



OLEDB DataLink Tutorial – Reading and Writing Information to a Database

This exercise will walk you through retrieving and writing data to a Microsoft Access database using the OLEDB DataLink. The OLEDB DataLink allows interaction with a number of different database types. It has complete and secure data management capabilities through formulated queries, stored procedures, and custom SQL statements. Although this tutorial uses a Microsoft Access database, the techniques learned in this tutorial will allow you to communicate with other database types such as Oracle, Sybase, and Microsoft SQL Server.

Requirements

In order to complete this exercise you must have the following:

- PC with Windows 2000 Professional or Windows 2000 Server
- I/Gear v5.2 or greater Installed

Goals

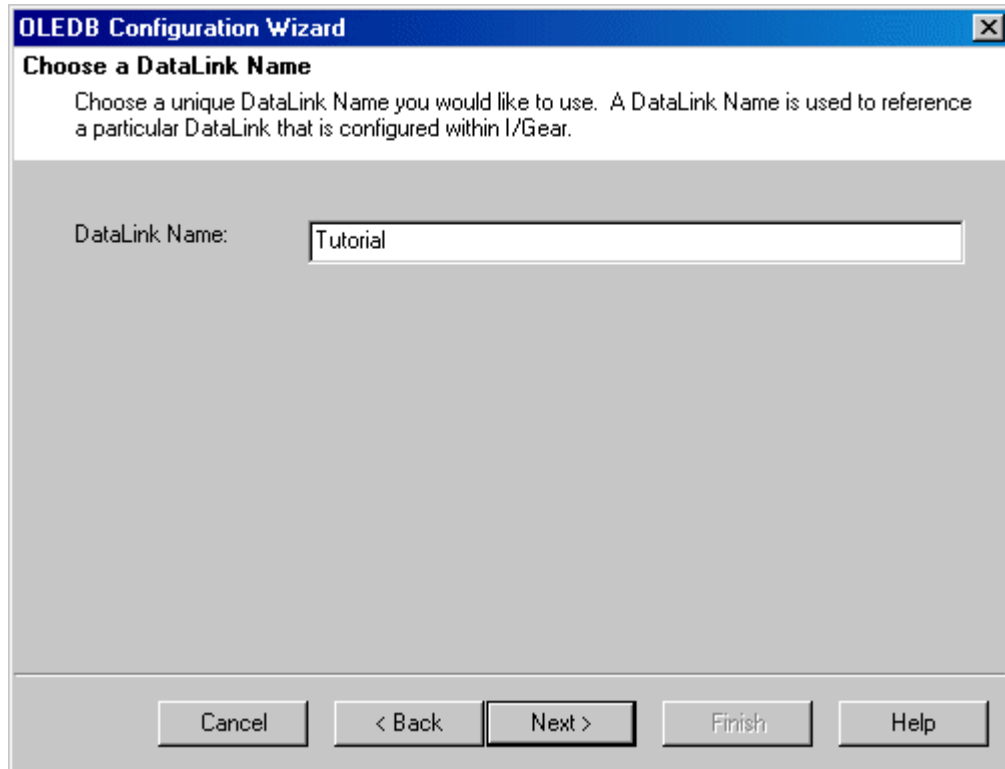
By the end of this exercise, you will know how to:

- Create a New OLEDB DataLink
- Retrieve data from a database table using an OLEDB Input Command
- Create a New DataPoint
- Execute a Command
- Write data to a database table using OLEDB Output Command

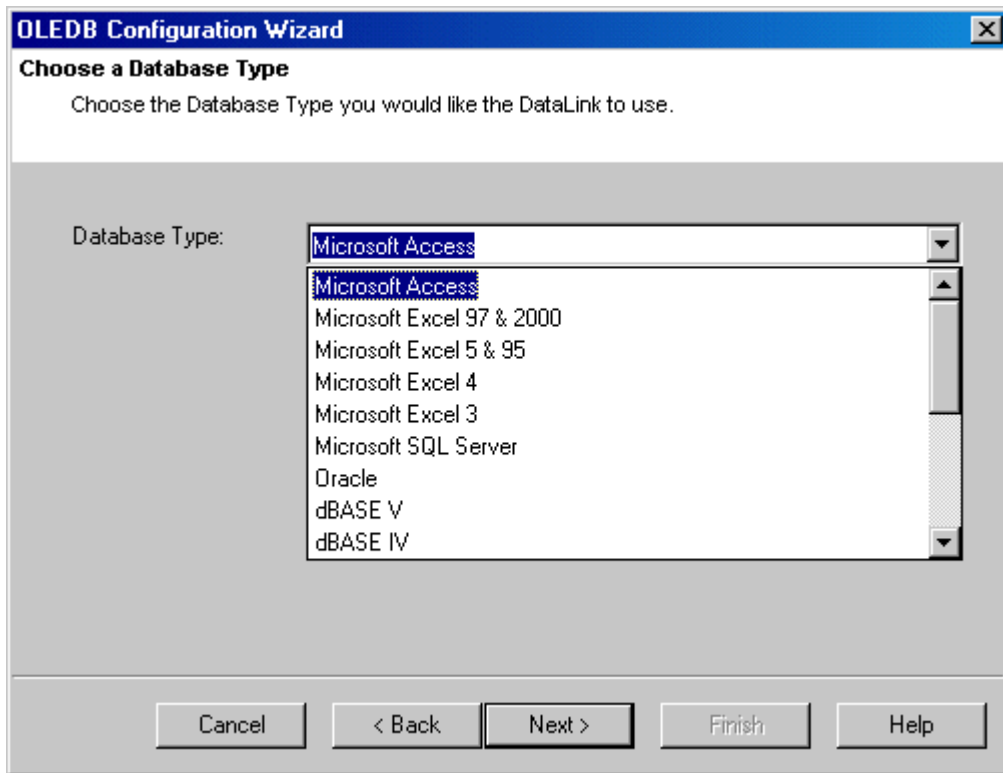
Step 1 – Connecting to the Database through an OLEDB DataLink

You will now create a new OLEDB DataLink to connect to the Tutorial database.

1. Right-click the **DataLinks** node in the tree.
2. On the pop-up menu, select **New DataLink...**
3. Select **OLEDB** from the list of DataLinks.
4. When the Configuration Wizard opens, click Next.
5. On the **Choose a DataLink Name** screen, type **Tutorial** and click Next.



6. On the **Choose a Database Type** screen, the Database Type combo box displays a list of common OLEDB database providers installed on your machine. Select **Microsoft Access** to indicate a connection to a Microsoft Access database and click Next.

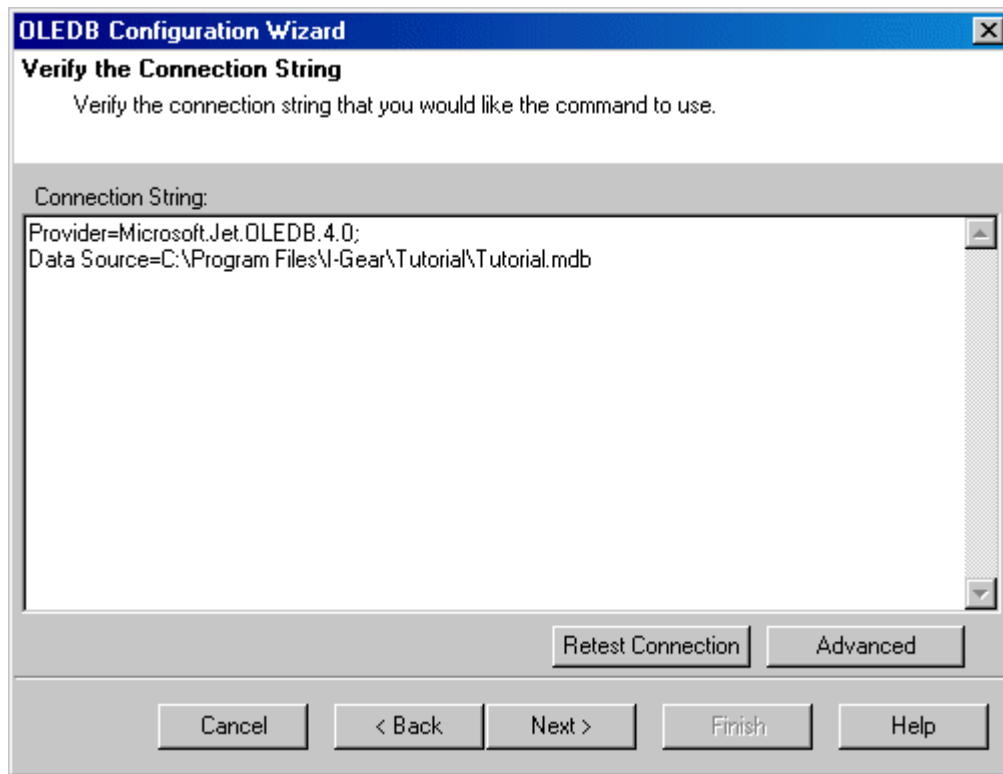


7. On the **Specify the Security Credentials** screen, type **C:\Program Files\Gear\Tutorial\Tutorial.mdb** in the Filename box, or browse for it using the Browse button. This is the path and name of the database you wish to connect to. For other database types, you may specify a server name here instead of a file. This file has no login account; therefore leave the **Username** and **Password** blank.

The screenshot shows a dialog box titled "OLEDB Configuration Wizard" with a sub-header "Specify the Security Credentials". Below the sub-header is a descriptive text: "Specify the Security Credentials you would like the DataLink to use. You can specify the username, password and location of the data store to use." The dialog contains three input fields: "Filename:" with the text "C:\Program Files\Gear\Tutorial\Tutorial.mdb" and a browse button "..."; "Username:" with an empty text box; and "Password:" with an empty text box. At the bottom of the dialog, there are five buttons: "Cancel", "< Back", "Next >", "Finish", and "Help". Above the "Next >" button, there are two additional buttons: "Test Connection" and "Advanced".

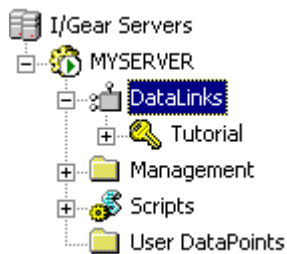
8. Click **Test Connection** to confirm the DataLink will successfully connect using the criteria specified thus far. If the connection fails, check your filename and make sure you have selected the correct file. Once the connection is successful, click Next.

9. On the **Verify Connection String** screen, verify the Connection String is similar to the one below and click Next. The Connection String is used by the DataLink to connect to the database. All elements in the string must be correct for the database type and location in order for the DataLink to be able to connect. It is also possible to edit or add additional parameters to the string if necessary.



10. Click **Finish** on the **Completing the OLEDB DataLink Configuration Wizard** screen.

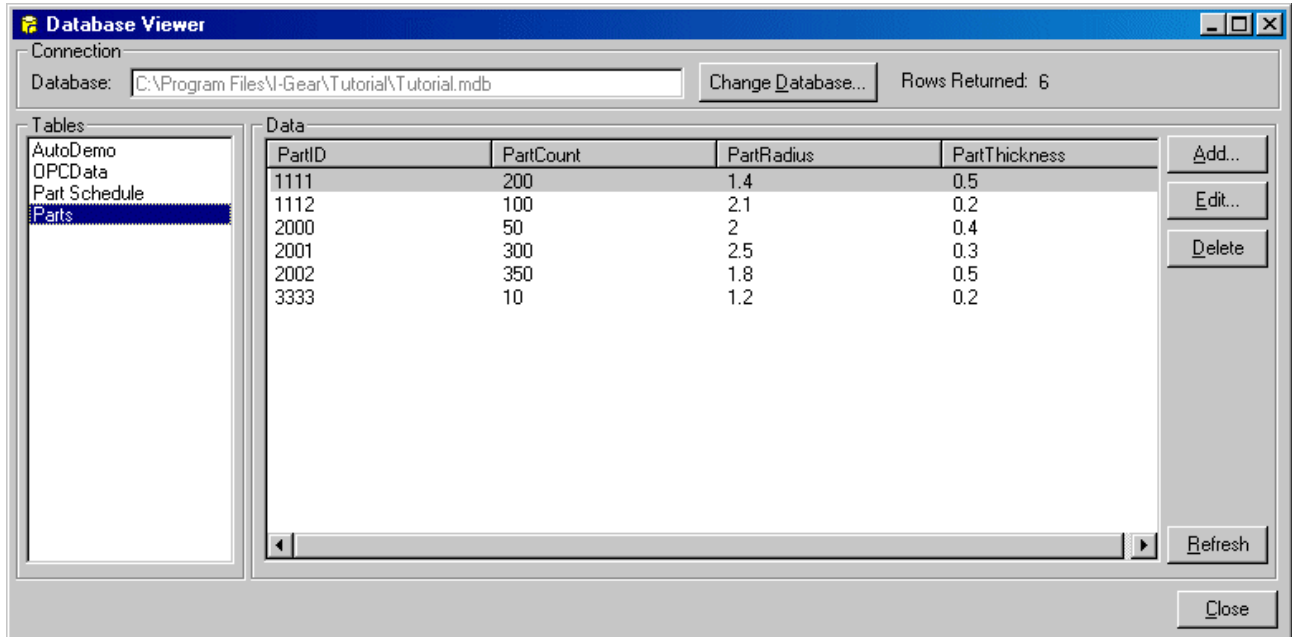
The new **Tutorial** OLEDB DataLink should now be in the server tree under DataLinks as shown.



Step 2 - Retrieve Part Information from the Database using an OLEDB Input Command

You will now create an OLEDB Input Command to retrieve data from the Parts table in the Microsoft Access Tutorial database. This table includes information for different manufacturing parts, including Part ID, Count, Radius, and Thickness.

To verify the data, you will use the Database Viewer tool included with the tutorials. This tool, shown below, will allow you to view data in the tables of the Tutorial database. The program is located in the Start menu at **Programs->I-Gear->Tutorial->Database Viewer**.



1. Expand the **Tutorial** DataLink tree.
2. Right-click the **Input Commands** node in the tree.
3. On the pop-up menu, select **New Command...**
4. When the Configuration Wizard opens, click Next.

5. On the **Choose a Command Name** screen, type **Parts** and click Next. Make sure the **Use DataLink Configuration Information** box is checked. This option tells the Parts Command that it is to use the same configuration for communicating with the device as set up in the **Tutorial** DataLink. If this option was turned off, the configuration for communicating with the device can be set up specific to this Command even though it is under the **Tutorial** DataLink. In this case, you are specifying that the Parts Command should use the connection information of the **Tutorial** DataLink.

The screenshot shows a dialog box titled "OLEDB Configuration Wizard" with a close button (X) in the top right corner. The main heading is "Choose a Command Name". Below the heading is a descriptive text: "Choose a unique Command Name you would like to use. A Command Name is used to reference a particular Command that is configured within I/Gear." There is a text input field labeled "Command Name:" containing the text "Parts". Below the input field is a checked checkbox labeled "Use DataLink Configuration Information". At the bottom right of the dialog is an "Advanced..." button. At the very bottom, there is a row of five buttons: "Cancel", "< Back", "Next >", "Finish", and "Help".

6. On the **Specify a Trigger Expression** screen, you select a Trigger for the Command. A Command Trigger is an expression determining when the Command will execute. There are several types of Triggering available:
- **Time Type** – Trigger occurs on a time interval from a specific base time such as every one second.
 - **Event Type** – Trigger occurs on certain events of an existing Command or DataPoint, such as on success of the Command or on increase of the DataPoint.
 - **Custom** – Specified by the user using specific syntax and Boolean rules.
 - **External** - The Command can only be executed from the I/Gear Object Model or through the Management Console.

Click Next to use the default trigger of every one minute.

The screenshot shows the 'OLEDB Configuration Wizard' dialog box with the title 'Specify a Trigger expression'. The instructions state: 'Specify the Trigger expression you would like to use. The Trigger expression is used by I/Gear to determine when to execute a particular command.'

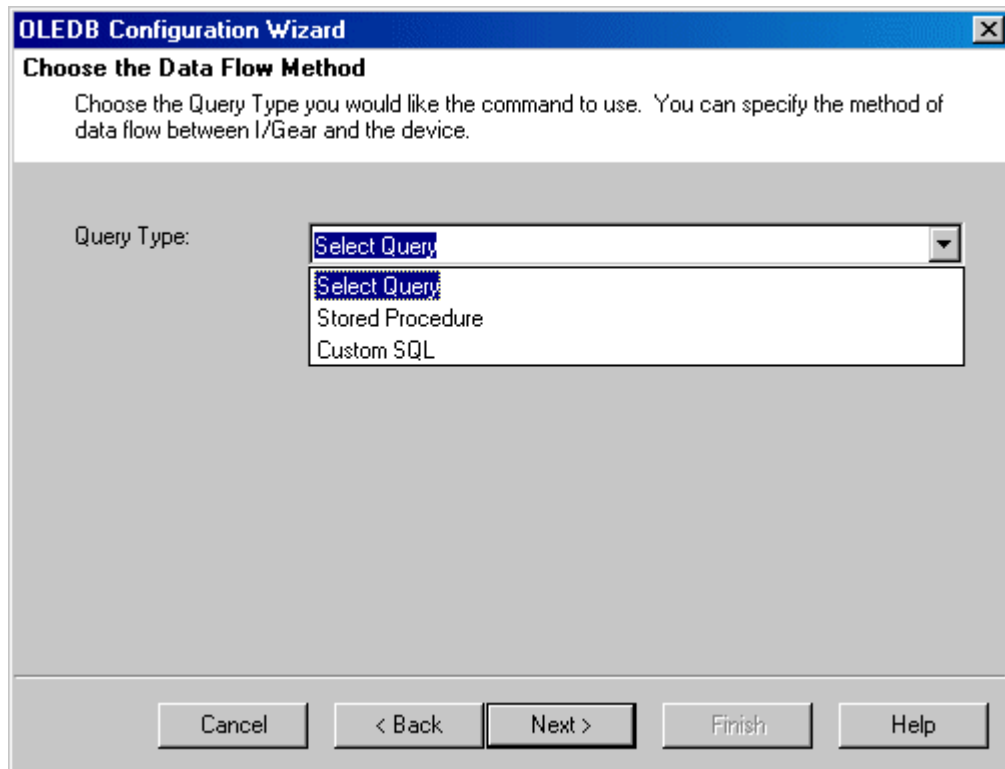
The dialog is divided into three sections:

- Basic Triggering** (selected with a radio button):
 - Time Type**: Includes a 'Time Base' dropdown set to 'Wed Jun 26, 2002 11:26:49 AM' and a checked 'Use Local Time' checkbox. Below it is an 'Every' field with '1' and a 'Minute(s)' dropdown.
 - Event Type**: Includes a 'DataPoint' field with a browse button and an 'Action' dropdown.
- Custom Triggering** (unselected): A text area containing the trigger expression: `{ TIME : BY=2002 : BM=6 : BD=26 : BH=11 : BN=26 : BS=49 : BZ=1 : EN=1 }`.
- External Triggering** (unselected): No visible options.

At the bottom, there are five buttons: 'Cancel', '< Back', 'Next >', 'Finish', and 'Help'.

7. On the **Choose the Data Flow Method** screen, you select the query type you would like to use. The Data Flow Method determines what type of SQL Statement to generate. There are three available options:
- **Select Query** – generates a SELECT Clause for retrieving specific database columns from the database.
 - **Stored Procedure** – generates a stored procedure call allowing assignment of any parameters of the stored procedure.
 - **Custom SQL** – allows the user to enter a custom SQL statement without the use of the wizard.

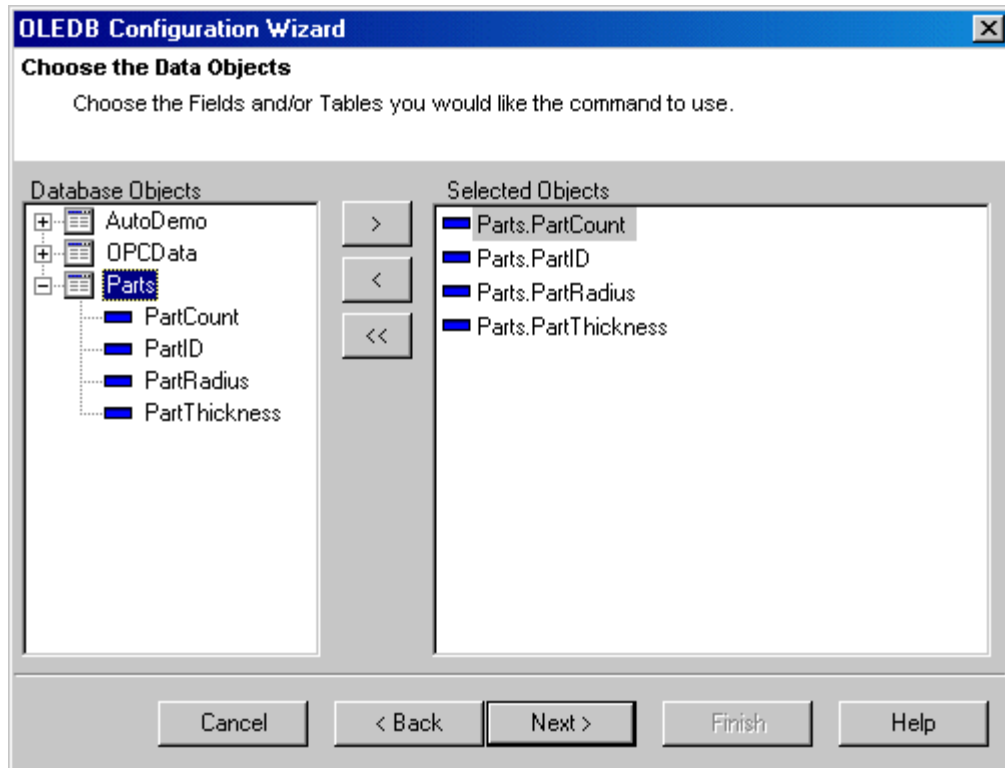
You will be using a Select Query to “select” specific data from the table. Choose **Select Query** from the list as shown below and click Next.



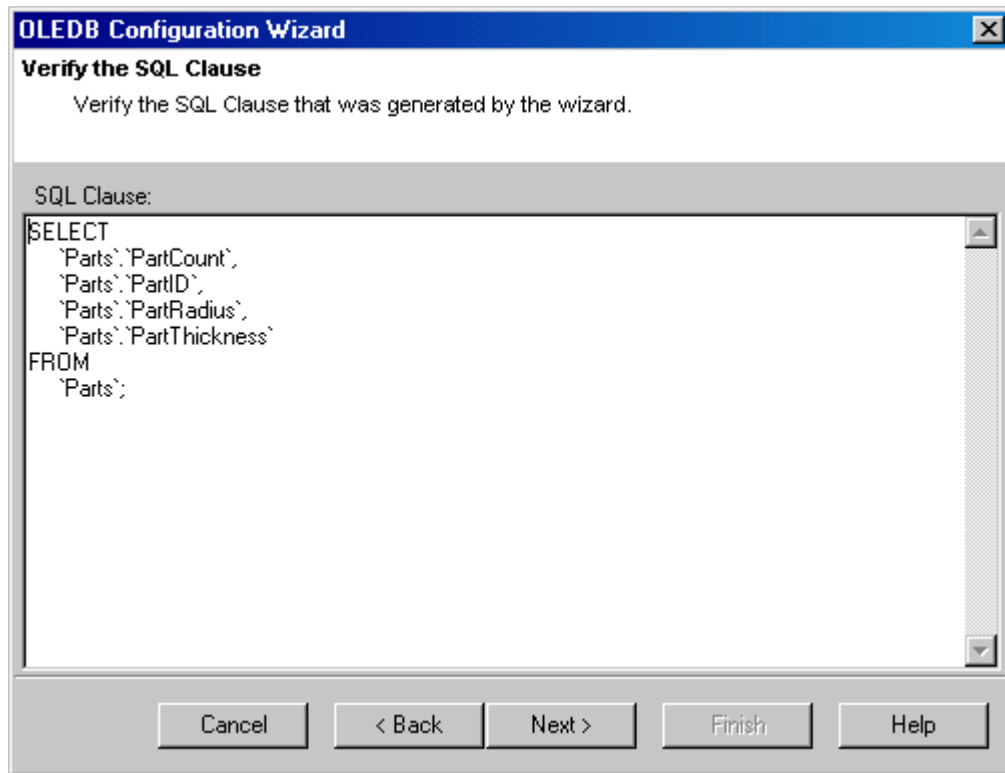
8. On the **Choose the Data Objects** screen, a list of Database objects is given. All tables from the **Tutorial** database are shown with the columns of each table being shown below them.

To move items between the Database Objects and Selected Objects lists, use the three directional buttons in the middle. The > button will move the current item from the Database Objects list to the Selected Objects list. If a node containing sub items is selected, such as a table with several columns, pressing this button will move all sub items to the Selected Object list. The < button removes the item selected from the Selected Objects list. The << button removes all items from the Selected Objects list.

You want to retrieve data from all columns in the Parts table. To do this, select **Parts** in the tree and click the > button. When done, click Next.

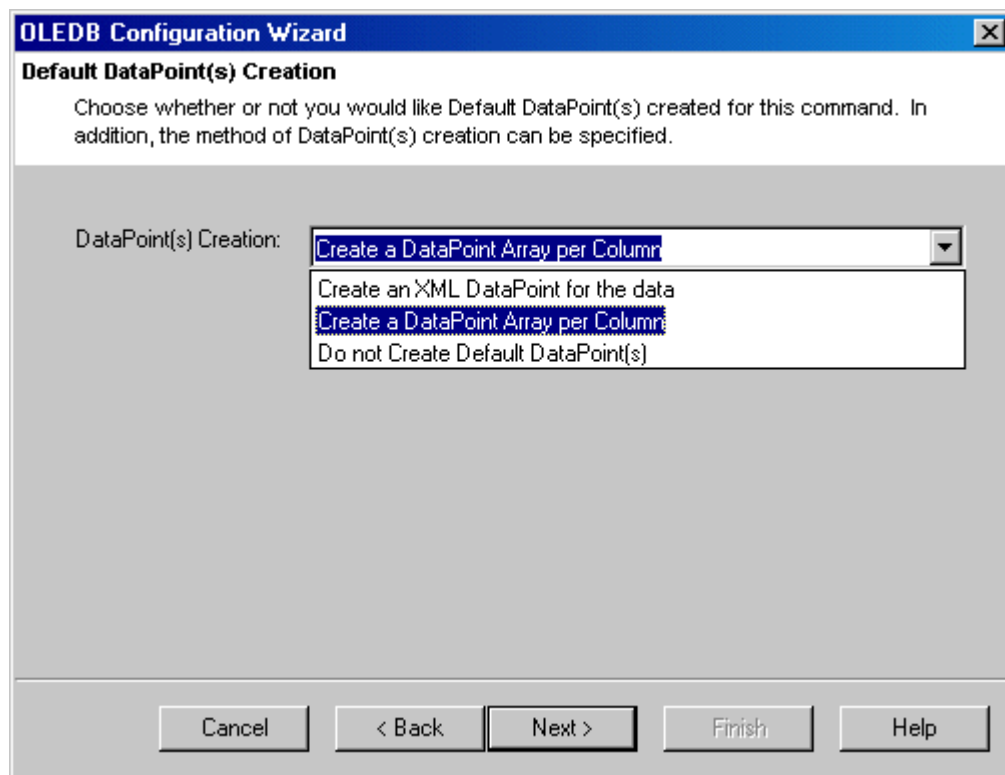


9. On the **Verify the SQL Clause** screen, confirm the SQL Clause is as shown. I/Gear formulates SQL statements so that they are formatted to work with the specific database type. This screen allows you to review the statement and edit or add any additional clauses. When finished, click Next.



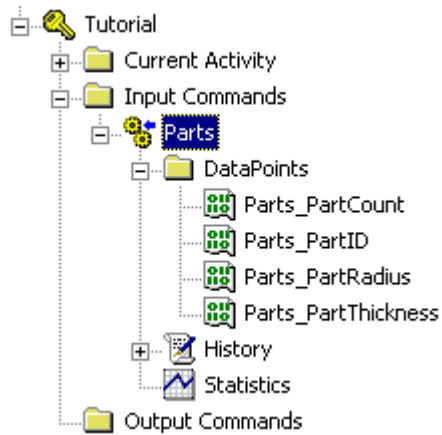
10. On the **Default DataPoint(s) Creation** screen, you specify how DataPoints will be created for the Command. There are three options:
 - **Create a DataPoint Array per Column** – one DataPoint array for each field of the returned recordset will be created. Each DataPoint will hold all values for the specific field in a DataPoint array. The indexes of the array will correspond across the DataPoints such that the data from row one of the table will be stored in the 0th element of the DataPoint arrays, such as Parts_PartID(0) and Parts_PartRadius(0).
 - **Create an XML DataPoint for the data** – a DataPoint containing an XML string representing the data will be created.
 - **Do not Create Default DataPoint(s)** – no DataPoints will automatically be created. You must manually create each DataPoint.

For this example, you want to return the data separated into fields. Select **Create a DataPoint Array per Column** and click Next.



11. Click **Finish** on the **Completing the OLEDB Command Configuration Wizard** screen.

The new Command **Parts** should now be in the tree under the **Tutorial** DataLink as shown. There should also be a **DataPoint** for each column of the **Parts** table.



The Command will be paused after it is created since you may wish to complete an entire configuration with many Commands and DataLinks before this Command will need to execute. Therefore, before continuing, un-pause the **Parts** Command by right-clicking it, and selecting **Pause** from the top of the menu.

Step 3 - Executing the Input Command







Now that the Input Command is created, you can execute the Command and retrieve the Parts from the database.

The **Parts** Command is set to trigger every 1 minute based on the time it was created. The procedure below will take you through manually executing the Command and viewing the Data. Commands can be externally executed at any time in addition to their regular trigger expression.

1. Right-click on the **Parts** Command and select **Execute** from the pop-up menu.
2. View the **Statistics** for the Command. The Statistics will show the time, duration, and status of the execution. There should be 6 records returned. You may have to manually Refresh the Statistics window if the Auto-Refresh option is not enabled.

Item	Value
Successes	
Average Execution Time	101 ms
Maximum Execution Time	891 ms
Minimum Execution Time	20 ms
Last Execution Time	8/29/2001 3:51:51 PM
Last Execution Duration	20 ms
Last Execution Status	Success - Rows Returned: 6
Failures	
Average Execution Time	0 ms
Maximum Execution Time	0 ms
Minimum Execution Time	0 ms
Last Execution Time	None
Last Execution Duration	0 ms
Last Execution Status	

3. Click on the **Parts_PartID** DataPoint and view data in right-hand pane. The data shown for the **PartID** DataPoint shows all of the data in the **PartID** column of the **Parts** table of the **Tutorial** database.

Name	Raw Value	Value
 Parts_PartID (0)	1111	1111
 Parts_PartID (1)	1112	1112
 Parts_PartID (2)	2000	2000
 Parts_PartID (3)	2001	2001
 Parts_PartID (4)	2002	2002
 Parts_PartID (5)	3333	3333

4. Repeat for each DataPoint to view the data for each column of the Parts table.

Verify the data returned by using the Database Viewer tool as described at the beginning of Step 1. You have now created an OLEDB Input Command to retrieve data.

Step 4 - Adding Part Information to the Database using an OLEDB Output Command

You will now create an OLEDB Output Command for the Parts table in the Microsoft Access Tutorial database. This Command will add a new part to the Parts table of the Tutorial database.

1. Expand the **Tutorial** DataLink tree
2. Right-click the **Output Commands** node in the tree.
3. On the pop-up menu, select **New Command...**
4. When the Configuration Wizard opens, click Next.
5. On the **Choose a Command Name** screen, type **New Part** and click Next.

The screenshot shows a dialog box titled "OLEDB Configuration Wizard" with a close button (X) in the top right corner. The main heading is "Choose a Command Name". Below the heading is a descriptive text: "Choose a unique Command Name you would like to use. A Command Name is used to reference a particular Command that is configured within I/Gear." There is a text input field labeled "Command Name:" containing the text "New Part". Below the input field is a checked checkbox labeled "Use DataLink Configuration Information". In the bottom right corner of the main area is a button labeled "Advanced...". At the bottom of the dialog box is a row of five buttons: "Cancel", "< Back", "Next >", "Finish", and "Help".

6. On the **Specify a Trigger Expression** screen, you will select a Trigger for the Command. There are several types of Triggers available:
- **Time Type** – Trigger occurs on a specified time interval from a specific base time such as every one second.
 - **Event Type** – Trigger occurs on certain events of an existing Command or DataPoint, such as on success of the Command or on increase of the DataPoint.
 - **Custom** – Specified by the user using specific syntax and Boolean rules.
 - **External** - The Command can only be executed from the I/Gear Object Model or through the Management Console.

You will be executing the Command from the Management Console. Therefore, select **External Triggering** and click Next.

The screenshot shows the 'OLEDB Configuration Wizard' dialog box with the title 'Specify a Trigger expression'. The text inside reads: 'Specify the Trigger expression you would like to use. The Trigger expression is used by I/Gear to determine when to execute a particular command.'

There are three radio button options for triggering:

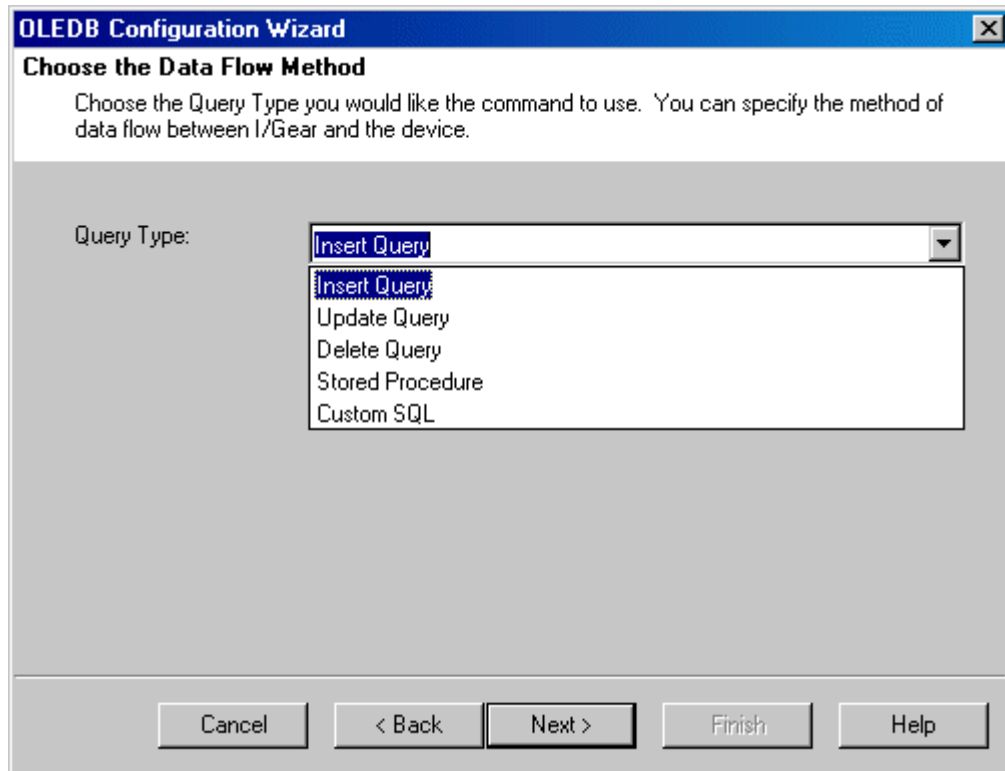
- Basic Triggering** (unselected):
 - Time Type**: Includes 'Time Base' (Wed Jun 26, 2002 11:32:19 AM), 'Use Local Time' (checked), and 'Every' (1 Minute(s)).
 - Event Type**: Includes 'DataPoint' and 'Action' fields.
- Custom Triggering** (unselected): Includes a text field containing 'EXTERNAL'.
- External Triggering** (selected): This option is highlighted with a dashed border.

At the bottom of the dialog are five buttons: 'Cancel', '< Back', 'Next >', 'Finish', and 'Help'.

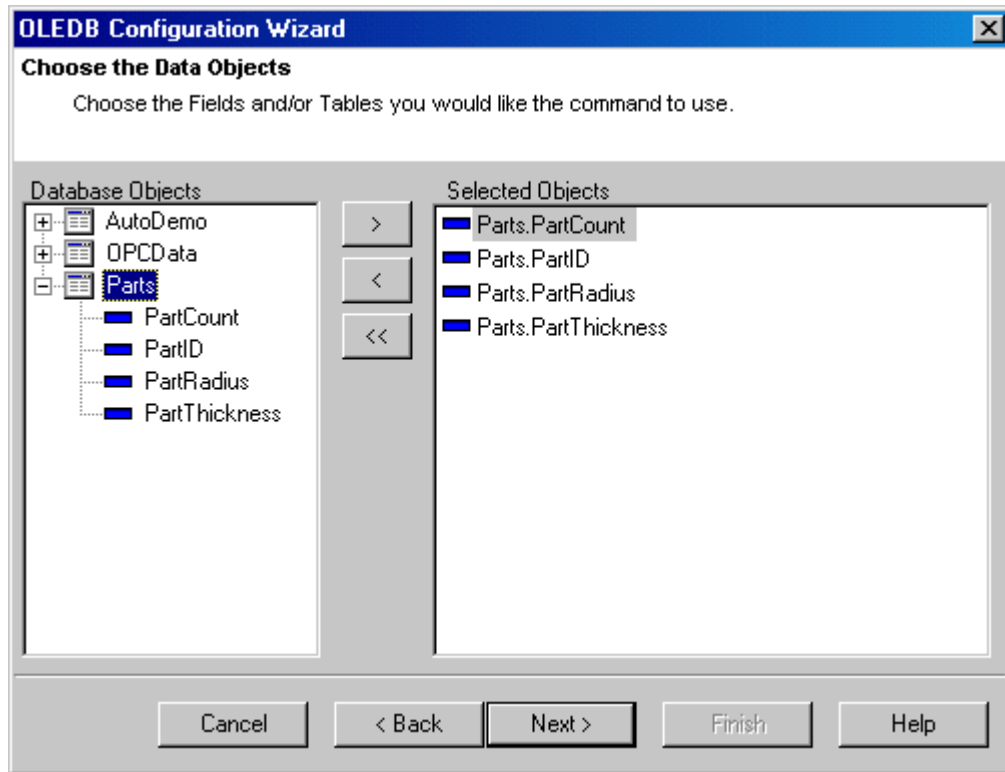
7. On the **Choose the Data Flow Method** screen, you will choose the query for the Command to generate. Like the Input Command, the Output Command has several options for formulating a SQL statement:

- **Insert Query** – generates an INSERT statement for specified columns and facilitates the assignment of new values to the chosen columns. This is used to insert new data.
- **Update Query** – generates an UPDATE statement for specified columns and facilitates the assignment of the new values for these columns. This is used to change existing data. By default, it will update all records in the table.
- **Delete Query** – generates a DELETE statement to delete records from the specified table. By default, this will delete all records in the table.
- **Stored Procedure** – generates an execution of a specified stored procedure and allows assignment of any parameters of the procedure.
- **Custom SQL** – allows the user to develop a custom SQL statement without the use of the wizard.

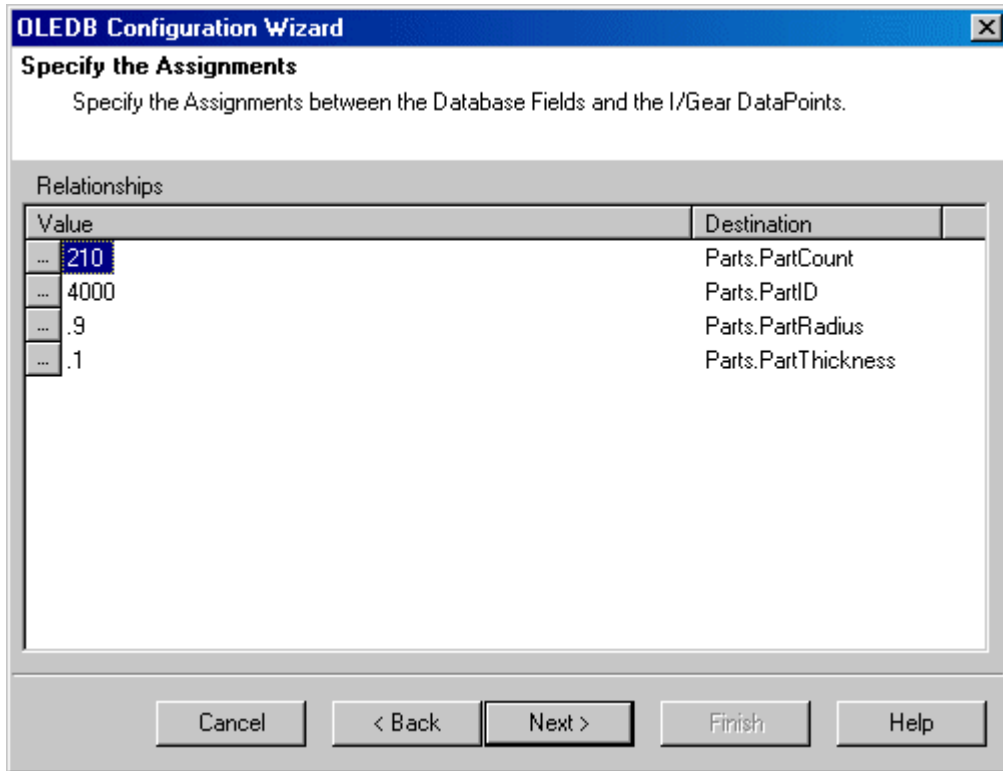
You will be “inserting” a new record into the table. Therefore, select **Insert Query** from the list as shown below and click Next.



8. On the **Choose the Data Objects** screen, a list of Database objects is given. All tables from the **Tutorial** database are shown with the columns of each table being shown below them. You want to write data to all columns in the Parts table. To do this, select **Parts** and click the > button. When done, click Next.



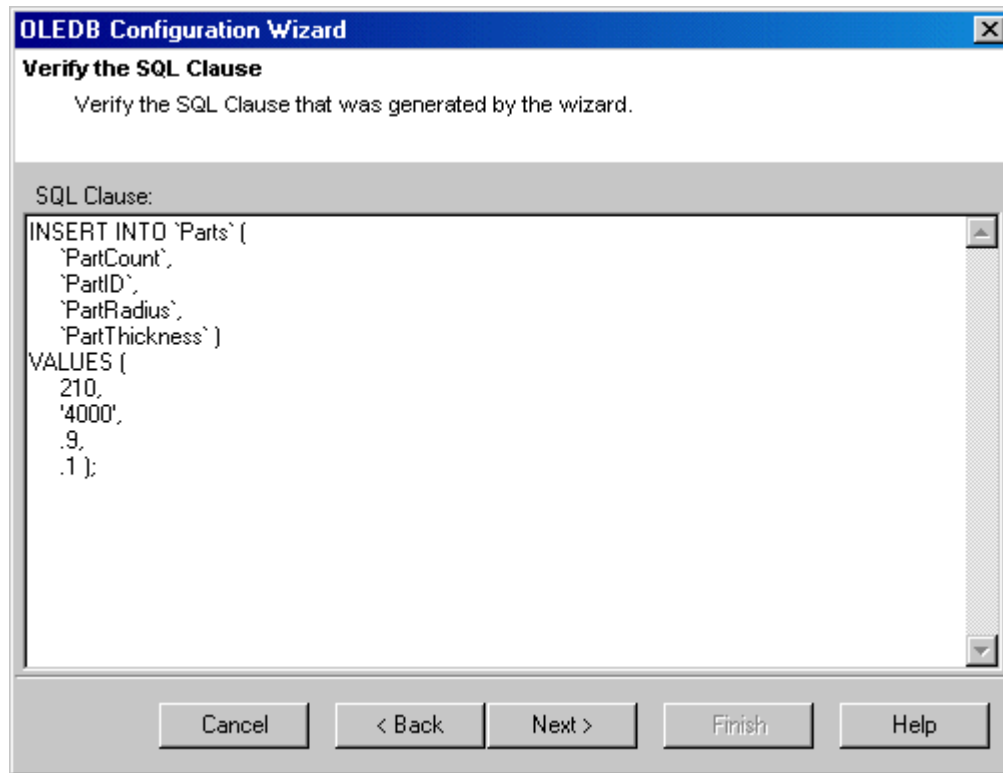
9. On the **Specify the Assignments** screen, enter the values shown below. These are the values for the new record. The Value is assigned to the given Destination. For example, you are inserting **210** as the value of the **PartCount** column for the new row. It is also possible to enter the Raw Data or Value of existing DataPoints from other Commands. The browse buttons (...) on each row open the **DataPoint Tree** and give you the ability to pick a DataPoint to bind with the destination. When finished, click Next.



The dialog box is titled "OLEDB Configuration Wizard" and "Specify the Assignments". It contains a table with two columns: "Value" and "Destination". The table has four rows of data. The first row has a browse button (...) and the value "210" in the "Value" column, and "Parts.PartCount" in the "Destination" column. The second row has a browse button (...) and the value "4000" in the "Value" column, and "Parts.PartID" in the "Destination" column. The third row has a browse button (...) and the value ".9" in the "Value" column, and "Parts.PartRadius" in the "Destination" column. The fourth row has a browse button (...) and the value ".1" in the "Value" column, and "Parts.PartThickness" in the "Destination" column. At the bottom of the dialog box, there are five buttons: "Cancel", "< Back", "Next >", "Finish", and "Help".

Value	Destination
... 210	Parts.PartCount
... 4000	Parts.PartID
... .9	Parts.PartRadius
... .1	Parts.PartThickness

10. On the **Verify the SQL Clause** screen, confirm the SQL Clause is as shown. I/Gear formulates SQL statements so that they are formatted to work with the specific database type. This screen allows you to review the statement and edit or add any additional clauses. When finished, click Next.



11. Click **Finish** on the **Completing the OLEDB Command Configuration Wizard** screen.
12. Execute the Command by right clicking on it in the Component Tree and selecting **Execute** from the pop-up menu.

After execution, verify the new part was added to the database by using the Database Viewer tool. The new record should now be shown in the table. You may have to click on **Parts** in the table list to refresh the data list. You can also verify the data by executing the **Parts** Input Command and verifying the new data is returned.

Congratulations! You have now completed the OLEDB DataLink tutorial.