds.

Record Selection Interval:  milliseconds

If the checkbox below is checked, the driver will start reading from the first record when the last record is reached. If it is not checked, the driver will stop at the last record.

Automatically move to the first record when the last record is reached.

## Running as an NT Service

### Running as an NT Service

Normally an OPC server that only supports stand alone program operation is forced to shut down when its host machine experiences a user login or logout. This server, however, can continue to supply OPC data across user login sessions by running as an NT service. The ability to run as an NT service is crucial for many applications where the server must provide data to OPC clients via DCOM. For these applications, the loss of a DCOM connection cannot be tolerated.

**Note:** For more information on running as an NT service, see the general server help file found under **Help | Contents** in the OPC server application.

**See Also:** [Connecting remotely in NT Service mode](#)

### Connecting remotely as an NT service

This ODBC communications application supports running as a service under Windows NT/2000. If set to NT service mode, this application by design will use the system account (anonymous user) instead of a user account. This could pose a problem if you are using Windows NT Authentication to connect to your remote data source. An error message may appear stating "Login failed for user NT AUTHORITY\ANONYMOUS LOGON" in the OPC server. Although it is possible to set your data source to allow "anonymous logon" (in which case you may use Windows NT Authentication but it will not be secure), we recommend the use of **SQL Authentication** if you need a secure connection while the

OPC server is running in NT service mode.

**See Also:**

[Running as an NT Service](#)

[Setting up SQL Authentication](#)

[Data Source Authentication](#)

## Data Source Authentication

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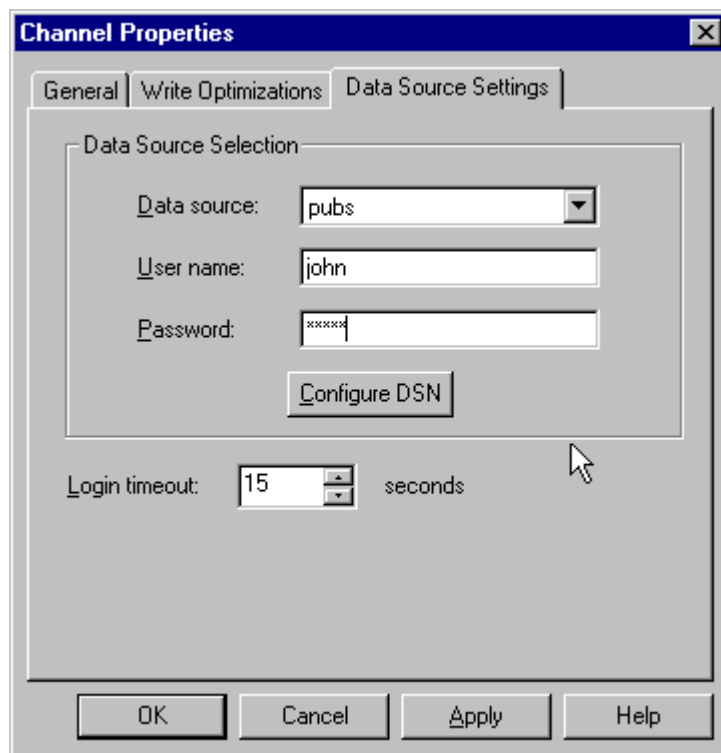
### Windows NT authentication

Some data sources may be configured to use authentication for security. One such data source is SQL server. SQL Server can authenticate with Windows NT authentication by default using the network Login ID, thus making the SQL server logon transparent. This eliminates the need for a user to enter a user name and password within the OPC server data source setting page.

### SQL Server authentication

SQL server also has its own authentication method. In order to connect the OPC server to SQL server using SQL authentication, you must first set the authentication method in SQL server to allow SQL authentication as well as define the Login ID and Password. Once you have done this, you may then enter the user name and password within the OPC server under the Channel Properties data source setting page.

**See Also:** [Setting up SQL Authentication](#) and [Running as an as NT Service](#).



## Setting up SQL Authentication

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The following instructions are on how to setup up SQL authentication. This is only necessary when attempting to connect remotely to SQL server while running as an NT service.

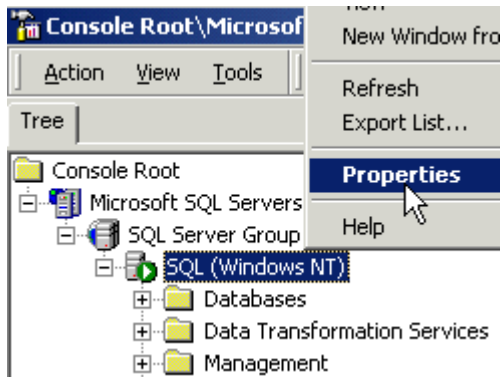
**See Also:**

[Running as an NT Service](#)

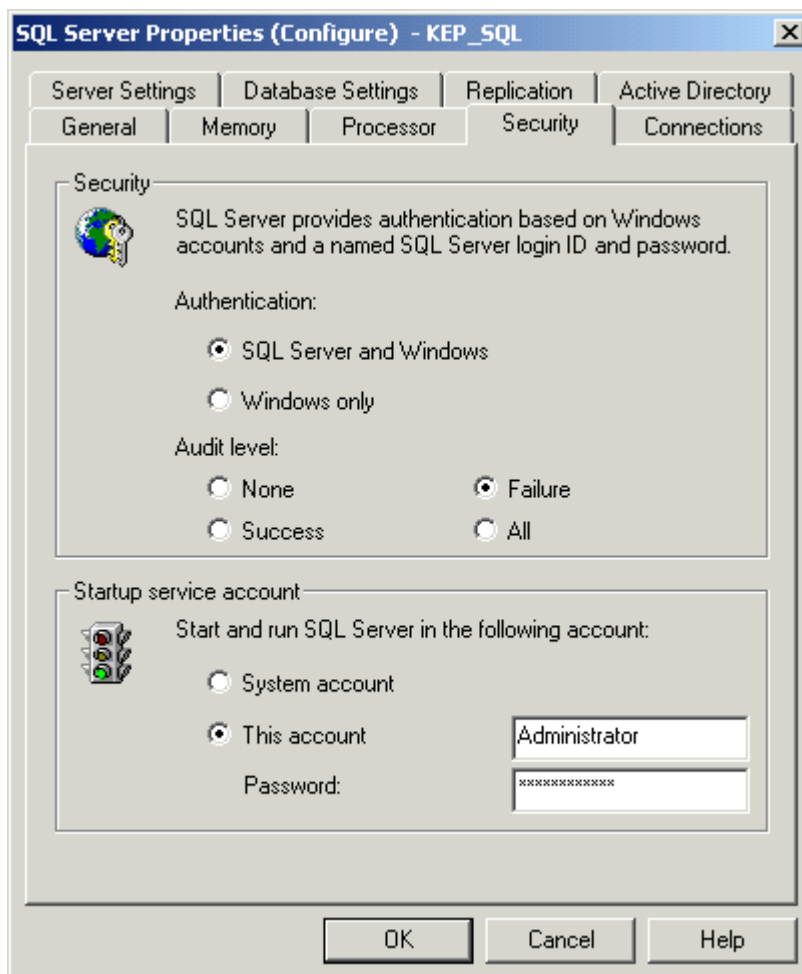
[Connecting remotely as an NT service](#)

[Data Source Authentication](#)

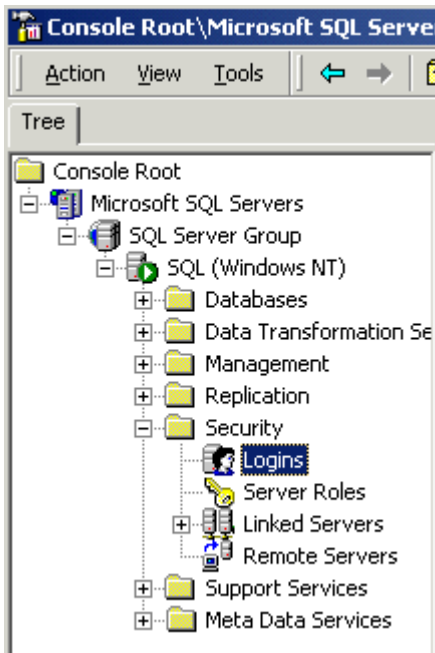
1. In **SQL manager**, right-click on the SQL server icon in the tree and open the **SQL Server properties**.



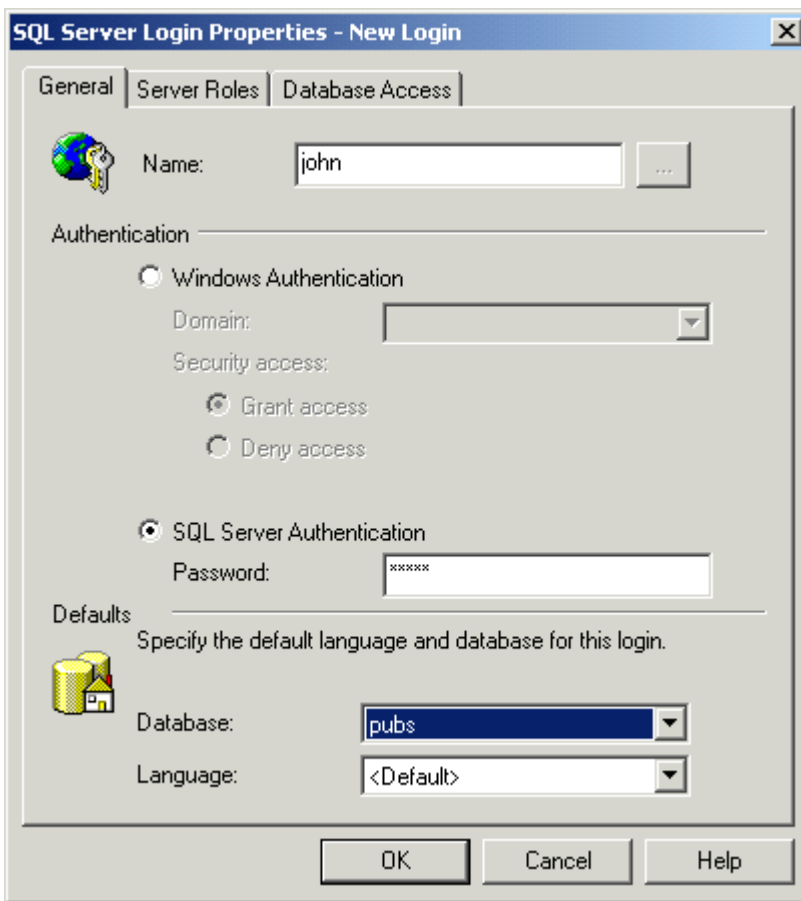
2. Select the **Security** tab and choose the **mixed authentication mode** (SQL Server and Windows radio button).



3. In the tree menu, right-click on the security folder. Click **Logins** and select **New User**.

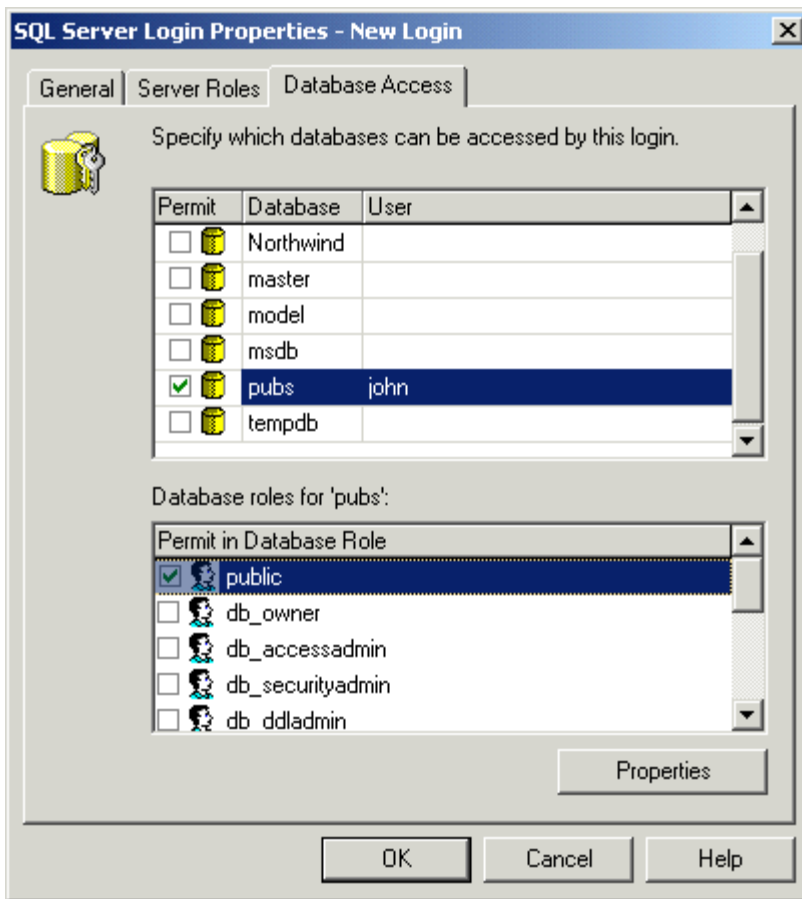


4. In the **General** tab of the New Login window, define a user name and password.



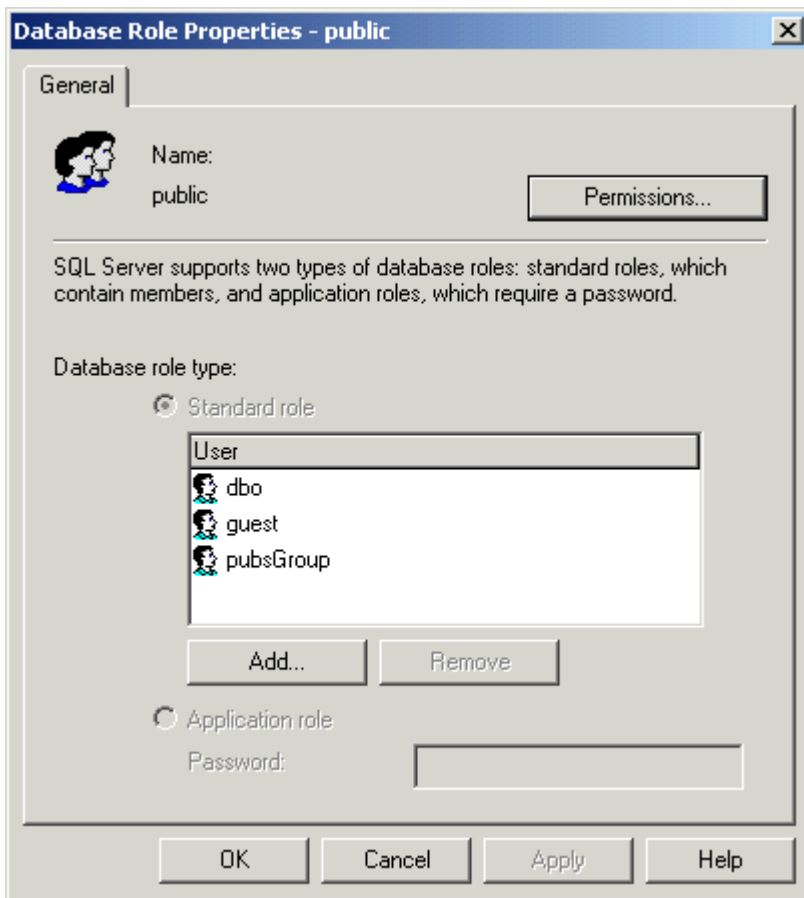
5. In the **Database Access** tab, select the database to which the user will connect.

6. Select a role for the database. In this example, **public** is used.

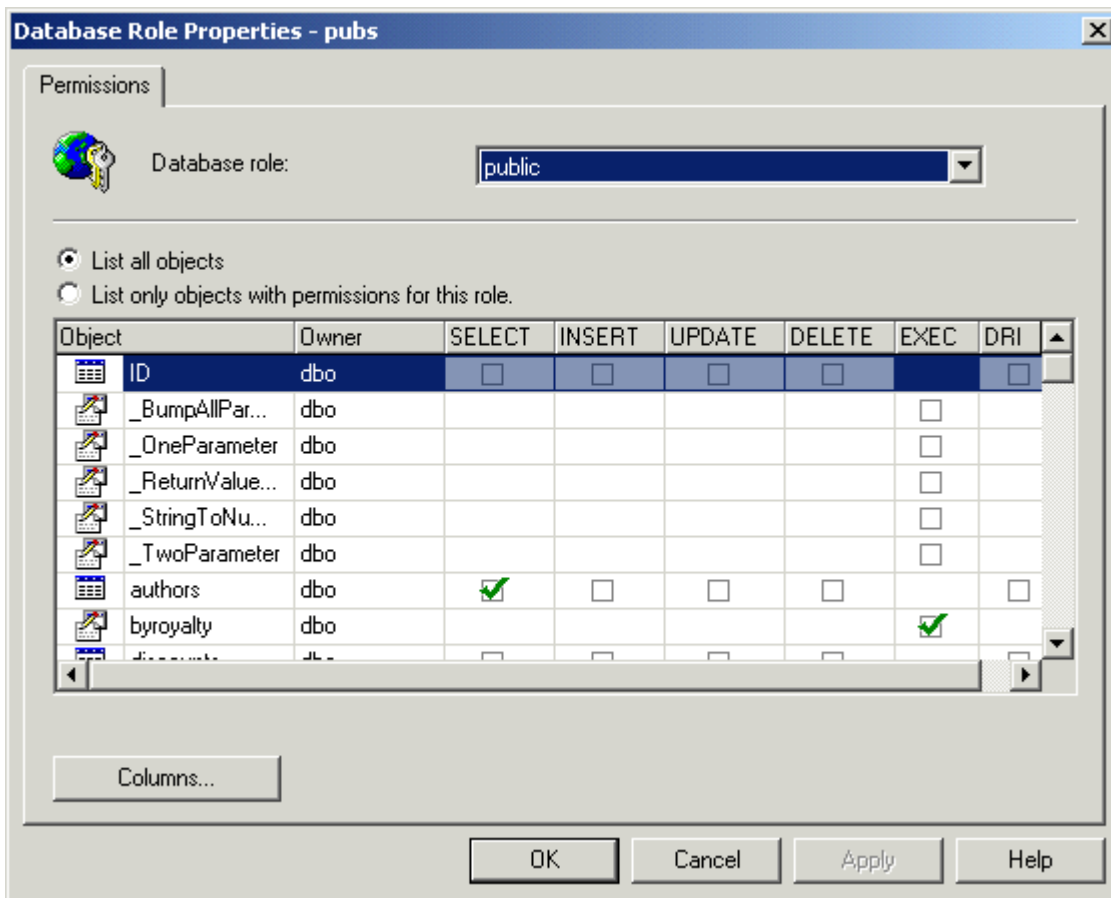


7. Select **Properties** at the bottom of the page.

8. In **Database Role Properties**, click on the **Permissions...** button.

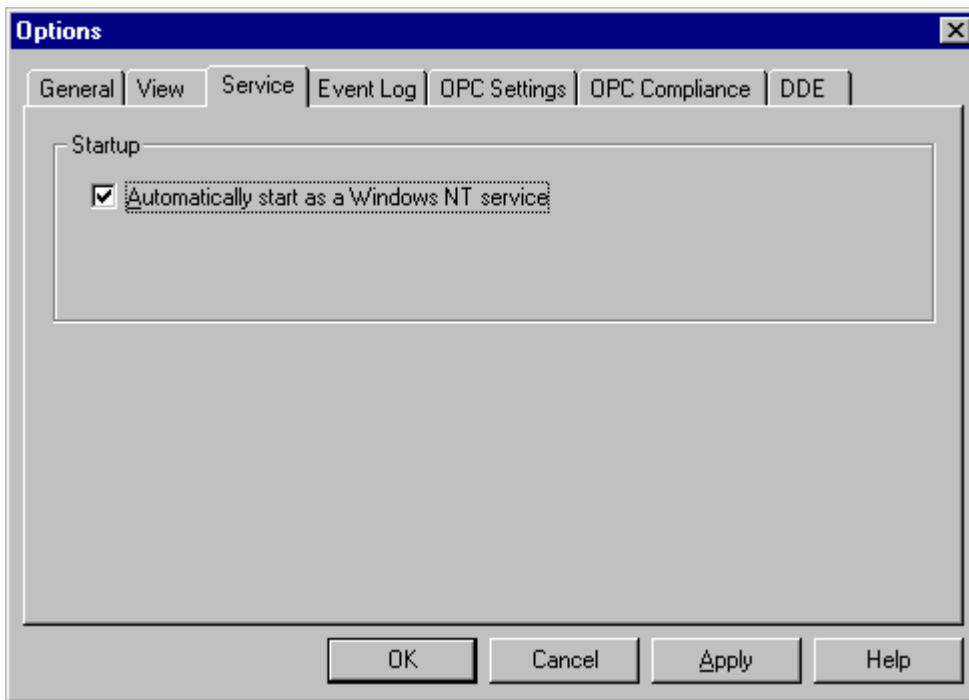


9. Check the boxes of the objects that the user will be able to access. In this example, the user is allowed to perform "Select" queries on the "author" table.

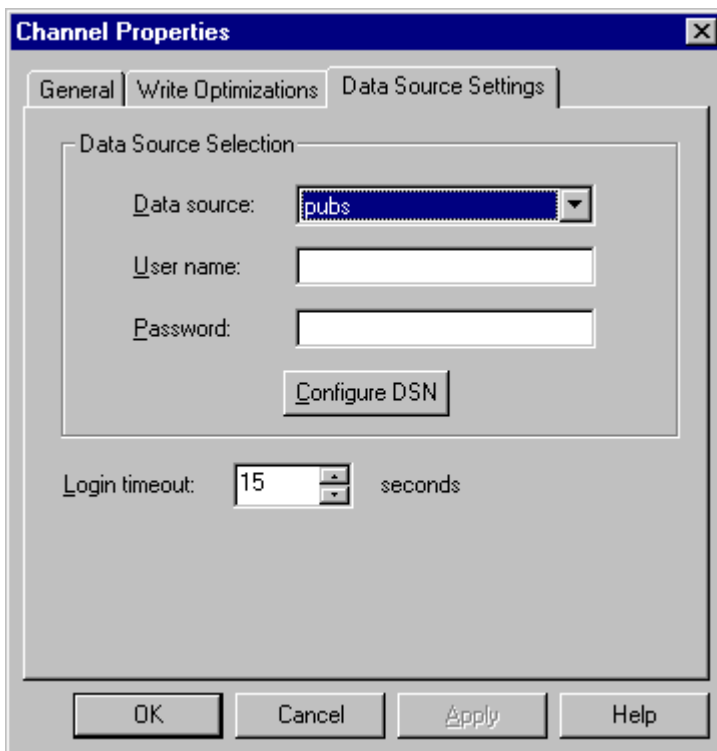


10. At this point, the data source name (DSN) should already be setup. If not, please proceed to [ODBC Data Source Setup](#) before continuing on.

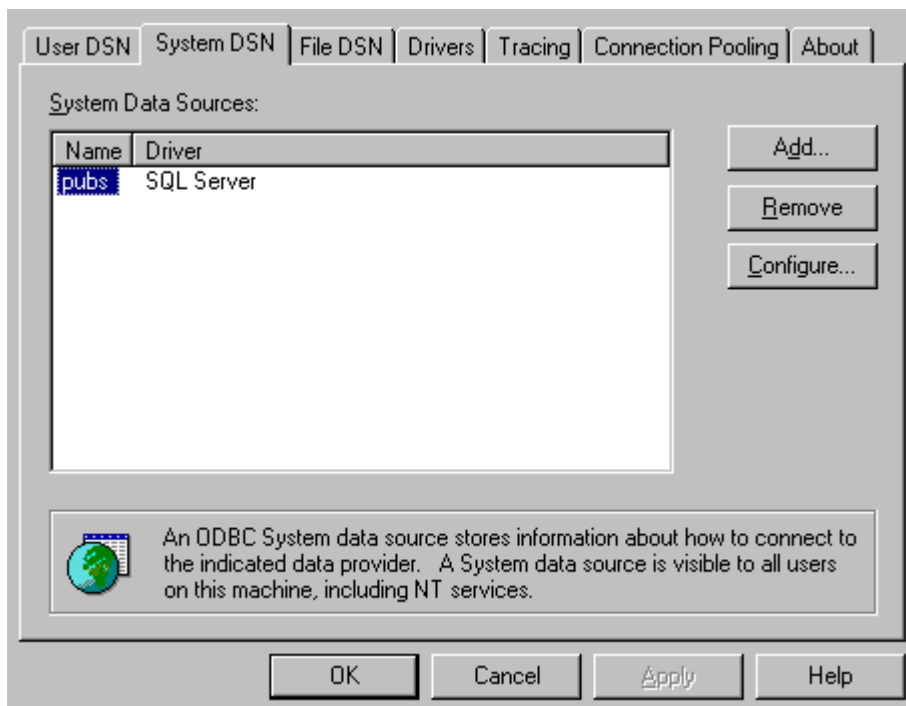
11. In the OPC server, select **Tools|Options**. Then select the **Service** tab, and click the check box to **enable NT Service Mode**.



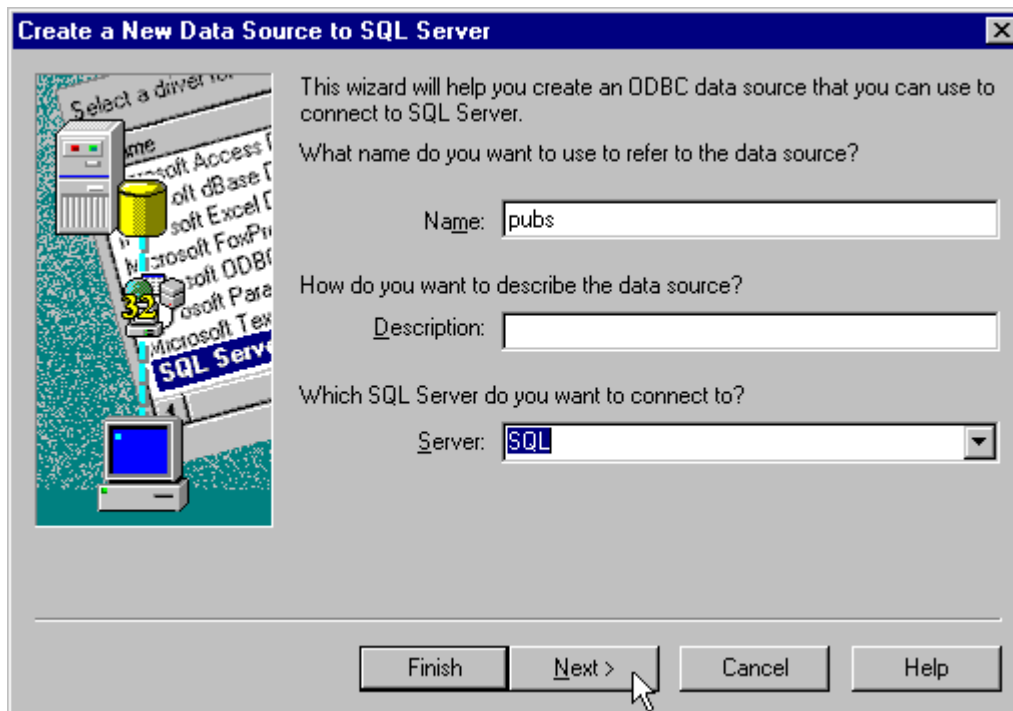
12. In the OPC Server application, right-click on the channel and select **Properties**. Click on the **Data Source Settings** tab and select **Configure DSN**.



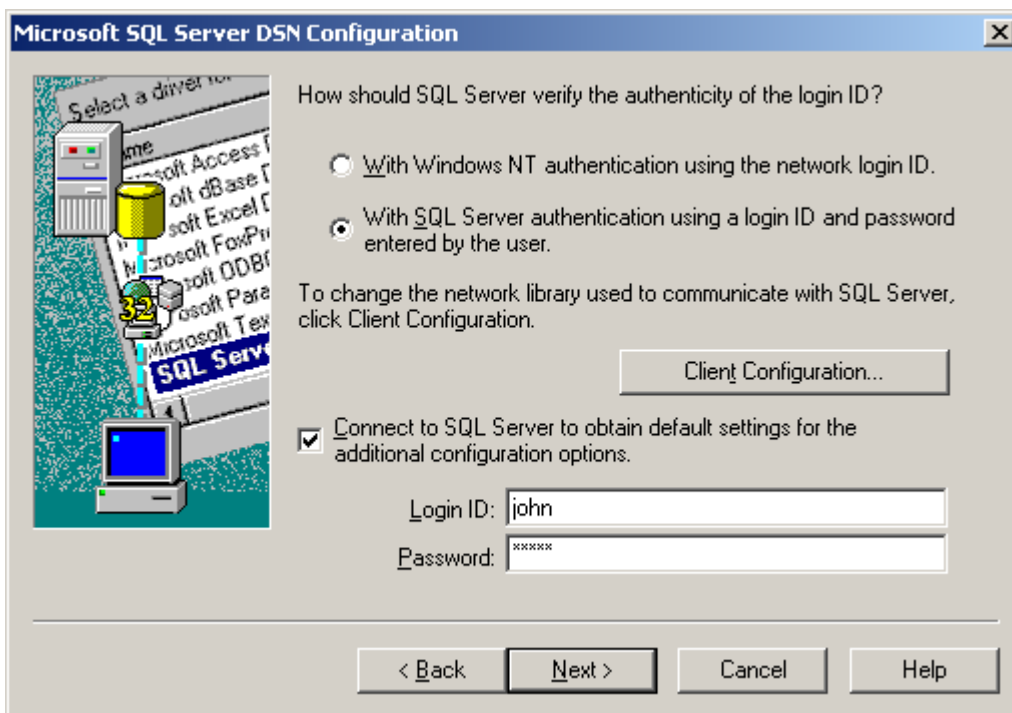
13. Select the DSN that was created and then click **Configure**.



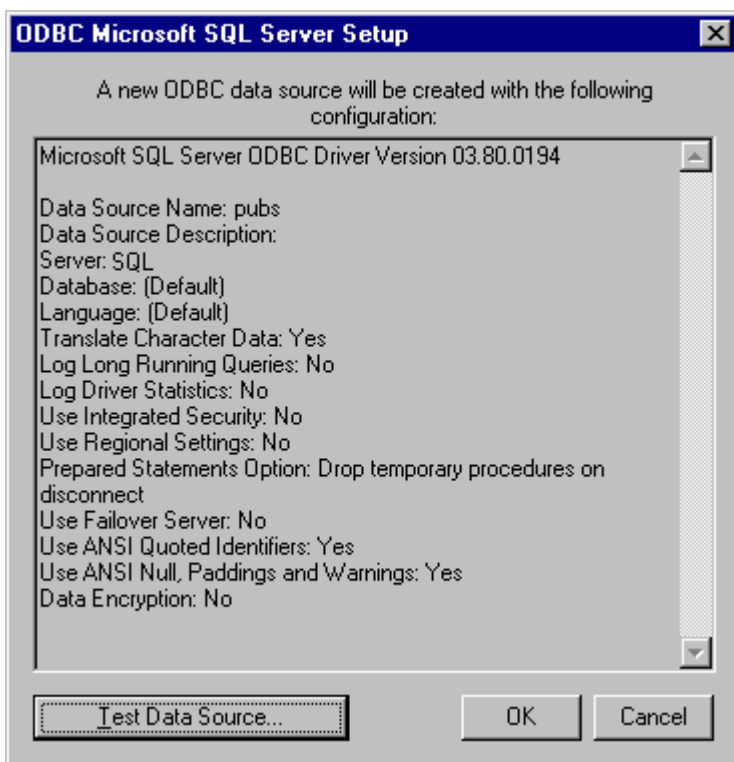
14. Confirm the data source name and the server name and then select **Next**.



15. Select the **SQL Server Authentication** radio button. Check the box next to "**Connect to SQL Server to obtain default settings...**" and then enter the user name and password for the user defined in the SQL Server.



16. Continue through the Wizard keeping the defaults for the remaining settings. Test the data source connection at the end by selecting **Test Data Source**. If the connection is good, you will receive the message **Test Successful**.



## 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. This driver limits string lengths to 256 characters.

**Note:** The default data type is String.

## Address Descriptions

Tag validation will only occur when a tag is requested by a client application. If a link to the ODBC data source can not be made by the driver, or the address that the tag references can not be resolved by the driver (i.e. the address can not be mapped to data set in the ODBC data source), then the tag's data quality will be set to bad. The appropriate [error message](#) will be placed in the OPC server's event log.

## Error Descriptions

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

### Address Validation

[Missing address](#)

[Device address '<address>' contains a syntax error](#)

[Data Type '<type>' is not valid for device address '<address>'](#)

[Device address '<address>' is read only](#)

[Array support is not available for the specified address: '<address>'](#)

### Device Status Messages

[Write request rejected on read-only item reference '<channel name><device name><address>'](#)

### Advanced Simulator Driver Specific Messages Configuration

[Unable to retrieve table names](#)

[Unable to retrieve table column names](#)

[Unable to retrieve table row count](#)

### Runtime

[Unable to connect to data source on channel '<channel name>'](#)

[Unable to open recordset on device '<device name>'](#)

[Unable to query recordset on device '<device name>'](#)

[Unable to retrieve database value for tag '<tag address>' on device '<device name>'](#)

[Unable to read internal tag '<tag address>' on device '<device name>'](#)

[Unable to write to internal tag '<tag address>' on device '<device name>'](#)

[Data source '<data source name>' is configured as read only \(all writes will be rejected\)](#)

## Address Validation

---

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

### Address Validation

[Missing address](#)

[Device address '<address>' contains a syntax error](#)

[Data Type '<type>' is not valid for device address '<address>'](#)

[Device address '<address>' is read only](#)

[Array support is not available for the specified address: '<address>'](#)

### Missing address

---

#### Error Type:

Warning

#### Possible Cause:

A tag address that has been specified statically has no length.

#### Solution:

Re-enter the address in the client application.

### Device address '<address>' contains a syntax error

---

#### Error Type:

Warning

#### Possible Cause:

A tag address that has been specified statically contains one or more invalid characters.

#### Solution:

1. Re-enter the address in the client application if the address is dynamic.
2. Re-enter the address in the server application if the address is static.

### Data Type '<type>' is not valid for device address '<address>'

---

#### Error Type:

Warning

**Possible Cause:**

A tag address that has been specified statically has been assigned an invalid data type.

**Solution:**

Modify the requested data type in the client or server application.

**Device address '<address>' is read only**

---

**Error Type:**

Warning

**Possible Cause:**

A tag address accessed by that client has requested an access mode that is not compatible with what the data source supports for that address.

**Solution:**

Change the access mode in either the client application or under device properties (if available) or under the actual tag in the server's tag data base.

**Note:**

Some data sources do not support write access while others may support write access to only certain items.

**Array support is not available for the specified address: '<address>'**

---

**Error Type:**

Warning

**Possible Cause:**

A tag address that has been specified statically contains an array reference for an address type that doesn't support arrays.

**Solution:**

Re-enter the address in the client application to remove the array reference or correct the address type.

**Device Status Messages**

---

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

**Device Status Messages**

[Write request rejected on read only item reference '<channel name><device name><address>'](#)

**Write request rejected on read-only item reference '<channel name><device name><address>'**

---

**Error Type:**

Serious

**Possible Cause:**

A tag that has been specified as read only cannot be written to.

**Solution:**

N/A

**Advanced Simulator Driver Specific Messages**

---

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

## Advanced Simulator Driver Specific Messages

### Configuration

[Unable to retrieve table names](#)

[Unable to retrieve table column names](#)

[Unable to retrieve table row count](#)

### Runtime

[Unable to connect to data source on channel '<channel name>'](#)

[Data source '<data source name>' is configured as read-only \(all writes will be rejected\)](#)

[Unable to open recordset on device '<device name>'](#)

[Unable to query recordset on device '<device name>'](#)

[Unable to retrieve database value for tag '<tag address>' on device '<device name>'](#)

[Unable to read internal tag '<tag address>' on device '<device name>'](#)

[Unable to write to internal tag '<tag address>' on device '<device name>'](#)

---

## Unable to retrieve table names

### Error Type:

Serious

### Possible Cause:

1. The ODBC data source is not available.
2. The ODBC data source does not contain any tables.

### Solution:

1. Verify the ODBC data source is configured properly, and that it is accessible by the user or from a remote machine.
2. Verify that the ODBC data source contains at least 1 table.

### Note:

The ODBC Specific Error returned by the ODBC data source driver contains specific information on the cause of the problem.

---

## Unable to retrieve table column names

### Error Type:

Serious

### Possible Cause:

1. The ODBC data source is not available.
2. The ODBC data source table does not contain any columns.

### Solution:

1. Verify the ODBC data source is configured properly, and that it is accessible by the user or from a remote machine.
2. Verify that the ODBC data source table contains at least 1 column.

### Note:

The ODBC Specific Error returned by the ODBC data source driver contains specific information on the cause of the problem.

---

## Unable to retrieve table row count

### Error Type:

Serious

### Possible Cause:

1. The ODBC data source is not available.
2. The ODBC data source table does not contain any records.

**Solution:**

1. Verify the ODBC data source is configured properly, and that it is accessible by the user or from a remote machine.
2. Verify that the ODBC data source table contains at least 1 record.

**Note:**

The ODBC Specific Error returned by the ODBC data source driver contains specific information on the cause of the problem.

**Unable to connect to data source on channel '<channel name>'**

---

**Error Type:**

Serious

**Possible Cause**

1. The ODBC data source is not available.
2. The ODBC data source is not accessible based on user name and password.

**Solution:**

1. Verify the ODBC data source is configured properly, and that it is accessible by the user or from a remote machine.
2. Verify that your authentication settings are properly configured in the data source (if applicable).

**Note:**

The ODBC Specific Error returned by the ODBC data source driver contains specific information on the cause of the problem.

**See Also:**

[Data Source Authentication](#)

**Data source '<data source name>' is configured as read only (all writes will be rejected)**

---

**Error Type:**

Serious

**Possible Cause:**

The ODBC data source is configured such that writes are not allowed.

**Solution:**

This should not create any trouble as all the tags are read only.

**Unable to open recordset on device '<device name>'**

---

**Error Type:**

Serious

**Possible Cause:**

1. The ODBC data source is not available.
2. The ODBC data source is not accessible based on user name and password.
3. The table or query specified by the device no longer exists.

**Solution:**

1. Verify the ODBC data source is configured properly, and that it is accessible by the user or from a remote machine.
2. Verify that the table or query is supported by the data source.

**Note:**

The ODBC Specific Error returned by the ODBC data source driver contains specific information on the cause of the problem.

---

**Unable to query recordset on device '<device name>'**

---

**Error Type:**

Serious

**Possible Cause:**

The ODBC data source is no longer available.

**Solution:**

Verify that the ODBC data source is accessible by the user or from a remote machine.

**Note:**

The ODBC Specific Error returned by the ODBC data source driver contains specific information on the cause of the problem.

---

**Unable to retrieve database value for tag '<tag address>' on device '<device name>'**

---

**Error Type:**

Serious

**Possible Cause:**

1. The ODBC data source is no longer available.
2. The tag represents an address that can not be resolved into a value available from the data source.

**Solution:**

1. Verify the ODBC data source is accessible by the user or from a remote machine.
2. Verify that the tag represents an address that is supported by the data source and/or access method.

---

**Unable to read internal tag '<tag address>' on device '<device name>'**

---

**Error Type:**

Serious

**Possible Cause:**

The internal tag depends on a successful response from the ODBC data source which is no longer available.

**Solution:**

Verify that the ODBC data source is still accessible by the user or from a remote machine.

**Note:**

The ODBC Specific Error returned by the ODBC data source driver contains specific information on the cause of the problem.

---

**Unable to write to internal tag '<tag address>' on device '<device name>' (Reason: ODBC Specific Error)**

---

**Error Type:**

Serious

**Possible Cause:**

The internal tag depends on a successful response from the ODBC data source which is no longer available.

**Solution:**

Verify the ODBC data source is still accessible by the user or from a remote machine.

**Note:**

The ODBC Specific Error returned by the ODBC data source driver contains specific information on the cause of the problem.



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