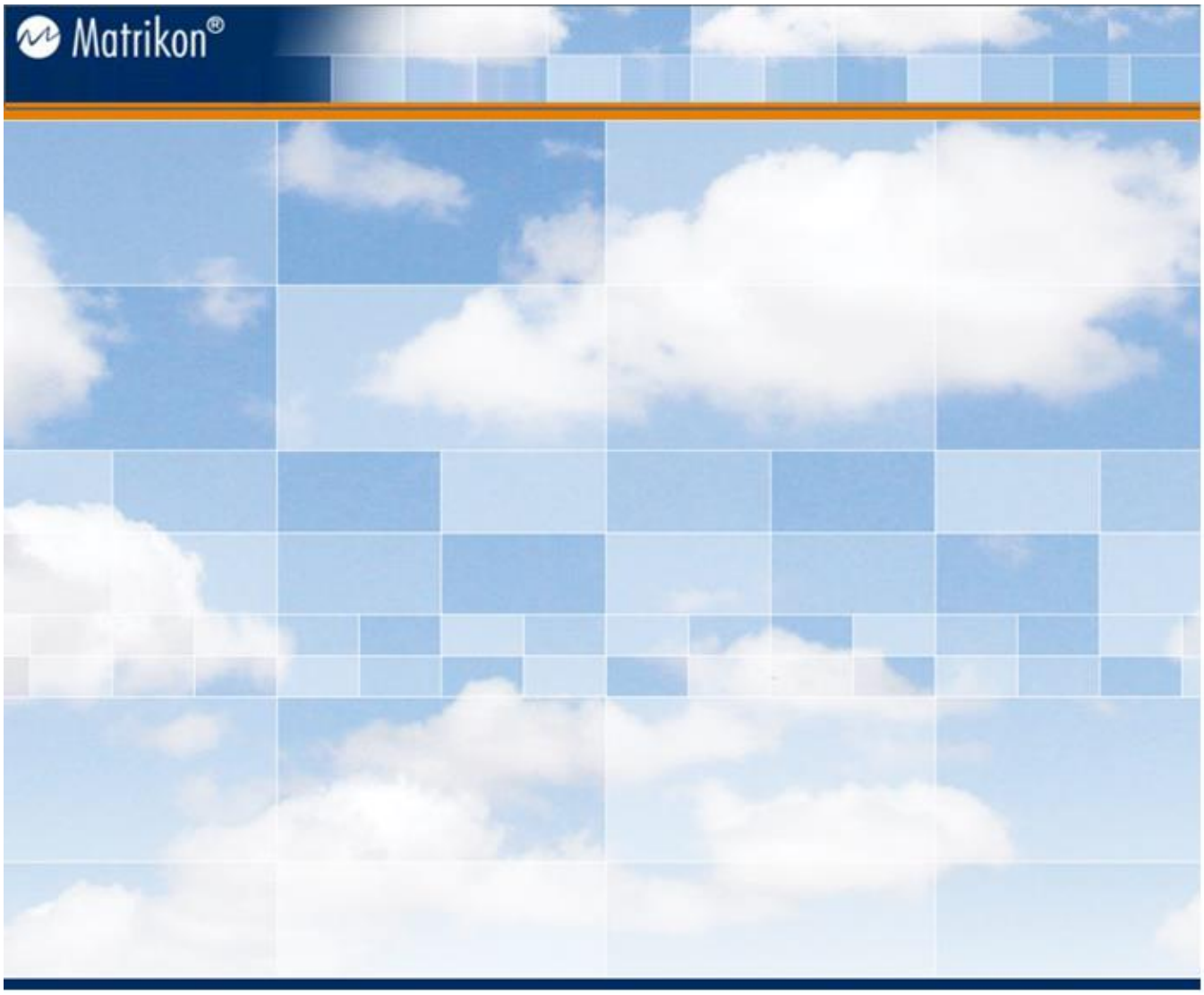

MatrikonOPC Client for ODBC

User’s Manual

Revision History

Date	Document Version	Description	Author
2008-06-10	1.0	Initial User's Manual for newly designed MatrikonOPC Client for ODBC.	DOC
2008-07-29	1.1	Added point to note in Installation section regarding need to un-install previous instances, if applicable.	LB
2008-08-19	1.2	Minor edits.	LB
2008-09-17	1.3	Minor edits.	MNA
2009-03-20	1.4	Update information for new features in Write to OPC Items Using a Select Statement section. Updated the OPC ODBC folder (Table 2) in the Installed Files section. Updated access path in Starting the MatrikonOPC Client for ODBC and Configuration Window sections. Appendix B – ODBC DSN Configuration updated.	JDJ, LB
2009-09-15	2.0	Added Beta tag lines. Updated software version to 3.1.1.0. IE 6 added to Software Requirements section. DEP settings note removed from Installation section. Contacting Support section updated. Updated Limitations section. Updated introduction to Appendix A – Distributed COM (DCOM). Updated DCOM Manual link.	LB
2009-10-22	3.0	Beta tag lines removed. Updated software version to 3.1.2.0. Formatting fixes.	LB
2010-08-06	4.0	Updated the screenshot Select OPC Server Connection Window (Figure 20). Updated software version number to 3.1.3.0.	BP, LB
2011-02-03	5.0	Updated software version number to 3.1.4.0.	BP
2011-02-08	5.1	Removed all references to Triggered Writes and updated screen shots to reflect that change. Updated Installed Files and Limitations sections.	BP
2011-09-21	6.0	Updated software version number to 3.1.4.1.	LB
2012-02-02	7.0	Updated software version to 3.1.4.2.	LB
2015-04-28	7.1	Updated software version to 3.1.4.3.	MJL
2017-04-20	7.1	Installation and Uninstallation Updates	DP
2017-09-13	7.2	Software version 3.1.4.4; updated copyright.	MJL
2017-10-26	7.3	Updated Software and Hardware requirements with additional information.	DP

2017-11-24	7.4	Updated to latest UM standards.	SC, MJL

Copyright and Trademark Information

SOFTWARE VERSION

Version: 4.0.0

DOCUMENT VERSION

Version: 7.4

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Introduction

Many industrial operations, such as plants and factories, generate large amounts of data. It is often necessary to keep a historical record of this data. Trending, cost analysis and safety auditing are common reasons to keep historical data.

It is common practice to store historical data in a database management system. Many database vendors provide access to their databases using the Open Database Connectivity (ODBC) standard. This standard allows a user to interact with the database using the Structured Query Language (SQL). The MatrikonOPC Client for ODBC provides custom functionality for transporting OPC data to and from an ODBC data source. Using the graphical configuration tool, basic functionally to insert and update OPC information in a database can be configured without specific knowledge of SQL. This software also allows a user to formulate custom queries using a combination of the SQL, and data tags from the OPC data source.

The ODBC Client can be used for any application that requires DA OPC data to be stored in an ODBC database. Examples of industries which may benefit from ODBC Client include but are not limited to, Manufacturing, Oil and Gas, and Pulp and Paper.

Who Should Use This Manual

This manual is intended for use by all users of the MatrikonOPC Client for ODBC.

This manual explains how to install and configure the software, and how to perform common tasks. In addition, technical information about OPC data items is included, along with sections on diagnostics and troubleshooting.

Overview of Manual

This document uses icons to highlight valuable information and assists the user throughout the manual.

⚠	This symbol denotes important information that must be acknowledged. Failure to do so may result in the software not functioning properly.
BOLD	Font displayed in this color and style indicates a hyperlink to the applicable/associated information within this document, or if applicable, any external sources.

The *User's Manual* has been designed in such a way that the user can click on references in the document to jump to that referenced point without having to scroll through several pages (in some cases). For example, if the user requires to see the sentence "*Refer to Figure 1 for more information*", press the **CTRL** key and click the mouse on the text "*Figure 1*" which will automatically take the user to the location of Figure 1 within the document.

This manual consists of several sections and is structured as follows:

- **Introduction** – this is an introductory chapter.
- **Getting Started** – provides instructions for installing the client, and how to contact Matrikon OPC's Support team.
- **Configuration** – depicts how to start and configure the client, and describes each component in detail, including windows/screens, panels, tabs, and menu commands.

- **Diagnostics** – explains how to use logging, statistical items, data qualities, timestamps, and result codes to get the most efficiency from the user's system.
- **Limitations** – provides information on specific performance and operational limitations of the software.
- **Troubleshooting** – provides solutions for common problems that may be encountered, and answers to frequently asked questions.
- **Un-installation** – provides instructions on un-installing software.
- **OPC Compliance** – details on the OPC standard the client uses for communication.
- **Appendices**:
  - A – Distributed COM (DCOM)
  - B – ODBC DSN Configuration

References

This document references information found within the following documents/sites:

- **www.opcfoundation.org**
- **www.MatrikonOPC.com**
- **www.opcsupport.com**

Document Terminology

The terms *screen* and *window* are used interchangeably throughout this document.

Table 1 provides a list of definitions for terms used throughout this document.

Term/Abbreviation	Description
COM	Component Object Model. A method for organizing software, specifying how to build components that can be dynamically interchanged.
DA	OPC Data Access. Provides access to real-time process data.
DCOM	Distributed Component Object Model. An extension of COM that allows communication between COM components over a network.
HMI	Human Machine Interface. Device that allows interaction between the user and machine. Typically used in process control applications.
Matrikon	Matrikon Inc.
Matrikon OPC	Matrikon's brand name for its OPC servers and clients.
OPC	A communication standard. Refer to **www.opcfoundation.org** for more information.
PLC	Programmable Logic Controller.
ODBC	Open Database Connectivity. A standard defining a method for applications to interact with compliant databases.

Table 1 - Terms and Definitions

Getting Started

This chapter contains important information about installing the client and how to contact Matrikon's Support team.

The **System Requirements** section shows how to avoid future problems by ensuring that the system meets the minimum software and hardware requirements. Detailed step-by-step instructions in the **Installation** section walks the user through the installation process and lists the files that are installed during this process.

Once the client has been installed, refer to the *Licensing Procedures* document that was installed along with the client and this User's Manual, to learn how to obtain the appropriate license. If any problems are encountered during installation or licensing, refer to the **Contacting Support** section for information about how to contact the Matrikon OPC Support team for assistance.

System Requirements

The software has minimum **Software** and **Hardware** system requirements. These requirements must be met for the software to function properly.

Note:
The user must have an administrative user account rather than a restricted user account to install and configure a Matrikon OPC product.

Software Requirements

The MatrikonOPC Client for ODBC requires the following software:

Operating System

- Microsoft Windows 10 or
- Microsoft Windows 2016 Server or
- Microsoft Windows 2012 R2 Server or
- Microsoft Windows 7 32Bit or
- Microsoft Windows 7 64Bit or
- Microsoft Windows Server 2008 R2 64Bit

Note:
It is recommended that the most current service packs are installed. The above listed OS along with service packs have been tested for MatrikonOPC Client for ODBC compatibility.

Additional Software Requirements

- Microsoft Visual C++2008 Runtime
- Microsoft .NET Framework 3.5

Hardware Requirements

The minimum hardware required for Matrikon Client for ODBC are mentioned below:

- Intel® CORE i5
- 4 GB RAM
- 80 GB 7200 RPM Hard Drive

Installation

Once the system requirements have been met, the user is ready to install the software.

Note:

- If the user already has an instance of MatrikonOPC Client for ODBC installed on the machine, **the user must completely un-install the old ODBC client before installing the new one**. If the user attempts to install one instance on top of another, a re-install requires to be performed.
- As part of the installation process, the **Matrikon OPC Analyzer** tool is installed and used to detect the system settings that affect the use of this software. No information is communicated back to Matrikon. Information is stored on this system **only** for future use by Matrikon OPC Support to assist with troubleshooting, if required.

Perform the following steps to install the software:

1. Insert the MatrikonOPC Client for ODBC CD into the CD drive.
2. Double-click the *Matrikon OPCODBCClient.EXE* file, if the Matrikon OPC InstallAware screen does not automatically appear. The **InstallAware Wizard** (Figure 1) verifies its contents.

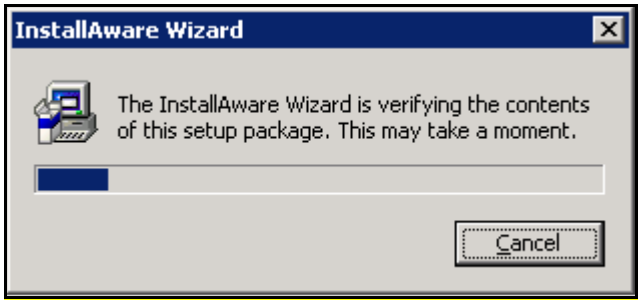

Figure 1 – InstallAware Wizard

Either a **Prerequisites** screen appears, or the user is taken directly to the **Licensing Agreement** screen. If the **Licensing Agreement** screen is the displayed screen, go to step 4.

3. Click on the **Next** button to install the listed pre-requisites, if the **Prerequisites** screen appears.

After all the prerequisites, have been installed, the **License Agreement** screen (Figure 2) appears.

Note:

From the **License Agreement screen**, the user has the option of selecting the **I reject the license** agreement option. Selecting the **I reject the license agreement** option button disables the **Next** button so the options are to return to the previous screen, **cancel** the install by clicking on the Cancel button, or select the **I accept the license agreement** option button to proceed through the installation.

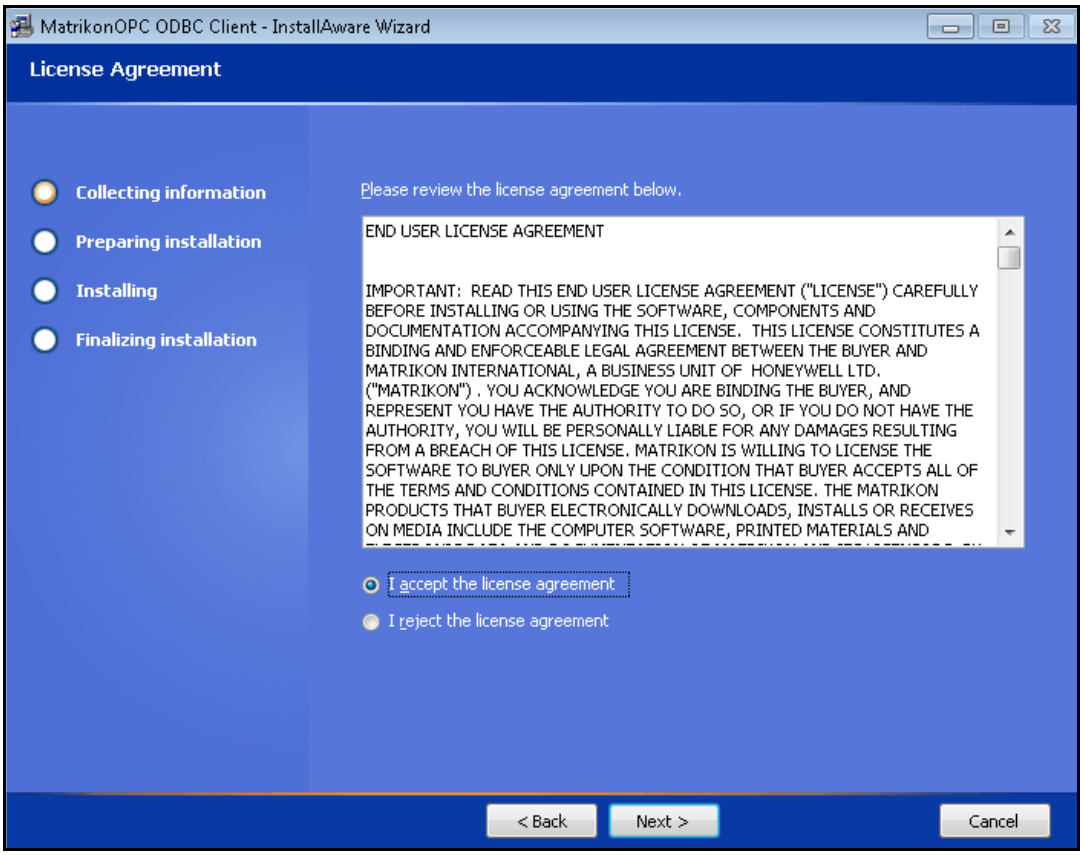

Figure 2 – License Agreement screen

4. Read the **Software License Agreement**, using the scroll bar to view the entire message.
5. Select the **I accept the license agreement** option button.
6. Click on the **Next** button. The **Setup Type** screen (Figure 3) appears.

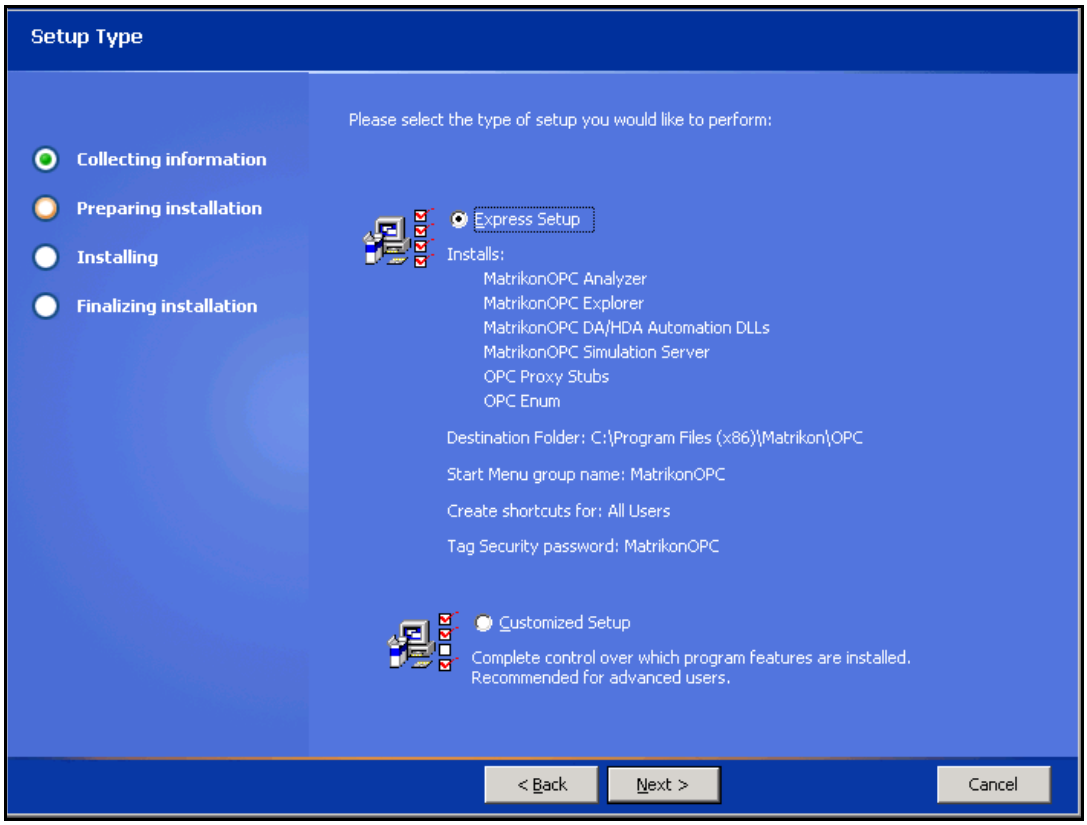

Figure 3 – Setup Type screen

7. Select the type of setup to be performed.
   If Express Setup is selected the Server will get installed with default options mentioned in **Setup Type** Screen (Figure 3) and the user will not see Step **9** to Step **15**.

   If Custom Setup is selected, the user will get the option to customize the installation.

> **Note:**
> Matrikon OPC recommends the user to select the **Express Setup** option.

8. Select Custom Setup and Click on the **Next** button. The **Select Features** Screen (Figure 4) appears.

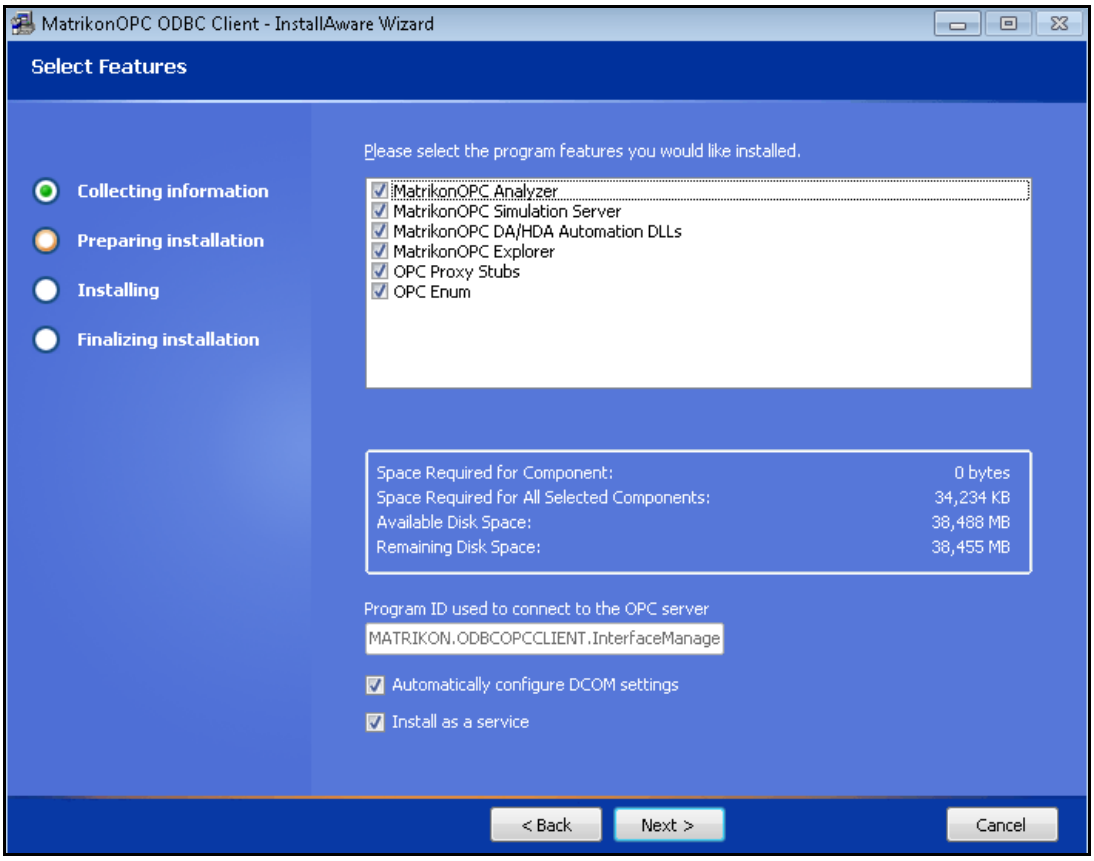

Figure 4 – Select Features screen

9. Click on the **Next** button. The **Destination Folder** screen (Figure 5) appears.

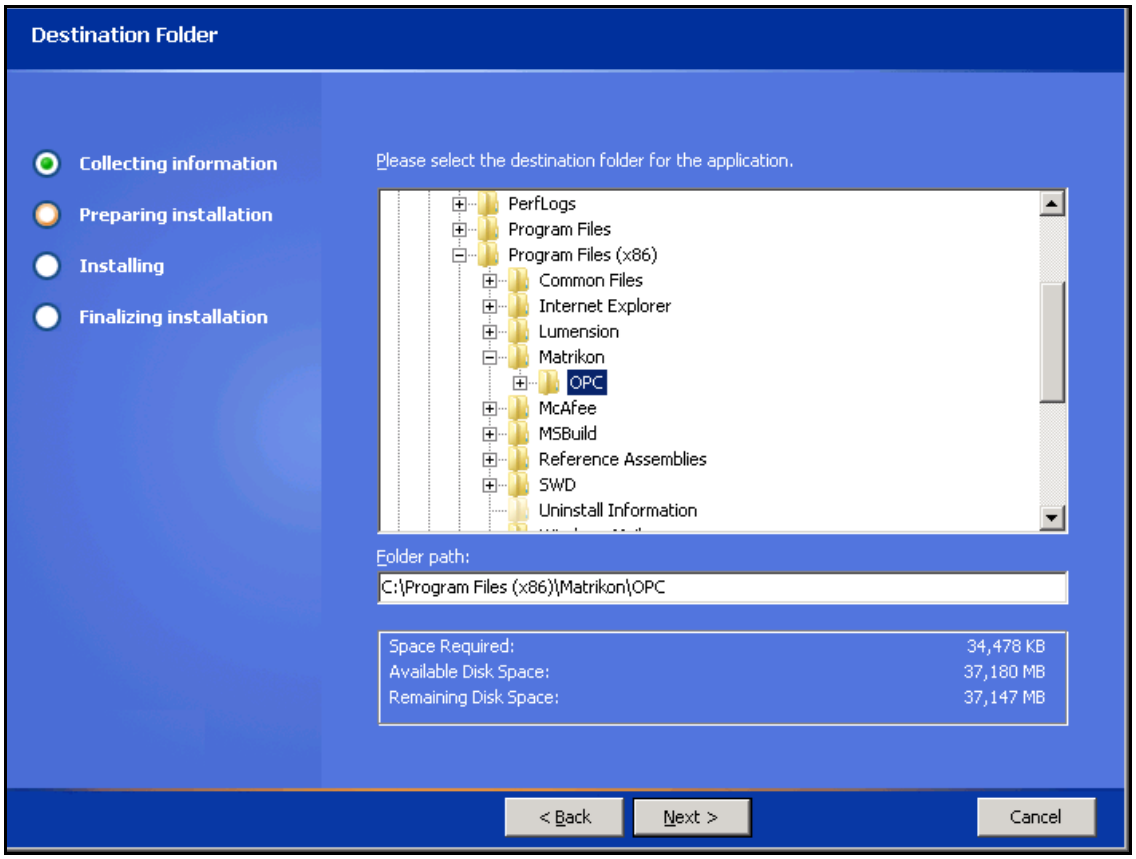

Figure 5 – Destination Folder screen

10. Select the folder in which MatrikonOPC Client for ODBC must be installed, or accept the default location displayed in the **Folder path** field.
11. Click on the **Next** button. The **Start Menu** screen (Figure 6) appears.

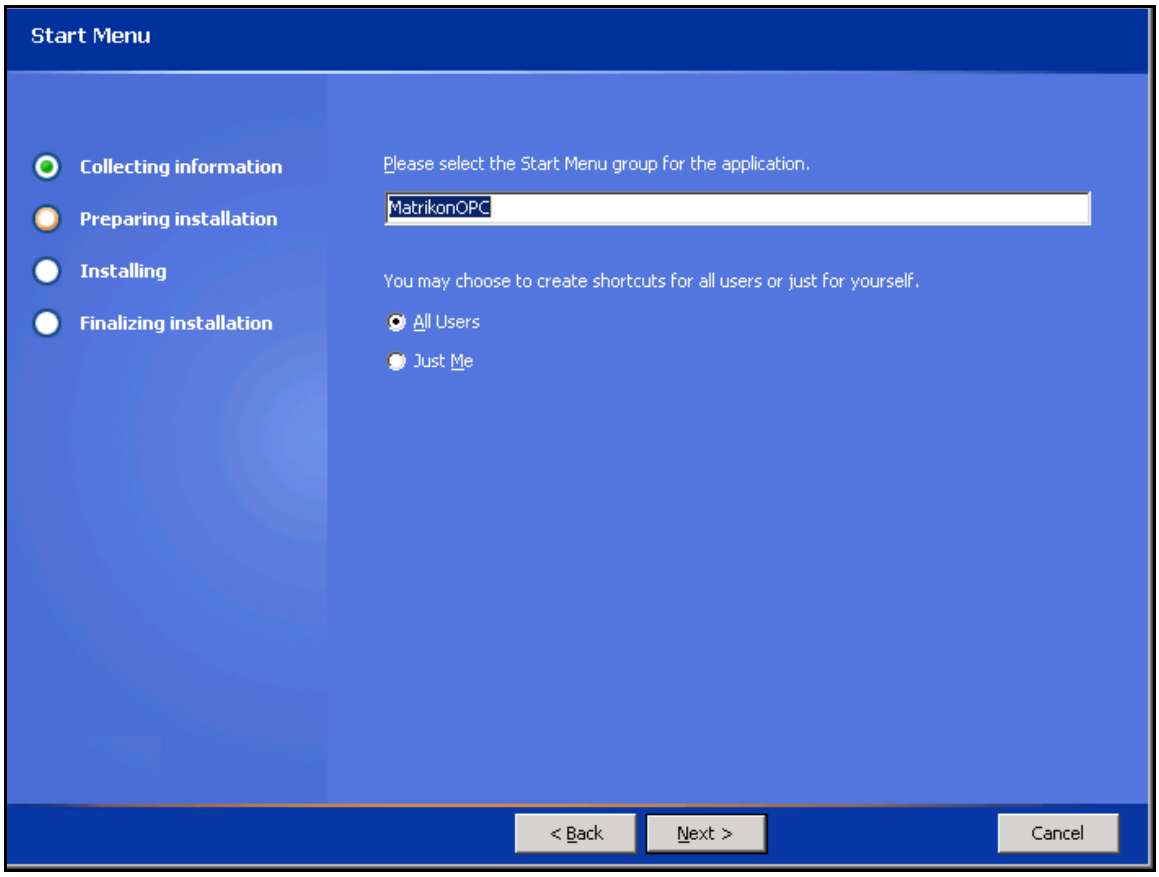

Figure 6 – Start Menu screen

12. Select the **Start Menu** group and the user specifies whether the shortcuts requires to be created only for yourself, or for all users, by selecting the applicable option button.

Note:
The default password provided for the user is ***Matrikon OPC***. Note this password for future references.

13. Click on the **Next** button to accept the default password. The **Licensing** screen (Figure 7) appears.

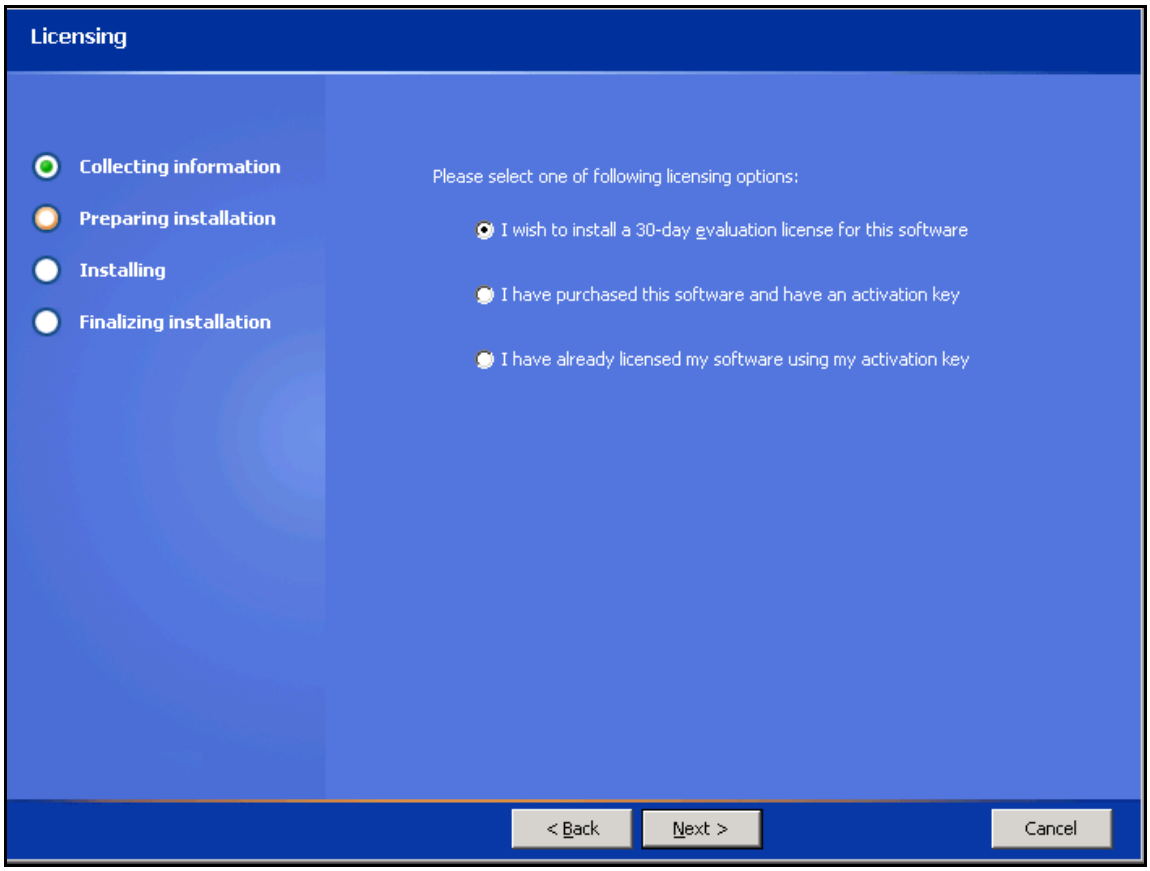

Figure 7 – Licensing screen

14. Select the applicable licensing option.
15. Click on the **Next** button. The **Ready to Install** screen (Figure 8) appears.

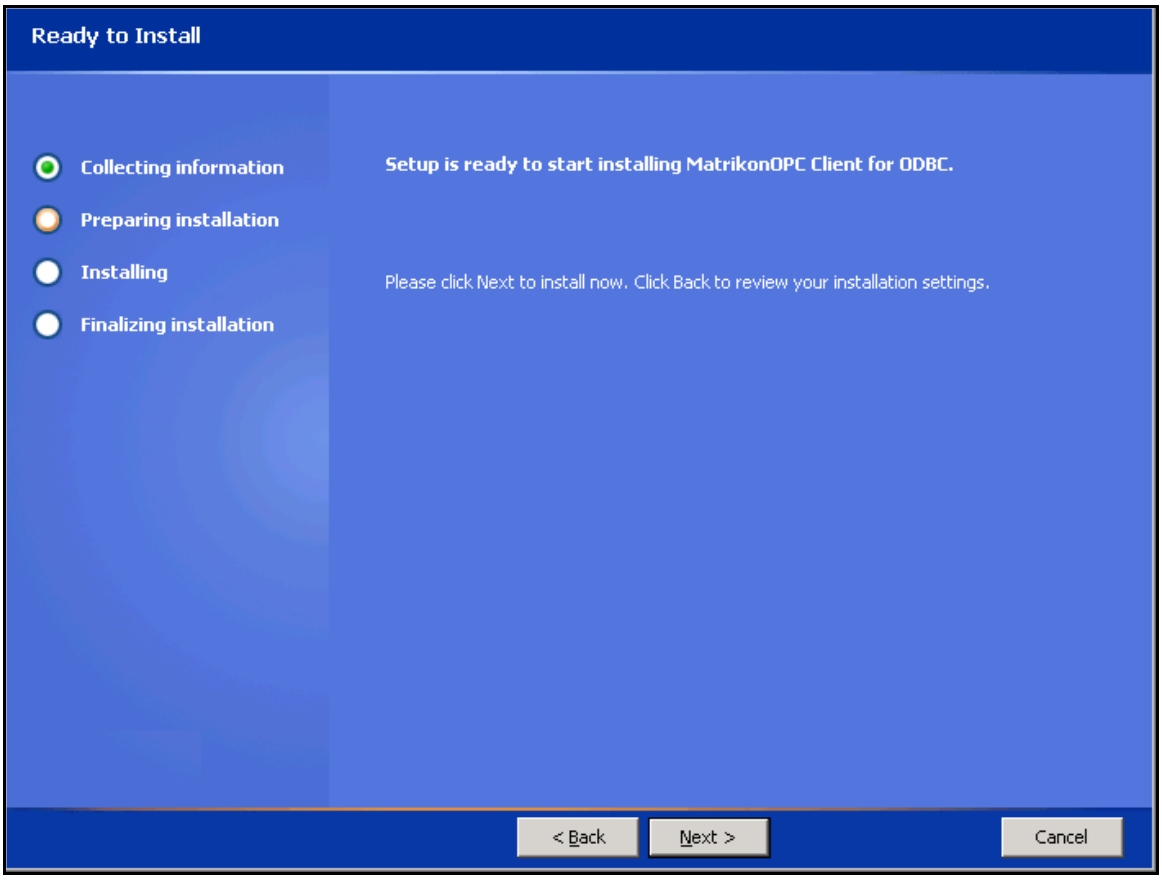

Figure 8 – Ready to Install screen

16. Click the **Next** button. The **Installing MatrikonOPC Client for ODBC** screen (Figure 9) appears, installation begins, and the product files are copied to the computer.

Note:
Prior to starting the installation, the user has the option of clicking on the **Back** button to change any of the installation information. Click the **Cancel** button if the user wishes to stop or cancel the installation.

Figure 9 – Installing MatrikonOPC Client for ODBC screen

Once the installation is complete, the **MatrikonOPC Client for ODBC Setup Complete** screen (Figure 10) appears stating that the Matrikon OPC server has been successfully installed.

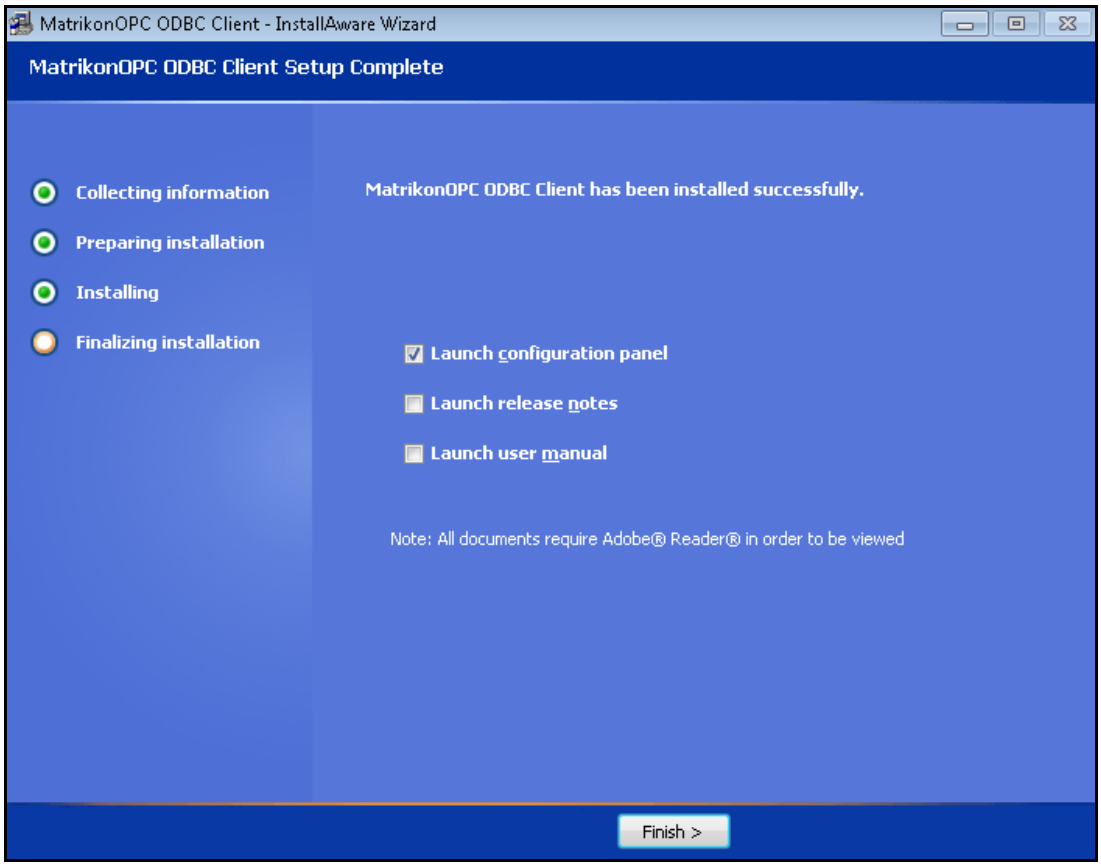

Figure 10 – MatrikonOPC Client for ODBC Setup Complete screen

17. Launch any or all the following features by selecting the necessary checkbox or checkboxes:
    - Configuration Panel
    - Release Notes
    - User Manual
    - Configuration Video
18. Click the **Finish** button to complete the installation and exit the Wizard.
    The necessary files are now been copied to the target computer, the software components are registered, and shortcut icons are created in the Start menu.

Note:
At this point, it is recommended that the user verifies the DCOM settings. Reference to the DCOM configuration can be found in the **DCOM Manual**. This configuration varies for different operating systems.

Installed Files

The installation program copies all necessary files to the target computer and creates shortcut icons in the **Start** menu.

The files listed in Table 2 are installed by default, in the following location:

C:\Program Files\Matrikon\OPC\OPC ODBC

File Name	Description
GDAODBC.dll	Dynamic link library used for ODBC connectivity.
LogLibrary.dll	Log library file.
MatrikonOPC Client for ODBC Release Notes.pdf	*Release Notes* for the client.
MatrikonOPC Client for ODBC User Manual.pdf	This *User's Manual* for the client.
Moces.log	ODBC client GUI log.
OdbcClient.xsd	An XML schema definition for the configuration files used for the ODBC Client. This file is necessary to validate that configuration files are correct upon load.
ODBCClientConfiguration.wmv	A tutorial video to configure the OPC Client for ODBC.
ODBCOPCCLIENT.exe	Client executable.
OdbcOpcClientGui.exe	Graphical client configuration executable.
ODBCOPCCLIENTps.dll	The interface library between the GUI and the client.
ODBCOPCCLient.log	ODBC Client log file.
SampleDB.mdb	Sample database.
SampleMTKConfig.xml	Sample configuration loaded on start-up.

Table 2 - Files Installed in "OPC ODBC" Folder

The files listed in Table 3 are installed by default, in the following location:

C:\Program Files\Common Files\Matrikon OPC\Common

File Name	Description
EULA.pdf	License document.
MTKAUTHORIZE.EXE	Matrikon product authorization utility.
OPCAuto.dll	Matrikon OPC Automation Component – enables developers to access OPC data from client applications developed using Automation tools.
OPCDA20_AUTO.DOC	Matrikon OPC Automation Component interface standard.
OPCDAAUTO.DLL	Matrikon OPC Automation Component – enables developers to access OPC data from client applications developed using automation tools (e.g., *Visual Basic*, *VBA*, *VB Script*).
opchda_ps.dll	The proxy-stub files to allow OPC clients to make remote connections to an OPC HDA Server.

File Name	Description
opchda10_auto.doc	Developer documentation for HDA Automation Component.
OPCHDAAuto.dll	Matrikon OPC HDA Automation Component – enables developers to access OPC HDA Data from client applications developed using Automation tools.
PSTCFG.EXE	Matrikon product configuration utility.
PSTCFGPS.DLL	Matrikon product configuration marshaling library.
EULA.pdf	End-User License Agreement in PDF format.
Hasp.exe	Hardware Key Licensing Utility.
haspds_windows.dll	Hardware Key Licensing Library.
Hinstall.exe	Hardware Key Device Driver Installation Utility.
ACLConfig.exe	GUI to Tag Security Utility.

Table 3 - Files Installed in "Common" Folder

Licensing

Most Matrikon OPC products require some form of licensing criteria be met to ensure that it functions successfully.

The Matrikon OPC ODBC Client supports **both** software and hardware licensing.

IMPORTANT TO NOTE:

The following licensing information is described in detail within the *Licensing Procedures* document which accompanies the ODBC Client software and *User's Manual:*

- Requesting a software license
- Enabling a temporary software authorization
- Installing a permanent software license
- Generating a new *AuthorizeRequest.MTK* file
- De-licensing software
- Installing a Hardware licensing
- Licensing Q&A and Troubleshooting

Note: De-licensing deactivates the transactions and re-licensing does not activate them. The user must activate them again, manually.

IMPORTANT TO NOTE:

De-licensing deactivates the transactions and re-licensing does not activate them. The user has to activate them again, manually.

Contacting Support

The Matrikon OPC Customer Services department (**www.opcsupport.com**) is available 24 hours a day, seven days a week.

Contact Matrikon OPC Support using the information below, or send an email to (**support@MatrikonOPC.com**). For Monday to Friday **daytime support** requests, contact Matrikon OPC Support using the regional phone numbers provided in Table 4.

Region	Office Hours	Contact Information
North America UTC/GMT -7 hours (MST)	8:00 am-5:00 pm	**+1-877-OPC-4-ALL**
South America UTC/GMT -3 hours (BRT)	9:00 am-5:00pm	**+55 (11) 3475-1846**
Europe / Middle East /Africa * UTC/GMT +1 hours (CET)	9:00 am-5:00 pm	**+49-221-969-77-10**
Australia/Asia * UTC/GMT +10 hours (AEST)	9:00 am-5:00 pm	**+61-2-4908-2198**

* Toll-free regional numbers coming soon!

Table 4 – Matrikon OPC Support Regional Contact Information

For after-hours support in all regions, contact either of the following numbers. No extra charge is levied from Matrikon OPC for calling their after-hours support numbers.

Region	Contact Information
All	**+1-780-231-9480**

Table 5 - After-Hours Support

Configuration

The client GUI allows users to view and alter configuration parameters at run time. When a user views a configuration parameter, the information is retrieved and displayed. The updated parameters are sent as a group to the client when submitted.

Minimal configuration of the MatrikonOPC Client for ODBC is required for the client to function properly, but users can customize the client's behavior as required. This chapter shows users how to start and configure the client and describes each component in detail, including the windows, panels, and menu commands.

The **Starting the MatrikonOPC Client for ODBC** section of this manual shows users how to start the software. The next sub-sections describe the **Tool Tray Menu**, **Control Panel**, and **Configuration** window, in detail.

At the end of this section are four sub-sections that cover saving, clearing, and loading configuration settings, and shutting down the server.

Starting the MatrikonOPC Client for ODBC

Choose the appropriate shortcut from the **Start** menu to launch the MatrikonOPC Client for ODBC.

Perform the following steps to start the MatrikonOPC Client for ODBC:

1. Click the Windows **Start** button and select **Programs** -> **Matrikon OPC** -> **OPC Client for ODBC**, and choose **OPC Client for ODBC**.
    - By default, the client is installed as a Windows service. The client can be installed as a service during the installation process by selecting the **Install as a service** checkbox on the **Select Features** Screen (Figure 4) accessed via the **Destination Folder** screen (Figure 5). When the client is installed as a service, the splash screen does not appear, nor does the logo appear in the **Tool Tray**. Instead, the main **Configuration** window is immediately displayed. If the client is installed as a Windows service, users can also start it using the **Service Control Manager** applet (under the Windows **Control Panel**).
    - If the client is not installed as a Windows service, the server starts and the **Matrikon** logo appears in the **Tool Tray** (Figure 11), located by default in the system tray.

Figure 11 - Tool Tray

    - If the client is not installed as a Windows service, the **Welcome** screen appears briefly when the client starts up.

> **Note:**
> If the client is installed as a service, users can choose to run it as an application by re-registering the OPC server executable using the **/REGSERVER** command-line switch.

Tool Tray Menu

> **Note:**
> If the client is installed as a Windows service, the **Tool Tray** and **Tool Tray Menu** are not available.

The **Tool Tray Menu** provides access to the **Configuration** window, and the **About** screen. It also contains the commands to shut down the server.

Perform the following steps to view the Tool Tray menu:

1. Right-click on the **Matrikon logo** .
   The **Tool Tray** menu appears (Figure 12).

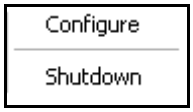

Figure 12 - Tool Tray Menu

Table 6 describes the commands in the **Tool Tray** menu.

Command	Description
Configure	Displays the main **Configuration window**.
Shutdown	Shuts down the server.

Table 6 - Tool Tray Menu Commands

Configuration Window

Note:
If the client is installed as a Windows service, the **Tool Tray Menu** is not available. In this case, the **Configuration** window is then accessed via the Windows **Start** menu: **Start -> Programs -> Matrikon OPC -> OPC Client for ODBC -> OPC Client for ODBC**

The **Configuration** window allows the user to configure database connections, table writes and custom writes. These operations will be discussed in depth later in this section.

If the client runs as a local executable, it runs on the background despite the main configuration window being closed, even if no database transactions are configured.

If the client runs as an NT service, it will run until it is manually shut down. Closing the main configuration window will shut down the configuration utility, but will not interfere with the normal operation of the client.

Perform the following steps to view the Configuration window:

1. Select **Configure** from the Tool Tray Menu or the Control Panel.
   The Configuration window (Figure 13) appears.

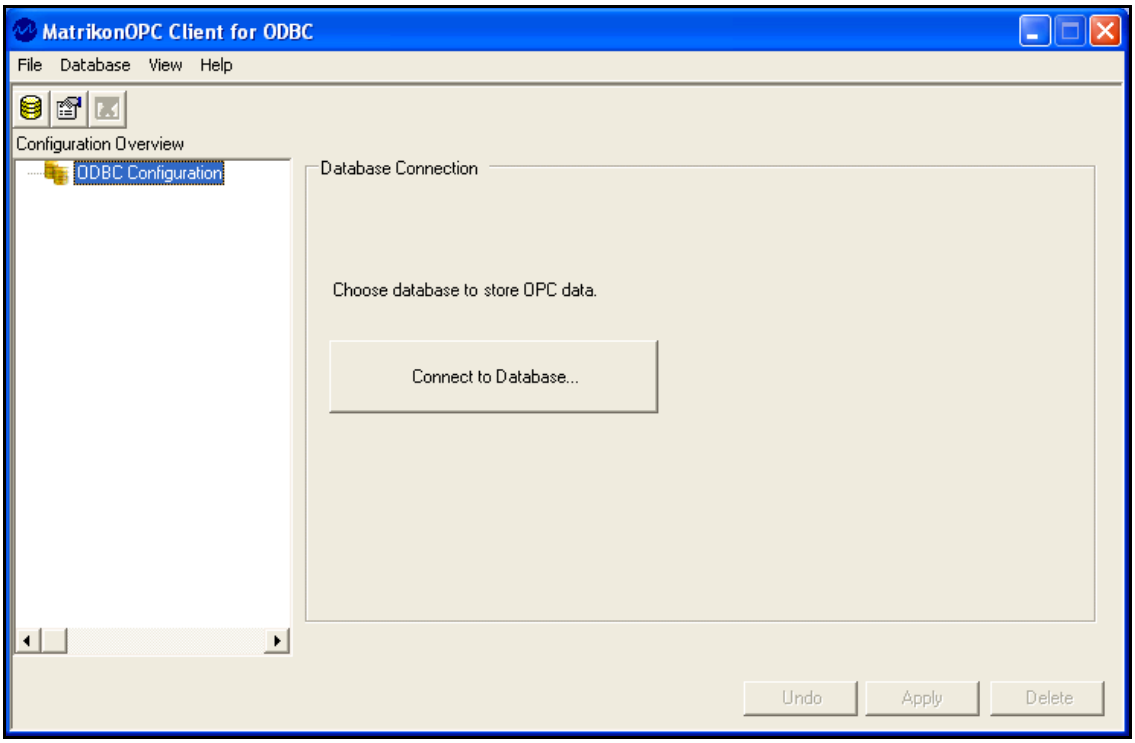

Figure 13 - Configuration Window

Table 7 describes the commands in the main **Configuration** window.

Command	Description
Main Menu	Provides access to the **File**, **Database**, **View**, and **Help** menus.
Main Toolbar	Provides shortcut buttons for commonly performed operations.
Connect to Database...	Launches the **Database Connection Configuration** window (Figure 14) to allow the user to configure the database connection.
Configuration Overview	Displays a tree of configured table writes. Right click on a component, to delete the component.
Undo	Undoes changes to a transaction. By selecting this option, the transaction is reverted to the last ***applied*** state.
Apply	Adds or updates the current transaction with the configuration specified in the GUI.
Delete	Deletes the current database, transaction or OPC item from the configuration. When deleting a database, transaction or OPC item, note its position in the **Current Overview** tree. The deletion operation will delete the current tree leaf **and** every leaf below it.

Table 7 - Configuration Window Commands

The following sections describe the menus available from the **Configuration** window, and what they are used for.

File Menu

Table 8 describes the **File** menu commands.

Command	Description
New	Clears the current configuration and starts a new one. The user is given the option to save the current configuration before clearing the existing one.
Open	Clears the current configuration and loads a new one from an existing file. Before clearing the old configuration, the user is prompted to save the current one. Displays the **Open** window to prompt for the file name.
Save	Saves the current configuration to an XML file. Displays the **Save Configuration** window to prompt for a new file name if the configuration is new and has not been saved before.
Save As	Saves the current configuration to an XML file. Displays the **Save Configuration** window to prompt for a new file name.
Shutdown	Shuts down the MatrikonOPC Client for ODBC and closes the **Configuration** window.
Exit	Closes the Configuration window. If the current configuration has not been saved, the user is prompted with the message "Save the configuration before closing?". The MatrikonOPC Client for ODBC remains running in the background even after exiting the window.

Table 8 - File Menu Commands

Database Menu

Table 9 describes the **Database** menu commands used to configure database connections and transactions.

Command	Description
 **Connect to Database**	Connects an ODBC data source to the client. Selecting **Connect to Database** will launch the **Database Connection Configuration** window (Figure 14).
Table Write	Begins configuring a new table write transaction for the selected database. This option is greyed out when the currently selected tree leaf is not a database.
Custom Write	Begins configuring a new custom write for the selected database. This option opens the **Custom Write** configuration window. The custom write option is greyed out when the currently selected tree leaf is not a database.

Table 9 - Edit Menu Commands (Server Configuration)

View Menu

Table 10 describes the **View** menu command.

Command	Description
 **Options**	Displays the **Preferences** window which is described in detail in the section **General Preferences** of this manual. The **Preferences** window allows the user to configure **General**, **Logging** and **Advanced** options.

Table 10 - View Menu Commands

Help Menu

Table 11 describes the **Help** menu command.

Command	Description
About	Displays the **Welcome** screen, which includes information about the software version.

Table 11 - Help Menu Commands

MatrikonOPC Client for ODBC Configuration

The MatrikonOPC Client for ODBC requires minimal configuration to setup OPC server and database communication. Communication between OPC servers and databases is defined by transactions. The term "transaction" refers to a mapping between a set of OPC items and a single database table. A configured transaction specifies how OPC item data is written to a database table, how database table information is written to OPC items or a combination of both.

The MatrikonOPC Client for ODBC defines two types of transactions:

- Table writes
- Custom writes

Both of which are discussed later in this manual.

OPC Groups and Transaction Groups

OPC servers use the concept of groups to define communication properties for a set of OPC items. When configuring a transaction, MatrikonOPC Client for ODBC will automatically create the necessary groups. However, transactions will assume several properties of these groups. These properties remain configurable. To fully utilize the MatrikonOPC Client for ODBC, it is necessary to have a basic understanding of how these properties affect the behavior of a transaction.

The update rate for an OPC group defines the minimum time (in milliseconds) between updates for an OPC item. If this value is set too low, the OPC server will be over loaded trying to obtain fresh values from the device.

Note:
This value should never be set below 100 milliseconds.

The I/O type refers to how data for items in this group will be retrieved from the OPC server. Communication with an OPC server may either be synchronous or asynchronous. When using synchronous communication, the OPC server polls the device for the values of OPC items. The frequency of this polling will be no lower than the group update rate.

The asynchronous communication I/O type does not periodically poll the values of OPC data items. Rather, this communication type creates a subscription to each item in the OPC group. Whenever a subscribed item changes, the server reports the new values to the client. The number of changes reported is limited by the group update rate. If the value changes more than once during the update rate, only one of these values will be reported.

The chosen I/O type affects how transactions are executed. If synchronous I/O is chosen, the transaction is executed for each OPC item once per polling period. If asynchronous I/O is chosen, a transaction will only be executed for an item when a change in data values is reported.

Connecting to a Database

Before configuring a transaction, it is necessary to define a database connection. The database connection is configured in the **Database Connection Configuration** window (Figure 14).

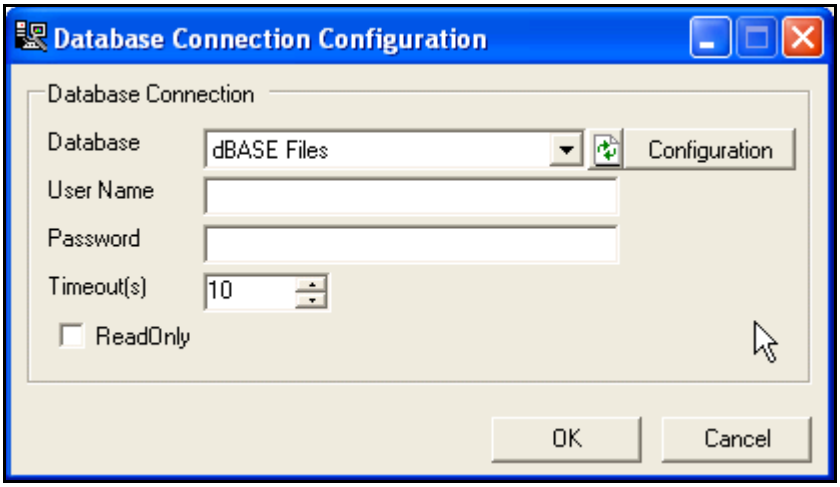

Figure 14 - Database Connection Configuration Window

The **Database Connection Configuration** window components are described in Table 12.

Command	Description
Database	The name of the data source, which can be obtained from the ODBC "Data Sources" section in the Windows Control Panel. For more detailed information, refer to **Appendix B - ODBC DSN Configuration**.
	Select this button to refresh the **Database** list. This option is used to allow newly configured ODBC data sources to be shown in the **Database** dropdown.
Configuration	Selecting this button will access the **ODBC Data Source Administrator** window. This option provides the ability to configure new ODBC data sources.
User Name	The name of the user that the MatrikonOPC Client for ODBC must use to connect to the database. **Note:** This field is dependent upon the setup of the user database. If the database does not require authentication, then this field is left blank.
Password	The password for the above user name. **Note:** This field is dependent upon the setup of the user database. If the database does not require authentication, then this field is left blank.
Timeout(s)	The amount of time (in seconds) that the MatrikonOPC Client for ODBC must wait for the ODBC data source before declaring a timeout.
Read Only	Specifies whether the MatrikonOPC Client for ODBC is permitted only to read from the database (i.e., checkbox is selected), or if it can write as well (i.e., checkbox is cleared).

Table 12 - Database Connection Configuration Window Components

Perform the following steps to define and connect to a database:

1. Select the **ODBC Configuration** node in the **Configuration Overview** pane on the left, from the main **Configuration** window (Figure 13), choose one of these available options:
   - Click on the **Connect to Database** button in the **Database Connection** panel on the right side of the screen, or
   - Click on the **Connect To Database** icon on the toolbar, or
   - Select the **Connect To Database** menu option from the **Database** menu.

   The **Database Connection Configuration** window (Figure 14) is displayed.
2. Select an ODBC data source from the **Database** drop-down list.
3. Select the **Configuration** button to configure it without leaving the ODBC Client **Configuration** window if the desired ODBC data source is not configured, (refer to **Appendix B - ODBC DSN Configuration**) for more information.

Note:
Click the **Configuration** button (on the **Database Connection Configuration** window) to go to the **ODBC Data Source Administrator** screen where the user can create a data source configuration. Once the new ODBC data source configuration is finished, the user is returned to the **Database Connection Configuration** window, where the user ***MUST*** click on the **Refresh** () button to refresh the list of available ODBC data sources.

4. Enter the **User Name** and **Password** in the fields if a username and password is required for the database.
5. Click the **OK** button to add the database. The **Database Connection Configuration** window closes.

Removing a Database Connection

Perform the following steps to remove/delete a database connection:

1. Highlight the database the user wishes to remove from the **Configuration** window, in the **Configuration Overview** pane and perform one of the following actions:
   - Right click on the desired database icon in the **Configuration Overview** pane and select **Delete** (highlighted in **red** in Figure 15) from the displayed menu, or
   - Click on the **Delete** button (highlighted in **blue** in Figure 15) at the bottom right of the **Configuration** window, or
   - Click on the **Delete** icon  (highlighted in **green** in Figure 15) on the toolbar.

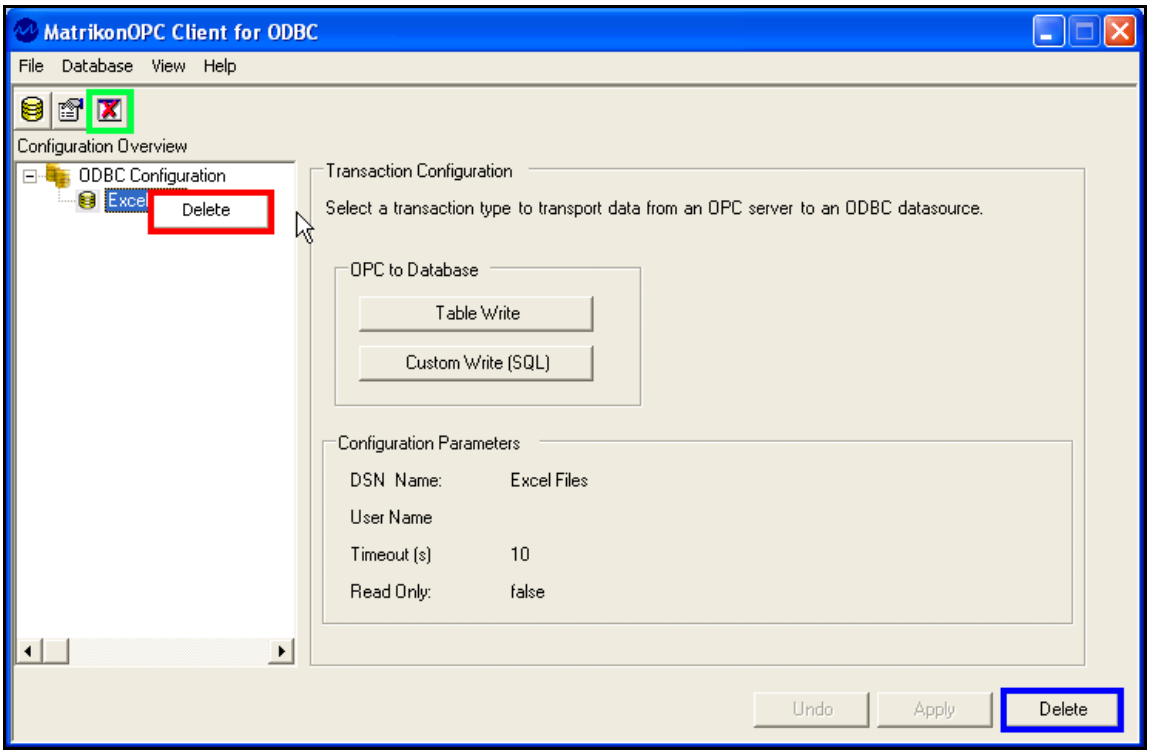

Figure 15 - Deleting Database Connection

A confirmation message (Figure 16) appears asking the user to confirm the action and warning that deleting a database connection also deletes any table and custom writes configured for the database.

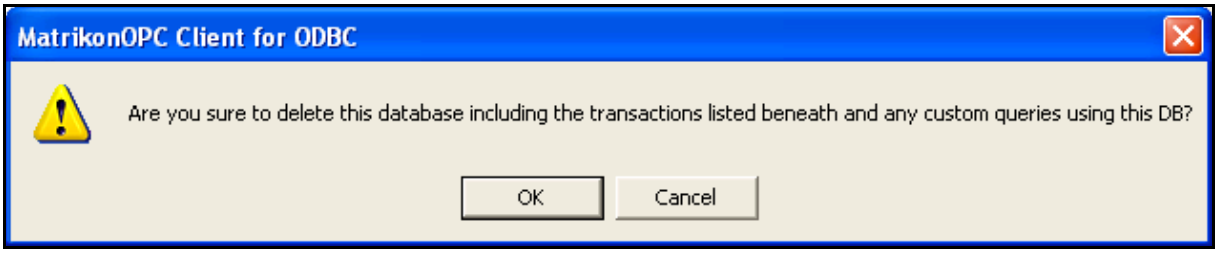

Figure 16 - Database Deletion Confirmation Message

2. Click the **OK** button. The confirmation message closes and the user is returned to the **Configuration** window and the selected database is no longer listed in the **Configuration Overview** pane.

Creating a Transaction

Note:
Before creating a table write, a database connection must be configured. For assistance, refer to **Connecting to a Database**.

Perform the following steps to create a transaction:

1. Select the desired database node from the **Configuration** window in the **Configuration Overview** pane to create a **Table Write** for a database.

The **Transaction Configuration** and **Configuration Parameters** screen sections are displayed in the right pane of the **Configuration** window (Figure 17).

2. Create a **Table Write** or **Custom Write** transaction from this screen.

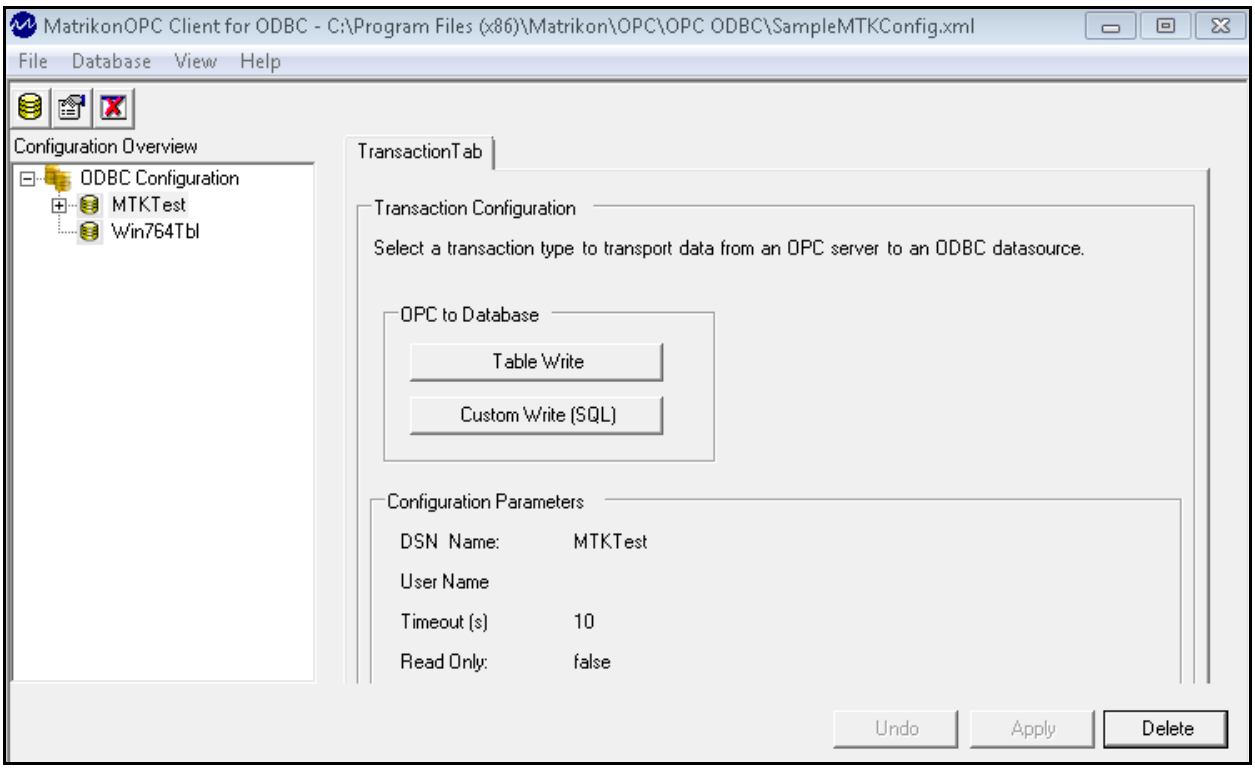

Figure 17 - Table Write or Custom Write

Table Writes

Table writes are used to write attributes of an OPC item to a database table. The user selects a set of OPC items to be associated with each transaction.

A table write may be classified as either an insert or an update. Both inserts and updates are analogous to their corresponding SQL operation. An insert transaction writes a new table entry to the database each time it is executed. An update transaction updates each entry in the database meeting the update criteria. A table write update will only update database entries with the same item name. Additionally, the user specifies to update database entries only if their quality matches to that of the current OPC item. The behavior of update transactions for this query is subtly different than SQL updates. There is one minor difference between an ODBC client update and an SQL update. For ODBC client updates where there are no table entries that match the update criteria, an entry with the new OPC item information is inserted into the database.

Perform the following steps to launch the table write transaction configuration panel:

1. Select the required database from the Configuration window, in the Configuration Overview pane (Figure 17).
2. Click on the **Table Write** button, or select the **Table Write** menu option under the **Database** menu.
   The table write transaction configuration panel (**Figure 18**) is displayed.

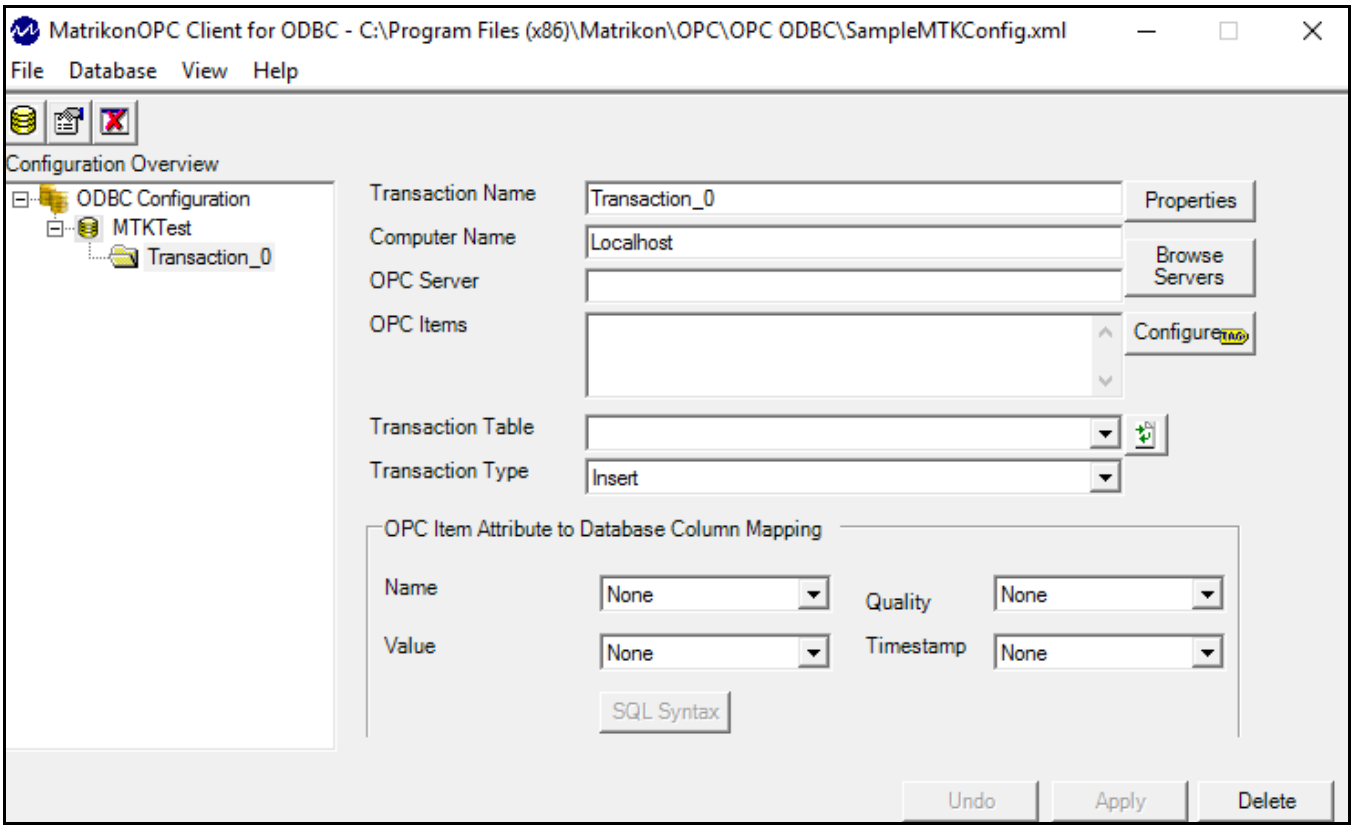

Figure 18 - Table Write Transaction Configuration Panel

The configuration panel components are described in Table 13.

Command	Description
Transaction Name	Allows the user to enter the name used to identify a transaction. When a transaction is first created, it is given a default name.
Properties	Click this button to access the **Set Transaction Properties** window which is used to define custom properties for the transaction. See **Customize the OPC Specific Settings** to view the window and for an explanation of these properties.
Computer Name	The name of the computer containing the OPC server. If applicable, this name includes the network path. This field can be entered manually, or populated using the **Browse Servers** command.
OPC Server	The ProgID for the OPC server. This field can be entered manually, or populated using the **Browse Servers** command.
Browse Servers	Use this button to browse for the OPC server to use with the transaction. OPC servers can be browsed on the local machine or, if applicable, the network neighborhood.
OPC Items	The OPC items for the transaction. This field can be entered manually, or populated using the **Configure** command.
Configure	Browse and select the OPC items involved in this transaction.
Transaction Table	The name of the table for the transaction.

Command	Description
Refresh	Click on this button to manually refresh the list of tables available from this database.
Transaction Type	Used to specify whether the transaction will be an insert or update.
OPC Item Attribute to Database Column Mapping	Used to specify the table columns where the **Name**, **Value**, **Quality** and **Timestamp** data are to be written. To be a validate Table Write, a column mapping must be chosen for at least one of the OPC item attributes.

Table 13 - Table Write Transaction Configuration Panel Components

Defining a Table Write

A table write can be defined in as few as five steps, with two optional steps as described below.

1. Choose a Transaction Name (Optional)

Enter a name for the table write in the **Transaction Name** field. This name must be unique; it cannot match the name of other table or custom write transactions. By default, a unique name of the form **Transaction_*X***, where ***X*** is a number, is generated when the query is created.

2. Choose an OPC Server

To browse the OPC server, click on the **Browse Servers** button to launch the **Select OPC Server Connection** window (Figure 19).

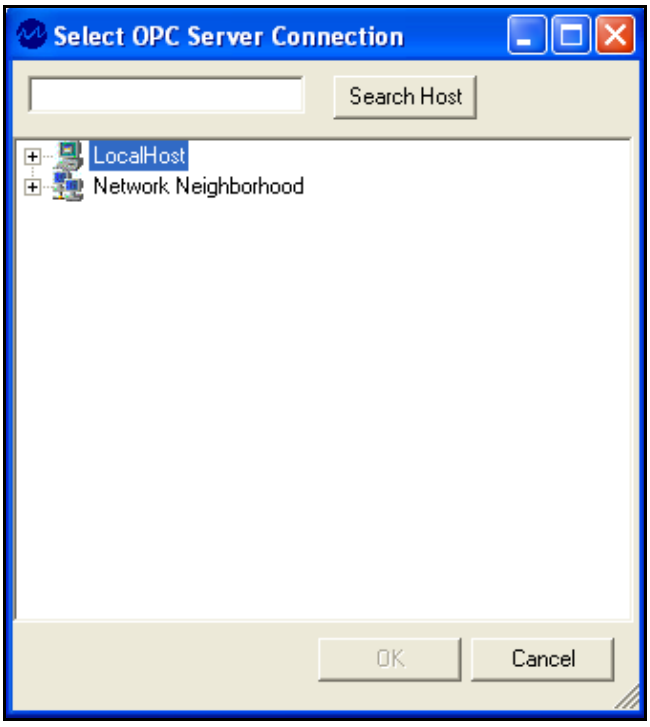

Figure 19 - Select OPC Server Connection Window

From the **Select OPC Server Connection** window, select a server from either a local or network machine. This option will automatically populate the **Computer Name** and **OPC Server** fields. Alternately, these names can be entered directly into these fields.

Click on the **OK** button to close the **Select OPC Server Connection** window.

3. Choose OPC Items

To browse OPC items, from the table write transaction configuration panel on the **Configuration** screen, click on the **Configure** button to display the **Add OPC Item(s)** window (Figure 20).

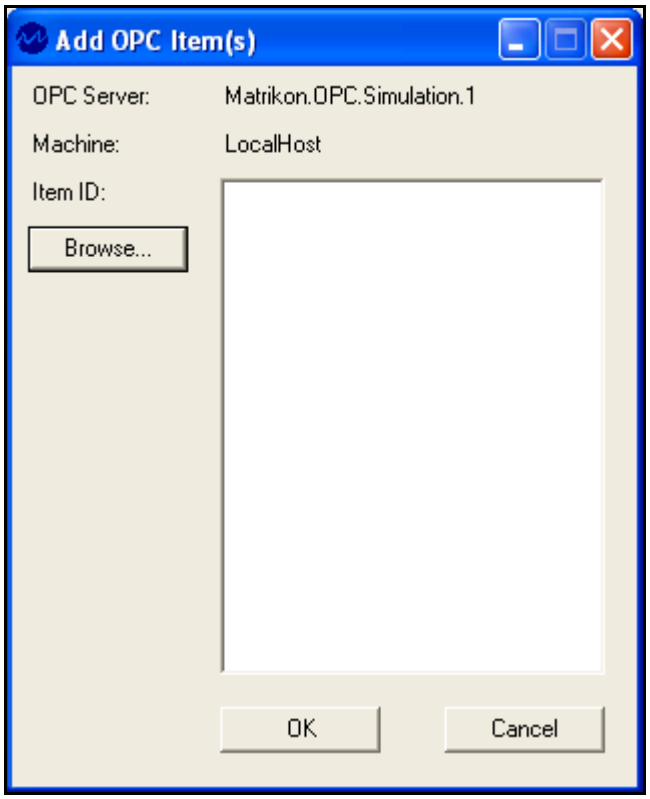

Figure 20 - Add OPC Item(s) Window

To instantiate a browse for the available items, click on **Browse** button on the **Add OPC Item(s)** window. This will launch the **Browse OPC Item(s)** window (Figure 21) containing the browsed items.

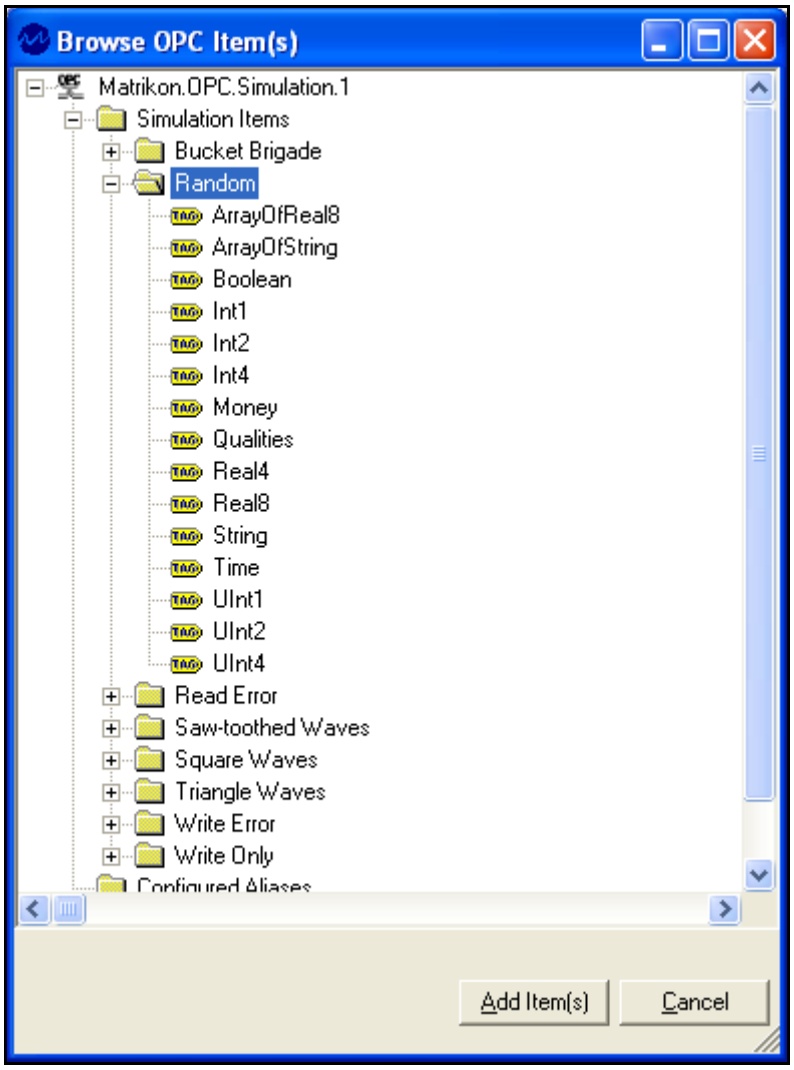

Figure 21 - Browse OPC Item(s) Window

Multiple items are selected from the **Browse OPC Item(s)** window. Browsing items will populate the **OPC Items** field in the table write transaction configuration panel on the **Configuration** screen. Items are typed directly into the **OPC Items** field. If the server address space cannot be browsed, OPC items are entered manually.

Select the item or items the user requires to add.

Click on the **Add Item** button. The Browse OPC Item window closes and the user returns to the **Add OPC Item(s)** window where the selected item or items are now listed.

Click on the **OK** button to close the **Add OPC Item(s)** window and returns the user to the **Configuration** window where the selected items are now listed in the **OPC Items** field.

4. Choose a Transaction Table

Select a table from the database to write to from the table write transaction configuration panel on the **Configuration** screen, in the **Transaction Table** field. If the name of the table is known, it can be typed directly into the **Transaction Table** field or the table can be selected from the drop-down list.

Note:

- Selecting the drop-down list may trigger the warning that it could take several minutes to load the table names. For many databases, this operation will take no more than a few seconds even though the warning appears. However, in some instances it may take several minutes to gather this information. This does not affect the operation of previously configured transactions.
- The GUI will only re-load table information for a database if the user navigates away from the database or any of its configured transactions. In instances where loading the table names is a slow process, further delays can be avoided by configuring all desired transactions for a database before moving onto the next database.

5. Choose a Transaction Type

In the **Transaction Type** field on the table write transaction configuration panel, select whether the transaction should be an ***Insert*** or ***Update*** operation from the drop-down list. Note that choosing ***Update*** exposes the **Update by Quality** checkbox in the **OPC Item Attribute to Database Column Mapping** screen section.

6. Choose an OPC Item Attribute to Database Column Mapping

The **OPC Item Attribute to Database Column Mapping** screen section is used to specify which database columns the attributes of OPC items are written to in the database. For the OPC **Name**, **Value, Quality** and **Timestamp** attributes, the associated column is selected from a drop-down list of available columns for that table specified in the **Transaction Table** field.

It is not necessary to map each attribute to a database column. However, only the mapped attributes will be written to the table. Each table write must define at least one attribute to column mapping. Additionally, more than one attribute cannot be mapped to the same table column. If the **Transaction Type** field is set to ***Update***, the **Update by Quality** checkbox is displayed. To filter updates by quality, select that checkbox.

7. Customize the OPC Specific Settings (Optional)

To customize the transaction group properties, click on the **Properties** button next to the **Transaction Name** field (**Figure 18**) to display the **Set Transaction Properties** window (Figure 22). A description of each of these options is presented in Table 14.

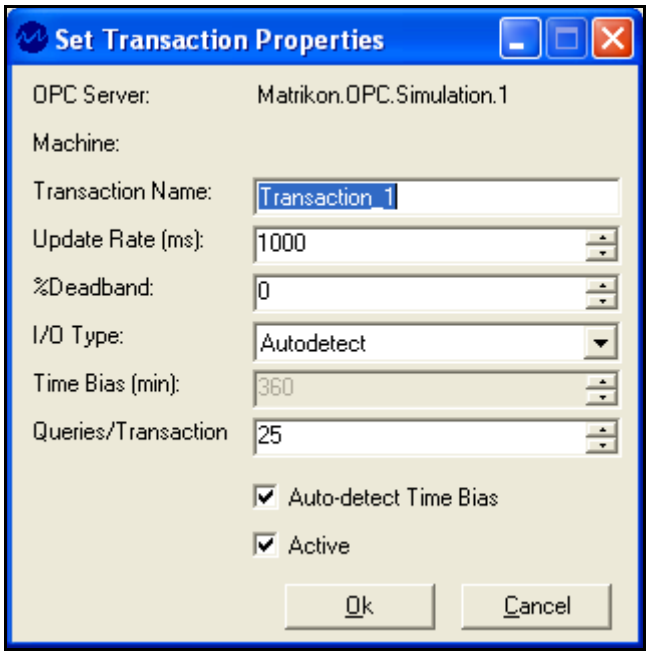

Figure 22 - Set Transaction Properties Window

Table 14 describes the **Set Transaction Properties** window components.

Command	Description
OPC Server	Displays the ProgID for the OPC server.
Machine	Displays the machine and network information where the OPC server resides.
Transaction Name	The name of the current transaction. This name may be modified in this window.
Update Rate(ms)	The minimum update rate (in milliseconds) for the transaction group. This corresponds to the update rate for the OPC group containing each of the items in this transaction.
%Deadband	A value which is used for asynchronous communication to specify what constitutes a change in an OPC item. For example, a dead-band value of 10% means that the value must change by at least 10% to be considered a change.
I/O Type	Allows the user to specify (by selecting an option from the drop-down list) how data for items in this group will be retrieved from the OPC server. Selecting a synchronous type tells the client to make a request for data and wait until the server retrieves it. Selecting an asynchronous type means that the client makes a request for data, but does not wait for the server to retrieve the data. Rather, the server responds with an update only after retrieval, and only if item values in the group have changed. Note that each type in this drop-down list refers to an OPC communication standard. Not all standards may be implemented by the OPC server. Selecting ***Autodetect*** attempts to automatically choose the I/O type. ***Autodetect*** will attempt to choose an asynchronous type first, but will default to synchronous if this fails.

Command	Description
Time Bias(min)	By default, OPC timestamps are based on UTC standard time. This field allows the user to select or enter a value to define a time bias that is to be used to convert this time to local time. The time bias specifies the number of minutes to subtract from UTC time. For example, a time bias of 420 means 420 minutes will be subtracted from the UTC time. **Note:** This field is disabled if the **Auto Detect Time Bias** checkbox has been selected.
Queries/Transaction	Advanced option to specify the number of SQL statements to bundle as a single SQL transaction for a MatrikonOPC Client for ODBC transaction.
Auto-detect Time Bias	Selecting this checkbox will result in the automatic calculation of the time bias setting based on the local settings of the local machine.
Active	This checkbox specifies if the transaction is active or inactive.

Table 14 - Set Transaction Properties Window Components

After completing these five steps (and two optional steps, if required), click on the **Apply** button to activate this transaction. A transaction cannot be executed until it has been applied. Figure 23 shows a complete example transaction.

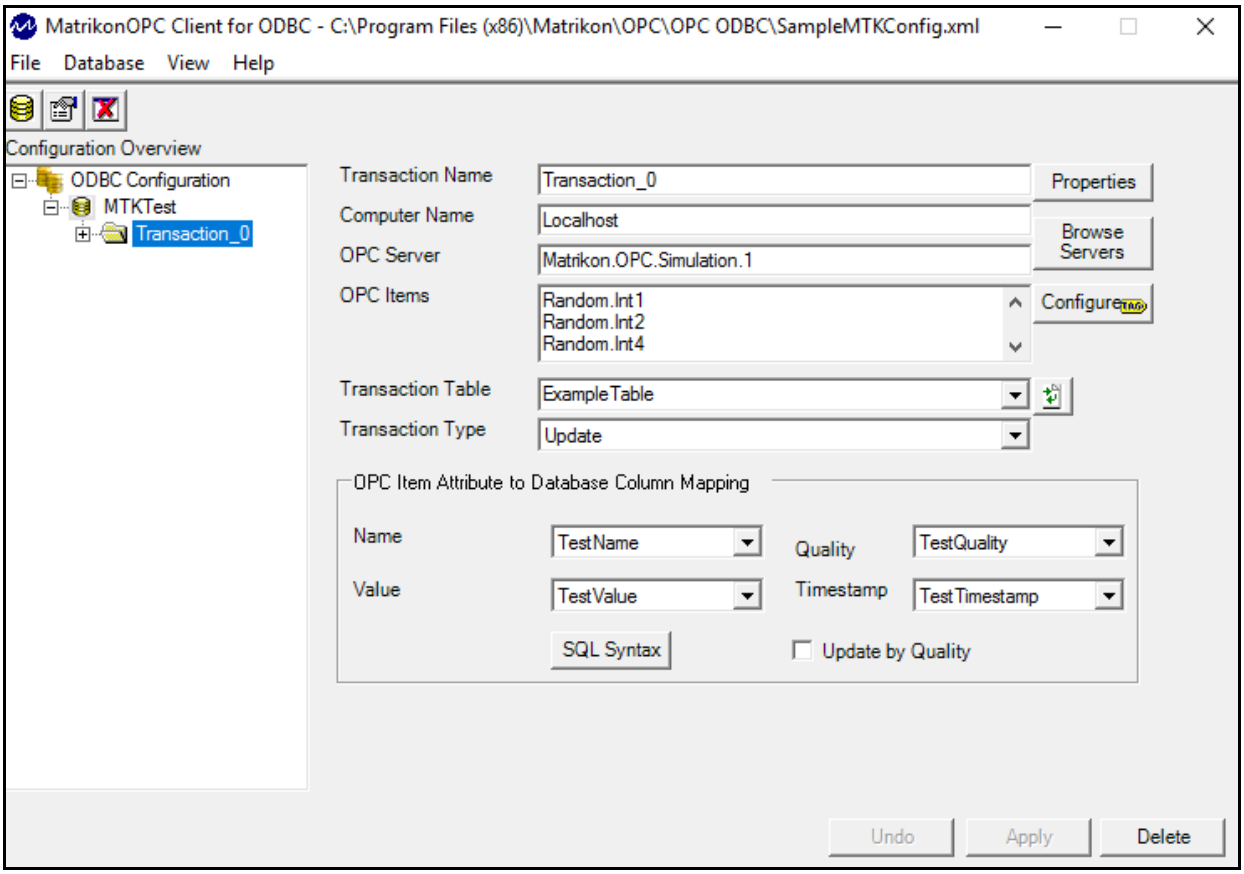

Figure 23 - Configured Table Write

Deleting a Table Write

Perform the following steps to remove/delete a table write:

1. Select the transaction to delete in the **Configuration Overview** pane, and perform one of the following actions:
   - Right click on the item in the **Configuration Overview** pane and select **Delete** from the displayed menu, or
   - Click on the **Delete** button in the bottom right of the **Configuration** window, or
   - Click on the **Delete** icon  in the toolbar.

   Before deleting the transaction, a message (Figure 24) appears asking the user to confirm the deletion of the transaction.

Figure 24 - Confirmation Message

2. Click the **OK** button. The confirmation message closes. The user is returned to the **Configuration** window and the selected transaction is no longer listed in the **Configuration Overview** pane.

Deleting a Transaction Tag

Individual OPC items are deleted from a table write in different ways.

Perform the following steps to remove/delete a transaction tag (Method 1):

1. Select the transaction to delete a tag or tags from the **Configuration** window, in the **Configuration Overview** pane.
2. Highlight those items to remove in the **OPC Items** field.
3. Right-click and select either the **Cut** or **Delete** menu option from the displayed menu.

   The deleted items no longer appear in the **OPC Items** field.
4. Click the **Apply** button to commit the change.

Perform the following steps to remove/delete a transaction tag (Method 2):

1. Select the transaction from which the user requires to delete a tag or tags in the **Configuration Overview** pane.

   The items associated with the selected transaction are listed below the transaction.
2. Select the transaction tag to be deleted, and perform either of the actions:
   - Right click on the item and select **Delete** from the displayed menu, or
   - Click the **Delete** button on the bottom right of the **Configuration** window, or
   - Click the **Delete** icon  in the toolbar.

Before deleting the tag, a message (Figure 25) appears asking the user to confirm the deletion of the tag.

Figure 25 - Confirmation Message

3. Click the **OK** button. The confirmation message closes and the user is returned to the **Configuration** window and the selected tag is no longer listed in the **Configuration Overview** pane.

Custom Writes

Using table write transactions, simple insert and update transactions can be configured with a minimum amount of effort. In certain instances, more sophisticated data manipulation is required.

The MatrikonOPC Client for ODBC is used to construct complex SQL statements using OPC item characteristics (name, value, timestamp or quality) and database table columns as parameters.

Perform the following steps to launch the custom write editor:

1. Ensure to create a database connection, described previously in the section Connecting to a Database.
2. Highlight the database in the Configuration Overview pane for which the user is creating a custom write once the database connection has been established. The Configuration screen appears (Figure 17).
3. Click the Custom Write (SQL) button, or select the Custom Write option from the Database menu to launch the custom write editor. The Add Query window (also referred to as the custom write editor) appears (Figure 26).

The custom write editor is composed of two panes. The pane on the left (labelled **Transaction Text)** is where the SQL statements are entered. The right pane contains a series of tabs used to configure transaction options, display results of executed transactions, and display query results. The following sections explain the **Add Query** window tabs, and illustrate how custom writes are used by presenting examples.

The **Add Query** window includes five tabs:

- **Data Values**
- **Transaction Options**
- **OPC Options**
- **Transaction Results**
- **Current Transactions**

Data Values Tab

The **Data Values** tab is displayed in Figure 26.

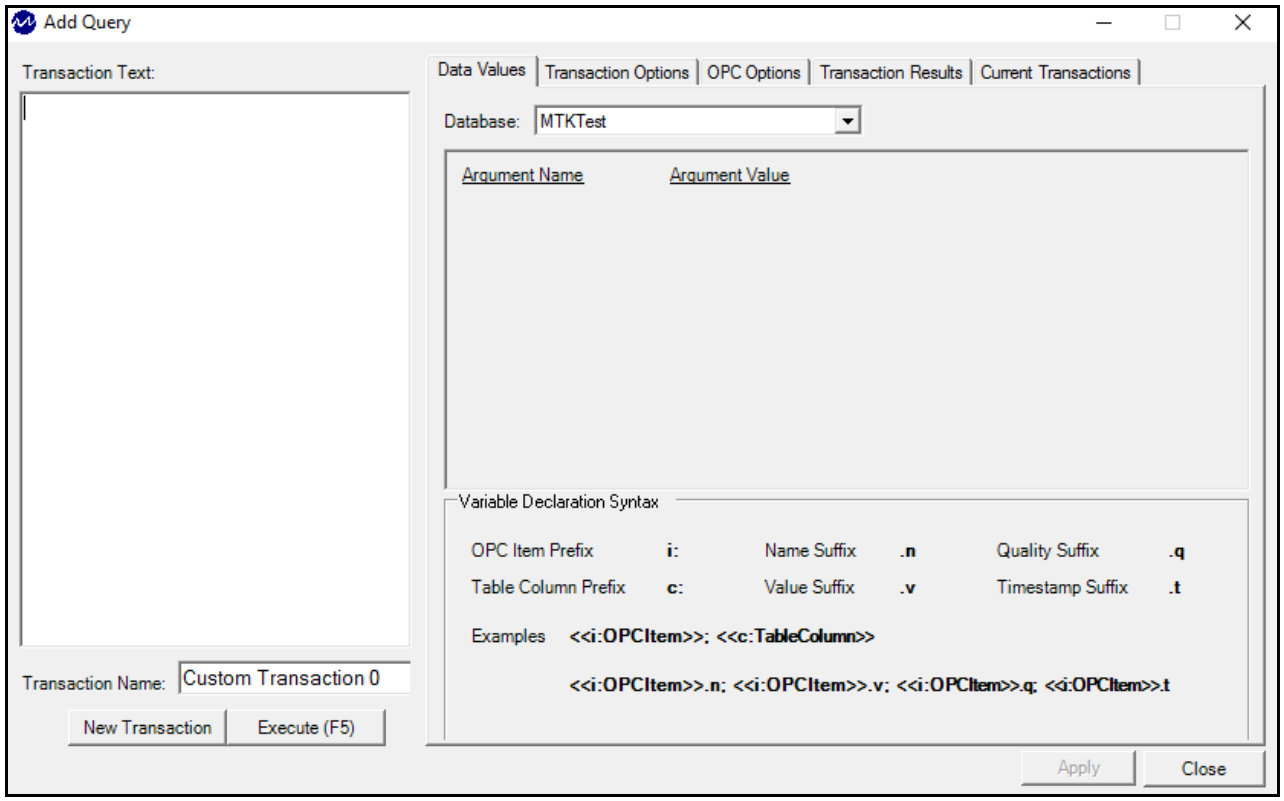

Figure 26 - Add Query Window - Data Values Tab

The options available in the **Transaction Text** panel are described in Table 15. These fields appear in this panel regardless of which tab is selected.

Command	Description
Transaction Text	Allows the user to enter the required SQL statements.
Transaction Name	Allows the user to enter the name used to identify this custom transaction.
New Transaction	Select this button to create a new blank custom query with a unique, automatically-generated name.
Execute (F5)	Select this button to execute the transaction displayed in the **Transaction Text** field. This option executes this custom transaction only once, and does not add it to the scheduled transactions for the client. Pressing the **F5** key in the query editor will also execute the query.

Table 15 - Add Query Window - Transaction Text Panel Components

Table 16 describes the components of the **Data Values** tab.

Command	Description
Database	Use this drop-down list to choose which connected database for which to configure a custom write.
Variable Name	This table column is used to specify the names of variables entered in the **Transaction Text** pane. There will be a variable definition for each unique variable name.
Variable Value	This table column is used to specify the values of the variables

Command	Description
	corresponding to each variable name entered in the **Transaction Text** pane. There will be a variable definition for each unique variable name.
Variable Declaration Syntax	This pane provides a legend specifying how to define variables in statements entered in the **Transaction Text** window. This legend will change to match the start/end delimiters defined in the **Transaction Options** tab.
Apply	Select this button to accept any changes made in the **Add Query** window. **Note:** This button stays consistent across all tabs.
Close	Select this button to cancel any changes made and close the **Add Query** window. **Note:** This button stays consistent across all tabs.

Table 16 - Add Query Window - Data Values Tab Components

Transaction Options Tab

The **Transaction Options** tab is displayed in Figure 27. The tab components are described in Table 17.

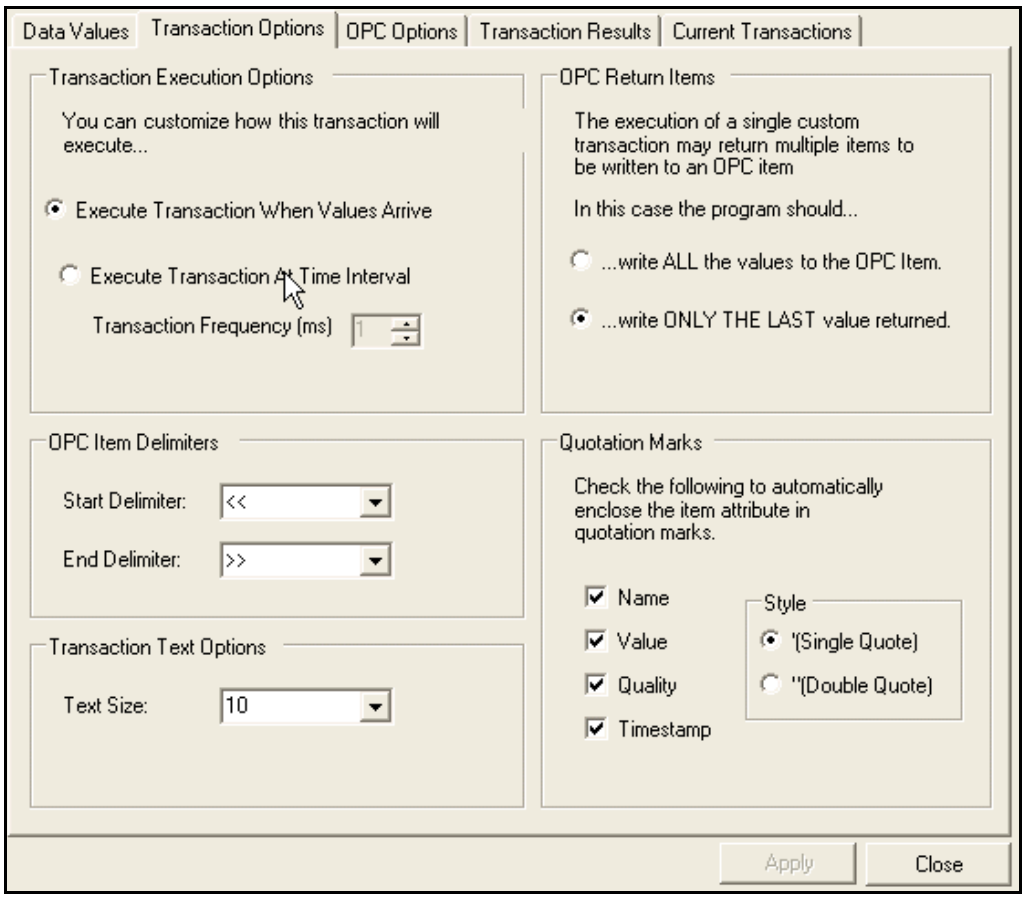

Figure 27 - Add Query Window - Transaction Options Tab

Command	Description
Transaction Execution Options	These options specify how the transaction is scheduled in the client. If the **Execute Transaction When Values Arrive** option button is selected, the transaction will be executed when new values are received for one or more of the associated OPC items. If the **Execute Transaction At Time Interval** option button is selected, the transaction will be scheduled to be executed at fixed intervals, regardless of whether or not any associated OPC item values have changed. This option should be used to ensure that transactions with no associated OPC items are executed. If this option is selected, the **Transaction Frequency** field is enabled. The **Transaction Frequency** field is available only if the **Execute Transaction At Time Interval** option button is selected. If enabled, this field allows the user to enter or select a value that specifies the frequency (in milliseconds) at which the transaction is executed.
OPC Item Delimiters	The **Start Delimiter** field allows the user to select from the drop-down list, the sequence of special characters used to delimit the beginning of an OPC item in a custom transaction. Values may either be chosen from the set { ***<<, {, {{, [, [[*** }, or entered manually. If chosen from the set, the value for the end delimiter automatically matches this choice. The **End Delimiter** field allows the user to select from the drop-down list, the sequence of special characters used to delimit the end of an OPC item in a custom transaction. Values may be chosen from the set { ***>>, }, }},],]]*** }. If chosen from the set, the value for the start delimiter automatically matches this choice.
Transaction Text Options	Allows the user to select from the **Text Size** drop-down list, the size of the text displayed in the **Transaction Text** window.
OPC Return Items	When it is time to execute a transaction, there may be multiple values returned for an OPC item. Select the **...write ALL the values to the OPC Item** option button to execute the transaction for each value in the set. Select the **...write ONLY THE LAST value returned** option button to execute the transaction for only the most recent value in this set.
Quotation Marks	Allows the user to select which attribute or attributes are to be enclosed in quotation marks: ***Name***, ***Value***, ***Quality***, ***Timestamp***.
Style	Allows the user to select the option button that defines the automatic use of either single quotation marks (**'*(Single Quote)***) or double quotation marks (**"(Double Quote)**) for each of the selected attributes (see **Quotation Marks**).
Apply	Select this button to accept any changes made in the **Add Query** window. **Note:** This button stays consistent across all tabs.
Close	Select this button to cancel any changes made and close the **Add Query** window. **Note:** This button stays consistent across all tabs.

Table 17 - Add Query Window - Transaction Options Tab

OPC Options Tab

The **OPC Options** tab is displayed in Figure 28 and the tab components are described in Table 18.

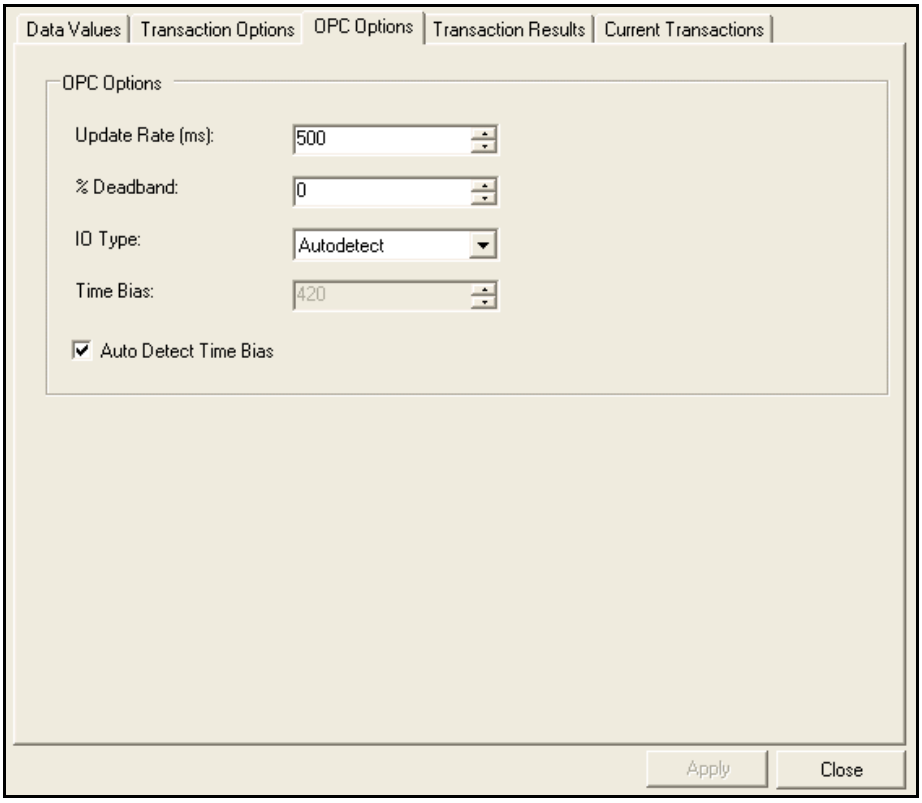

Figure 28 - Add Query Window - OPC Options Tab

Command	Description
Update Rate (ms)	Allows the user to enter or select the minimum update rate (in milliseconds) for the OPC group(s) associated with the transaction. This will be the minimum time between entries for an OPC item in the database.
% Deadband	Allows the user to enter or select a value which is used for asynchronous communication to specify what constitutes a change in an OPC item. For example, a deadband value of 10% means that the value must change by at least 10% to be considered a change.
IO Type	Allows the user to specify (by selecting an option from the drop-down list) how data for items in this group will be retrieved from the OPC server. Selecting a synchronous type tells the client to make a request for data and wait until the server retrieves it. Selecting an asynchronous type means that the client makes a request for data, but does not wait for the server to retrieve the data. Rather, the server responds with an update only after retrieval, and only if item values in the group have changed. Note that each type in this drop-down list refers to an OPC communication standard. Not all standards may be implemented by the OPC server. Selecting ***Autodetect*** attempts to automatically choose the I/O type. ***Autodetect*** will attempt to choose an asynchronous type first, but will default to synchronous if this fails.
Time Bias	By default, OPC timestamps are based on UTC standard time. This field

Command	Description
	allows the user to select or enter a value to define a time bias that is to be used to convert this time to local time. The time bias specifies the number of minutes to subtract from UTC time. For example, a time bias of 420 means 420 minutes will be subtracted from the UTC time. **Note:** This field is disabled if the **Auto Detect Time Bias** checkbox has been selected.
Auto Detect Time Bias	When this checkbox is selected, the time bias is automatically calculated based on the system time zone settings. **Note:** If this checkbox is selected, the **Time Bias** field is disabled.
Apply	Select this button to accept any changes made in the **Add Query** window. **Note:** This button stays consistent across all tabs.
Close	Select this button to cancel any changes made and close the **Add Query** window. **Note:** This button stays consistent across all tabs.

Table 18 - Add Query Window - OPC Options Tab Components

Transaction Results Tab

The **Transaction Results** tab is displayed in Figure 29 and the tab components are described in Table 19.

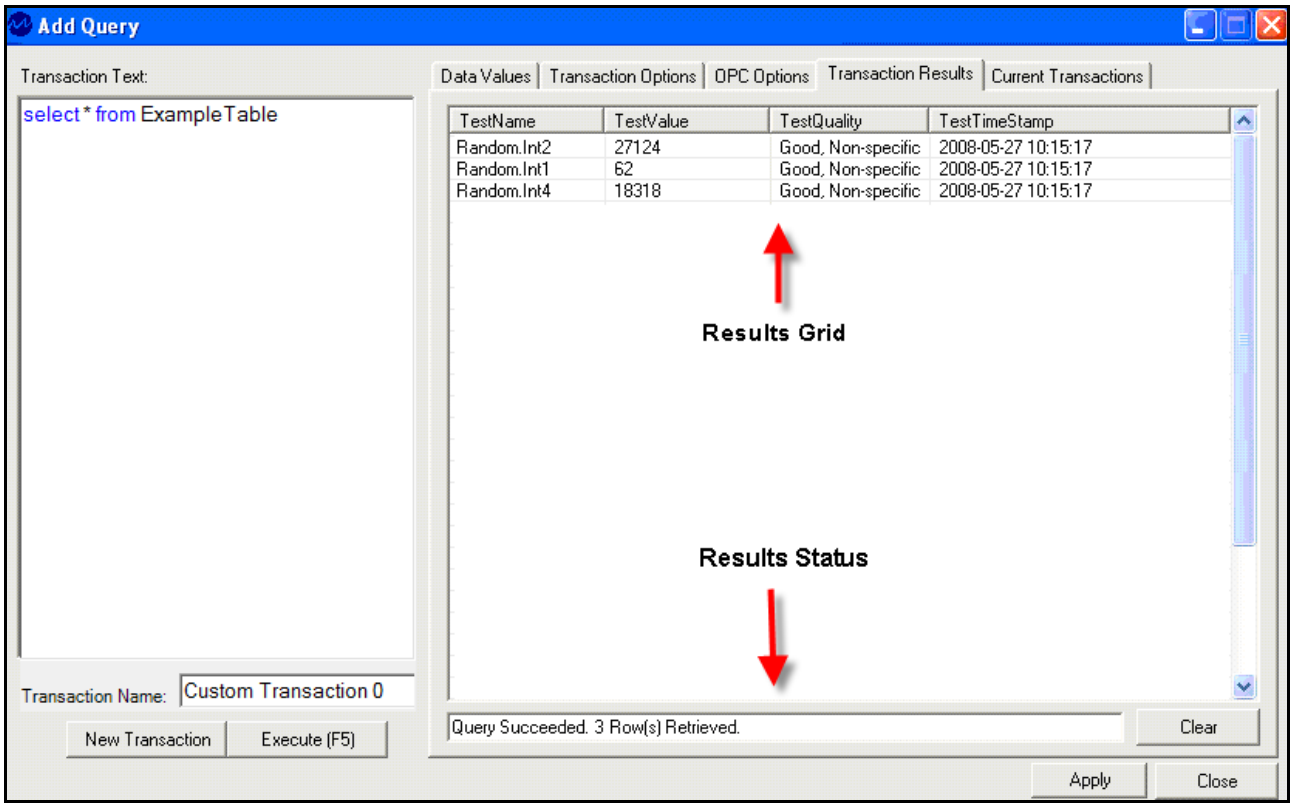

Figure 29 - Add Query Window - Transaction Results Tab

Command	Description

Command	Description
Results Grid	Displays the ***Name***, ***Quality***, ***Value***, and ***Timestamp*** results for the transaction.
Result Status	Displays the transaction query execution results.
Clear	Select this button to clear the tab.
Apply	Select this button to accept any changes made in the **Add Query** window. **Note:** This button stays consistent across all tabs.
Close	Select this button to cancel any changes made and close the **Add Query** window. **Note:** This button stays consistent across all tabs.

Table 19 - Add Query Window - Transaction Results Tab Components

Current Transactions Tab

The **Current Transactions** tab is displayed in Figure 30 and the tab components are described in Table 20.

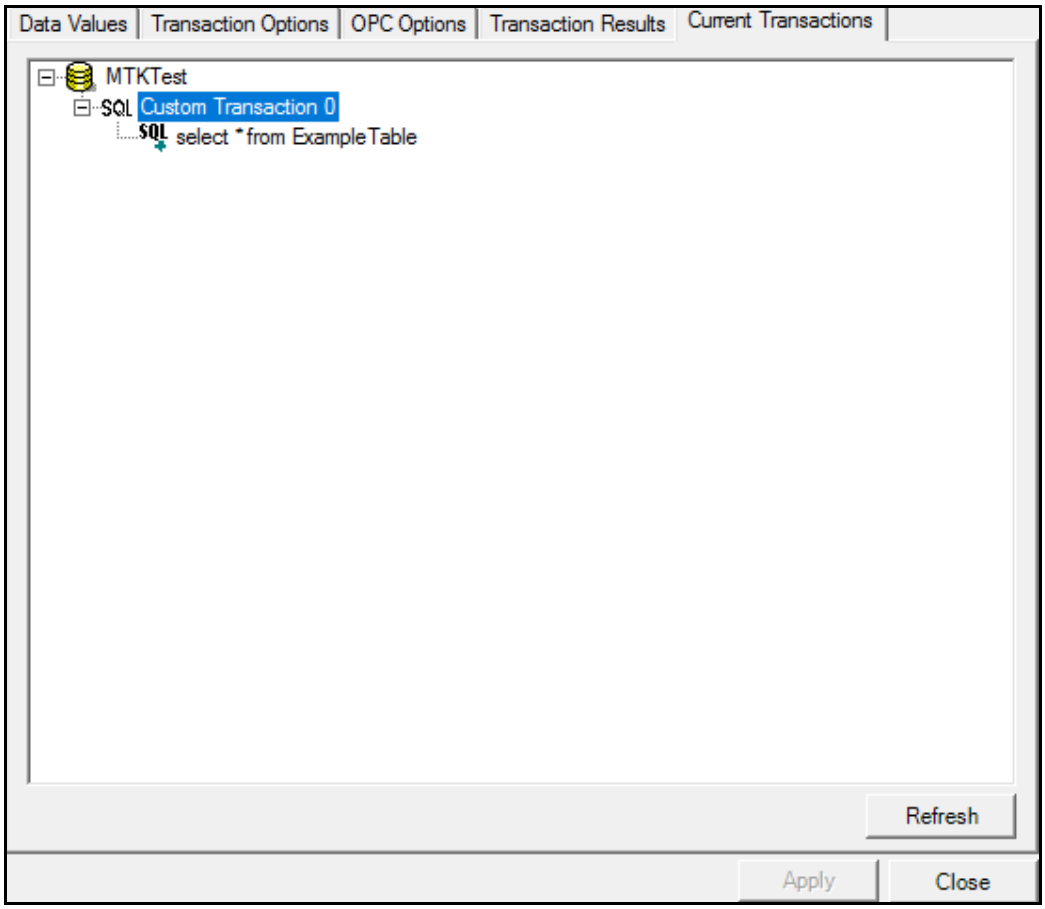

Figure 30 - Add Query Window - Current Transactions Tab

Command	Description
Display	This pane displays all current transactions and associated items. Select and expand the nodes to view and transactions.
Refresh	Click on this button to refresh the current view in the display.
Apply	Select this button to accept any changes made in the **Add Query** window. **Note:** This button stays consistent across all tabs.
Close	Select this button to cancel any changes made and close the **Add Query** window. **Note:** This button stays consistent across all tabs.

Table 20 - Add Query Window - Current Transactions Tab Components

Executing Simple Queries

SELECT * FROM…

The **Add Query** window can be used to execute SQL statements that do not involve OPC items or table column parameters. In the **Transaction Text** field, enter a simple **select * from table_name**. Ensure that the table **table_name** exists in the selected database (as shown on the **Data Values** tab). Next, press the **Execute** button or the **F5** key to execute the query. Figure 31 shows an example from a sample database containing a table named **ExampleTable**, with the columns **TestName**, **TestValue**, **TestQuality** and **TestTimeStamp**.

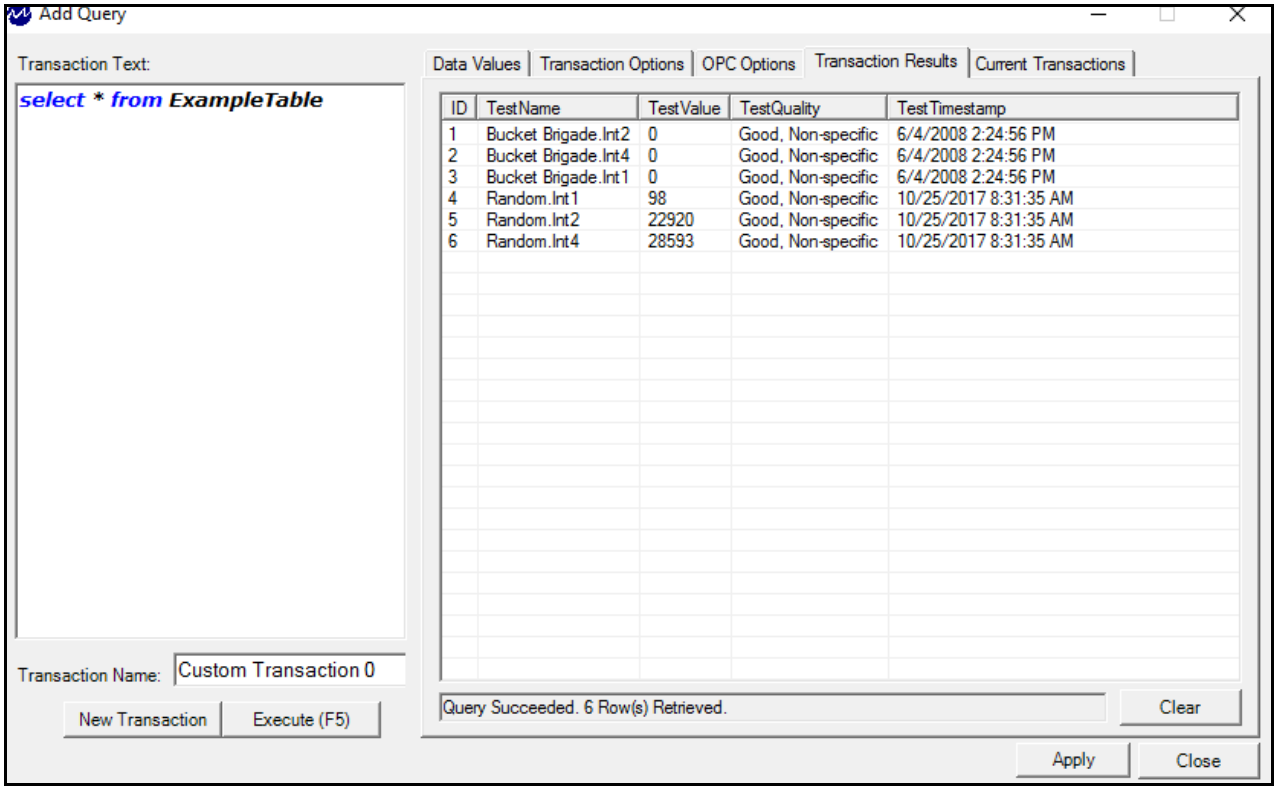

Figure 31 - Simple Select Transaction Results

UPDATE…

In the **Transaction Text** field, enter the following: ***update ExampleTable set TestValue = '55' where TestValue = '0'***.

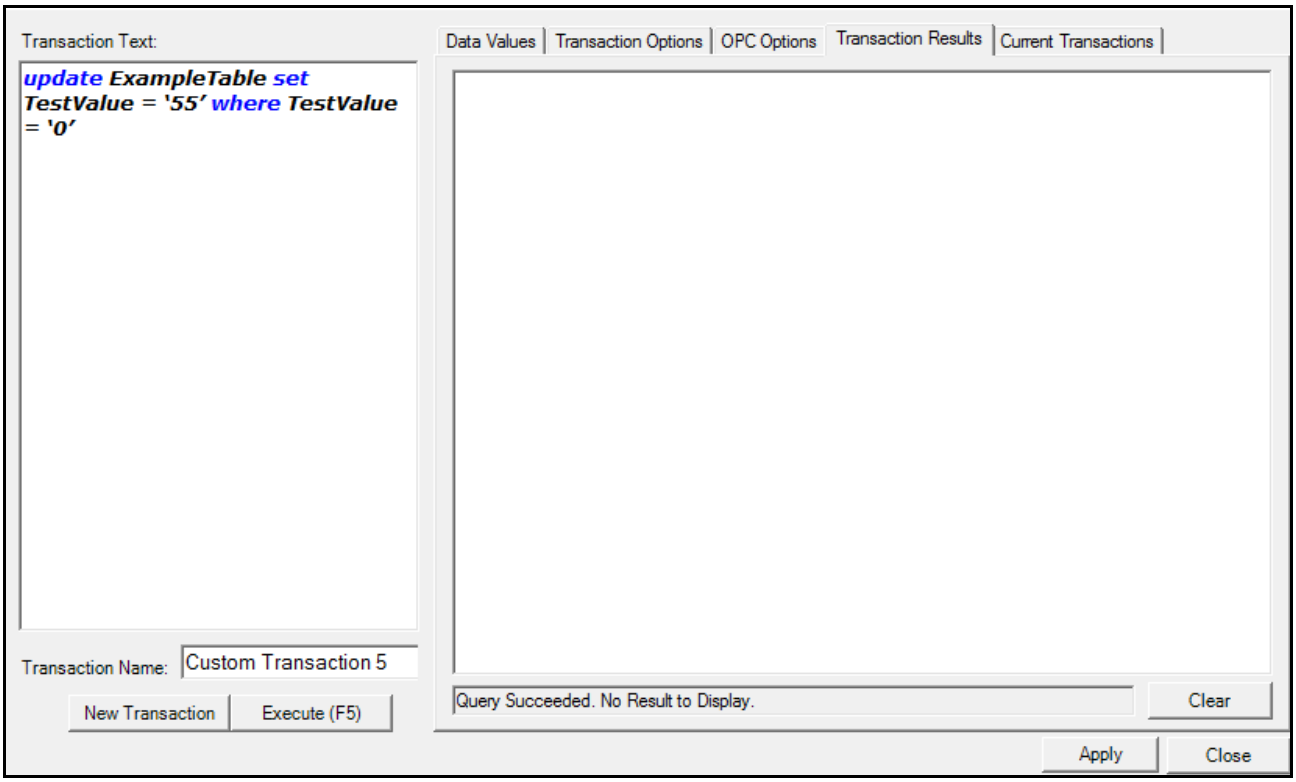

Figure 32 - Simple Update Statement

Note that the ***Bucket Brigade.Int1, Bucket Brigade.Int2, Bucket Brigade.Int4*** values that was previously ***0*** has changed to **55.**

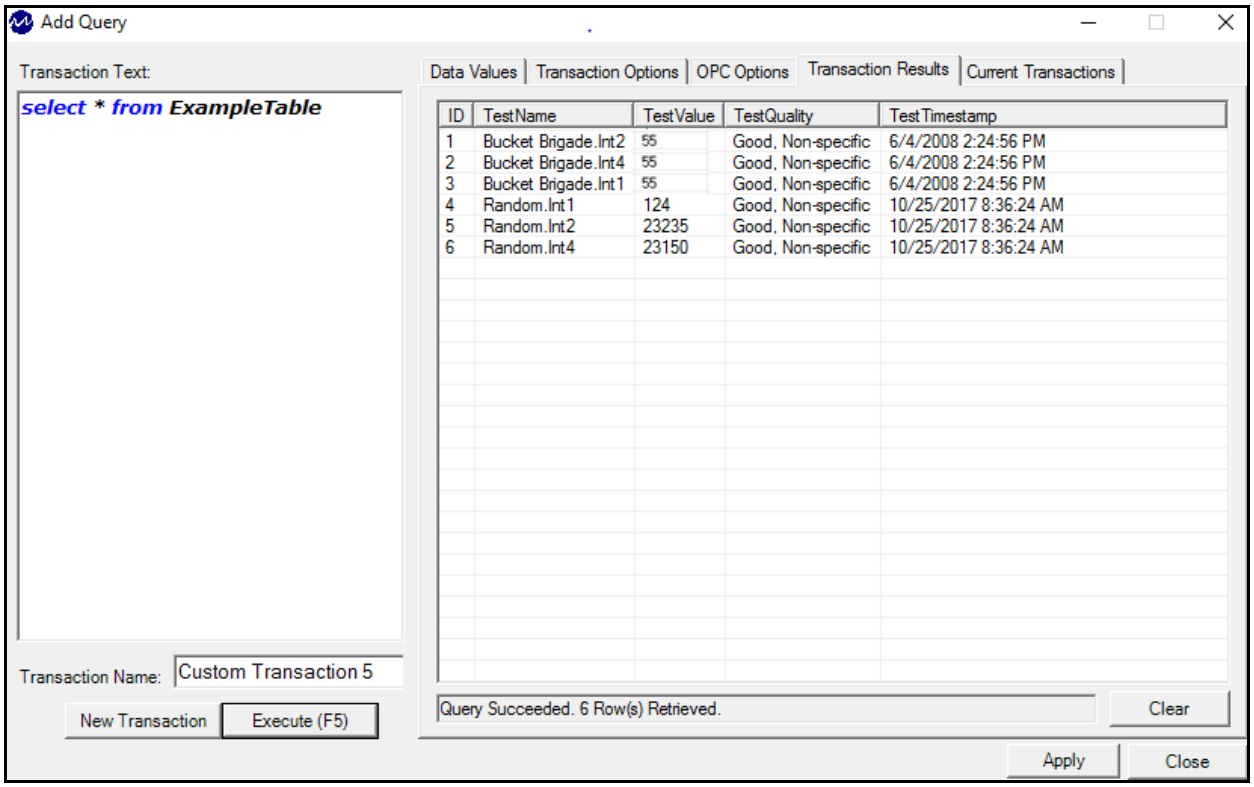

Figure 33 - Table ExampleTable after Update Statement

The MatrikonOPC Client for ODBC can act as a query analyzer for the databases. The range of queries that can be executed by the client is limited only by the database that the user is trying to connect, and the ODBC driver that the user is trying to connect to the database.

Using an OPC Item in a Transaction

One of the most powerful features of custom writes is the ability to use OPC item attribute values as parameters for transactions. Each OPC item has four attributes: ***Name***, ***Value***, ***Quality***, and ***Timestamp***. The MatrikonOPC Client for ODBC defines a syntax allowing each of these attributes to be used in custom writes.

The first step is to specify an OPC item variable. OPC item variables are declared inside of the SQL statement using two string delimiters. These delimiters are chosen from several pre-defined options. However, the default start and end delimiters are **<<** and **>>**. Each example for custom writes will use the default delimiters.

To specify an OPC item variable, the prefix **i:** is used. Based on the default delimiters, the declaration for a variable named **itemname** is: ***<<i:itemname>>***

To access the ***Name***, ***Value***, ***Quality***, and ***Timestamp*** attributes of an OPC item, the suffixes ***.n***, ***.v***, ***.q***, and ***.t*** respectively are used. Thus ***<<i:itemname>>.n*** is used to access the name attribute of item name. The following example illustrates how these can be used:

1. Click on the **Transaction Options** tab from the **Add Query** window.
2. Note which characters are being used to enclose an OPC item in the **OPC Item Delimiters** screen section. By default, the **Start Delimiter** is **<<** and the **End Delimiter** is **>>**. Ensure that these delimiter values are selected.
3. Enter ***<<i:itemname>>*** followed by a space in the **Transaction Text** field.

The pane on the right of the screen displays one row with ***itemname*** as an **Argument Name**, and a red **Tag** button adjacent to a blank field in the **Argument Value** column (Figure 34).

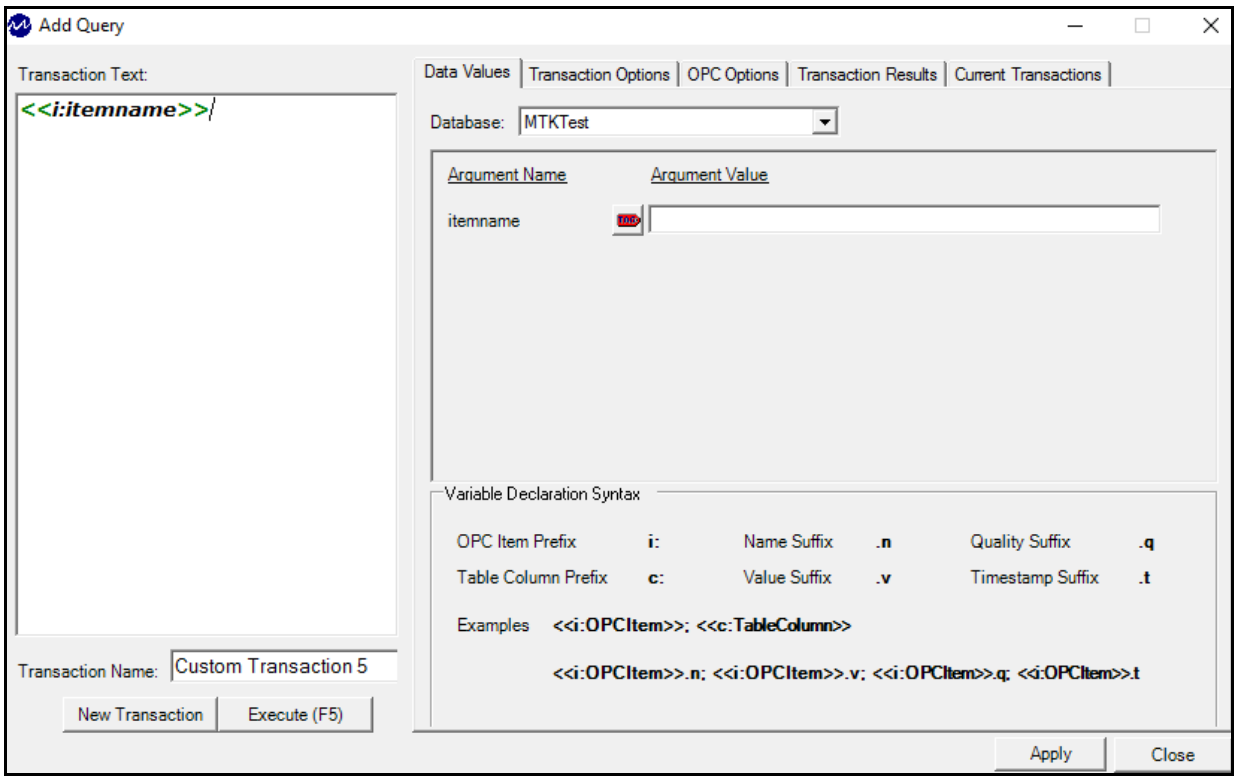

Figure 34 - Syntax Example

4. Click the **Tag** button.

   The **Select OPC Item** window appears.

5. Use this window to browse the list of available servers and choose a tag to associate with the variable.

6. Double-click the OPC item, set the **Argument Value**. The **Tag** button will turn green, and the field adjacent to the button is populated with the item name information as shown in Figure 35 - Successfully Assigned OPC Item.

   When a variable is properly declared in the Transaction Text pane, the start and end delimiters are highlighted. This can be seen in Figure 35 where the << and >> delimiters are both displayed in green.

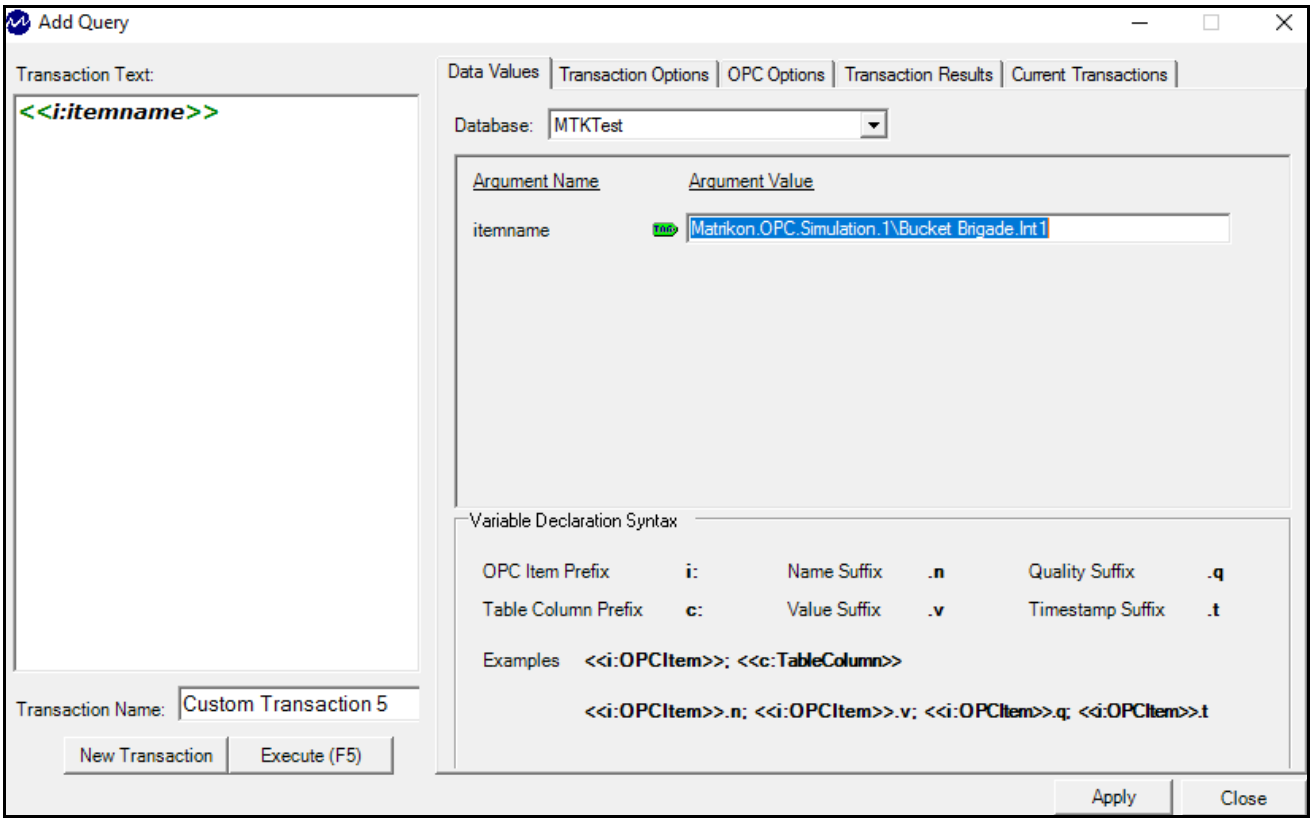

Figure 35 - Successfully Assigned OPC Item

Creating an Insert Transaction using an OPC Item

The following example illustrates how to use OPC item variables in an SQL insert statement. For this example, create a database table named **ExampleTable** with four columns:

1. **TestName** of type varchar.
2. **TestValue** of the type associated with OPC item.
3. **TestQuality** of type varchar or number.
4. **TestTimestamp** of type datetime.

Then perform the following steps to create the insert transaction:

1. Enter the following string into the **Transaction Text** field:

   ***insert into* " ExampleTable "**
   values(<<i:item1>>.n,<<i:item1>>.v,<<i:item1>>.q,<<i:item1>>.t)

Note:
After entering the above string, the **Add Query** screen will appear as it does in Figure 36. In the display, the variable delimiters will be highlighted in **green**, and SQL keywords highlighted in **blue**.

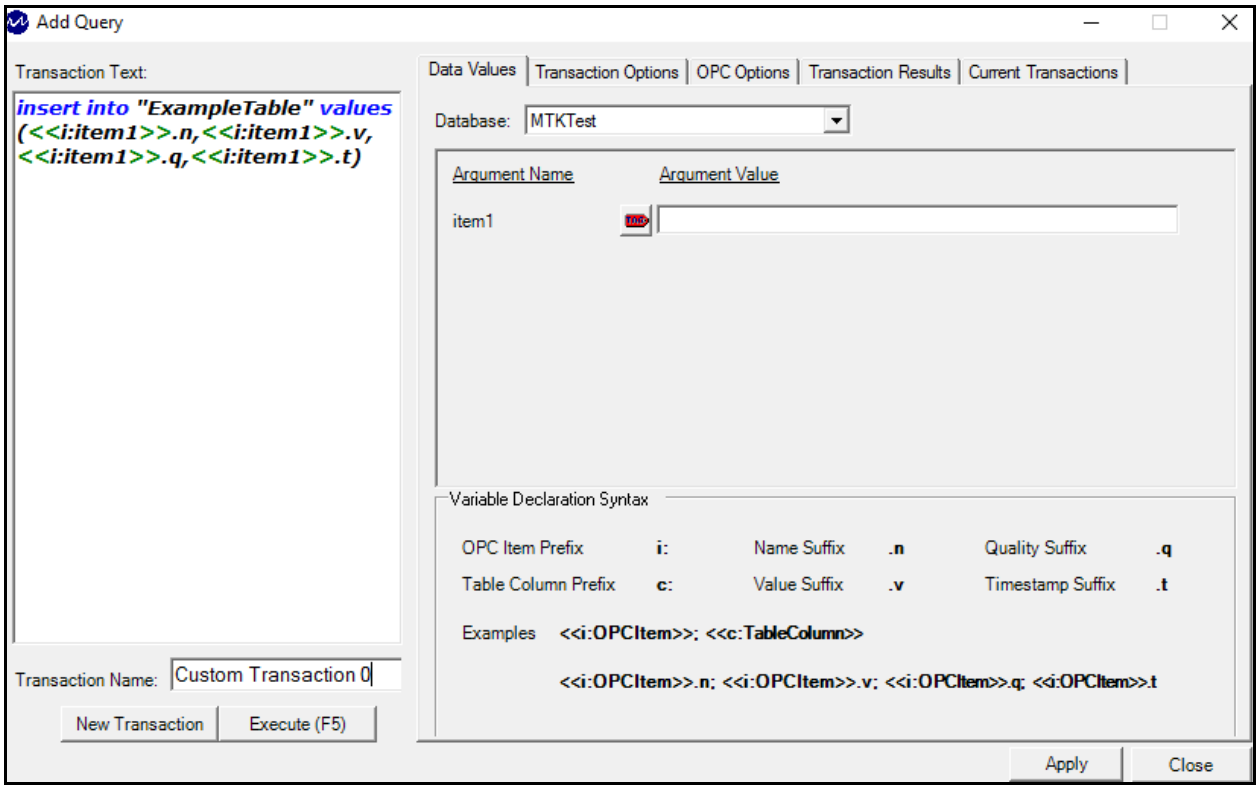

Figure 36 - Custom Write GUI - Insert Statement

2. Select an OPC item that will provide the values for the transaction, to associate an OPC item with this transaction, following the procedure described in **Using an OPC Item in a Transaction**.

3. Click the **Apply** button. This will schedule the transaction for execution based on the transaction execution option discussed in **Transaction Options Tab**.

   The GUI will switch to the **Current Transactions** tab. In this tab, the root node indicates the custom transaction name and each child node points to each individual transaction occurred in the query.

   Note the **Current Transactions** tab, after expanding each node in the tree, the transaction is displayed as shown in Figure 37.

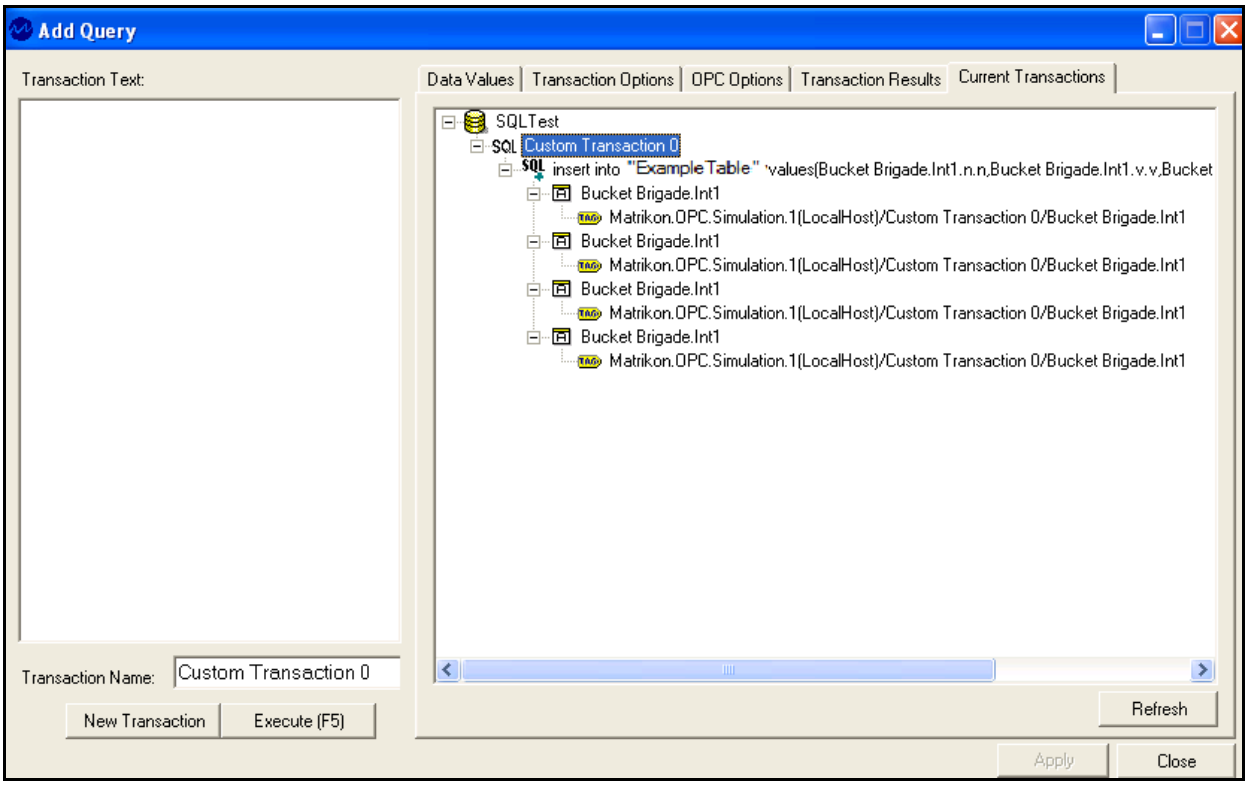

Figure 37 - Custom Insert Transaction Display

Write to OPC Items Using a Select Statement

An SQL select statement can be used to write a value from a database to an SQL item. Database column variables are declared using a slightly different syntax. Instead of ***i:***, the syntax ***c:*** is used to specify that the variable refers to a column. The only OPC attribute used for the table column custom writes is the value. Thus, table column variables do not have an attribute suffix associate with them.

Using ***ExampleTable*** as our database table, an example transaction using a table column variable is as follows. Enter the following into the **Transaction Text** field on the screen:

select <<c:TestValue>> from ExampleTable where TagName = 'BucketBrigade.Int2'

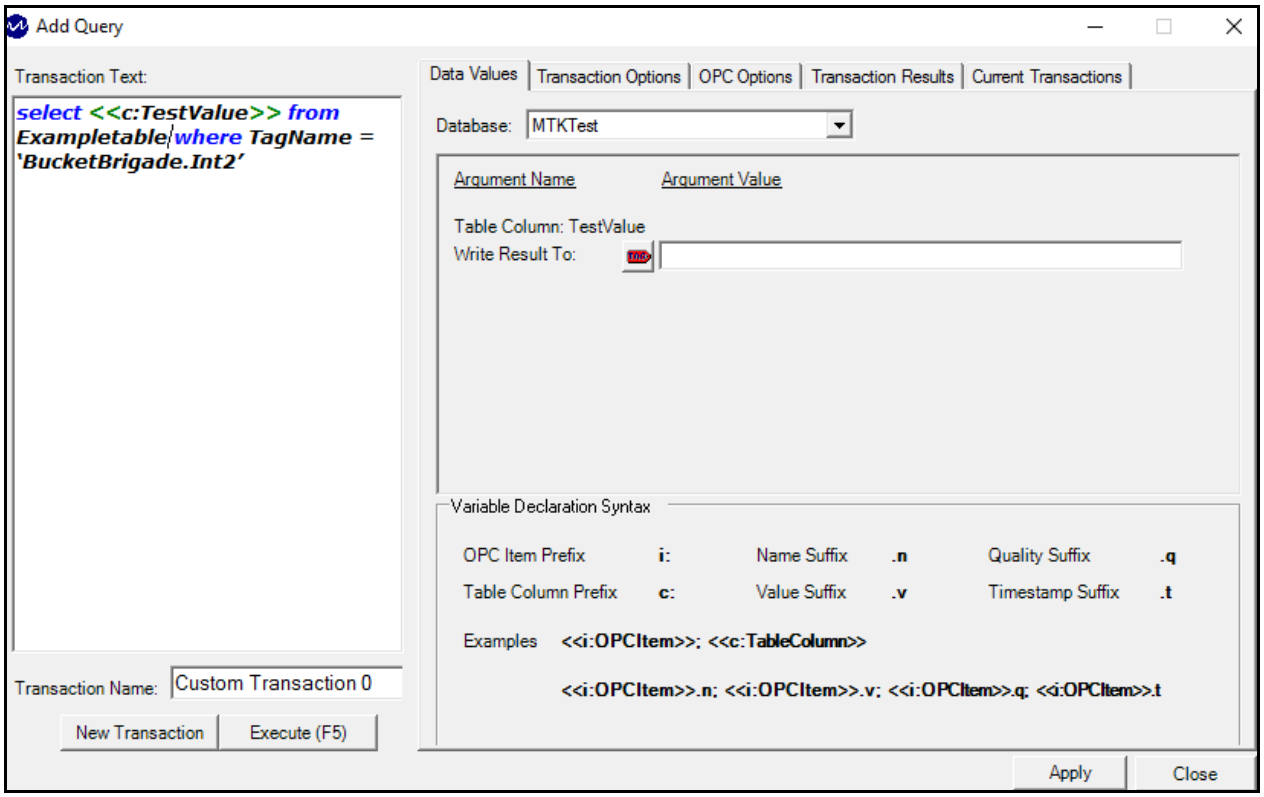

Figure 38 - Select Statement Example

Like transactions using OPC item variables, a tag must be chosen for this transaction. Click on the red **Tag** button to browse the available servers, and select a tag from one of these servers. This chooses the tag that is to receive database column information. The above example may return more than one value to be written to the selected OPC item. Depending on the options selected, the client will either write only the latest value returned, or each of the values returned.

Note:
Ensure that the transaction is scheduled to execute. By default, custom writes are scheduled to execute whenever a change in the associated OPC item is detected. If this transaction was scheduled in that manner, it would only be executed whenever an external source modified the OPC item. It is unlikely that this is the desired behavior. Such a schedule should be scheduled to execute at fixed intervals. This can be done on the **Transaction** Options tab.

General Preferences

The **Preferences** window is used to configure basic client behavior, logging and performance settings. This window is accessed by choosing the **Options** menu item from the **View** menu. This window consists of three tabs:

- **General**
- **Logging**
- **Advanced**

General Tab

The **General** tab (Figure 39) allows the user to customize configuration files, and how quality values are reported. The **General** tab components are described in Table 21.

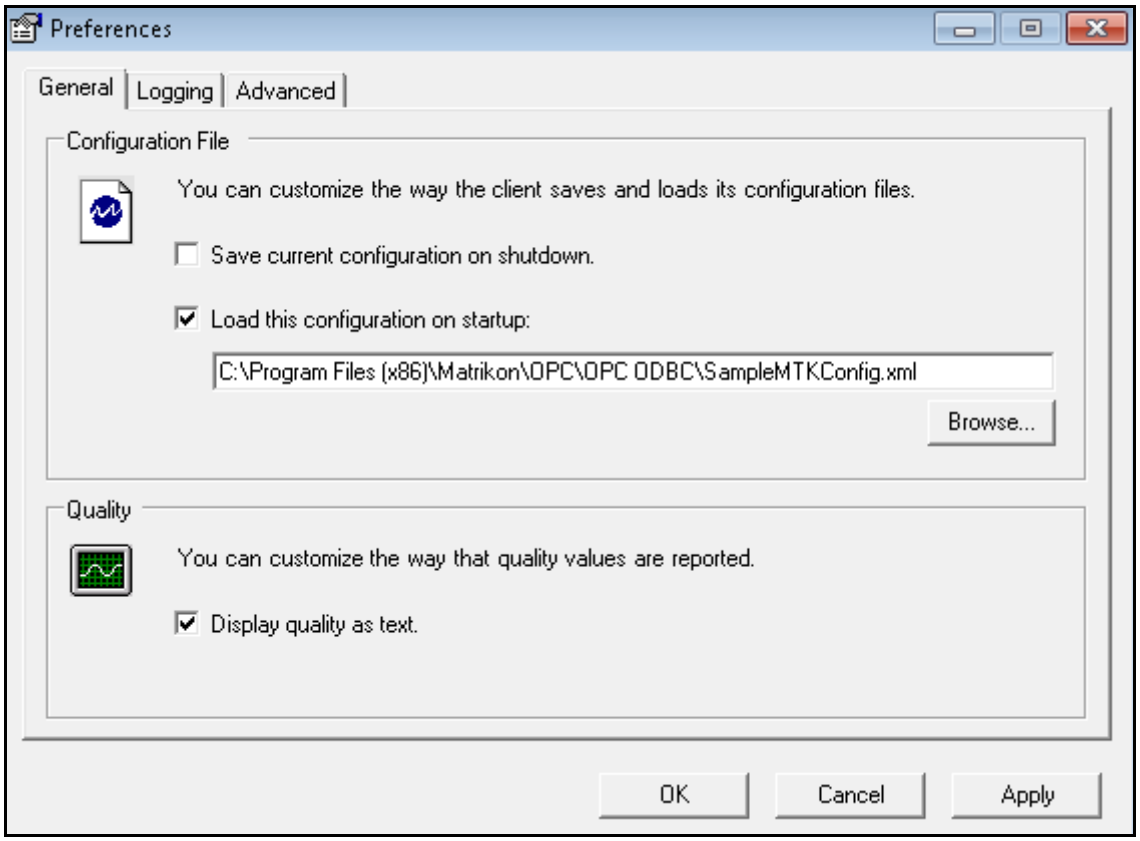

Figure 39 - Preferences Window - General Tab

Command	Description
Save current configuration on shutdown	Selecting this option specifies that the ODBC client should save its current configuration whenever the client is shutdown. This option refers to the shutdown of the entire client, not just the configuration GUI. The configuration is saved to the file name displayed in the textbox shown in Figure 39. **Note:** This option is only applied after the ODBC client restarts.
Load this configuration on startup	Selecting this checkbox enables the text field and **Browse** button below the checkbox, allowing the user to select and load the ODBC configuration file when the client starts up.
Browse	Click on this button to display the **Open** window to select an existing file name. For this button to be enabled, the **Load this configuration on startup** checkbox must be selected.
OK	Selecting this button commits any changes made in the **Preferences** window and closes the window. **Note:** This button stays consistent across all tabs.
Cancel	Selecting this button cancels any changes made in this window. **Note:** This button stays consistent across all tabs.

Command	Description
Apply	Selecting this button commits any changes made in the window. **Note:** This button stays consistent across all tabs.

Table 21 - Preferences Window - General Tab Components

Logging Tab

The **Logging** tab (Figure 40) allows the user to customize error and debug information. The tab components are described in Table 22.

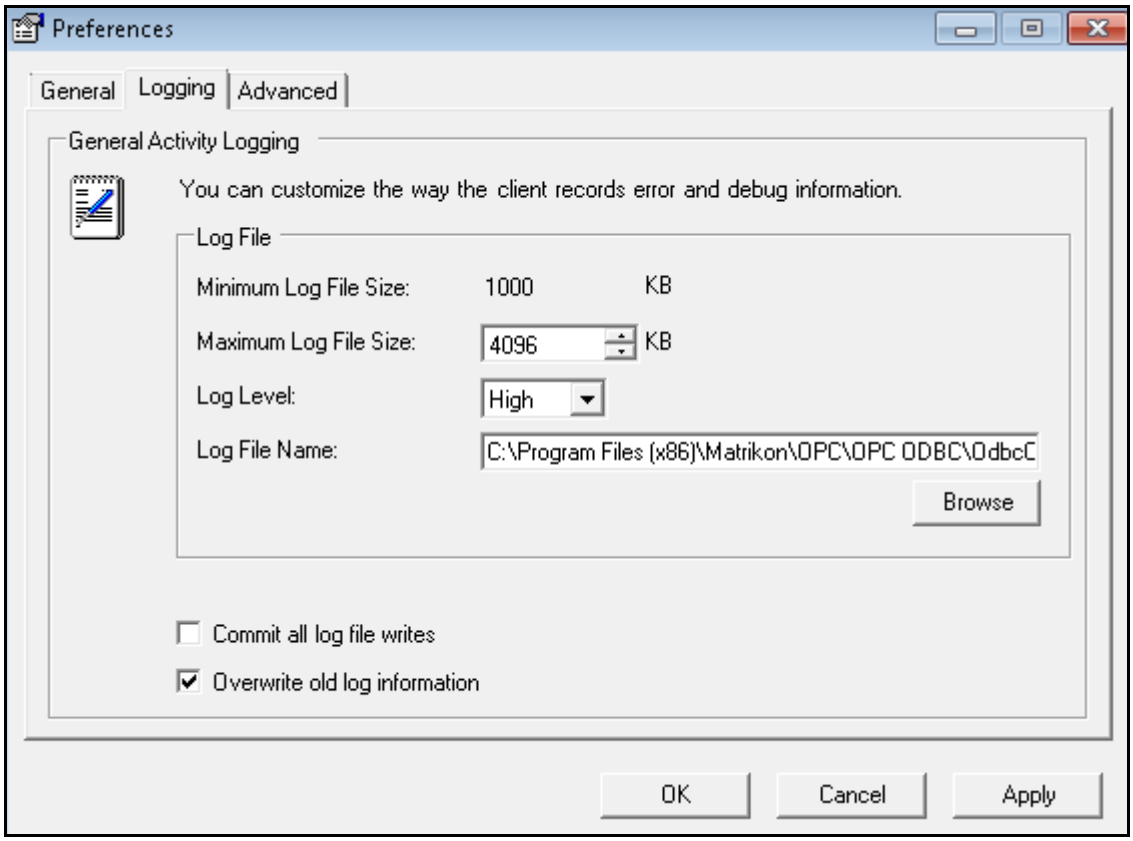

Figure 40 - Preferences Window - Logging Tab

Command	Description
Minimum log file size	This option cannot be changed. ***500 KB*** is the minimum default log file size.
Maximum log file size	Sets the maximum log file size before logs will wrap.
Log Level	Sets the general logging activity logging at the specified detail level (***High***, ***Medium***, ***Low***, or ***None***).
Log File Name	Displays the full path for the general activity log file.
Browse	Click on the **Browse** button to display the **Open** window used to select an existing file name.
Commit all log file	Purges the file buffer after each message is logged in the event of an

Command	Description
writes	unexpected server shut down.
Overwrite old log information	Overwrites the old log file each time the server starts up, if selected. Otherwise, rename the old log file with a (*.*bak*) suffix.
OK	Selecting this button commits any changes made in the **Preferences** window and closes the window. **Note:** This button stays consistent across all tabs.
Cancel	Selecting this button cancels any changes made in this window. **Note:** This button stays consistent across all tabs.
Apply	Selecting this button commits any changes made in the window. **Note:** This button stays consistent across all tabs.

Table 22 - Preferences Window - Logging Tab Components

Advanced Tab

The **Advanced** tab (Figure 41) is used to define the request queue settings. The tab components are described in Table 23.

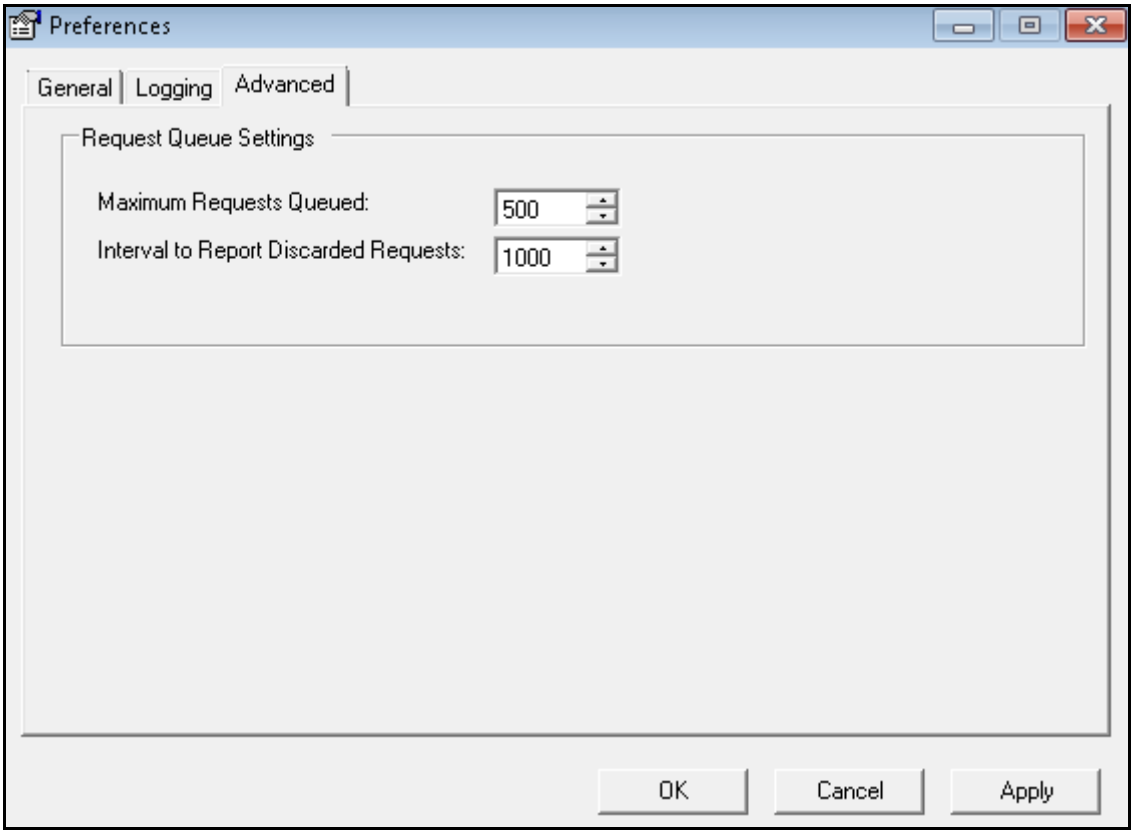

Figure 41 - Preferences Window - Advanced Tab

Command	Description
Maximum Requests Queued	Allows the user to specify the maximum number of ODBC Client transactions that can be queued. Setting this value to ***0*** means that there is

Command	Description
	no maximum value for the queue size.
Interval to Report Discarded Requests	Allows the user to specify how often to report discarded transactions in the log file. Consider a value of ***n*** for this field. When the number of discarded transactions reaches a multiple of ***n*** the total number of processed and discarded transactions is logged. Note that this only occurs if logging is enabled.
OK	Selecting this button commits any changes made in the **Preferences** window and closes the window. **Note:** This button stays consistent across all tabs.
Cancel	Selecting this button cancels any changes made in this window. **Note:** This button stays consistent across all tabs.
Apply	Selecting this button commits any changes made in the window. **Note:** This button stays consistent across all tabs.

Table 23 - Preferences Window - Advanced Tab Components

Saving a Configuration

Note:
When the client configuration is complete, use the **Save Configuration** window to save the configuration to an XML file.

Perform the following steps to save a configuration to an XML file:

1. Select the **Save As** menu option from the **File** menu.
   The **Save Configuration** window appears.
2. Enter a file name if the file is saved for the first time.
3. Click **Save**.
   The configuration is saved.

Clearing a Configuration

Note:
Starting a new configuration will clear the existing one.

Perform the following steps to clear a configuration:

1. Choose the **New** menu option from the **File** menu.
2. The user will be prompted with a message "Do you want to save the configuration?", select **Yes** to save the configuration, **No** to clear without saving, and **Cancel** to retain the current configuration.
   If the user has not selected **Cancel**, the configuration is cleared.

Loading an Existing Configuration

Note:
If the user has previously saved a configuration, the current configuration can be cleared and then load the saved configuration file.

Perform the following step to load an existing configuration file:

1. Select the **Open** menu option from the **File** menu.
   The **Open Configuration** window appears.
2. Browse for the configuration file that the user wants to load.
3. Click **Open**.
4. Click **OK**.
   The old configuration is cleared and the new configuration is loaded from the file.

Shutting Down the Server

Note:
The MatrikonOPC Client for ODBC will run until a shutdown has been requested.

Perform the following steps to shut down the server:

1. Select **Shutdown** on the **Control Panel** or the **Tool Tray Menu**. If the server is running as a local executable, choose **Shutdown Server** from the **File** menu or right-click the MatrikonOPC Client for ODBC icon and select shutdown.
   The server is shut down.

Note:
The shutdown command is not available for the server if it runs as a Windows service. Services can be shut down only from the **Service Control Manager** applet in the Windows **Control Panel**.

Diagnostics

The server supplies diagnostic information to assist operators and support personnel with troubleshooting communication problems and software faults.

Logging

All Matrikon OPC servers produce log files that record errors and debugging information. The log files can be extremely valuable for troubleshooting. As such, it is important to note that the default log level is set to low. The **General Logging** tab of the **Options** dialogue in the main configuration window contains settings to control server logging.

General Activity Logging records information about the internal workings of the OPC server. It is useful for troubleshooting problems with configuration and device communication. Interface Activity Logging records information about the client/server OPC communication. It is useful for troubleshooting compliance issues.

For General logging, the higher the log level, the more information that is recorded. However, server performance may decrease at higher log levels. The recommended operating level is ***Medium***. More log levels are available for both types of logging which record more detailed information, as well as the ability to output log statements to a console window at run time. Contact Matrikon OPC support for further instructions on how to enable the higher log levels and console logging.

For Interface logging, the log level can be considered very high and therefore should never be used during normal operation of the OPC server unless specifically working on problems related to interfacing.

Matrikon OPC Sniffer is a useful tool for logging OPC client/server communication. It enhances the Interface Activity Logging by recording the client-side transactions. It can also be used with other OPC servers. Matrikon OPC Sniffer is a utility used to troubleshoot OPC client/server interoperability issues. Contact the Matrikon OPC Sales department for further information about this product, or use the following link to access the **Matrikon Sniffer Download**.

In general, the server logs all errors and other information of immediate importance to the user at the low detail level, all warnings and other information of moderate importance to the user at a medium detail level, and additional information concerning the normal functioning of the software at a high detail level. The server also logs further information of concern to support personnel at the debug log level.

Note:
The higher the log level, the slower the performance of the server. It is recommended that the log level be left at the default, unless troubleshooting needs to be performed.

Limitations

MatrikonOPC Client for ODBC has the following limitations:

1. **Table Writes for Oracle -** do not support the ***TimeStamp*<>** syntax required by Oracle databases. For Oracle ODBC data sources, table write functionality can be configured as a custom write.
2. **Stored Procedure and Triggered Write Configuration –** customers who upgrade from the old version to the new version of ODBC Client should note that the new GUI does not allow Triggered Writes and Stored Procedures to be configured graphically.
3. **Display for legacy configuration files** – the new GUI of this client does not display each of the transaction types from the previous version of the client. Triggered Writes and Stored procedures are not displayed in the new GUI, and the OPC item to table column mappings will not show up in the new GUI.
4. **Custom Write Variable –** the custom variable **c:** syntax does not allow the variable name to contain the '***[***' or '***]'*** characters.For example, the variable name **<<c:[ColumnName]>>** is not valid. Rather, **<<c:ColumnName>>** should be used. One side effect of this limitation is that users may not use column names with spaces for **c:** variables, as they must be delimited using '***[***' and '***]***'.

Refer to the *MatrikonOPC Client for ODBC Release Notes* for known issues.

Troubleshooting

The following section addresses some of the most common problems encountered, and questions asked, while using this OPC server. Please check the following **Problems/Solutions** and **Questions/Answers** sections before contacting the Matrikon OPC Support team.

Problems and Solutions

Client cannot be configured; no Matrikon logo in Tool Tray

Problem:	The client cannot be configured because there is no Matrikon logo in the **Tool Tray**.
Solution:	If the client is running as a service, the Matrikon logo does not appear in the **Tool Tray**. To configure the client, start the configuration utility by using the shortcut to the OPC server in the Windows **Start** menu (this shortcut starts the **Configuration** utility as well as the OPC Server).

Registered ODBC data sources not visible from the configuration GUI

Problem:	When connecting to a database, a registered ODBC data source does not appear in the dropdown list.
Solution:	ODBC data sources must be registered as either a system, file or user DSN. If the data source is registered as a user DSN, it may be necessary to execute the client as that user. If the client runs as a service, make sure the service is set to execute as the appropriate user.

Server does not retain settings

Problem:	The client does not retain its previous settings and needs to be reconfigured each time it starts up.
Solution:	In the **Configuration** window, choose **Options** from the **View** menu. Under the **General** tab, ensure that the **Load this configuration on start-up** checkbox is selected and that the correct file name appears in the edit box.

Server cannot save configuration in XML format

Problem:	The OPC client cannot save the configuration in XML format.
Solution:	Microsoft Internet Explorer 4.01 (or later) must be installed to use the .XML format.

Server does not show up as remote program in OPC client application

Problem:	The OPC server I wish to connect to, does not show up in a list of remotely available program IDs in the client application.
Solution:	Follow the steps found in **Appendix A – Distributed COM (DCOM)** to copy the

	program ID from the server machine to the client machine.

Access denied or time-out error when connecting to remove server via DCOM

Problem:	***Access Denied*** error message appears, or time out occurs when trying to connect to a remote OPC server via DCOM.
Solution:	Ensure that the access and launch permissions for the OPC server are set correctly on the server machine. For more information, refer to **Appendix A – Distributed COM (DCOM)**.

Server does not start up or client cannot connect

Problem:	The client tries to connect to the server and fails, or the server does not start up.
Solution:	Ensure that the access and launch permissions for the OPC server are set correctly. For more information, refer to **Appendix A – Distributed COM (DCOM)**.

About screen and Configuration window do not show up

Problem:	The **About** screen and **Configuration** window do not show up when a remotely connecting client or a client that runs as a service (such as the *Aspen Technologies CIMIO OPC Manager*) tries to launch the OPC server.
Solution:	Either set the identity for the OPC server to the interactive user, or consider running the server as a service. For more information, refer to **Appendix A – Distributed COM (DCOM)**.

DA 2.05 asynchronous I/O does not work

Problem:	After installing an older OPC server, DA 2.05 asynchronous I/O no longer works.
Solution:	The old installation program installed and registered its own (older) version of the OPC proxy/stub DLL. Reinstall the standard OPC proxy/stub DLLs, using an up-to-date installation program or re-register them using the **REGSVR32** command-line utility.

Questions and Answers

How do I remove the server as a service?

Problem:	How do I remove the client as a service?
Solution:	Re-register the OPC server executable using the ***/REGSERVER*** command-line switch.

How can I get OPC data into other applications?

Problem:	How can I get OPC data into *Microsoft Excel*, *Microsoft Word*, or another application with support for *Visual Basic*, *VBA*, or *VB Script*?

Solution:	Use the Matrikon OPC **Automation Component** to create a *Visual Basic* script that connects to a server, creates groups and items, and receives data change updates. Contact **Support** for examples of how to do this in *Excel*, *Visual Basic*, or an *HTML* document.

Search the *Matrikon OPC Support Knowledge Base* at **www.opcsupport.com** to find the answers to other commonly-asked MatrikonOPC Client for ODBC questions.

Un-Installation

To successfully un-install MatrikonOPC Client for ODBC, using the **Add or Remove Programs** from the Microsoft Windows **Control Panel** is recommended.

Perform the following steps to un-install MatrikonOPC Client for ODBC:

1. Click the **Start** button and highlight the **Control Panel** item.
2. Select **Programs and Features** from the displayed menu.
   The Uninstall or change a program window is displayed.
3. Scroll through the list of currently installed programs and updates to find and select **MatrikonOPC Client for ODBC** (Figure 42).

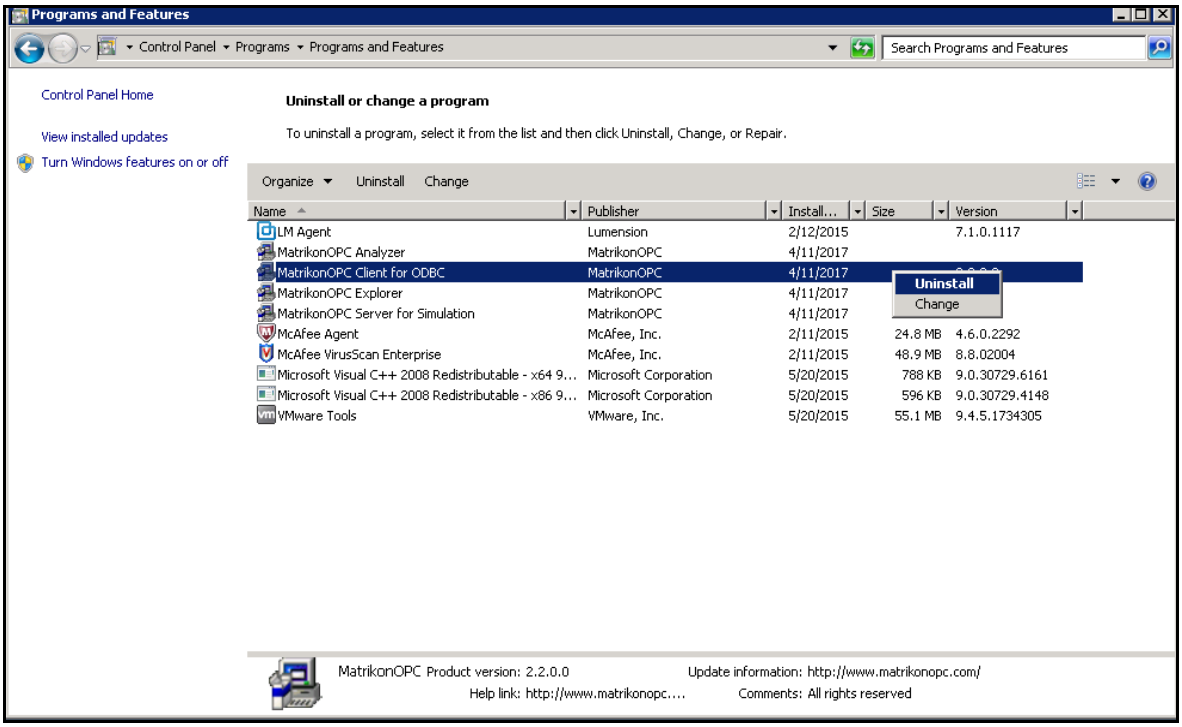

Figure 42 – Programs and Features

4. Click the **Uninstall** button associated with the MatrikonOPC Client for ODBC program to initiate the un-install process.
   The **MatrikonOPC Client for ODBC– InstallAware Wizard** appears, and the Welcome to **MatrikonOPC Client for ODBC Maintenance** screen (Figure 43) is displayed.

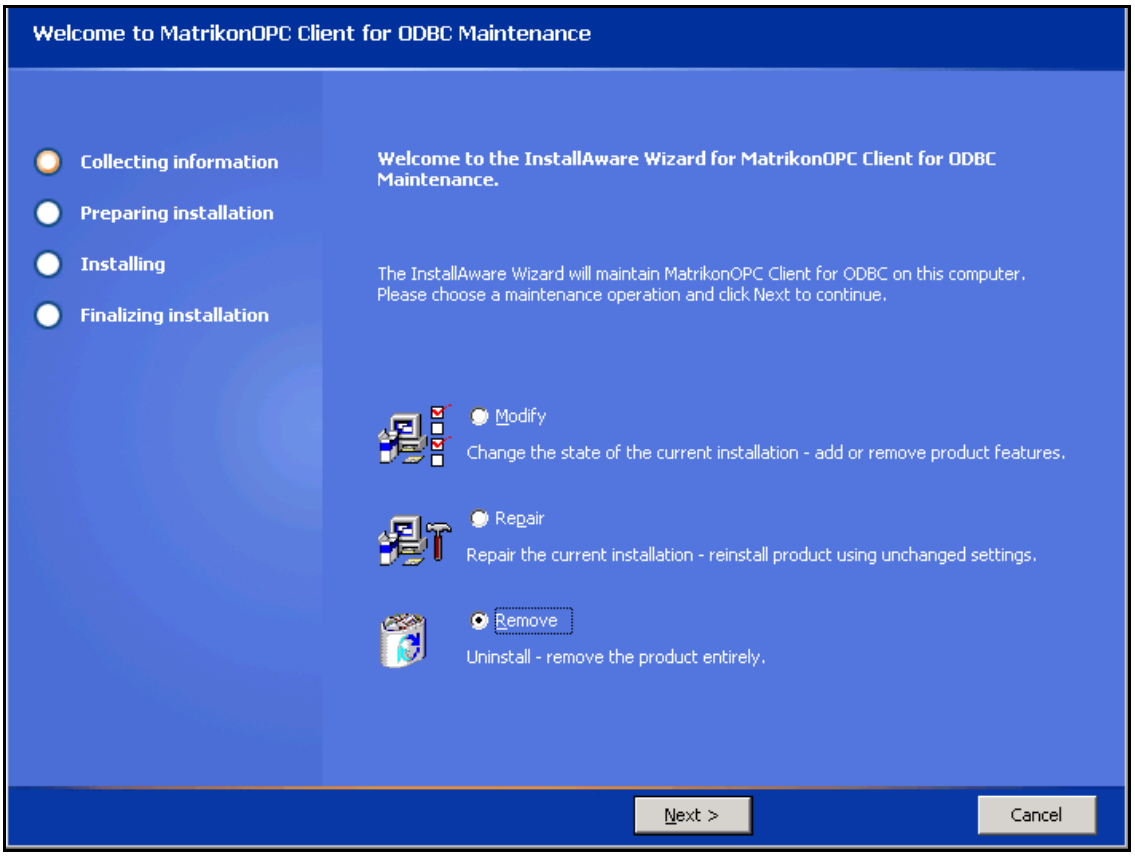

Figure 43 – MatrikonOPC Client for ODBC Maintenance Screen

5. Select the **Remove** option button to un-install MatrikonOPC Client for ODBC entirely.
6. Click the **Next** button. The **Ready to Uninstall** screen (Figure 44) is displayed.

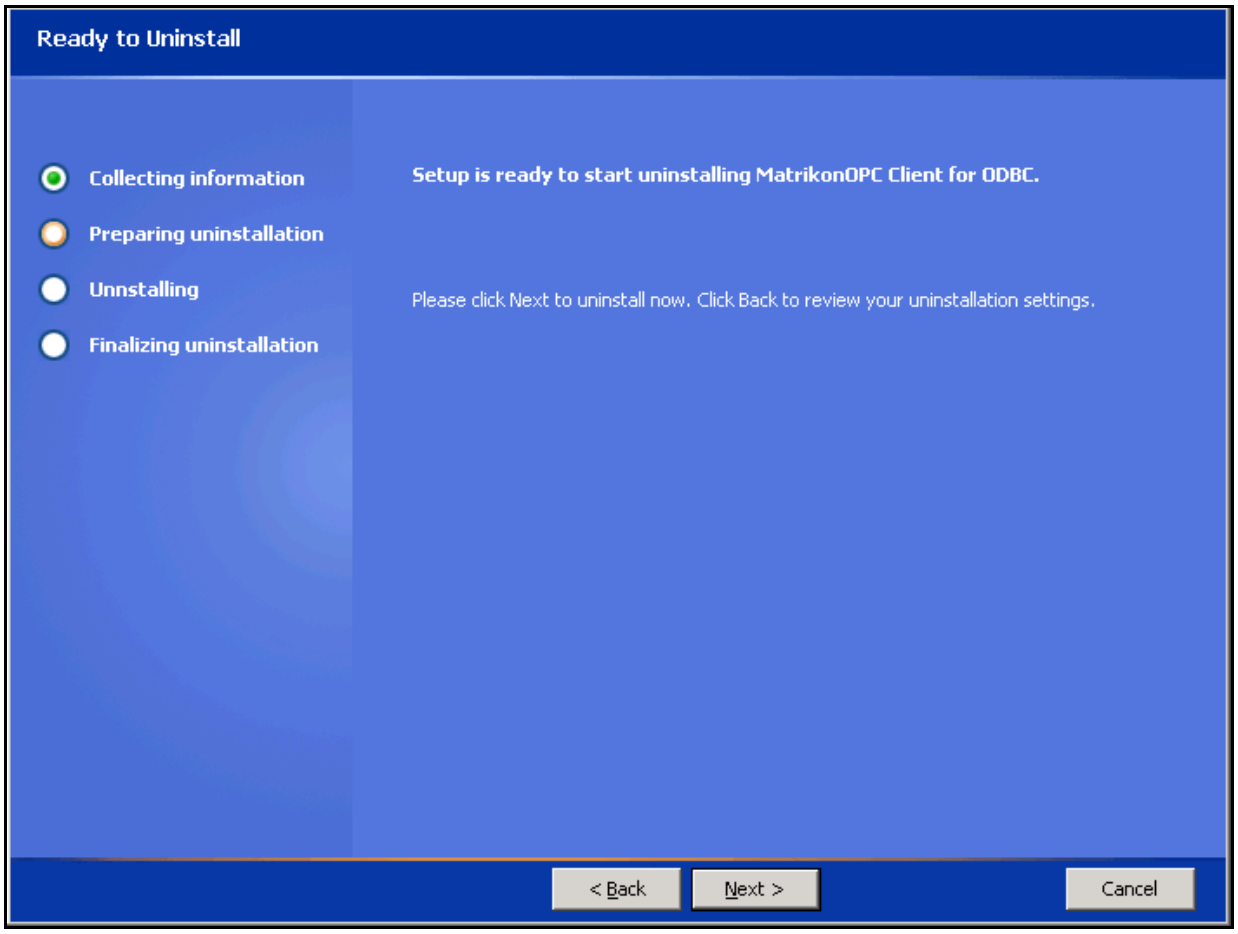

Figure 44 – Ready to Uninstall Screen

7. Click the **Next** button.
   The **Uninstalling MatrikonOPC Client for ODBC** screen (Figure 45) appears and the uninstall takes place.

Figure 45 – Uninstalling MatrikonOPC Client for ODBC Screen

When the un-install has finished, the **MatrikonOPC Client for ODBC Setup Complete** screen (Figure 46) appears stating that MatrikonOPC Client for ODBC was successfully un-installed.

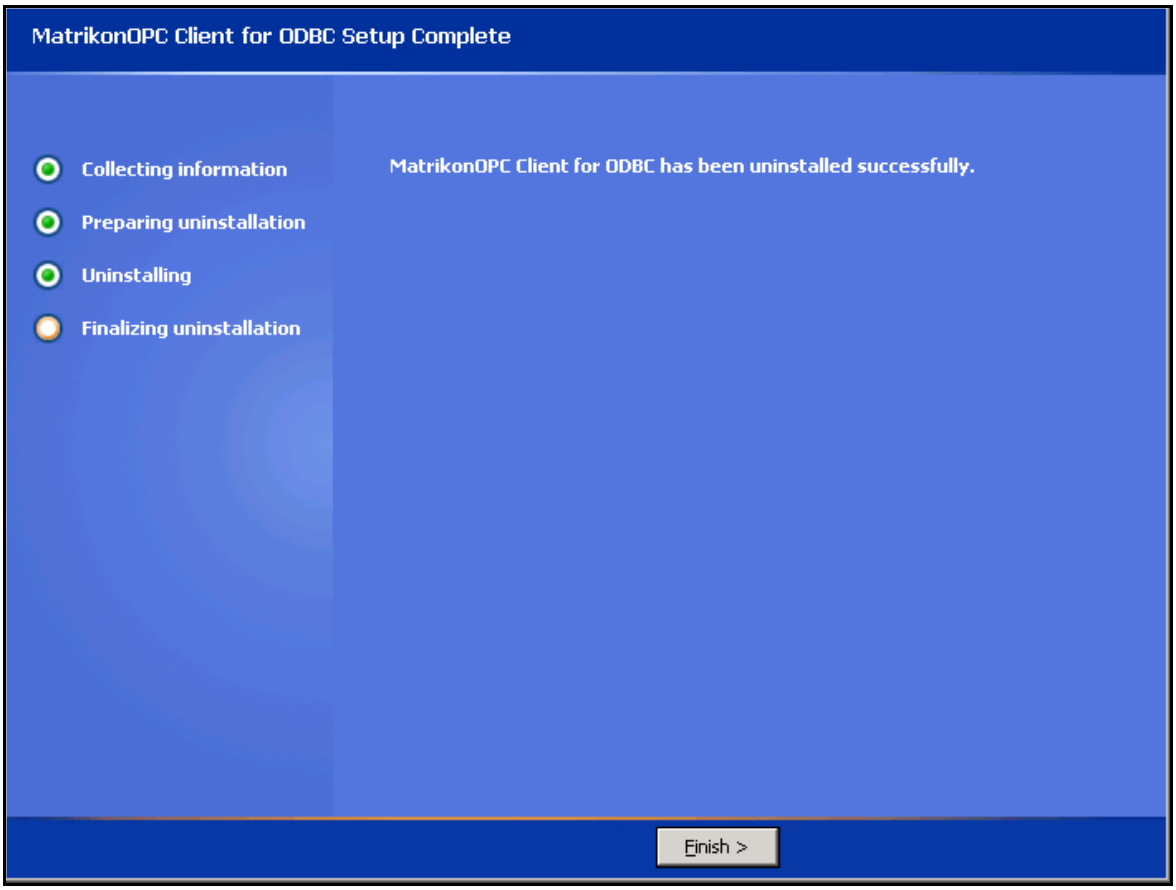

Figure 46 – MatrikonOPC Client for ODBC Setup Complete Screen

8. Click the **Finish** button to complete the un-install and exit the Wizard.
   The program no longer appears listed in the **Programs and Features** window.

OPC Compliance

For more information on OPC, view the documents listed below (as well as other OPC Specifications) at **http://www.opcfoundation.org**. The MatrikonOPC Client for ODBC can connect to OPC servers that implement the following interfaces:

- OPC Data Access Custom Interface Standard 2.05

Appendix A Distributed COM (DCOM)

DCOM is an object protocol that enables COM components (such as OPC clients and servers) to communicate directly with each other across a network. A certain amount of configuration is required on the system where the OPC server is installed to allow remote clients to connect to it over the network.

Readers should be familiar with DCOM and with Windows 2000 security features and security administration. Information regarding Distributed COM and various links to related sites, white papers, specifications, and so on, can be found at:
http://www.microsoft.com/com/default.mspx.

Note:

- The following steps are suggestions only. Enquire with the Windows Network Administrator for more information about the settings that the user should use, especially between different domains.
- The steps provided in this appendix apply to Windows NT operating systems only. For information on how to configure DCOM settings for newer Windows operating systems, Refer to the Matrikon OPC Online Support page on **DCOM Settings**.

DCOM Configuration Utility

Start the DCOM configuration utility either from the server configuration utility or from the command-line (`DCOMCNFG`). Answer, **yes** to any message boxes that appear (allowing the utility to assign application ID entries to those servers that don't already have them).

The main window for ***DCOMCNFG*** allows the user to either configure default settings for all COM servers or else to configure settings for a specific server chosen from the list. The former will affect all servers configured to use the default settings. The latter will affect the selected server only.

Note:
DCOM settings are stored in the registry and loaded by COM (and OPC) servers at start-up. Therefore, server processes must be shut down and re-started for these changes to take effect.

Default Properties

The **Default Properties** tab contains settings that affect all DCOM communication on the machine.

- Ensure to select the **Enable Distributed COM on this computer** so that the machine is available to others via DCOM.
- Select the **Enable COM Internet Services on this computer** to allow DCOM access to the machine from the Internet (check with the administrator).
- In general, the other settings do not need to be changed.

The **Authentication Level** specifies when COM should authenticate the identity of calling clients (each call, each packet, etc).

- Normally, it should be set to **Connect**, indicating that COM should authenticate clients when they first connect to a server. If it is set to **None**, then COM performs no authentication and ignores any access permission settings.

The **Impersonation Level** specifies if servers can ascertain the identity of calling clients and if it performs operations on the client's behalf (as if the server is the client).

- Normally, it should be set to **Identify**, allowing the server to identify the calling client to see if it is allowed access to a certain resource but not to access any of these resources as the client.
- Select the **Provide additional security for reference tracking** to make even the reference counting on COM objects secure. This setting is not generally required.

Security Permissions

The most important DCOM settings for an OPC server are the security permissions. There are two ways for the user to set these:

1. Change the specific settings for the server (recommended).
2. Change the default settings (not recommended) and make sure that the OPC server will use these.

Either way, ensure that the access and launch permissions are correct for the server.

Setting Security Permissions

Perform the following steps to set the security permissions for an OPC Server:

1. Open the DCOM configuration utility.
2. Select the OPC server, and then click **Properties**.

   The **Distributed COM Configuration Properties** window (Figure 47) appears.

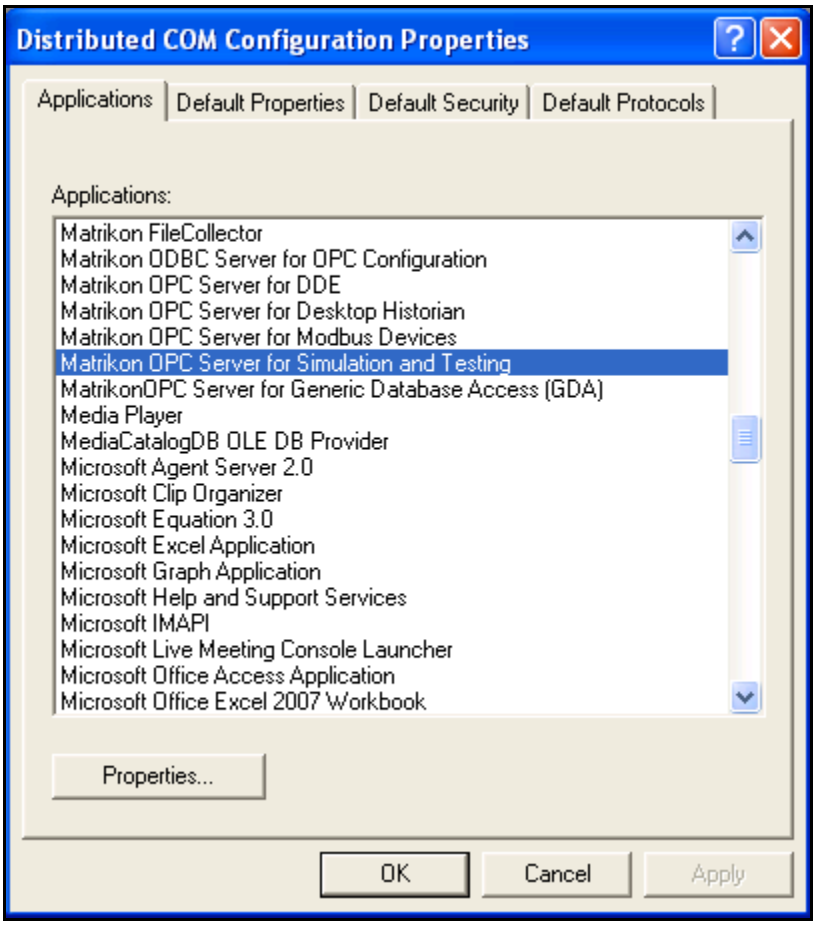

Figure 47 - Distributed COM Configuration Properties Window

3. Click on the **Security** tab to set the security for the server.
   The **Distributed COM Configuration Security** tab (Figure 48) appears.

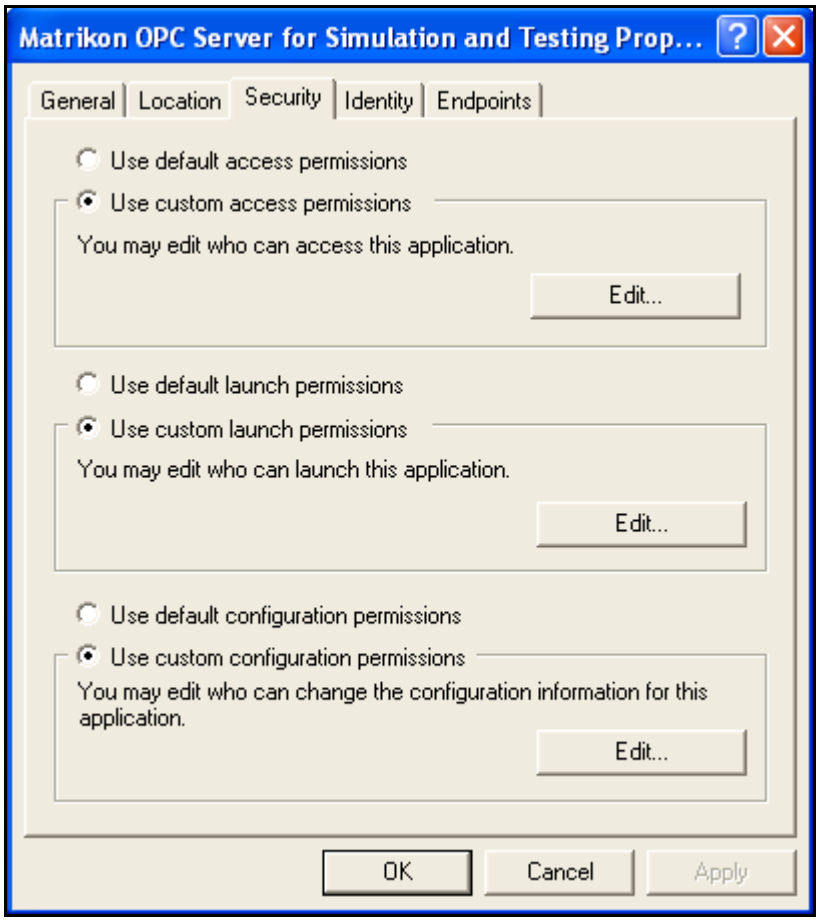

Figure 48 - Distributed COM Configuration Security Tab

Note:

- The **Access Permissions** contain an *Access Control List* of principals that can interact with objects supplied by a server.
- The **Launch Permissions** contain an *Access Control List* of principals that can start up a server process or service.

4. Include the names of users or user groups from trusted domains that can use the OPC server on this machine. Include the **Everyone** group to allow access to all users on a specific domain.
5. Click **Use custom access permissions** and then click **Edit** to set the *Access* permissions. The **Registry Value Permissions** window (Figure 49) appears.

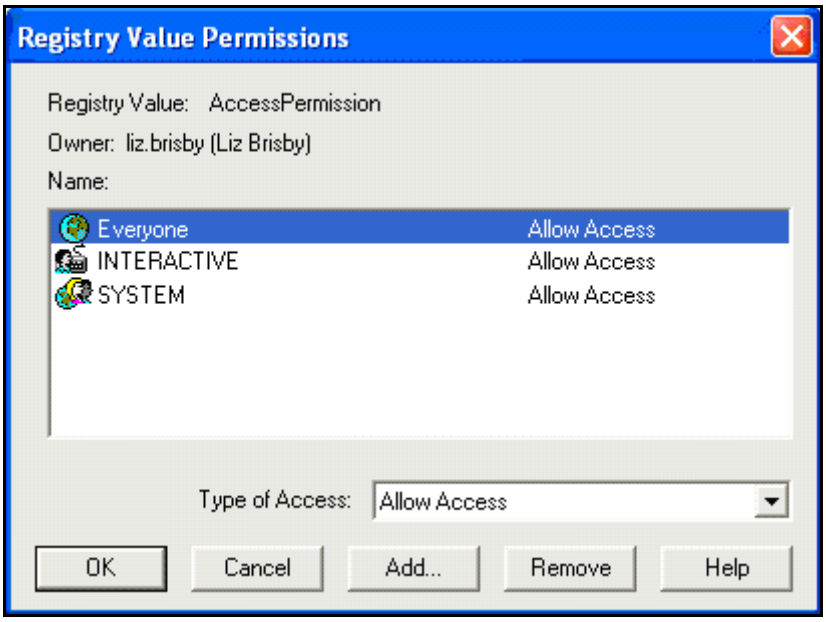

Figure 49 - Registry Value Permissions Window

6. Click **Add** to add users to the list.
   The **Add Users and Groups** window (Figure 50) appears.

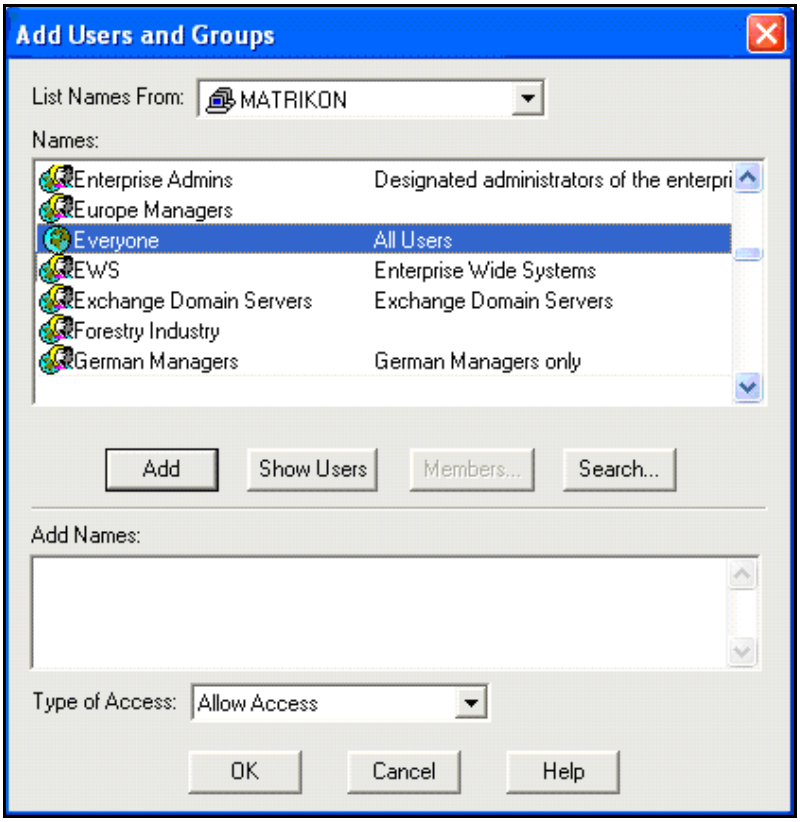

Figure 50 - Add Users and Groups Window

7. Select the user, and click **Add** to add a user to the list. If the username, the user requires to add does not appear then click **Show Users**.

8. Click **OK** to close the **Add Users and Groups** window once the user is done adding users. The user then chooses to **Allow Access** or **Deny Access** for each user.

Note:

- The procedure to set the launch permissions is like the above, but instead of choosing **Allow Access** the user must choose **Allow Launch**.
- The Configuration Permissions contain an *Access Control List* of principals that can modify the configuration information for a server. In other words, it indicates who can alter the registry entries for installed servers as well as who can access the registry for the purposes of installing new servers. It is usually simpler to install and configure servers as a user with local administrative rights.

9. Create a local user account on both the server and the client machine with identical *username* and *password* to connect to an OPC server from outside of the domain. Then, add the local user on the OPC server to the DCOM permissions. Use the local account on the client machine to connect to the OPC server.

Server Identity

The **Identity** tab for a selected COM (or OPC) server specifies the user account that should be used when COM starts up the process. The available settings are different for servers that run as local executables as opposed to those that run as NT services.

Note:

It is strongly recommended that OPC servers should be installed to run as NT services if they are going to be accessed by remote clients via DCOM. This ensures that the server can always be accessed even if no one is presently logged on to the machine, and only one server process ever starts up. It also adds more security in terms of who can shut down the server process.

Servers that run as local executables have the option of running as the launching user (the calling client–this is the default), the interactive user (the one currently logged onto the machine), or a specified user. It is usually best to use the interactive user or a specified user. Otherwise, remote clients might start up multiple separate server processes that are not accessible to others.

Servers that run as NT services should generally run as the local **System** account. Alternatively, the server can be set to run as a specified user, although this is usually done from the **Service Control Manager** applet rather than DCOMCNFG. *Access* and *Launch* permissions are particularly important when installing a server to run as an NT service.

Default Protocols

The **Default Protocols** tab specifies the communication protocols available to DCOM. The order that protocols appear in the list indicates the priority in which they will be used (the topmost having the highest priority).

The more protocols that appear in the list, better are the chances of connecting to an OPC server on an unknown remote machine (such as at an OPC Interoperability Workshop). However, it may also take longer for DCOM to time out if a server machine is not present since it must try each protocol in turn.

For most situations, it is best to remove all unused protocols from the list and only include those that are necessary for the network. For example, on a TCP/IP network, one would include the **Connection-oriented TCP/IP** protocol. Contact the IT personnel for more information about the network.

Note:
Evidence indicates that there are problems with the datagram-oriented protocols (such as UDP/IP) that can cause memory leaks in DCOM. Therefore, it is strongly recommended that these protocols be removed from the list of default protocols. Datagram-oriented protocols are not supported under Windows 2000 at all (although the DCOM configuration utility still allows the user to configure them).

Remote Program ID

Before the **OPC Server Browser** became available, OPC client applications had to search the registry to generate a list of available OPC servers. Therefore, some older OPC clients need to have a program ID in the local registry to connect to an OPC server.

The simplest solution is to install the OPC server software on the client machine even if it is not used. Alternatively, use the following steps to copy a program ID to the client machine.

Note:
This method may not work for every OPC client. Refer to the client documentation for more information.

WARNING:
Any changes made to the registry must be made with **extreme caution**!

1. Back up the registry.
2. Run **REGEDIT** as a user that has access rights to the local registry on the server machine.
3. Expand the **HKEY_CLASSES_ROOT** key.
4. Find the program ID(s) for the desired OPC server(s).

Note:
In the case of Matrikon OPC Servers, the ID has the form *Matrikon.OPC.Device*. If the user quickly types the first few letters, then **REGEDIT** should jump to the location of that key. Some servers may have both a version-specific as well as a version-independent program ID. In this case both IDs should be copied to the client machine.

5. Select the key and choose **Export Registry File** from the **Registry** menu. For each program ID, Enter a file name, and then click **Save**. Ensure not to overwrite other export files that is created.
6. Copy the exported **REG** files to the client machine.
7. Merge the **REG** files into the registry of the client machine.

Note:

Double clicking on the file from the desktop of the client machine. Alternatively, run **REGEDIT** on the client machine and choose **Import Registry File** from the **Registry** menu, selecting each file in turn. This must be done as a user who has write access to the local registry.

8. Use **REGEDIT** to check that the program IDs have in fact, been copied.
9. Delete the **REG** files since they are no longer needed.

Appendix B ODBC DSN Configuration

This section provides the user with step-by-step instructions on how to properly configure the OPC server to connect with the sample Microsoft Access database supplied.

DSN Types Note

Microsoft Windows supports the configuration of three types of ODBC data sources:

1. **System:** A registered data source that can be used by any user of the system.
2. **User DSN:** A data source defined for a specific user.
3. **File DSN:** A data source intended for use by multiple users on potentially different machines. These DSN settings are saved in a file with a .DSN extension.

Data Source Configuration

Note:
The MatrikonOPC Client for ODBC communicates with databases that are registered as ODBC data sources. An example for registering a database as a system DSN is presented below.

1. Select **Control Panel** -> **Administrative Tools** -> **Data Sources (ODBC)** from the **Start** button, or select the configuration tool right from the MatrikonOPC Client for ODBC by clicking **Configure** on the **Database Connection Configuration Window** as shown in Figure 51.

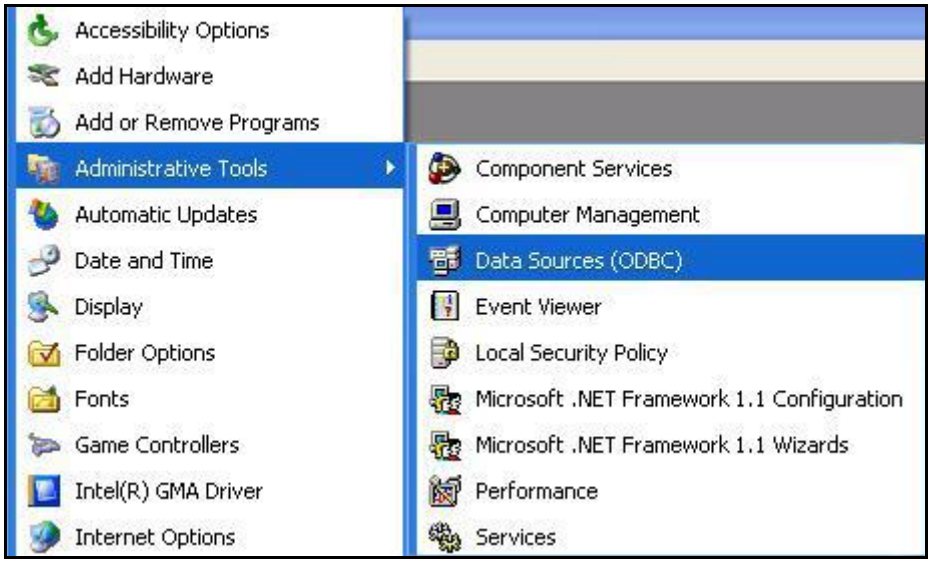

Figure 51 - ODBC Data Source Administration Screen Access Path

The **ODBC Data Source** Administrator screen appears.

2. Select the **System DSN** tab (Figure 52).

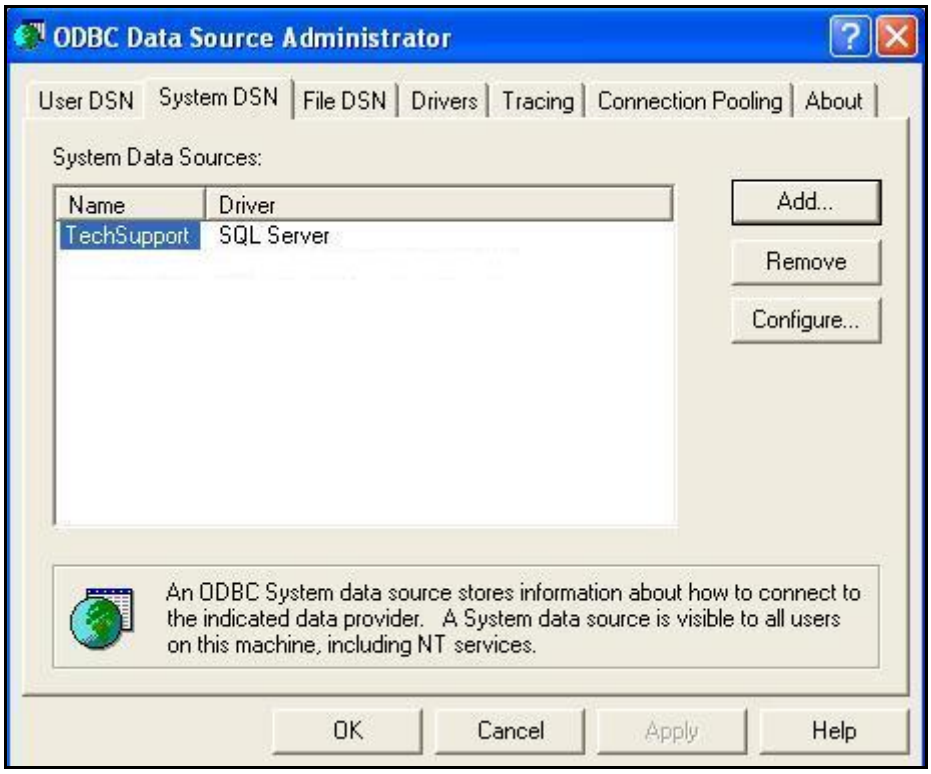

Figure 52 - ODBC Data Source Administrator (System DSN Tab)

3. Click the **Add** button.
   The **Create New Data Source** window (Figure 53) appears.

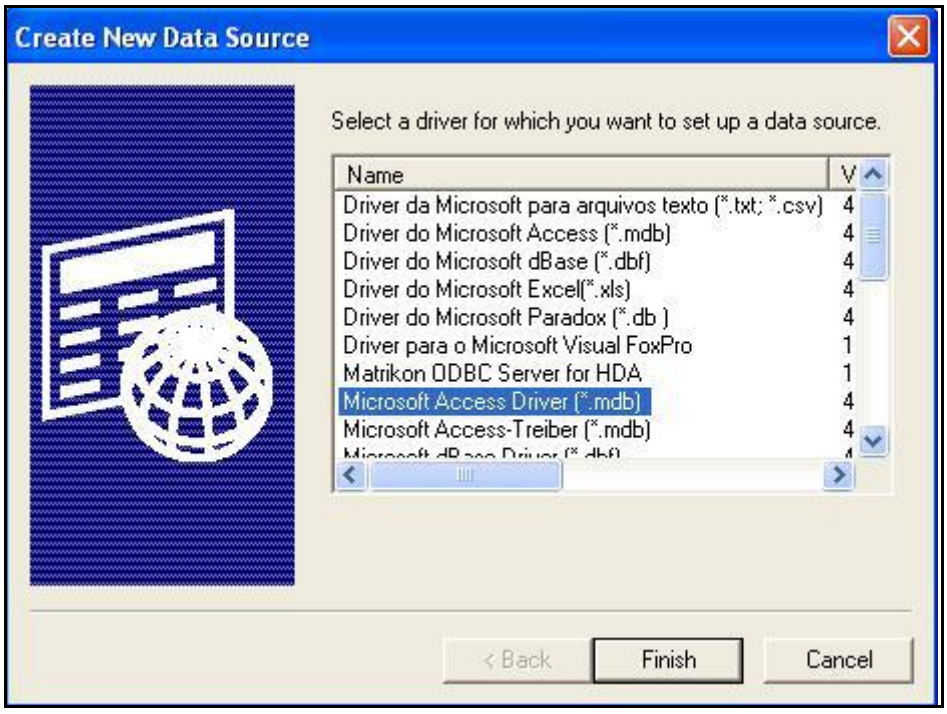

Figure 53 - Create New Data Source Window

4. Select the driver for the data source. The sample that is provided uses the Microsoft Access driver, if the user is connecting to an Oracle database ensure the user uses the driver provided by the Oracle Client tools installation and not the Microsoft ODBC for Oracle driver. Select that option from the list.
5. Click the **Finish** button.
   The **ODBC Microsoft Access Setup** window (Figure 54) appears.

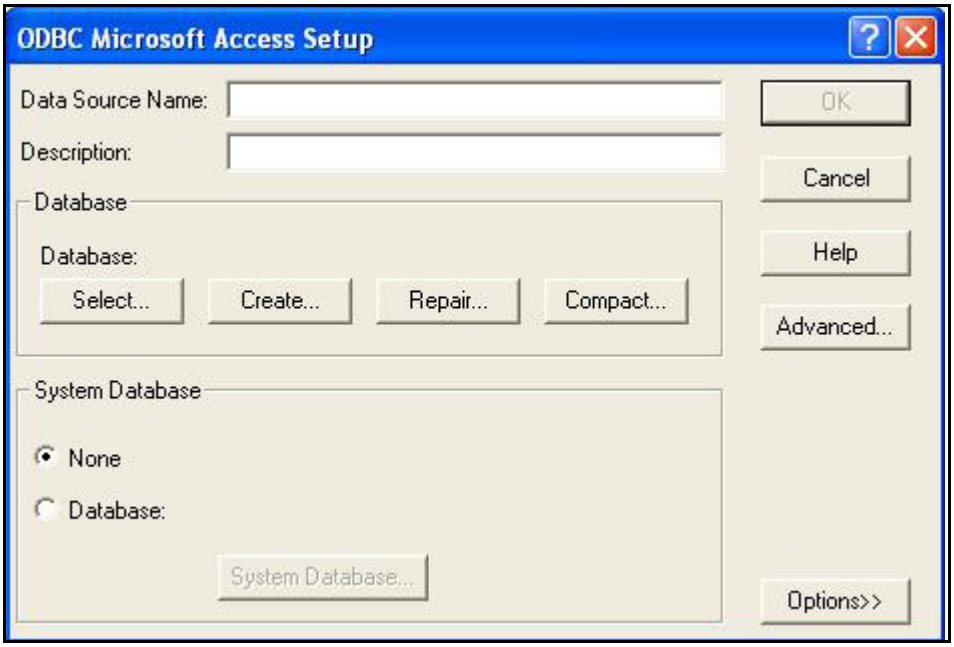

Figure 54 - ODBC Microsoft Access Setup Window

6. Enter **TestDatabase** in the Name field to configure the name of the DSN.

Note:
This name can be anything, however, the configuration file that is **Data Source** included with this installation assumes that the user will name the DSN as **TestDatabase**.

7. Click the **Select** button.
   The **Select Database** window (Figure 55) appears.
8. Browse to the OPC server installation directory path and select the **SampleDB.mdb** file.

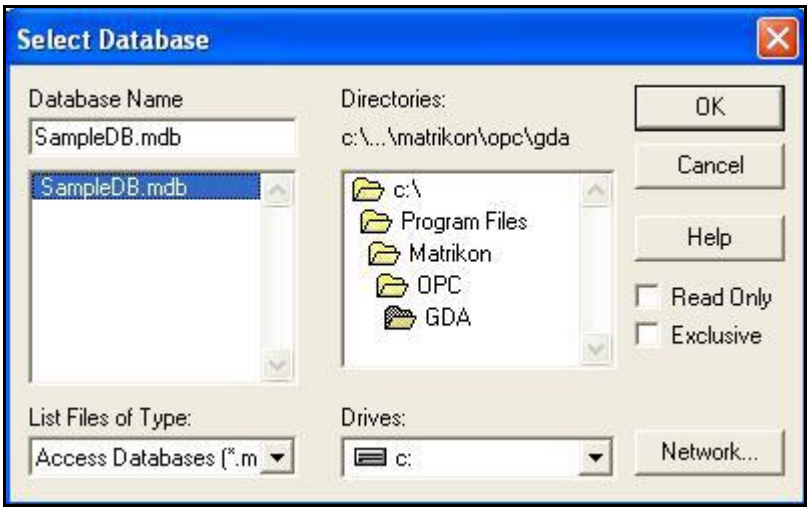

Figure 55 - Select Database Window

9. Click the **OK** button to close the **Select Database** window and return to the **ODBC Microsoft Access Setup** window.
10. Click the **OK** button to finish the DSN configuration from the **ODBC Microsoft Access Setup** window.
11. TestDatabase should now appear in the list of system DSNs (Figure 56) that the user notices in the **ODBC Data Source Administrator** window.

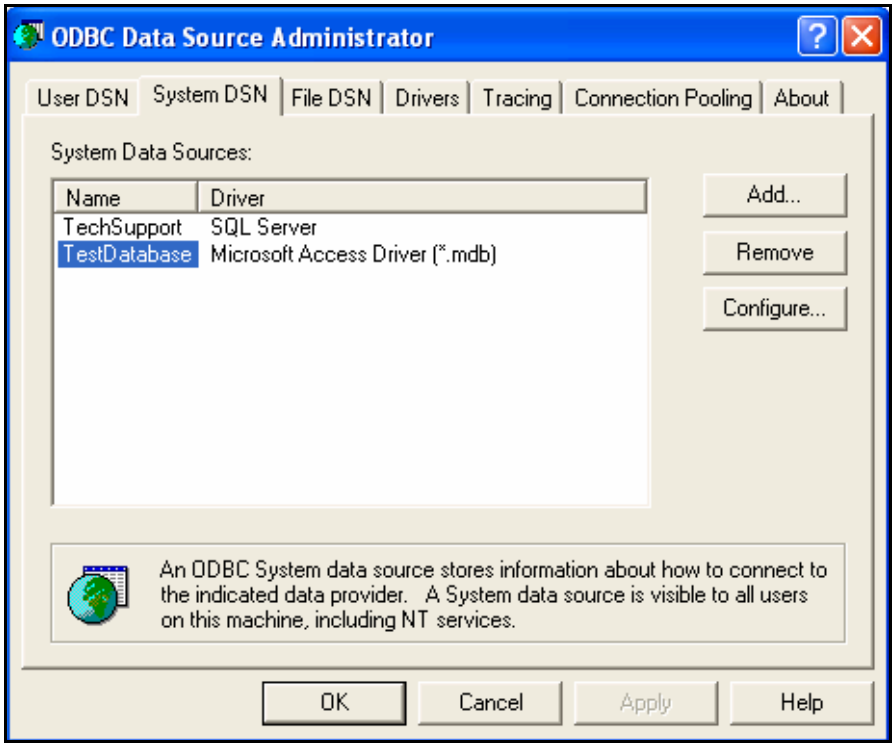

Figure 56 - List of System DSNs

Note:

If the user has moved the database location, the user must update the DSN information, or else error 11616 will occur. Refer to the *Release Notes* to read about the bug.