

Advanced Simulator Driver Help

© 2011 Kepware Technologies

Table of Contents

Table of Contents	2
Advanced Simulator Driver Help	3
Overview	3
Driver Setup	4
Data Source Settings	4
Data Source Setup	5
Tables	9
Timing	9
Running as an NT Service	10
Connecting Remotely as an NT Service.....	10
Data Source Authentication	10
Setting Up SQL Authentication.....	11
Data Types Description	20
Address Descriptions	21
Error Descriptions	22
Address Validation	22
Missing address.....	22
Device address '<address>' contains a syntax error.....	22
Data Type '<type>' is not valid for device address '<address>'.....	23
Device address '<address>' is Read Only.....	23
Array support is not available for the specified address: '<address>'.....	23
Device Status Messages	23
Write request rejected on read-only item reference '<channel name><device name><address>'.....	23
Advanced Simulator Driver Specific Messages	23
Unable to retrieve table names.....	24
Unable to retrieve table column names.....	24
Unable to retrieve table row count.....	24
Unable to connect to data source on channel '<channel name>'.....	25
Data source '<data source name>' is configured as Read Only (all writes will be rejected).....	25
Unable to open recordset on device '<device name>'.....	25
Unable to query recordset on device '<device name>'.....	25
Unable to retrieve database value for tag '<tag address>' on device '<device name>'.....	26
Unable to read internal tag '<tag address>' on device '<device name>'.....	26
Unable to write to internal tag '<tag address>' on device '<device name>' (Reason: ODBC Specific Error).....	26
Index	27

Advanced Simulator Driver Help

Help version 1.013

CONTENTS

[Overview](#)

What is the Advanced Simulator Driver?

[Driver Setup](#)

How do I configure the Advanced Simulator Driver to communicate with ODBC data sources?

[Data Types Descriptions](#)

What data types are supported by this driver?

[Address Descriptions](#)

How do I address a data location in the ODBC data source?

[Error Descriptions](#)

What error messages are produced by the Advanced Simulator Driver?

Overview

The Advanced Simulator Driver plugs into the industrial-based OPC Server, which supplies reliable data access to any HMI, SCADA, Historian or Enterprise application supporting OPC, DDE, FastDDE and SuiteLink. The Advanced Simulator driver provides single-point access to multiple ODBC data sources via ODBC. It simulates live data by traversing through all the records in a selected table at a rate set by the user.

Note: For information on general server topics, refer to the OPC server's help documentation.

Driver Setup

Supported ODBC Data Sources

The Advanced Simulator Driver supports any ODBC-compliant data source, including the following:

Microsoft Access
Microsoft SQL
MySQL*
Oracle
Sybase

*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 MySQL-specific data handling requirements. Users should make sure that the MyODBC driver is installed for the PC that is running the OPC server.

Note: Description of additional Advanced Simulator Driver support is as follows:

- Multiple connection sessions to multiple ODBC data sources.
- Automatic tag generation from the ODBC data source.
- OPC DA.
- Drag and drop editing.
- CSV import and export for easy manipulation of many tags.
- New tags that can be added to the application at any time (including Runtime).
- Running as a Windows NT Service.

Communication Protocol

ODBC API

Requirements

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

Maximum Channels and Devices

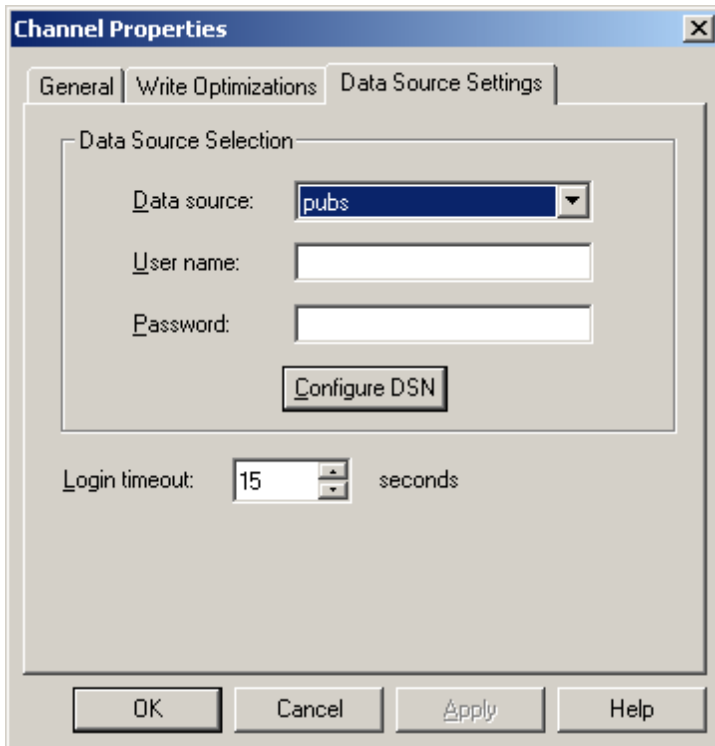
The maximum number of channels supported by this driver is 100. The maximum number of devices is 4096 per channel.

General

Users start a server project by creating a channel. To do so, select Advanced Simulator from the list of available device drivers in the Channel Creation Wizard. In this case, the channel corresponds to the Advanced Simulator driver and its particular ODBC data source.

Data Source Settings

The Data Source Settings tab is used to configure various data source settings. It is located in Channel Properties.



Data Source

This parameter is used to select a Data Source Name (DSN). A DSN must be created and configured for a data source before it will appear in this list and the ODBC database. For information on how to do so, follow the instructions below.

1. To start, click **Configure DSN** to open the **Microsoft® ODBC Data Source Administrator**.
2. Select either the **User DSN** or **System DSN** tab. 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. Next, map an ODBC data source to a data source name.
4. Once a DSN has been configured successfully, it will appear in the Data Source drop-down menu.

Note: For more information, refer to [Data Source Setup](#).

User Name and Password

The User Name and Password settings are only needed if required by the data source. For example, these fields are required when using SQL server authentication.

Note: Some data sources allow Windows NT Authentication to be used in order to gain access to the data source. When used, the data source will ignore the User Name and Password specified in the Data Source Settings tab and will use the network Login ID instead. For more information, refer to [Data Source Authentication](#).

Login Timeout

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

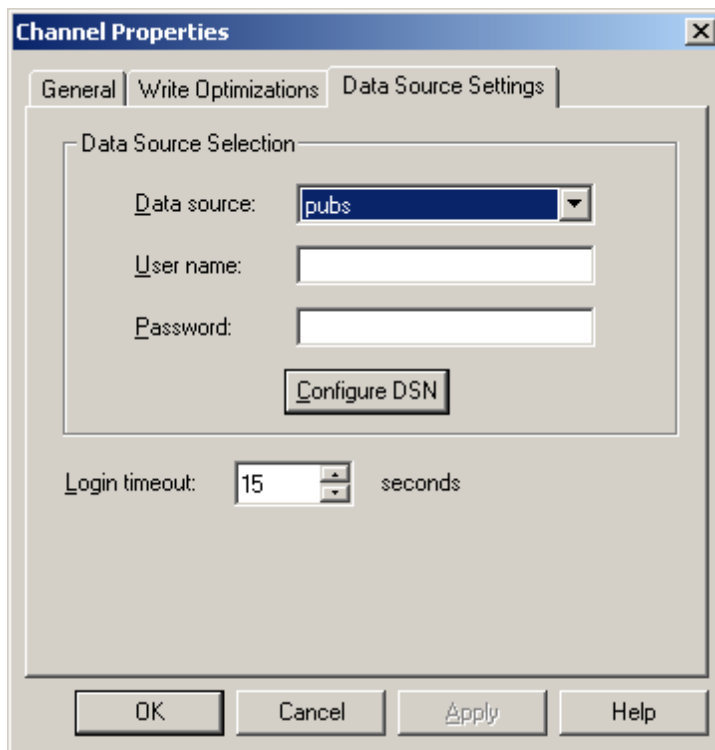
Data Source Setup

For information on setting up a data source in the OPC server using the Advanced Simulator driver, refer to the instructions below.

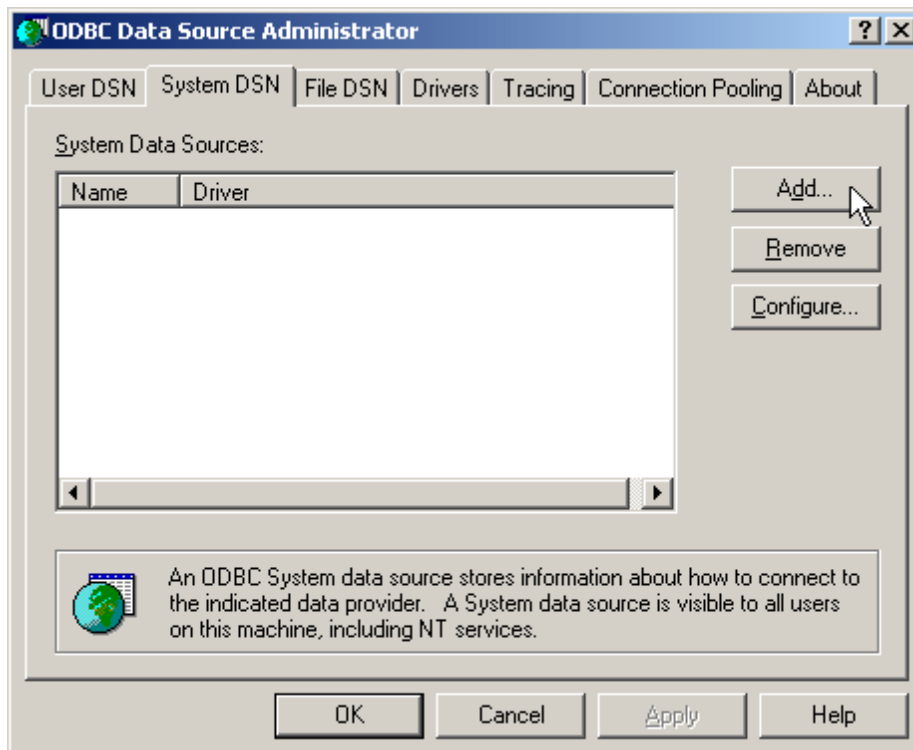
Important: It is required that the 64 bit version of the Microsoft® ODBC Data Source Administrator be used when configuring a DSN on a 64 bit operating system. This is because the 64 bit version is used by this product's configuration utility.

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

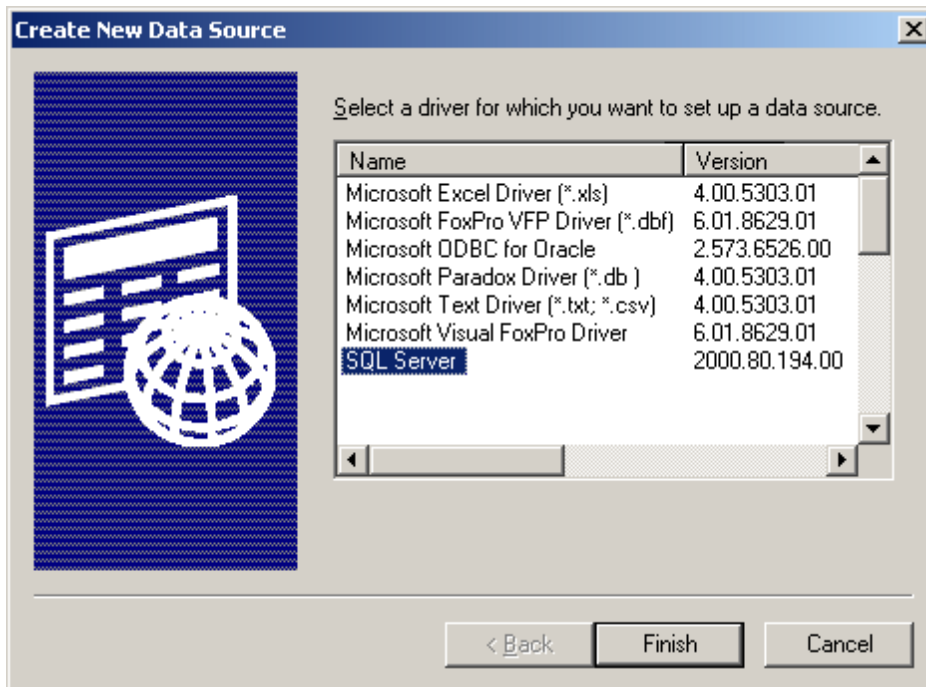
1. To start, create a channel in the OPC server project. Then, right-click on that channel in the OPC server application and select **Properties**.
2. In the **Data Source Settings** tab, click **Configure DSN**.



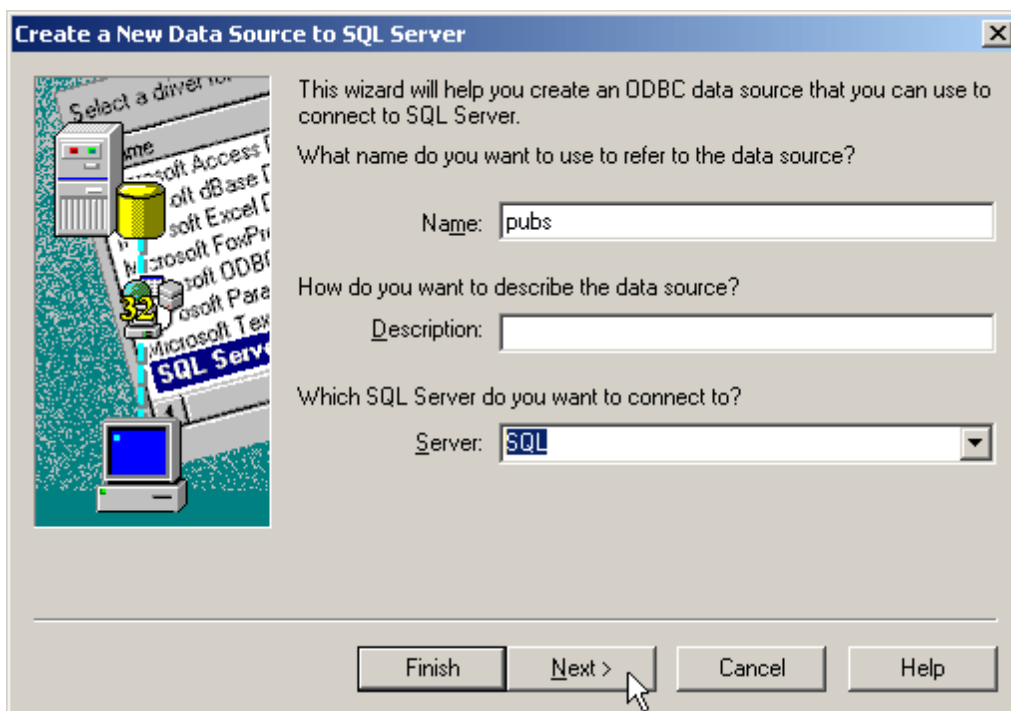
3. In this example, **System DSNs** are used because they are local to the computer and not user-dedicated. Users may choose to select **User DSNs** as well, which are local to the computer and only accessible to the current user. Click **Add**.



- Next, select the desired data source. In this example, the **SQL Server** data source is used.

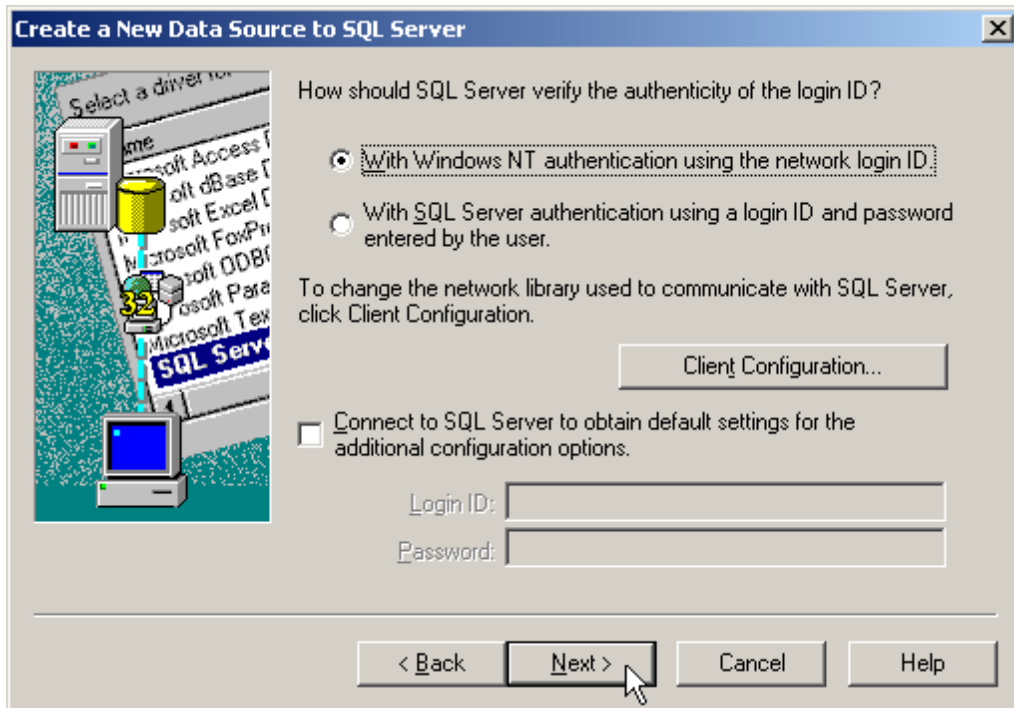


- Name the ODBC data source and then select the **SQL Server** to which it will be connected. Then, click **Next**.

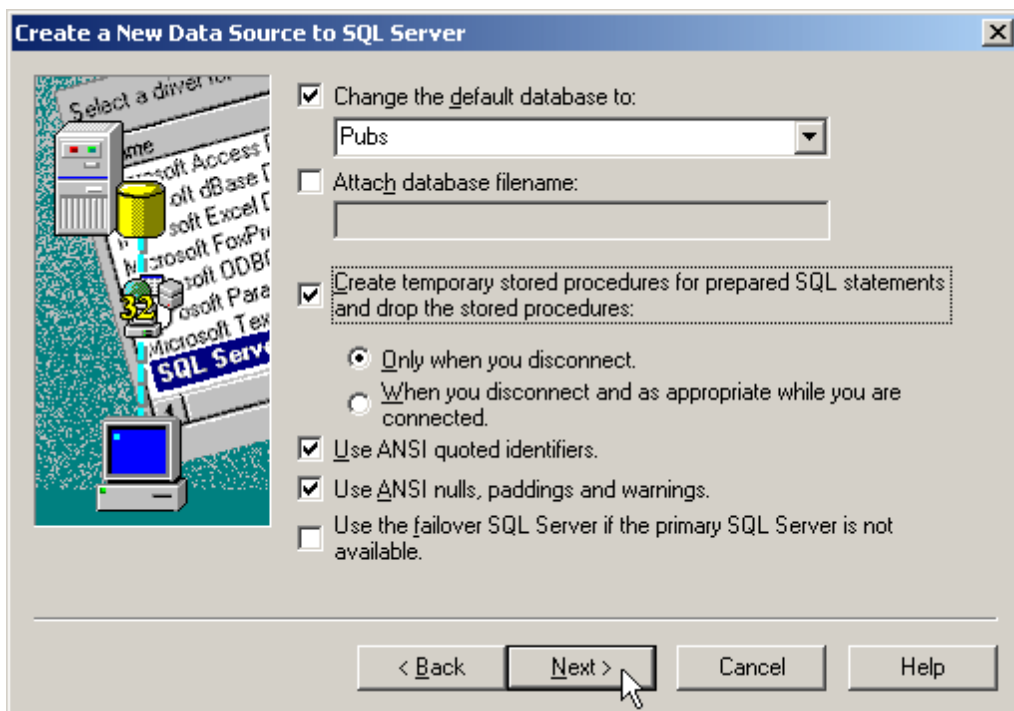


- Ensure that the **Windows NT Authentication** default is selected. Click **Next**.

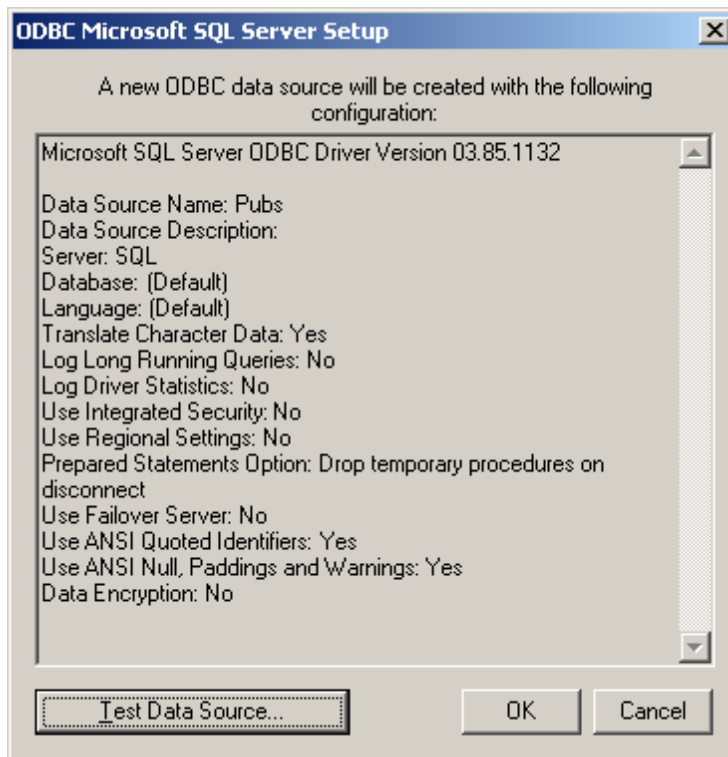
Note: If planning to use the OPC server in NT Service mode, refer to [Running as an NT Service](#).



- Next, change the default database to the one for the desired connection. If the specific database is unavailable, select the default instead.



- 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, users will receive the message **Test Successful**.



Tables

Selecting Tables

This parameter is used to specify a table from which data will be accessed. All table names available from the ODBC data source are available for selection.



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	Access	Description
MoveTo	Read/Write	This internal tag moves forward or backward to the specified record number. It will continue updating the tags from its 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, users have the option to automatically start with the first record.

Record Selection Interval

This parameter specifies 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

Automatically Move to the First Record When the Last Record is Reached

When checked, this parameter causes the driver to start reading from the first record when the last record is reached. When unchecked, 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

An OPC server that only supports stand alone program operation is usually 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. This 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, refer to the OPC server help file located in the server application under **Help | Server Help**.

See Also: [Connecting Remotely as an NT Service](#)

Connecting Remotely as an NT Service

This ODBC communications application supports running as a service under Windows NT/2000. When set to NT service mode, this application will use the system account (anonymous user) instead of a user account by default. This may pose a problem when trying to use Windows NT Authentication to connect to the remote data source. An error message may appear stating "Login failed for user NT AUTHORITY\ANONYMOUS LOGON" in the OPC server.

It is recommended that SQL Authentication be used when the OPC server is running in NT service mode because it provides a secure connection. It is possible, however, to set the data source to allow anonymous logon. In this case, Windows NT Authentication may be used but will not provide a secure connection.

See Also: [Setting Up SQL Authentication](#) and [Data Source Authentication](#).

Data Source Authentication

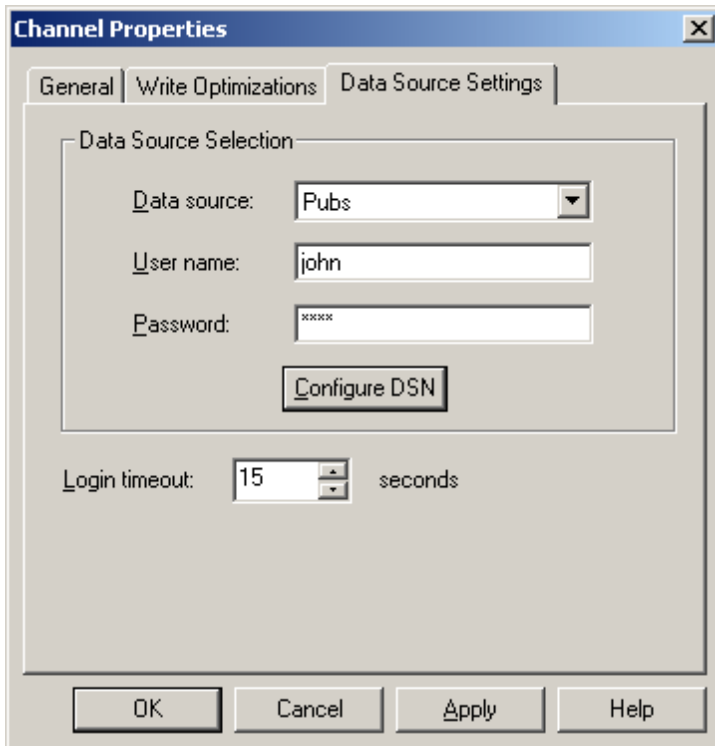
Windows NT Authentication

The SQL server is configured to use authentication for security. It can authenticate with Windows NT authentication by default through the use of the network Login ID. This makes SQL server logon transparent and eliminates the need for a user name and password.

SQL Server Authentication

The SQL server has its own authentication method. In order to connect the OPC server to the SQL server using SQL authentication, users must first set the authentication method in the SQL server to allow SQL authentication. They must also define a Login ID and Password. Once completed, users may enter the user name and password within the OPC server under the Channel Properties' Data Source Setting dialog.

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

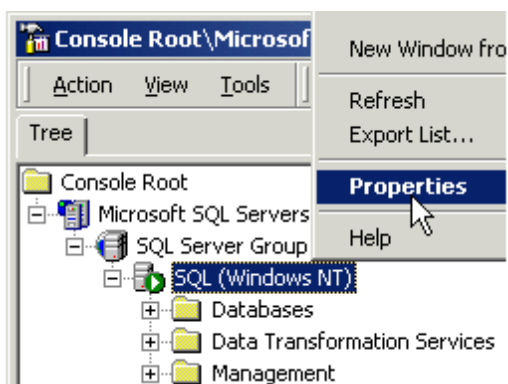


Setting Up SQL Authentication

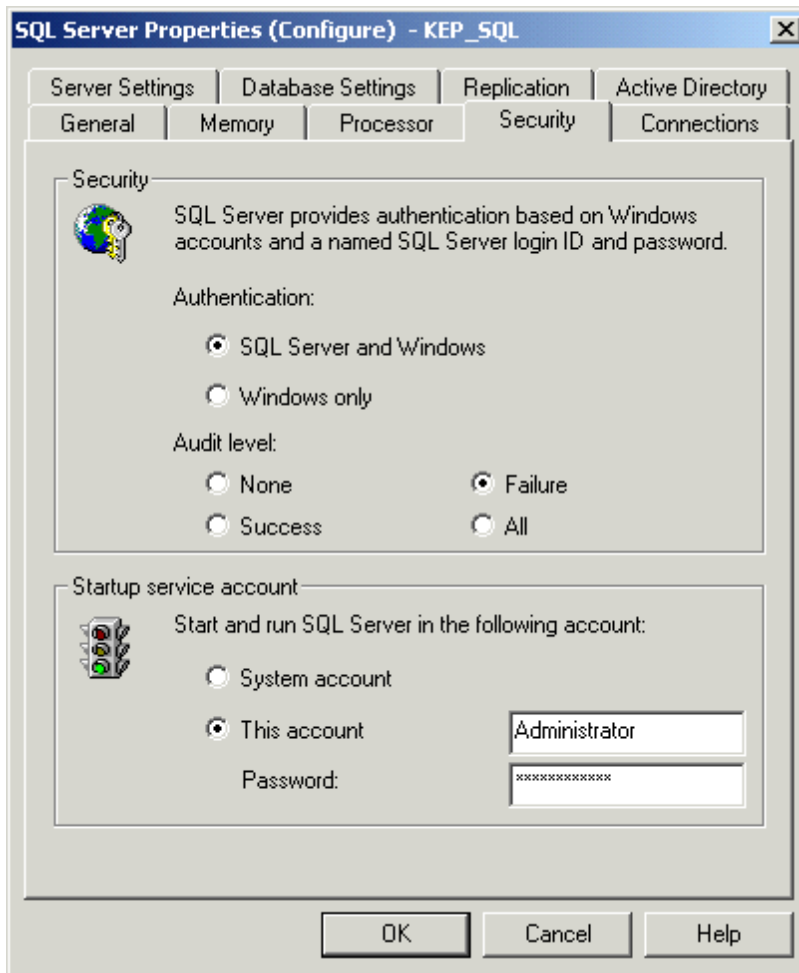
Refer to the instructions below for information on how to setup SQL authentication. This is only necessary when attempting to connect remotely to SQL server while running as an NT service.

See Also: [Running as an NT Service](#), [Connecting Remotely as an NT Service](#) and [Data Source Authentication](#).

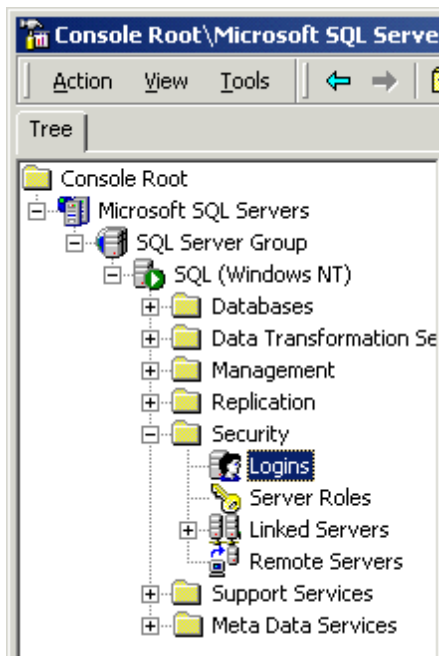
1. In the **SQL Manager**, right-click on the SQL server icon in the tree and then select **Properties**.



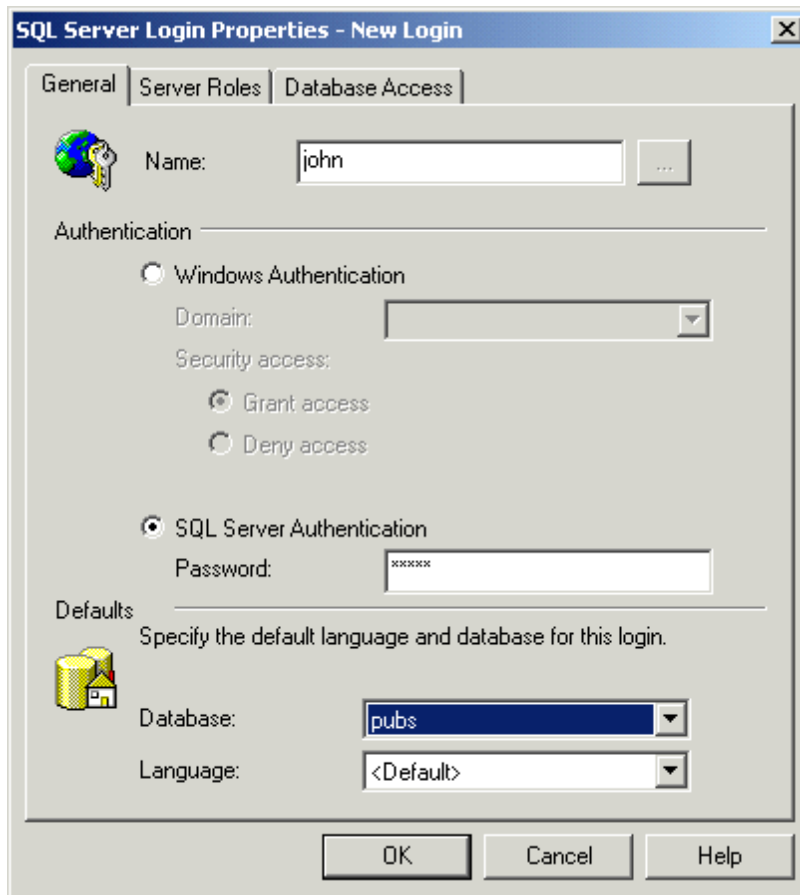
2. Open the **Security** tab and then select the mixed authentication mode **SQL Server and Windows**.



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



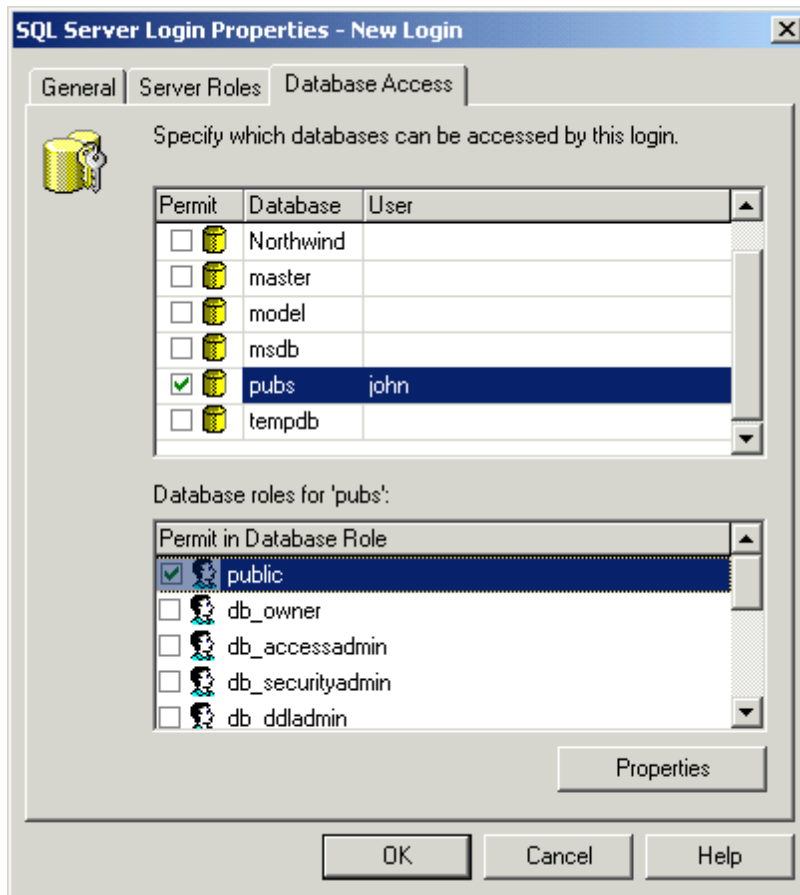
4. In the **New Login** dialog, select the **General** tab. Define a user name and password.



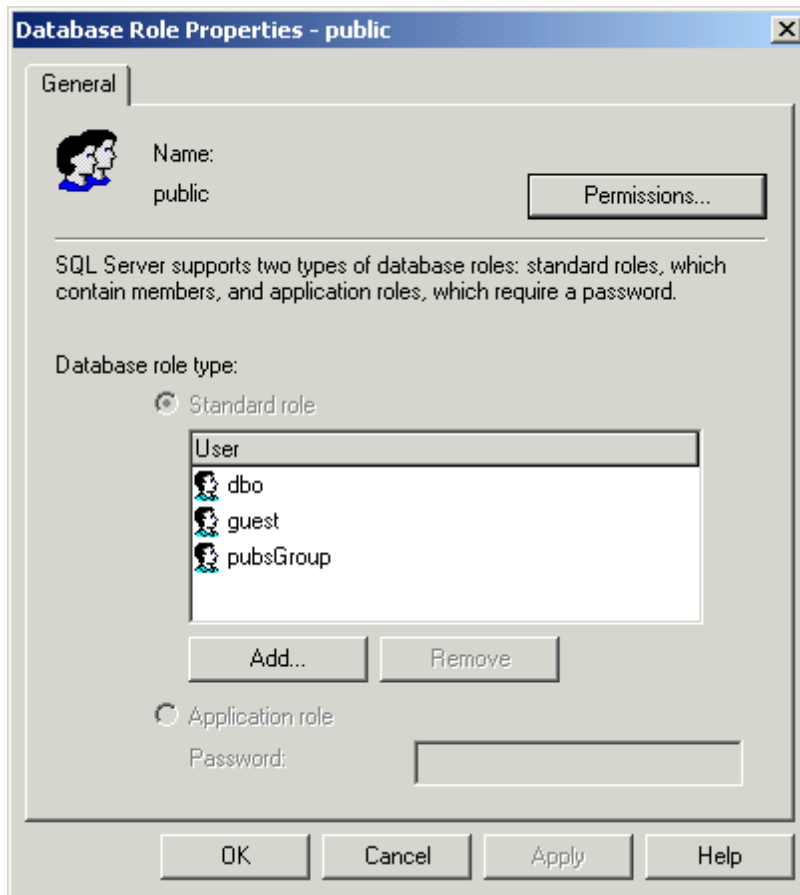
The screenshot shows the 'SQL Server Login Properties - New Login' dialog box with the 'General' tab selected. The 'Name' field contains 'john'. Under 'Authentication', 'SQL Server Authentication' is selected, and the 'Password' field contains 'xxxxxx'. Under 'Defaults', the 'Database' is set to 'pubs' and the 'Language' is set to '<Default>'. The 'OK', 'Cancel', and 'Help' buttons are visible at the bottom.

5. Next, open the **Database Access** tab and select the database to which the user will connect.

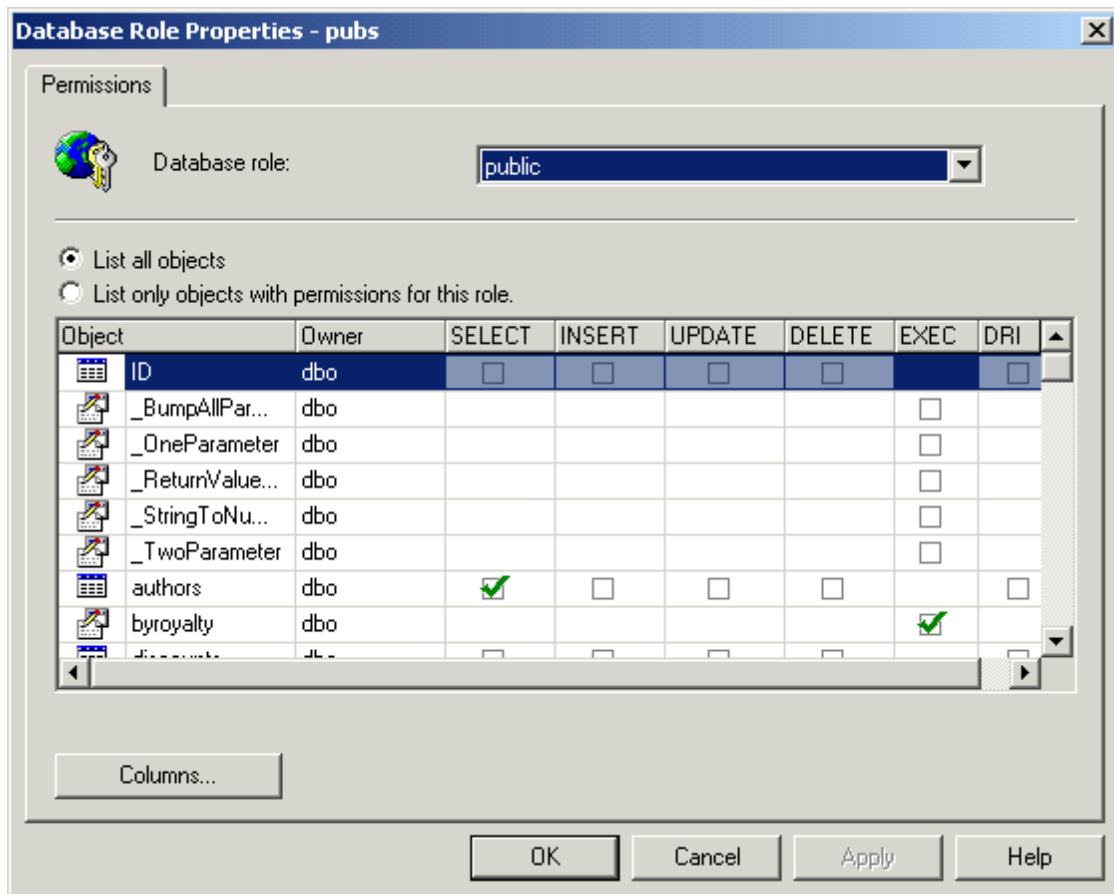
6. Select a role for the database. In this example, **Public** is used. When finished, click **Properties**.



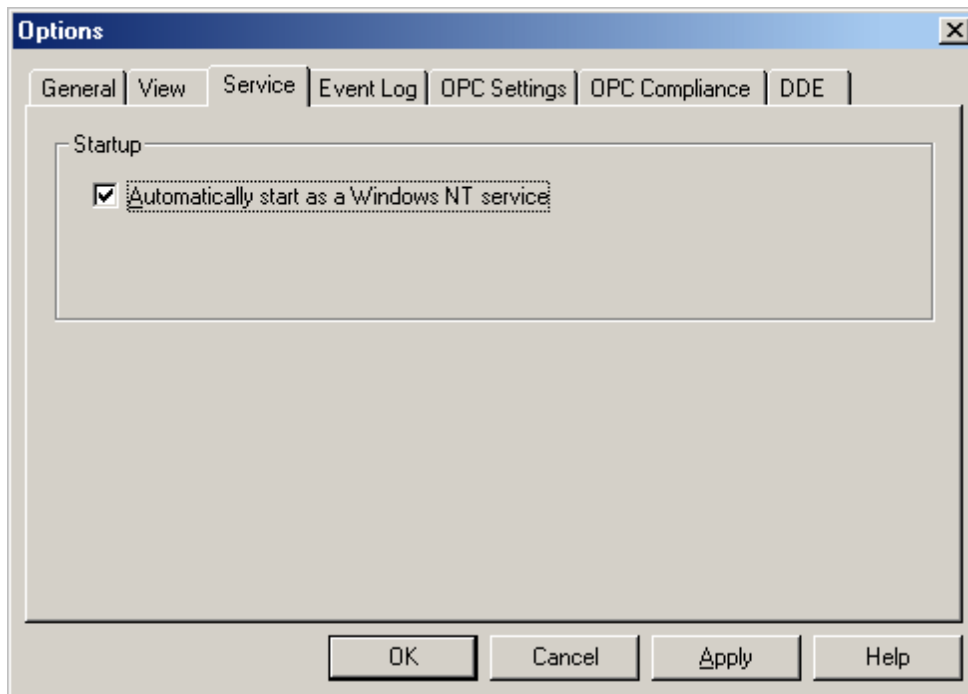
7. Under **Database Role Properties**, click on **Permissions....**



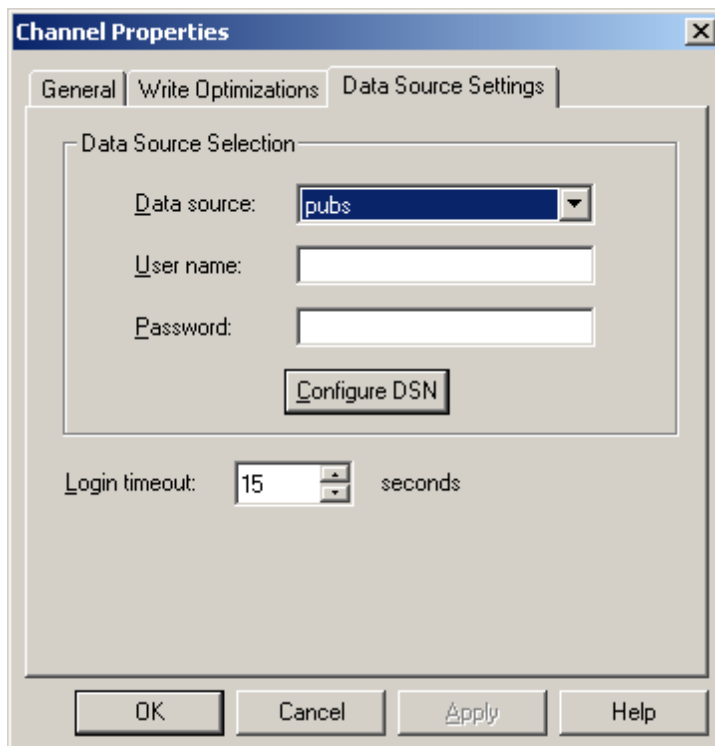
8. Check the boxes of the objects that the user will be able to access. In this example, the user is allowed to perform "Select" queries on the "author" table.



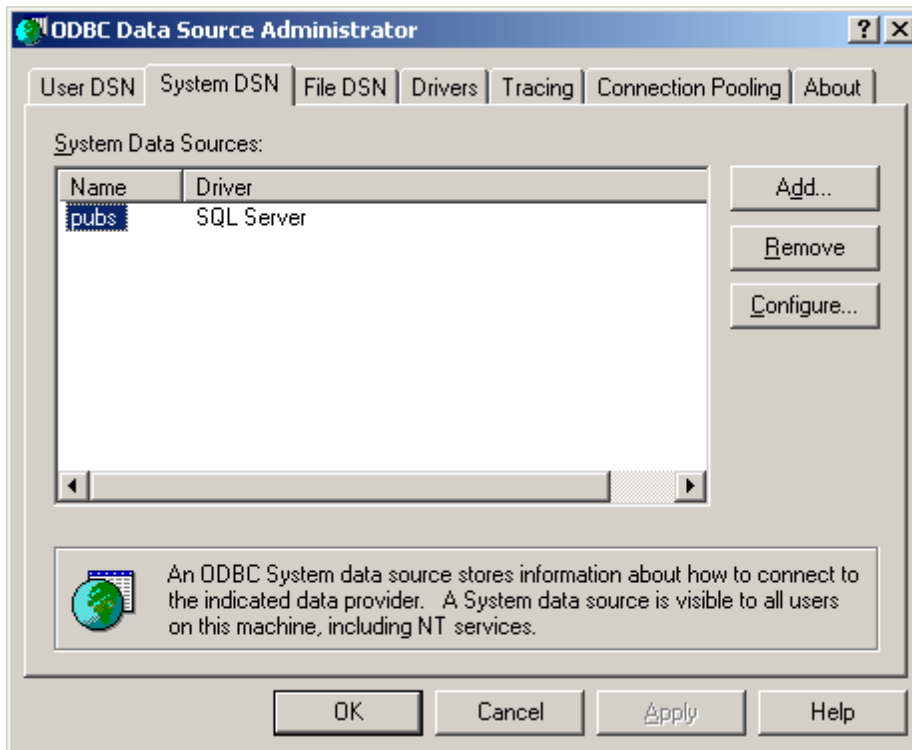
- At this point, the Data Source Name (DSN) should already be set up. If not, refer to [Data Source Setup](#) before continuing.
- In the OPC server, select **Tools | Options**. Open the **Service** tab and then check **Automatically Start as a Windows NT Service**.



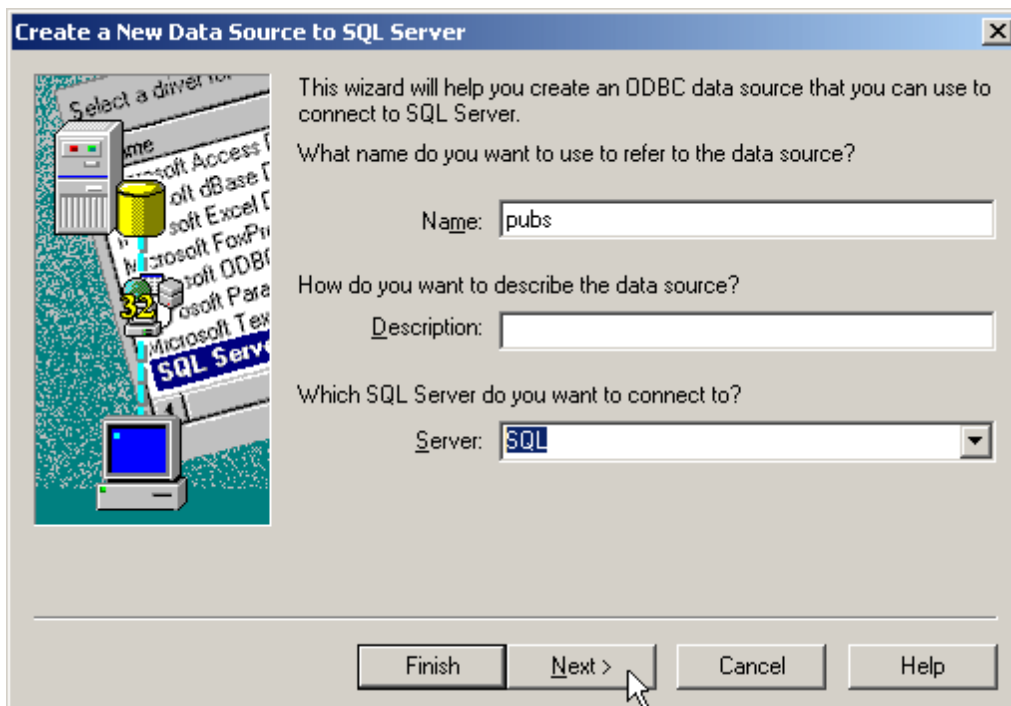
11. Return to the OPC Server application and then right-click on the channel and select **Properties**. Open the **Data Source Settings** tab and click **Configure DSN**.



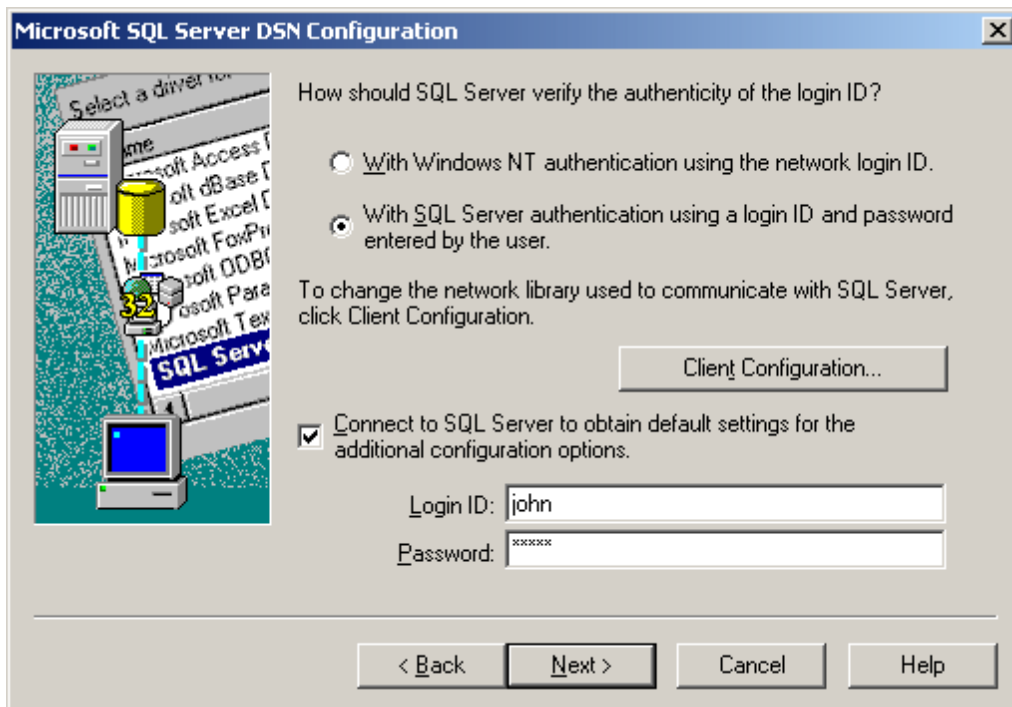
12. Select the System DSN that was created and then click **Configure**.



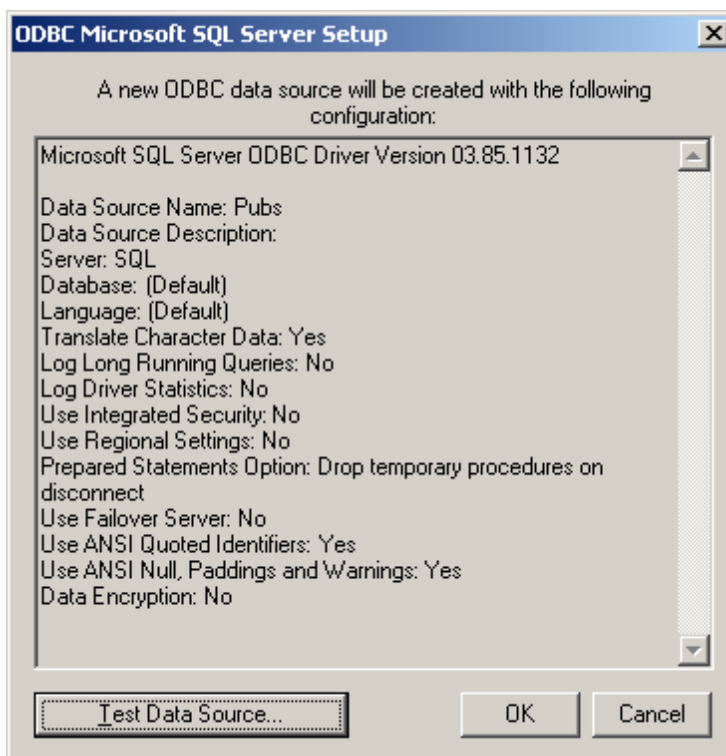
13. Next, confirm both the data source name and the server name. Then, select **Next**.



14. Check **With SQL Server Authentication using a login ID and password entered by the user**.
15. Check **Connect to SQL Server to obtain default settings for the additional configuration options**. Then, enter the user name and password for the user defined in the SQL Server.



16. Continue through the Wizard, keeping the default settings for the remaining parameters. Test the data source connection at the end by selecting **Test Data Source**. If the connection is good, users 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 cannot be made by the driver or the address that the tag references cannot be resolved by the driver (meaning that the address cannot be mapped to the 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. For more information, refer to [Error Descriptions](#).

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 the 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 the client application, Device Properties or under the actual tag in the server's tag database.

Note:

Some data sources do not support Write access, whereas others support it for specific items only.

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:

1. Re-enter the address in the client application in order to remove the array reference.
2. 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 that 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 that 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 that 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 one 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 that the ODBC data source is configured properly and that it is accessible by the user or from a remote machine.
2. Verify that the 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 that 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 that 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.

Index

A

Address Descriptions.....	21
Address Validation.....	22
Advanced Simulator.....	3
Advanced Simulator Driver.....	3-4
Advanced Simulator Driver Help.....	3
Advanced Simulator Driver Specific Messages.....	22-23
Array support is not available for the specified address: '<address>'.....	23

C

Communication Protocol.....	4
Configure DSN.....	6
Connecting Remotely as an NT Service.....	10

D

Data source '<data source name>' is configured as Read Only (all writes will be rejected)....	25
Data Source Authentication.....	10
Data Source Settings.....	4
Data Source Setup.....	5
Data Type '<type>' is not valid for device address '<address>'.....	23
Data Types Description.....	20
Device address '<address>' contains a syntax error.....	22
Device address '<address>' is Read Only.....	23
Device Status Messages.....	22-23
Driver Setup.....	4
DWord.....	20

E

Error Descriptions.....	22
-------------------------	----

H

Help Contents.....	3
--------------------	---

M

MDAC.....	4
Microsoft Data Access Components.....	4
Missing address.....	22

O

ODBC API.....	4
---------------	---

Overview.....	3
P	
Possible Cause.....	22-23
R	
Record Selection Interval.....	9
Running as an NT Service.....	10
S	
Setting Up SQL Authentication.....	11
String.....	20
Supported ODBC Data Sources.....	4
System DSN.....	6
T	
Tables.....	9
Timing.....	9
U	
Unable to connect to data source on channel '<channel name>'.....	25
Unable to open recordset on device '<device name>'.....	25
Unable to query recordset on device '<device name>'.....	25
Unable to read internal tag '<tag address>' on device '<device name>'.....	26
Unable to retrieve database value for tag '<tag address>' on device '<device name>'.....	26
Unable to retrieve table column names.....	24
Unable to retrieve table names.....	24
Unable to retrieve table row count.....	24
Unable to write to internal tag '<tag address>' on device '<device name>' (Reason: ODBC ... Specific Error).....	26
W	
Write request rejected on read-only item reference '<channel name><device name><- address>'.....	23