

# **Introduction to OPC**

## **Tutorial**

# Introduction to OPC Tutorial

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**This manual is a product of Matrikon Inc.**

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## Document Revision History:

Date	Document Version	Description	Author
2002-10-31	1.0	Initial document.	LE
2002-11-08	2.0	Proposal creation.	LE
2010-11-06	3.0	Converted to standard template and updated information.	BJH, WD, LB

## **SOFTWARE VERSION**

Version: N/A

## **DOCUMENT VERSION**

Version: 3.0

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## Introduction

**MatrikonOPC™** is the world's leading provider of open data connectivity products for industrial applications – from the plant floor to the enterprise. MatrikonOPC is committed to the success of every customer. To deliver on this promise, MatrikonOPC provides secure and reliable software, expert live support, and extensive OPC training services around the world. Through its Global Partner Network, MatrikonOPC also builds strong, working relationships with third-party vendors and local system integrators to maximize the value delivered to end-customers. With offices in North America, Europe, Asia-Pacific, and the Middle East, MatrikonOPC provides local service on a global scale.

This document is designed as a guide to use the following MatrikonOPC tools (all of which must be installed on the local computer):

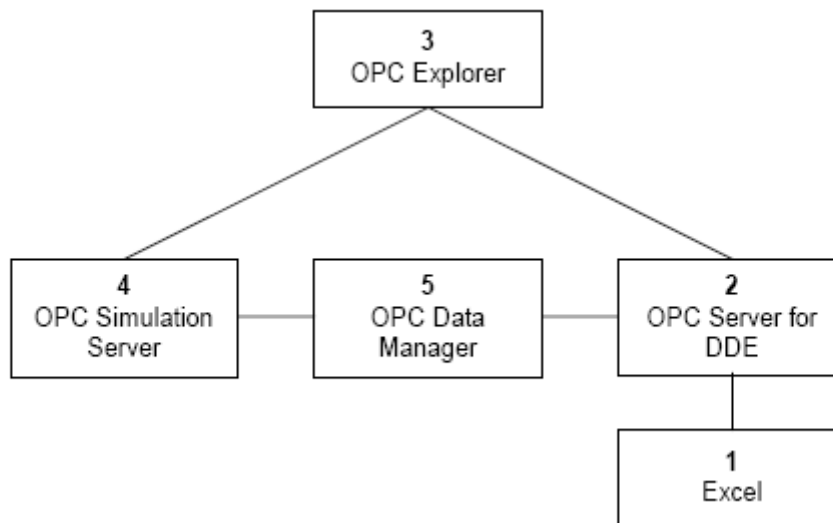
- **MatrikonOPC Server for DDE**
- **MatrikonOPC Explorer**
- **MatrikonOPC Server for Simulation and Testing**
- **MatrikonOPC Data Manager**

Those applications listed above are all available for download for evaluation purposes. For more information, refer to **Downloading and Installing MatrikonOPC Tools**.

**Note:** To complete this tutorial, **Microsoft Excel** must also be installed on the local computer.

## MatrikonOPC Tools General Overview

The OPC Architecture diagram (Figure 1) depicts how the OPC software applications connect with one another. Each box denotes a separate software application. Each line denotes a connection.



**Figure 1 - OPC Architecture**

In Figure 1, the process control system is arranged as follows:

1. **Microsoft Excel** acts as the data source. All of the process control data is read from, and written to, Microsoft Excel.
2. The **MatrikonOPC Server for DDE** connects **Microsoft Excel** to the OPC client.

3. **MatrikonOPC Explorer** acts as the data sink. It reads data and commands, and writes data back to **Microsoft Excel**.
4. The **MatrikonOPC Server for Simulation and Testing** simulates a connection to a sample device or sample application. It transfers simulated data that is read by **MatrikonOPC Explorer**.
5. **MatrikonOPC Data Manager** has OPC client functionality that connects the two OPC servers. Sample tag values are shared between the **MatrikonOPC Server for Simulation and Testing** and the **MatrikonOPC Server for DDE**.

## Downloading and Installing MatrikonOPC Tools

All of the MatrikonOPC software used in this tutorial are available as free evaluation versions that can be downloaded from the following locations:

### MatrikonOPC Explorer:

<http://matrikonopc.com/products/opc-desktop-tools/opc-explorer.aspx>

### MatrikonOPC Server for DDE:

<http://www.matrikonopc.com/opc-drivers/168/base-driver-details.aspx>

### MatrikonOPC Server for Simulation and Testing:

<http://matrikonopc.com/products/opc-drivers/opc-simulation-server.aspx>

### MatrikonOPC Data Manager:

<http://www.matrikonopc.com/products/opc-data-management/opc-data-manager.aspx>

To install each software package, download and run each executable. Follow the instructions that accompany each installation.

### Notes:

- The **MatrikonOPC Server for DDE** and **MatrikonOPC Data Manager** are meant to be used in this tutorial for demonstration purposes only and come with a free 30-day fully-functional demo license. After the demonstration period has expired, the software ceases to operate until a registered version is installed.
- The **MatrikonOPC Explorer** and **MatrikonOPC Server for Simulation and Testing** are fully-functional OPC testing tools and no licensing is required for these applications.

## Tutorial Overview

The exercises in this tutorial describe the function of each MatrikonOPC application while providing guidance through the process of configuring the **MatrikonOPC Server for DDE**. Working through this tutorial provides the necessary knowledge to help troubleshoot OPC software implementations by highlighting where problems may occur when connecting any OPC software applications.

The **MatrikonOPC Server for DDE** is configured using the following steps:

1. Use **Microsoft Excel** to create sample data. Refer to **Configure the Data Source** for more information.
2. Configure the connection between the DDE server (using **MatrikonOPC Server for DDE**) and **Microsoft Excel**. Refer to **Configure the OPC Server** for more information.
3. Configure **MatrikonOPC Explorer** to read and write values to and from **Microsoft Excel** using the **MatrikonOPC Server for DDE**. Refer to **Using an OPC Client (MatrikonOPC Explorer)** for more information.

4. Connect **MatrikonOPC Explorer** to the **MatrikonOPC Server for Simulation and Testing**. Then connect the two OPC servers using **MatrikonOPC Data Manager**. Refer to **Exchanging Data Between Two OPC Servers** for more information.



## Configure the Data Source

OPC Technology provides the means to access data contained within a data sources using OPC server functionality. For an OPC server to access data, the data source itself must be available for connection and must contain valid data to access. This tutorial shows how to establish an OPC connection with a data source (in this case, **Microsoft Excel**), using MatrikonOPC tools.

### Creating Sample Data in Microsoft Excel

The first step is to ensure that the data source is running and has data. This is done by creating some sample data in various cells in **Microsoft Excel** and save the data in a workbook file.

#### To create sample data in Microsoft Excel:

1. Open **Microsoft Excel** with a new workbook.
2. In columns A and B, and rows 1, 2 and 3, enter the values displayed in Figure 2 which are to be referenced by **MatrikonOPC Server for DDE**.

	A	B
1	FIC101	1550
2	PIC204	15
3	TIC306	20

Figure 2 - Microsoft Excel Sample Data

In the sample data, **Column B** represents simulated values as follows:

- **FIC101** represents the value of *Flow Controller 101*.
  - **PIC204** represents the value of *Pressure Controller 204*.
  - **TIC306** represents the value of *Temperature Controller 306*.
3. Save the workbook and name it **Book1.xls**.
  4. Leave **Microsoft Excel** running with the newly-created workbook (i.e., **Book1.xls**) open.

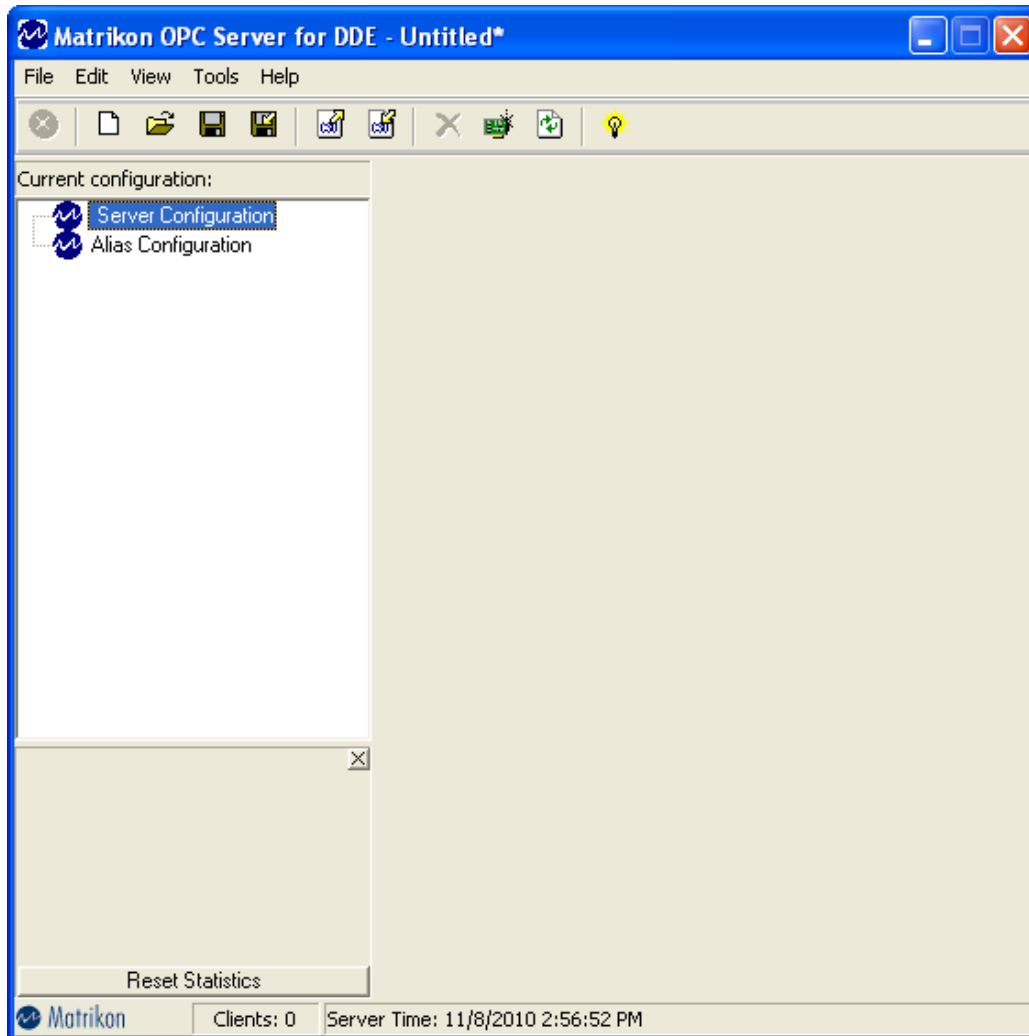
## Configure the OPC Server

With completion of the **Configure the Data Source** section, a data source has been established (i.e., Microsoft Excel) and contains valid data points. The **MatrikonOPC Server for DDE** can be used to establish a connection to the sample data in **Book1.xls**.

The **MatrikonOPC Server for DDE** is used to establish a connection to **Microsoft Excel** (which uses the DDE protocol to provide data access functionalities to other applications), and provide OPC access to **Microsoft Excel** data to any OPC client (MatrikonOPC Explorer in this tutorial). It provides key functionality such as read and write access to all valid DDE server items, and DDE server connection status. The **MatrikonOPC Server for DDE** can be used by any OPC-compliant application such as an HMI or Process Historian, to connect to DDE servers such as **Microsoft Excel**, **Matlab**, the **Six Sigma** statistical package **MiniTab**, and others.

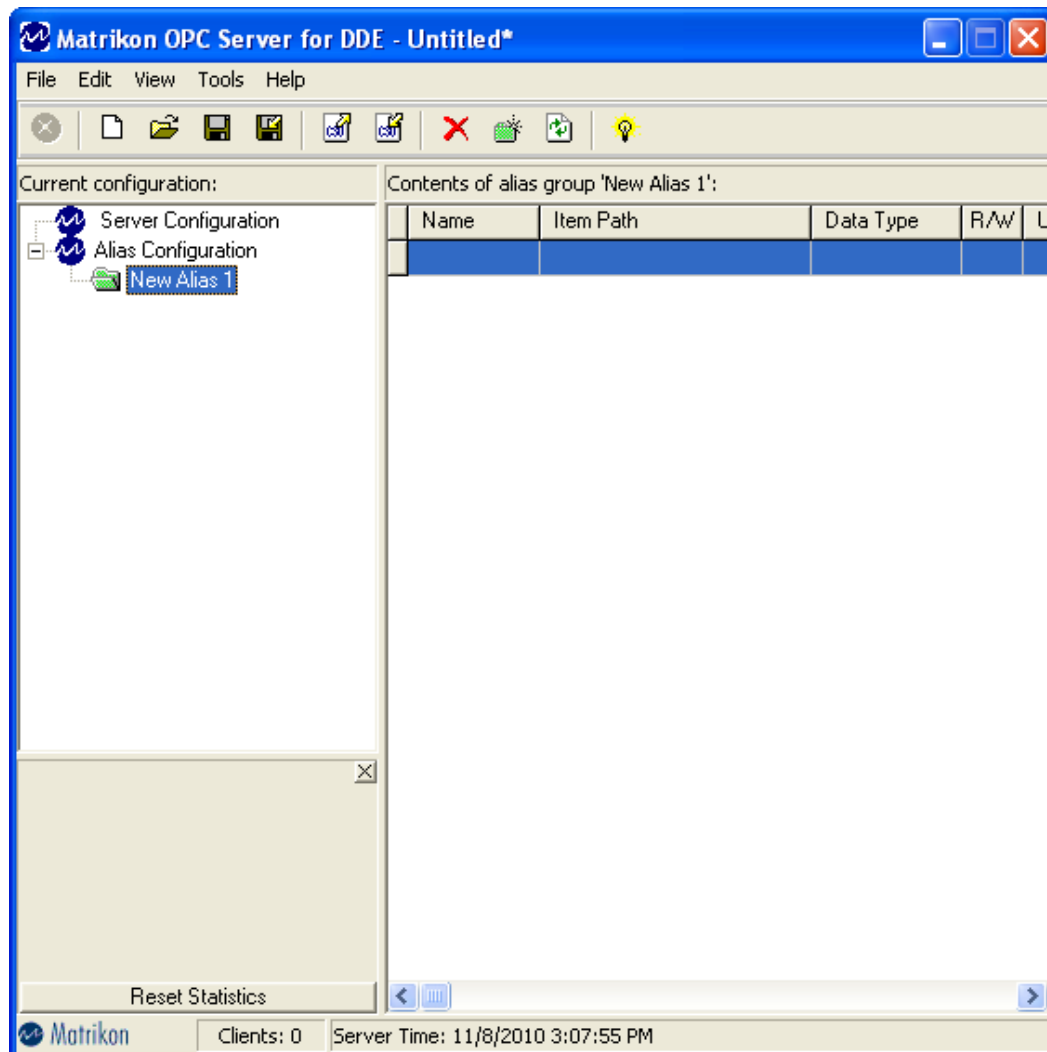
### To configure the MatrikonOPC Server for DDE to connect with Microsoft Excel:

1. Click on the Windows **Start** button. Select **Programs -> MatrikonOPC -> DDE -> MatrikonOPC Server for DDE**.
2. The **MatrikonOPC Server for DDE** configuration screen (Figure 3) appears.



**Figure 3 - MatrikonOPC Server for DDE Configuration Screen**

3. In the **Current configuration** pane (on the left side of the screen), select **Alias Configuration**.  
**Note:** When **Alias Configuration** is selected, the **Contents** pane on the right side of the screen appears and initially shows that no aliases have been created.
4. From the **Edit** menu, select **Insert Alias Group**.  
 Or,  
 Right-click your mouse on **Alias Configuration** and select **Insert Alias Group** from the displayed menu.
5. An alias group folder called **New Alias 1** appears beneath the **Alias Configuration** item. The contents of the new alias group (currently blank) are shown in the **Contents** pane (Figure 4).



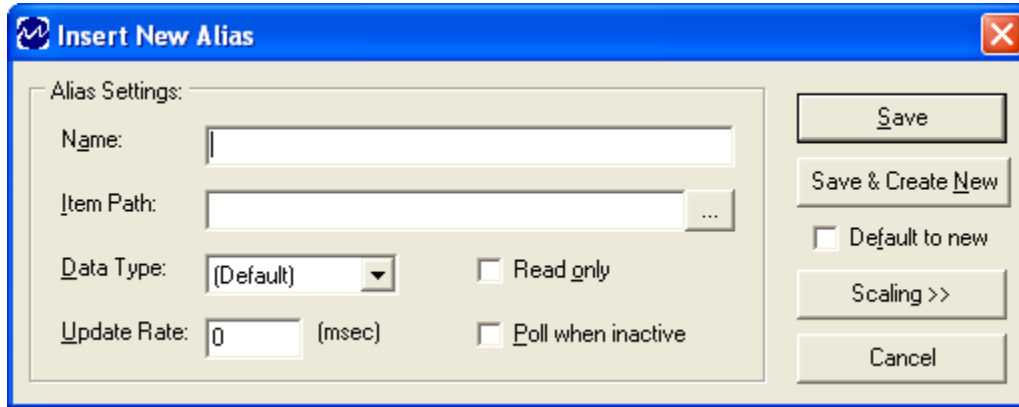
**Figure 4 - New Alias Group**

6. In the **Current configuration** pane, select the new alias group, **New Alias 1**.
7. From the **Edit** menu, select **Insert New Alias**.  
 Or,

Right-click your mouse in the **Contents** pane and select **Insert Alias Group** from the displayed menu.

8. The **Insert New Alias** window (Figure 5) appears.

**Note:** The **Insert New Alias** window allows the OPC server to reference specific values in the **Microsoft Excel** file with the **MatrikonOPC Server for DDE**.



**Figure 5 - Insert New Alias Window**

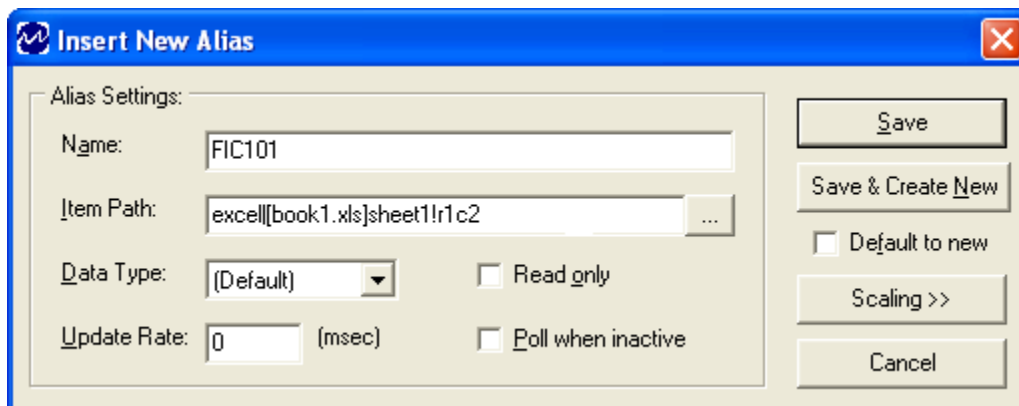
9. For each tag value listed in **Book1.xls**, insert a new alias as follows:

- a. **Name:** Tag name (e.g., **FIC101**).
- b. **Item Path:** The Excel cell reference. For example, enter **excel[[book1.xls]sheet1!r1c2** for **FIC101**'s value. In **Microsoft Excel**, the pipe (**|**) is used to separate the file name.



**Note:** The **Item Path** syntax is formatted according **Microsoft Excel** requirements, not **MatrikonOPC** requirements. Therefore, data access syntax may be different for other DDE applications. Make sure you have spelled the file name and item path correctly.

10. Leave the rest of the fields as is (i.e., the default settings) as shown in Figure 6.



**Figure 6 - Insert New Alias - Settings**

11. Click on the **Save** button to save the new alias.

Or,

Click on the **Save & Create** new button to enter another alias.

12. Enter the remaining aliases:

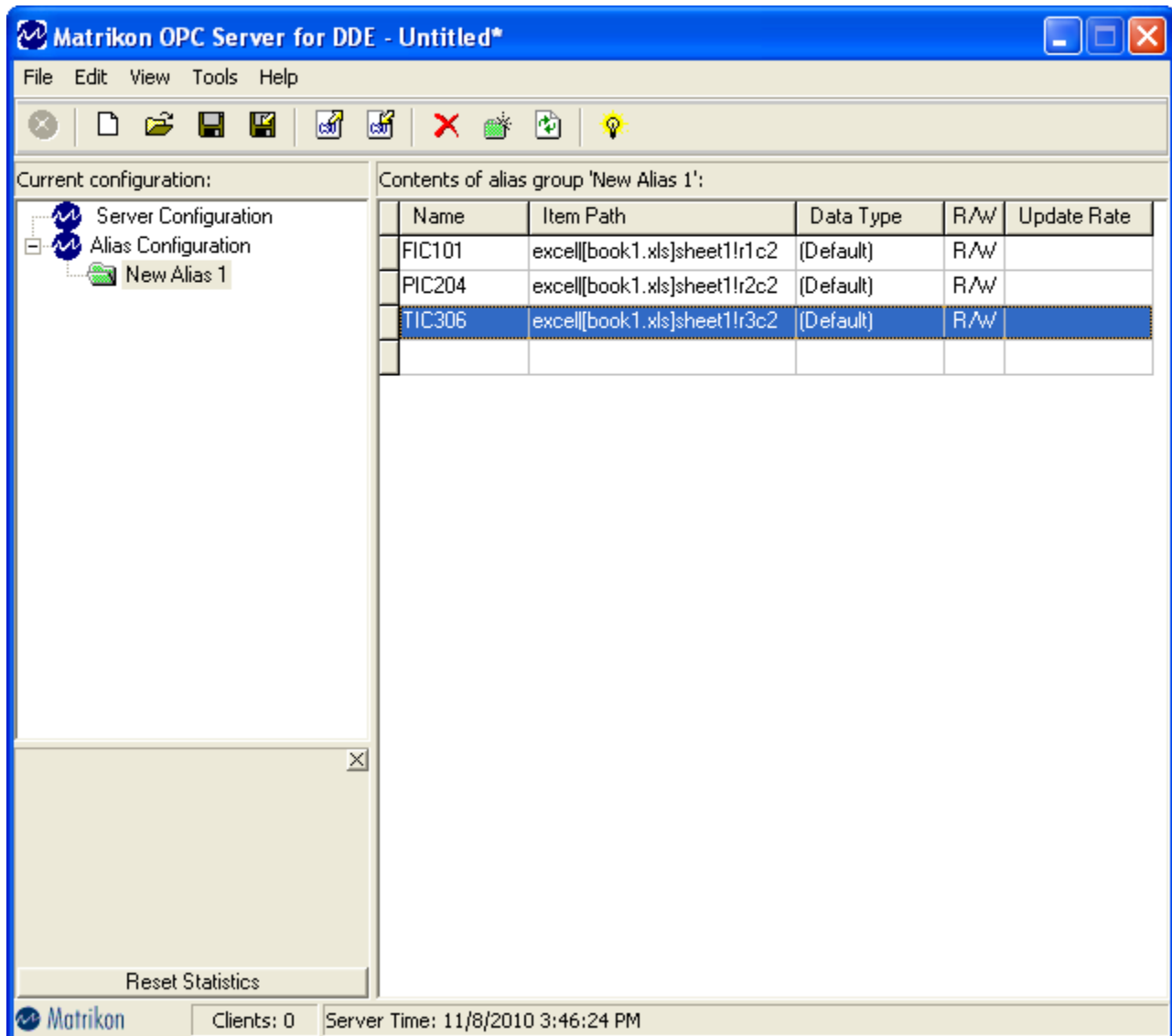
a. **Name:** PIC204

**Item Name:** excel[[book1.xls]sheet1!r2c2

b. **Name:** TIC306

**Item Name:** excel[[book1.xls]sheet1!r3c2

13. The **Configuration** screen should now appear as shown in Figure 7.



**Figure 7 - New Aliases**

14. The **MatrikonOPC Server for DDE** is now configured properly and connected to **Microsoft Excel**. This means that any OPC client (e.g., **MatrikonOPC Explorer**) can connect with the configured sample data in **Book1.xls** using the interface provided by the DDE server.

## Using an OPC Client (MatrikonOPC Explorer)

Once the **MatrikonOPC Server for DDE** has been configured, the connection between **Microsoft Excel** and the **MatrikonOPC Server for DDE** can be utilized by an OPC client to access Excel data. The next step is to configure **MatrikonOPC Explorer** to read and write values to and from Microsoft Excel through a connection to the **MatrikonOPC Server for DDE**.

This section shows how to use **MatrikonOPC Explorer** to interface with the **MatrikonOPC Server for DDE** to access data from a DDE server (Microsoft Excel).

Configuration steps include:

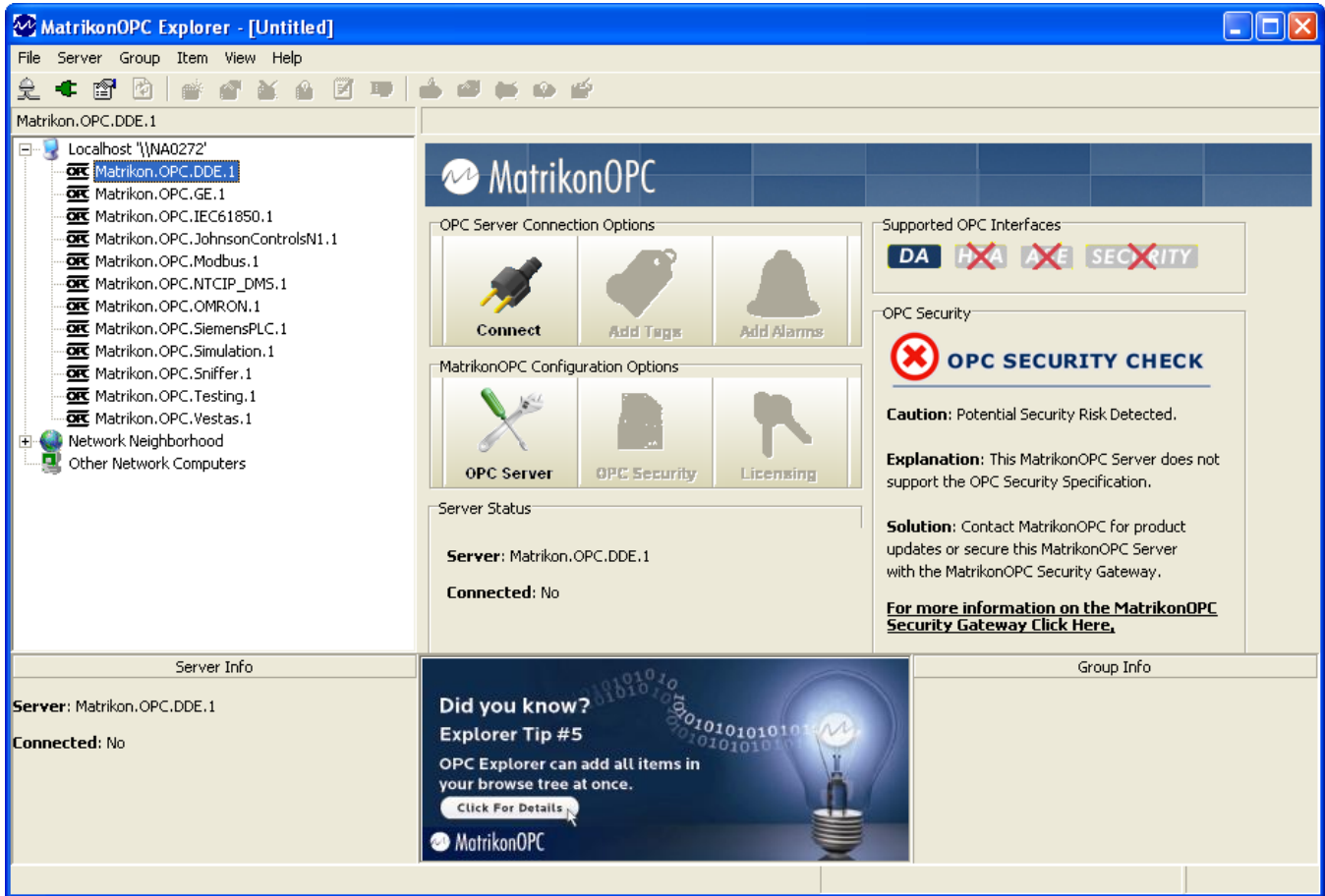
- Opening **MatrikonOPC Explorer** and connecting to the **MatrikonOPC Server for DDE**. Refer to **Establishing Connection Between OPC Explorer and OPC Server for DDE** for more information.
- Adding data points to be read from the connection to the **MatrikonOPC Server for DDE** that originate from Microsoft Excel. Refer to **Adding Data Points in OPC Explorer** for more information.
- Monitoring the connection and current values of the Microsoft Excel data points within OPC Explorer. This includes writing to the configured data points in Microsoft Excel by changing the tag value in OPC Explorer and seeing the change appear in the Excel workbook, **Book1.xls**. Refer to **Testing the Connection Between OPC Explorer and Microsoft Excel** for more information.

## Establishing Connection Between OPC Explorer and OPC Server for DDE

To configure MatrikonOPC Explorer:

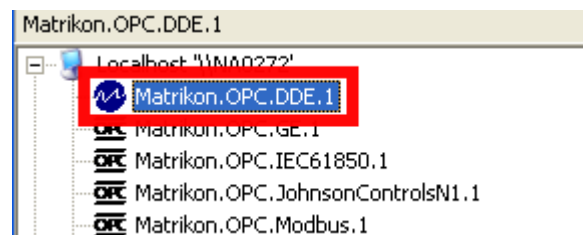
1. Click on the Windows **Start** button. Select **Programs -> MatrikonOPC -> Explorer -> MatrikonOPC Explorer**.
2. The **MatrikonOPC Explorer** configuration screen appears (Figure 8). Listed in the navigation pane on the left side of the screen, are the names of the OPC servers installed on the local computer.

**Note:** The MatrikonOPC Server for DDE (previously installed in this tutorial) should appear on this list (**Matrikon.OPC.DDE.1**). If it does not, contact **MatrikonOPC Support**.



**Figure 8 - MatrikonOPC Explorer**

3. Right-click your mouse on **Matrikon.OPC.DDE.1** and select **Connect** from the displayed menu.  
Or,  
Click on the **Connect** button in the **OPC Server Connection Options** screen section.
4. Connection to the OPC server can be verified by:
  - The presence of the blue MatrikonOPC icon next to the server name in the navigation pane (Figure 9).



**Figure 9 - Icon - Server Connected**

- In the **Server Status** screen section, **Yes** appears next to the **Connected** field (Figure 10).

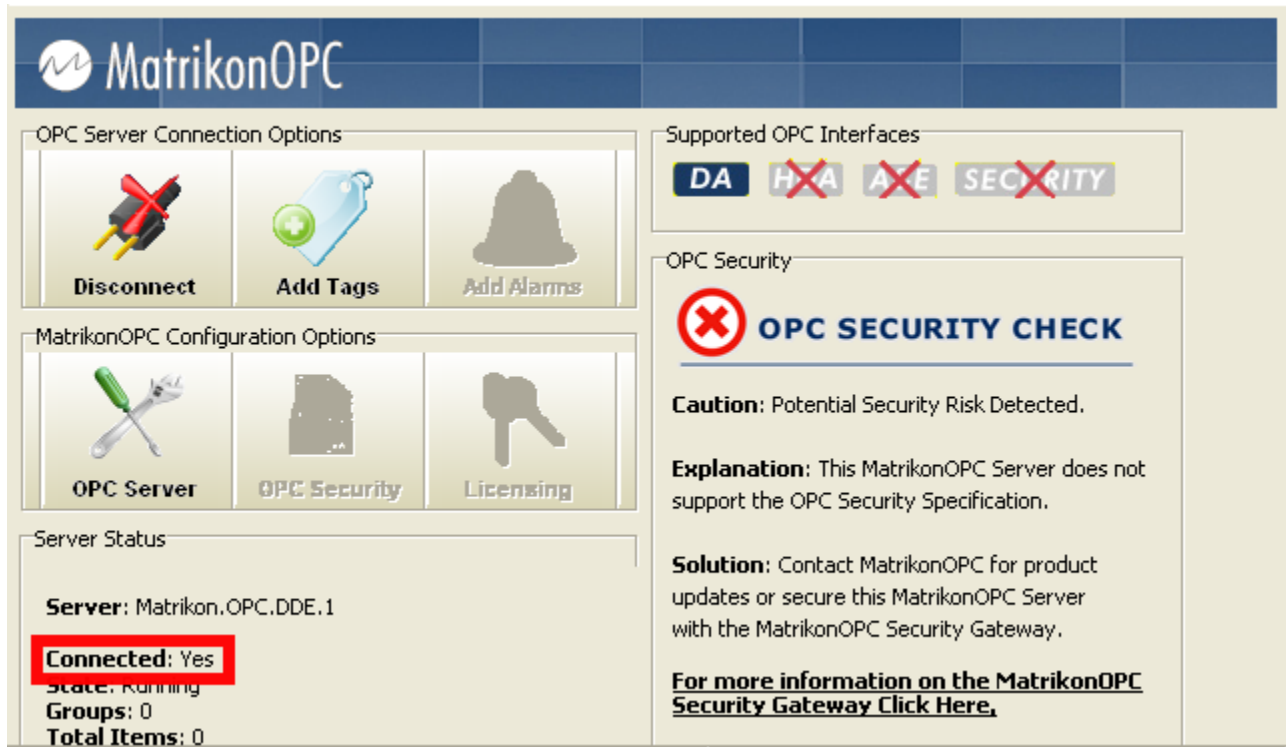


Figure 10 - Server Status

## Adding Data Points in MatrikonOPC Explorer

To add data points in MatrikonOPC Explorer:

1. In the **OPC Server Connection Options** screen section, click on the **Add Tags** button (Figure 11).

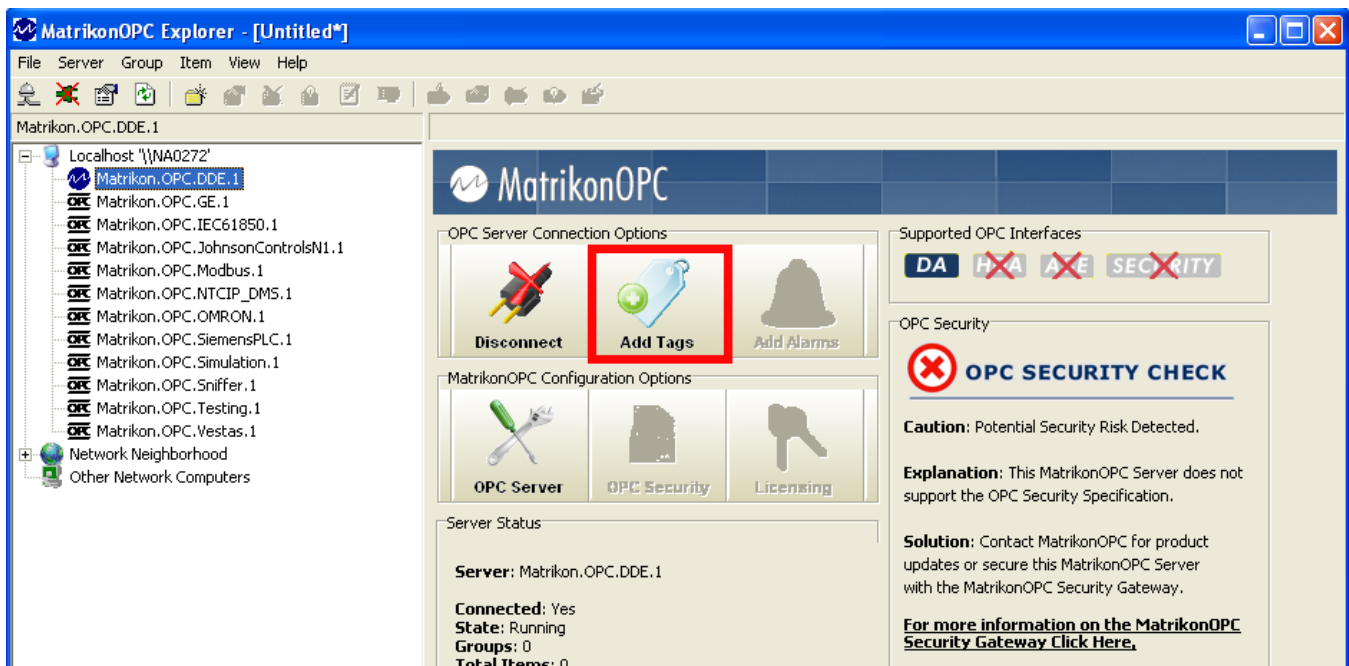
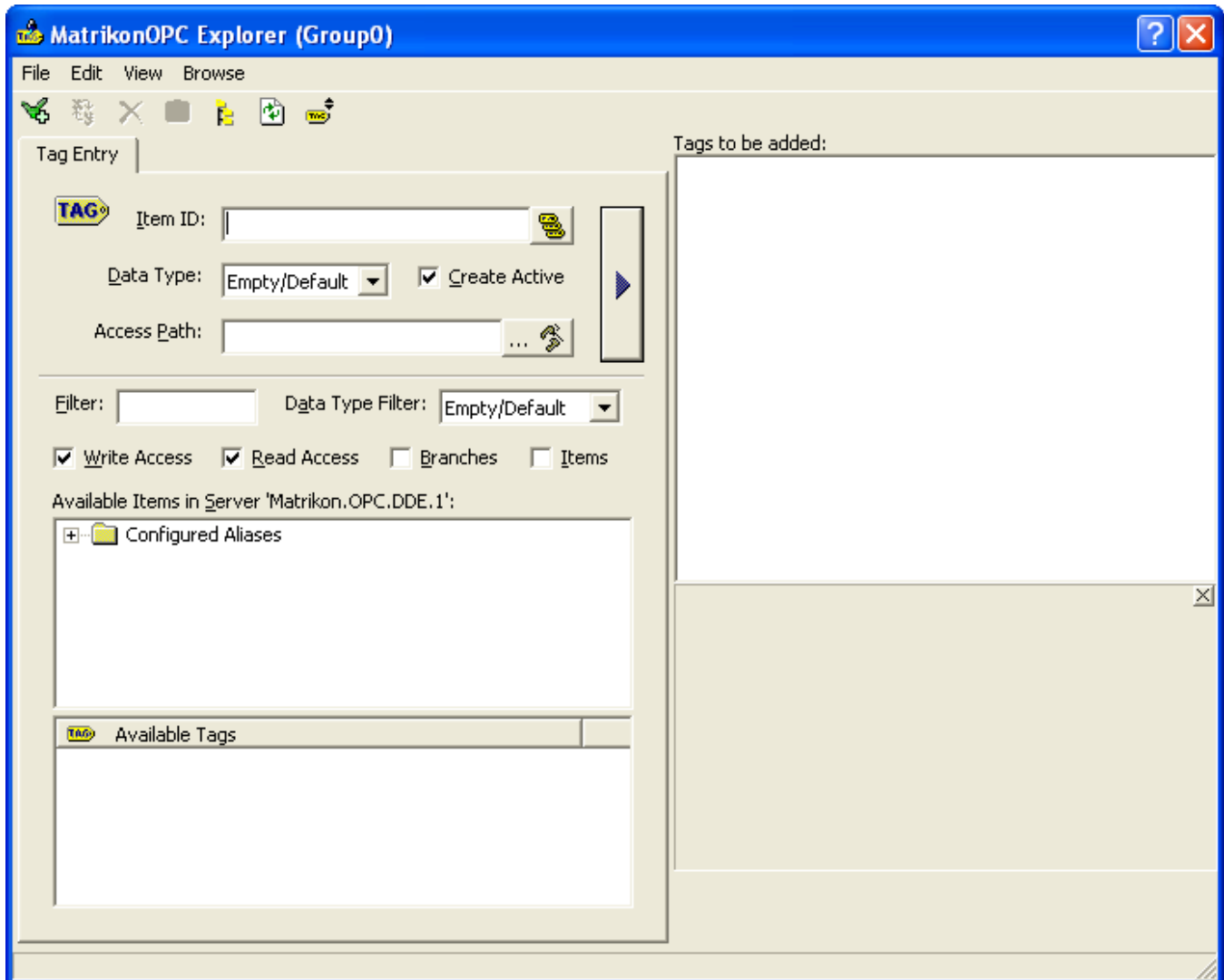


Figure 11 - Add Tags Button



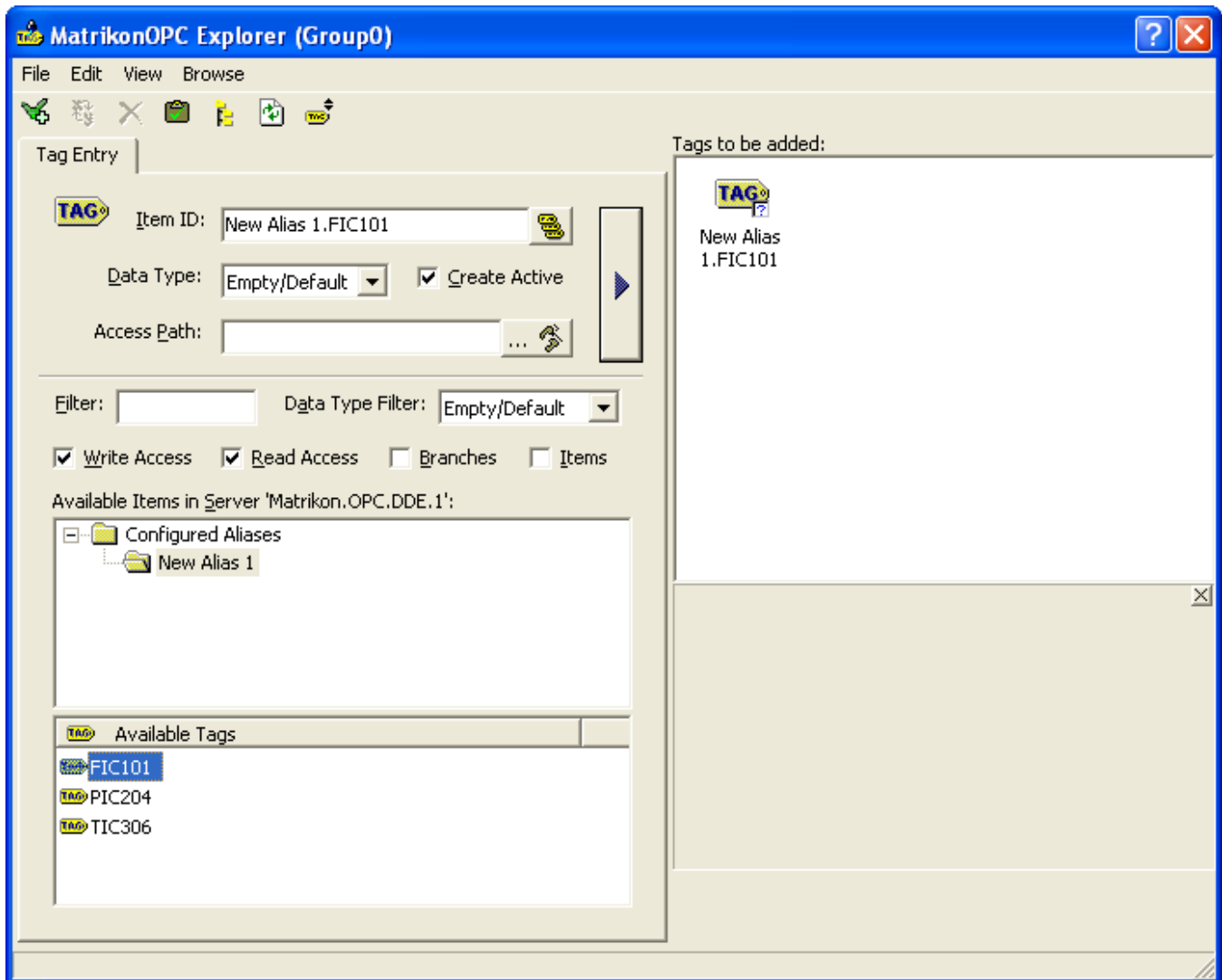
- The **OPC Explorer** browsing window appears (Figure 12). The browsing window is specific to the OPC server currently selected and connected.




**Figure 12 - MatrikonOPC Explorer Browsing Window**

- In the **Available Items** screen section, double-click your mouse on the **Configured Aliases** folder to open it display the **New Alias 1** folder.
- Click on the **New Alias 1** folder. The **Microsoft Excel** tags, for which aliases had been created earlier in this tutorial, now appear in the **Available Tags** screen section.
- Double-click your mouse on the **FIC101** tag.
- The tag name appears in the **Item ID** field (Figure 13).

**Note:** If the selected data point does not already appear in the **Tags to be added** screen section, click on the right-pointing arrow button to the left of this section.



**Figure 13 - Configured Tags**

7. The data tag appears in the **Tags to be added** screen section, and displays a blue question mark.
8. Select the data tag, and from the **File** menu select the **Validate Tags** option.  
Or,  
Click on the **Validate Items**  icon.
9. If the **OPC Server for DDE** can access the tag from **Microsoft Excel**, the blue question mark changes to a green checkmark (Figure 14).



**Figure 14 - Validated Data Point**

**Note:** If **OPC Explorer** cannot read the tag from **Microsoft Excel**, the blue question mark changes to a red X. If this happens, make sure the correct **Item Path** was entered when the alias was created in the **Configure the OPC Server** section of this tutorial.

10. Repeat steps 5 through 8 for the remaining tags.

11. From the **File** menu, select **Close**.

Or,

Click on the **Close**  button.

12. The browse window is closed and **OPC Explorer** is updated.

13. **OPC Explorer** now shows the tags as **Active**, and displays the sample values originally entered in the **Microsoft Excel** worksheet (Figure 15).




Contents of 'Group0'					
Item ID	Access Path	Value	Quality	Timestamp	Status
 New Alias 1.FIC101		1550	Good, non-specific	11/09/2010 1:06:44.080 PM	Active
 New Alias 1.PIC204		15	Good, non-specific	11/09/2010 1:06:44.080 PM	Active
 New Alias 1.TIC306		20	Good, non-specific	11/09/2010 1:06:44.080 PM	Active

Figure 15 - Microsoft Excel Data Points - OPC Explorer

## Testing the Connection Between MatrikonOPC Explorer and Microsoft Excel




There are two tests shown in this tutorial:

1. Issuing an OPC Write in **MatrikonOPC Explorer** and witnessing the change in values in **Microsoft Excel**.
2. Changing values in **Microsoft Excel** and witnessing the values of the same points change within **MatrikonOPC Explorer**.

### OPC Writing in MatrikonOPC Explorer

This example (i.e., test) shows that an OPC client can write to a configured data point.

1. In **OPC Explorer**, right-click your mouse on the **FIC101** tag.
2. Select **Write Values** (Figure 16) from the displayed menu.

Contents of 'Group0'					
Item ID	Access Path	Value	Quality	Timestamp	Status
 New Alias 1.FIC101			Good, non-specific	11/09/2010 1:06:44.080 PM	Active
 New Alias 1.PIC204			Good, non-specific	11/09/2010 1:06:44.080 PM	Active
 New Alias 1.TIC306			Good, non-specific	11/09/2010 1:06:44.080 PM	Active

Write Values

Deactivate

---

Delete Del

Export Items

---

Properties Alt+Enter

Figure 16 - Write Values Function

3. The **Write Values** window (Figure 17) appears.

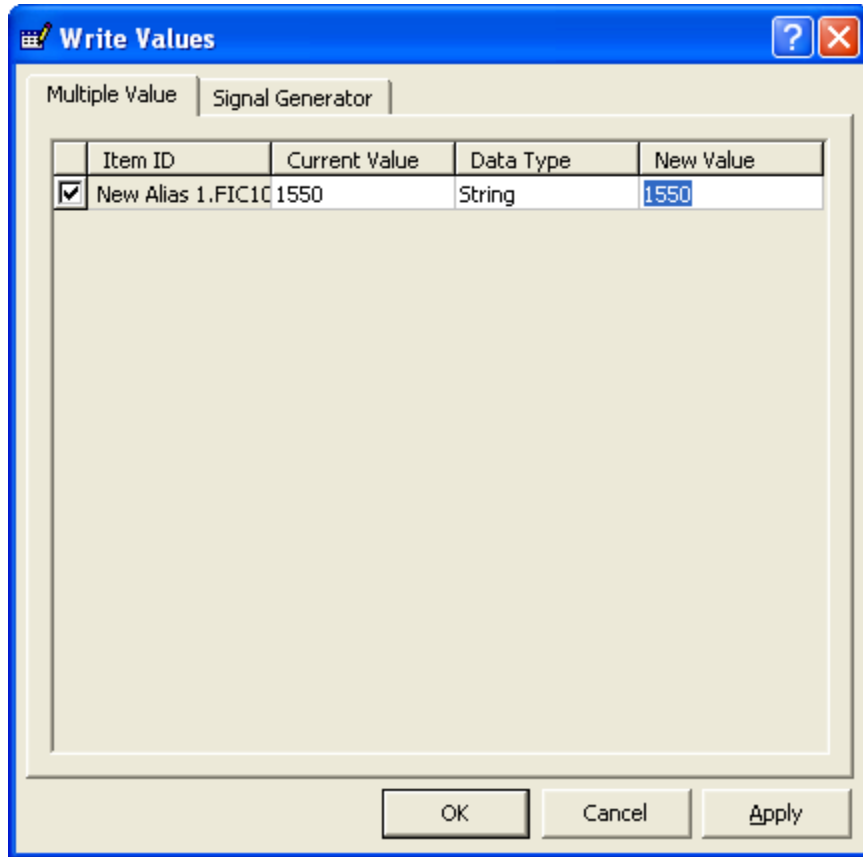


Figure 17 - Write Values Window

4. With the current value highlighted in the **New Value** field, change it from **1550** to **1600**. Click **OK**.
5. The value displayed in **OPC Explorer** and in the **Microsoft Excel** workbook (**Book1.xls**), is now **1600** (Figure 18).

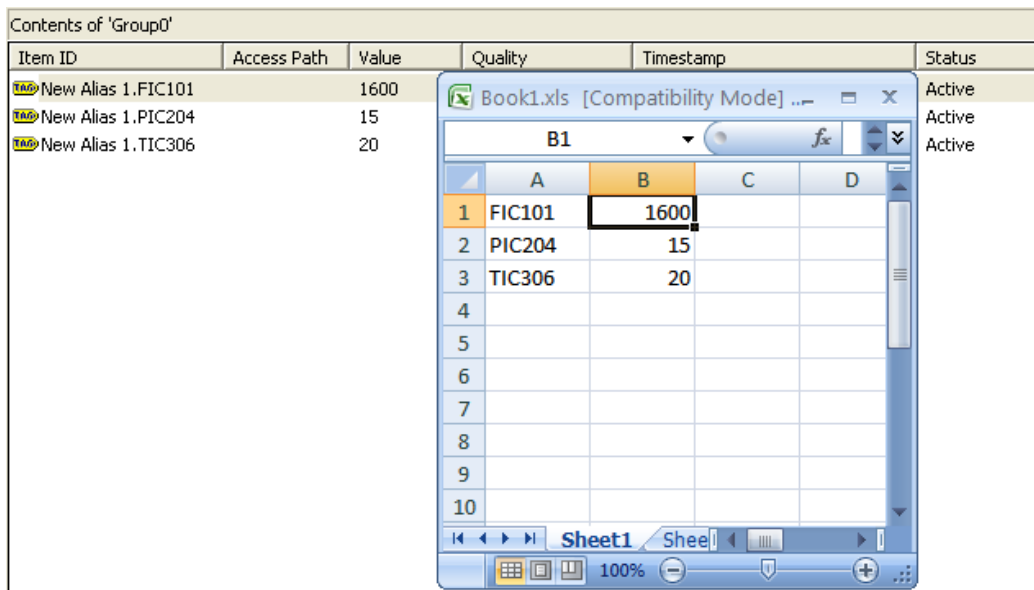
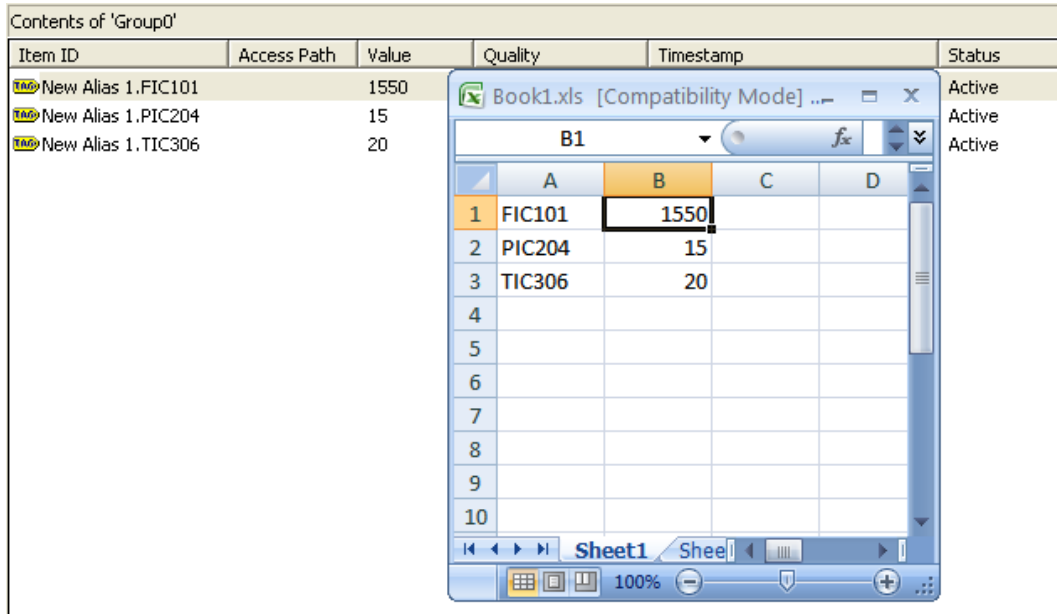


Figure 18 - OPC Write to Excel

## OPC Reading in MatrikonOPC Explorer

This example shows how an OPC client receives an update when a value in the data source is changed.

1. In the **Book1.xls** spreadsheet, change the value for **FIC101** back to **1550** from **1600**.
2. In **OPC Explorer**, view the data point screen and confirm that the value for **FIC101** has been changed back to **1550** (Figure 19).



Item ID	Access Path	Value	Quality	Timestamp	Status
New Alias 1.FIC101		1550			Active
New Alias 1.PIC204		15			Active
New Alias 1.TIC306		20			Active

	A	B	C	D
1	FIC101	1550		
2	PIC204	15		
3	TIC306	20		
4				
5				
6				
7				
8				
9				
10				

Figure 19 - Value Change Confirmation

## Exchanging Data Between TWO OPC Servers

The connection between **Microsoft Excel** and the **MatrikonOPC Server for DDE** is configured and tested. The next step is to establish the exchange of data between the **MatrikonOPC Server for Simulation and Testing** and the **OPC Server for DDE**.

To establish OPC communication, OPC client functionality is required to broker the connection. In this case, for communication to occur between two OPC servers, an OPC-enabled application is required that has OPC client functionality to establish a read from one OPC server and create a corresponding write to the other OPC server. MatrikonOPC Data Manager can enable the exchange of OPC data between two OPC servers.



**Note:** There is no configuration required for the **MatrikonOPC Server for Simulation and Testing** because it simulates a connection to a virtual data source. The OPC server generates a variety of data types and data points that behave in a specific manner.

This section includes information on the:


- Configuration of **MatrikonOPC Data Manager** to establish connectivity between the **OPC Server for DDE** and the **OPC Server for Simulation and Testing**.
- Testing of established connectivity to ensure that data (which is read and written, to and from, the two OPC servers using **OPC Data Manager**) appears in **Microsoft Excel**.

## Configure OPC Client (MatrikonOPC Data Manager) Connection Group

To establish a connection to the OPC servers, **MatrikonOPC Data Manager** requires that an OPC Group be created to dictate certain characteristics of the OPC communication (e.g., Update Rate).

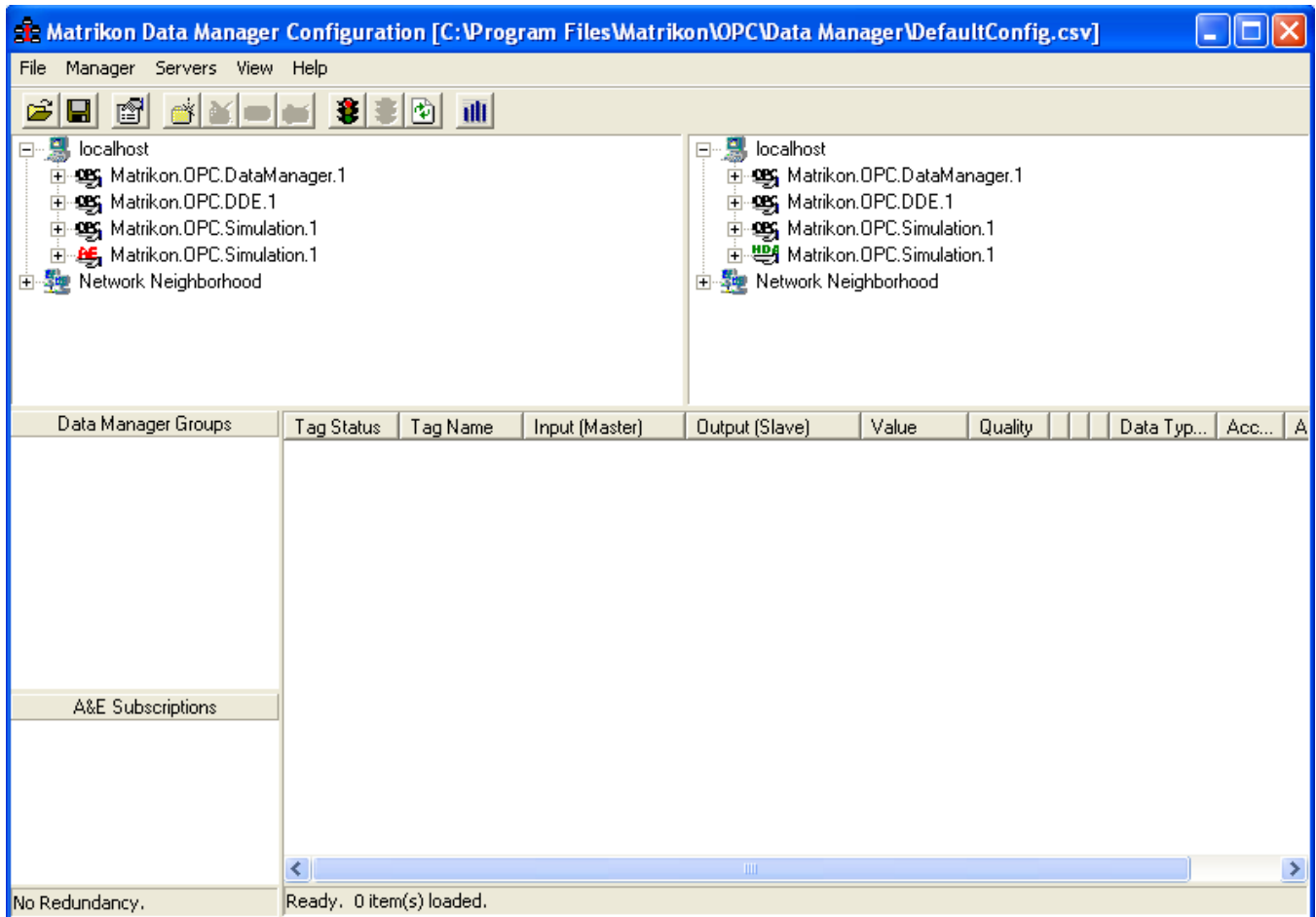
### To configure an OPC Data Manager Group:

1. Click on the Windows **Start** button. Select **Programs -> MatrikonOPC -> Data Manager -> MatrikonOPC Data Manager**.

2. **OPC Data Manager** starts and the following software icon  appears in the system tray (bottom right side of your screen)

**Note:** It may take a few seconds for OPC Data Manager to load and for the icon to appear.

3. Right-click your mouse on the icon and select **Configure** from the displayed menu.
4. The **MatrikonOPC Data Manager Configuration** screen (Figure 20) appears.



**Figure 20 - MatrikonOPC Data Manager Configuration Window**

5. In the **Data Manager Groups** screen section (lower left hand side of the screen), right-click your mouse and select **Add Group** from the displayed menu.
6. The **Add Data Manager Group** window (Figure 21) appears.

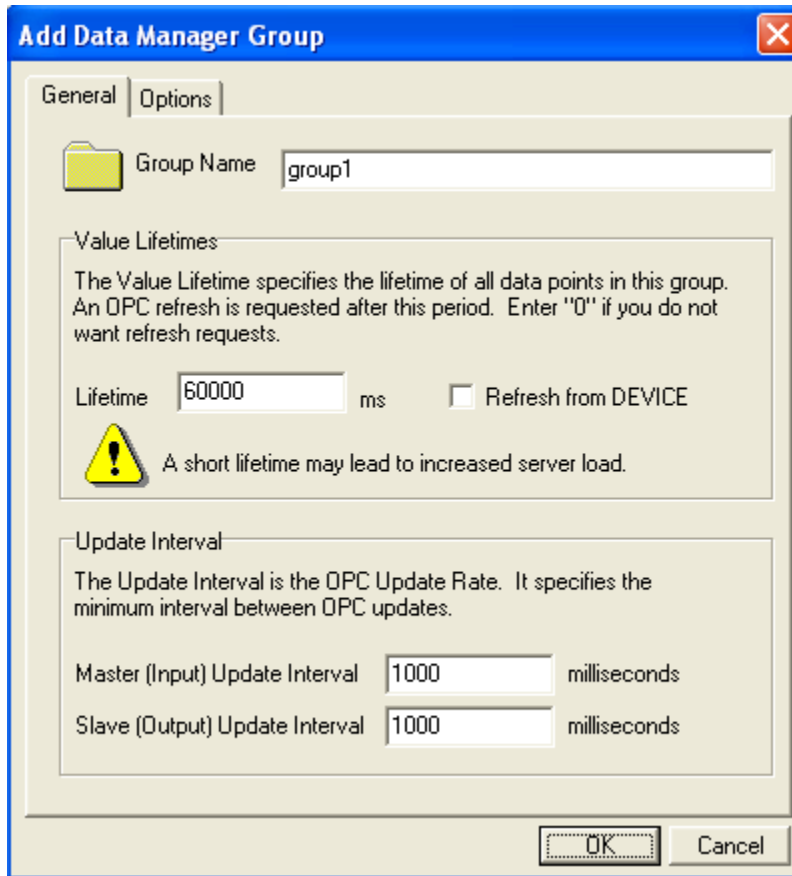


Figure 21 - Add Data Manager Group Window

7. In the **Group Name** field, type **group1** and click **OK**.
8. The **Add Data Manager Group** window closes. You are returned to the **MatrikonOPC Data Manager Configuration** screen where the newly-created **group1** now appears listed in the **Data Manager Groups** screen section (Figure 22).

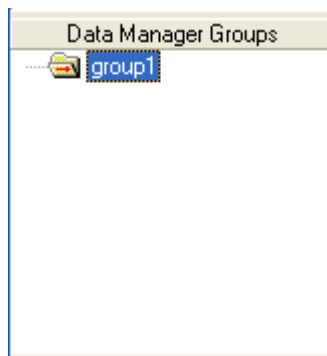


Figure 22 - Configured OPC Data Manager Group

## Add OPC Data Points

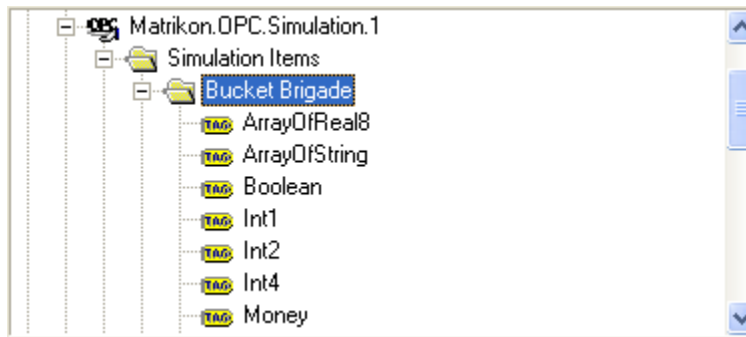
Using the shared connection between the **MatrikonOPC Server for Simulation and Testing**, and the **MatrikonOPC OPC Server for DDE**, the **MatrikonOPC Data Manager** can now define points within each system that will be communicating with each other.



**OPC Data Manager** presents you with two views (top left and right panes) that represent the source and destination OPC server connections to which data points will be exchanged.

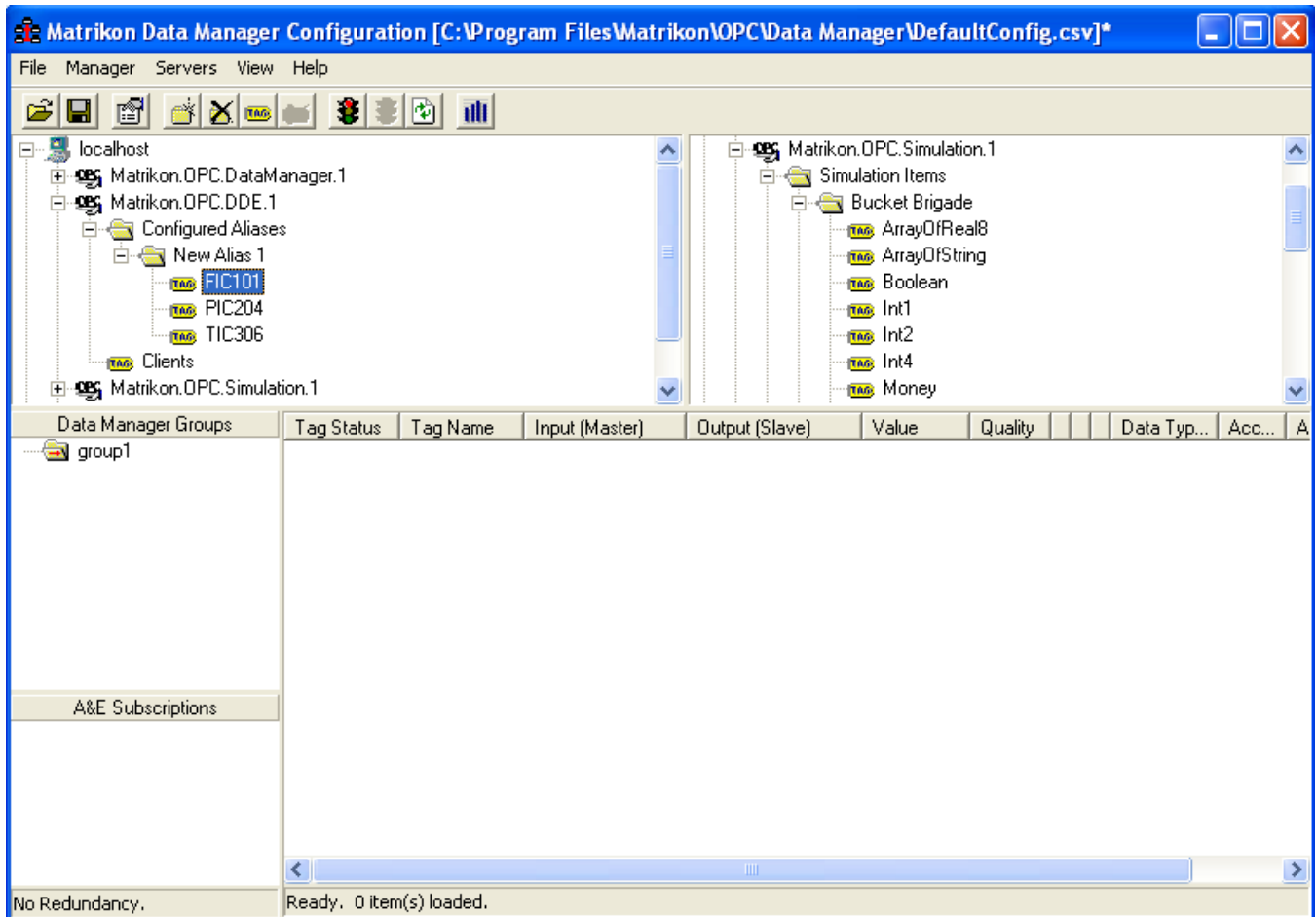
**To add shared OPC data points:**

1. Using the upper right pane of the **OPC Data Manager Configuration** screen, click on **Matrikon.OPC.Simulation.1** to start the connection to the **MatrikonOPC Server for Simulation and Testing**.
2. The connection to the **OPC Server for Simulation** should be established and **OPC Data Manager** should now be able to browse the OPC server for data points. The **Simulation Items** folder appears nested within the address space of the **OPC Server for Simulation**.
3. Select and expand the **Simulation Items** folder, followed by the **Bucket Brigade** folder which displays numerous tags (Figure 23).



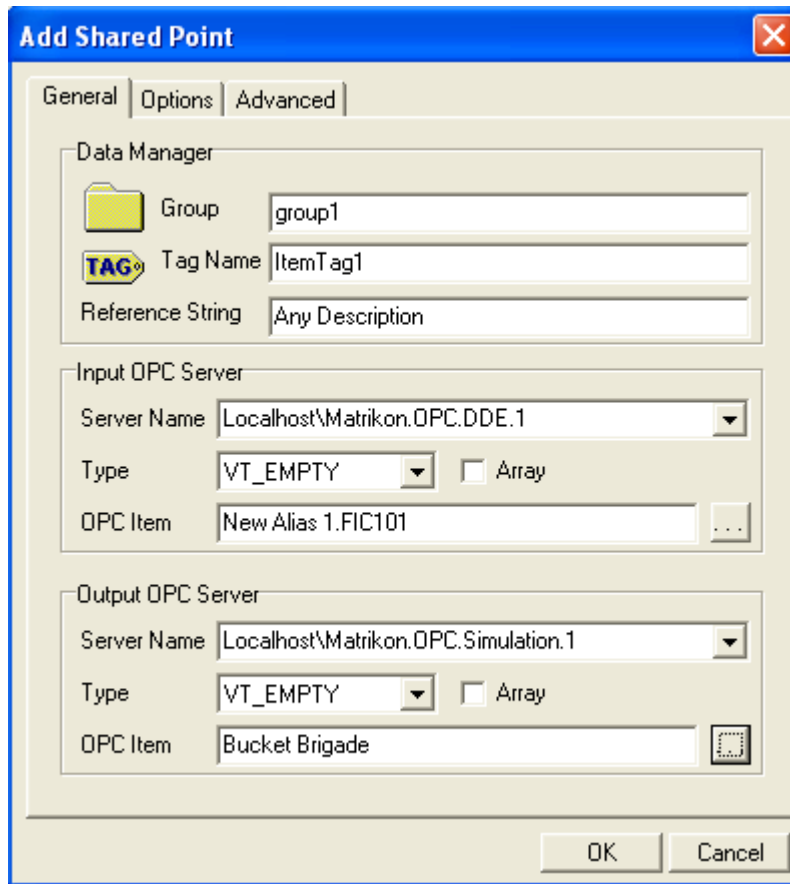
**Figure 23 - Simulated Data Points in MatrikonOPC Server for Simulation and Testing**

4. In the upper left pane of the **OPC Data Manager Configuration** window, click on **Matrikon.OPC.DDE.1** to establish a connection to the **OPC Server for DDE**.
5. Select and expand the **Configured Aliases** folder. The data points of interest are already configured as aliases (created in **Configure the OPC Server**) and are found in the **New Alias 1** folder (Figure 24).



**Figure 24 - Configured Data Points in MatrikonOPC Server for DDE Address Space**

6. Drag and drop the **FIC101** tag into the **Bucket Brigade** folder on the right side of the screen.
7. The **Add Shared Point** window (Figure 25) appears.



**Figure 25 - Add Shared Point Window**

8. In the **Input OPC Server** screen section, the name of the source server (e.g., **Localhost\Matrikon.OPC.DDE.1**) is displayed in the **Server Name** field.
9. In the **Output OPC Server** screen section, the name of the destination server (e.g., **Localhost\Matrikon.OPC.Simulation.1**) is displayed in the **Server Name** field.
10. In the **OPC Item** field in the **Output OPC Server** screen section, type the name of a data point that allows both read and write access (e.g., **Bucket Brigade.Int1**) as shown and highlighted in Figure 26.

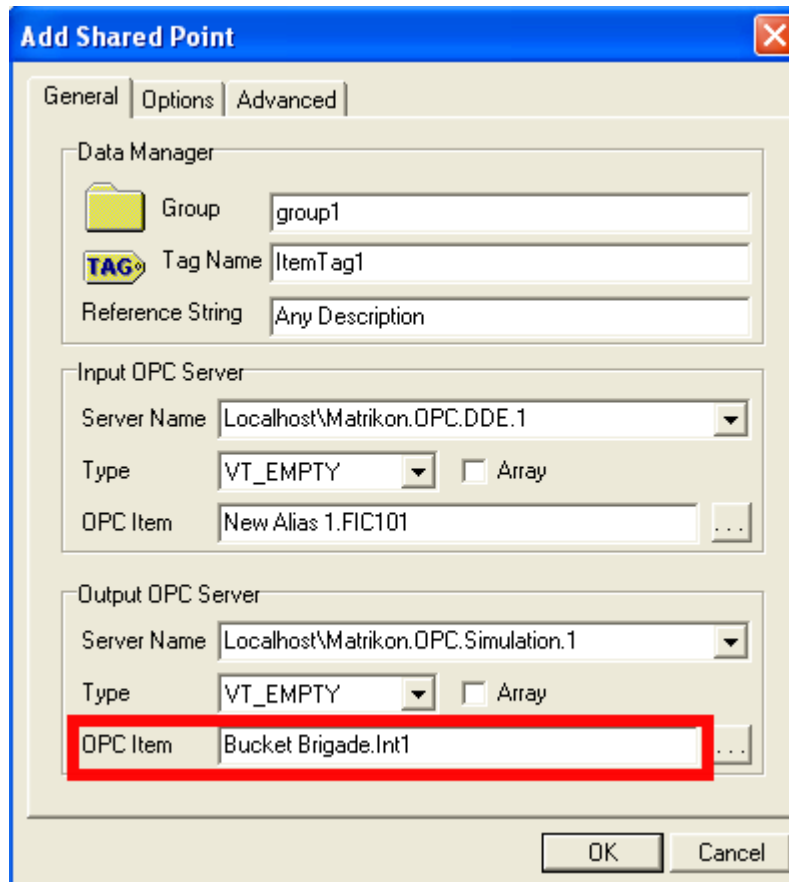


Figure 26 - Completed Shared Point Configuration

11. Click on the **Options** tab.

12. In the **Direction** screen section, select the **Bidirectional** option (Figure 27).

**Note:** When the shared point configuration is set to **Bidirectional**, data values are allowed to be written and read from both source and destination OPC servers.

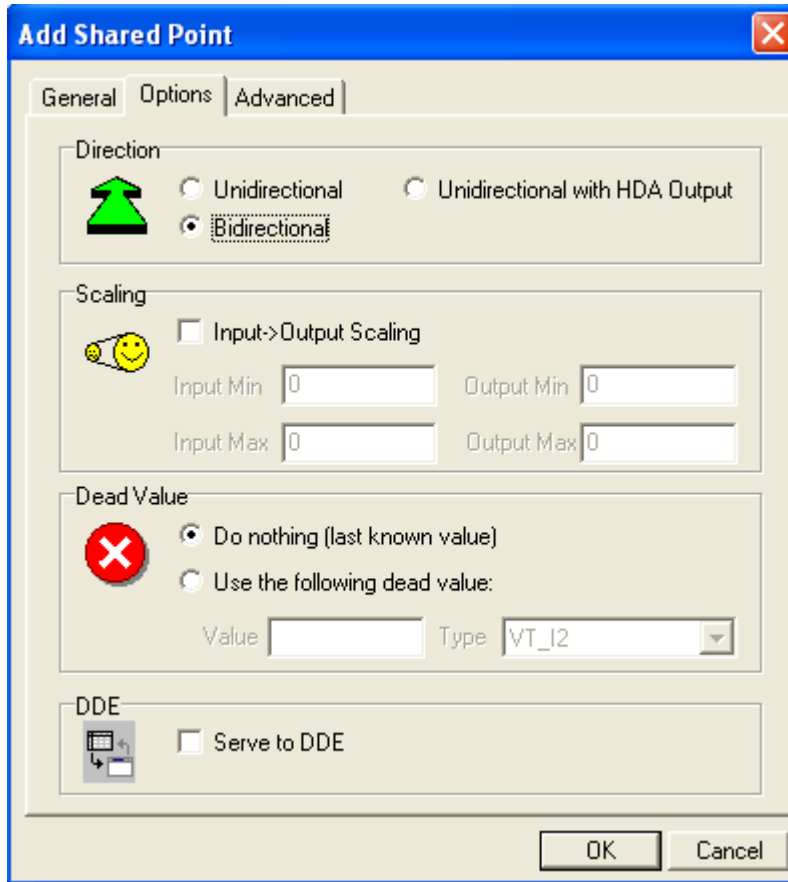


Figure 27 - Add Shared Point Window (Options Tab)

- Click on the **OK** button to save the settings and finish adding the shared point. The **Add Shared Point** window is closed and you are returned to the **OPC Data Manager Configuration** screen. The tag values are displayed in the lower right side pane (Figure 28).

**Note:** The tag values are now shared between the **FIC101** data point in the **MatrikonOPC Server for DDE** and the **Bucket Brigade.Int1** data point in the **MatrikonOPC Server for Simulation and Testing**.

Tag	A.	B.	Master (Input)	Acc...	Slave (Output)	Acc...	Type	Value	Quality	Timestamp
Itemtag1	B.	Localhost\Matrk...	Localhost\Matrk...				VT_BSTR	1600	Good	11/13/2002 17:26:11

Ready.

Figure 28 - Active OPC Data Manager Configuration

## Testing the OPC Connection

### Modifying the Values in MatrikonOPC Data Manager

The intention of this test is to understand the behaviour of the OPC architecture when issuing an OPC Write in the **MatrikonOPC Data Manager** for the created shared data points. The expected behaviour of issuing an OPC Write in **OPC Data Manager** on a bidirectional shared point is that the value will be written to both the **OPC Server for DDE** and the **OPC Server for Simulation and Testing**.

#### To test the OPC Write in the MatrikonOPC Data Manager:

1. In the pane on the lower right side of the **Configuration** screen, right-click your mouse on the shared point (that was added in the **Add OPC Data Points** section of this tutorial).
2. Select **Write** from the displayed menu.
3. The **Write Value** window (Figure 29) appears.

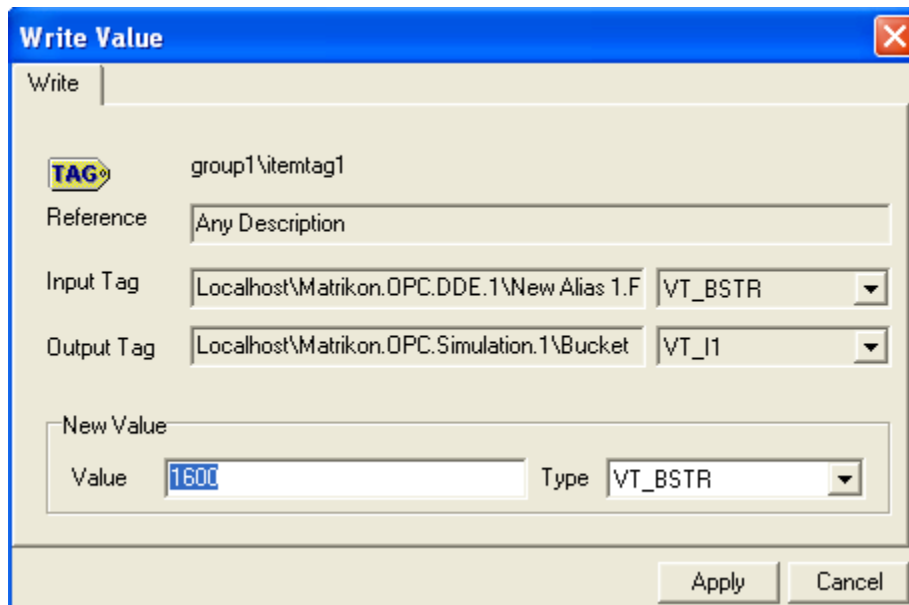


Figure 29 - Write Value Window

4. In the **Value** field, type **1550**.
5. Click on the **Apply** button to commit the change and close the **Write Value** window.
6. Review the **Book1.xls** file to confirm the **FIC101** value has changed (Figure 30).

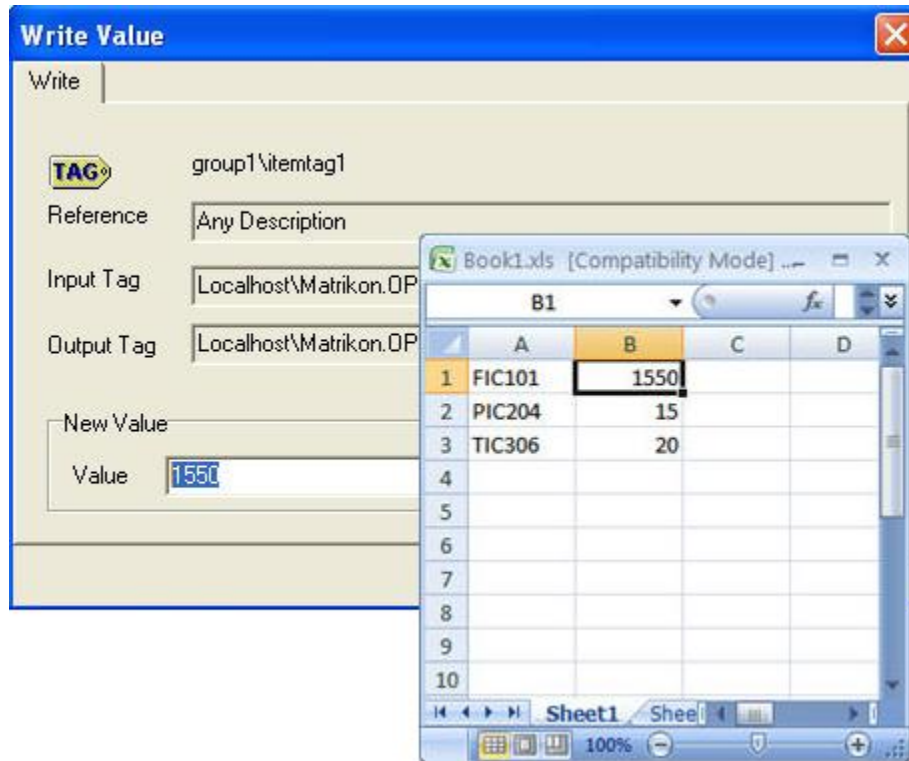


Figure 30 - Verified Value Change in Microsoft Excel

7. To ensure that the values were written to the **OPC Server for Simulation**, establish another connection to the OPC server using **OPC Explorer**.
8. Browse and add the **Bucket Brigade** items that **OPC Data Manager** is referencing (i.e., **Int1**, **Int2**, and **Int4**).
9. Verify the value of the **FIC101** data point has changed from **1600** to **1550** (Figure 31).

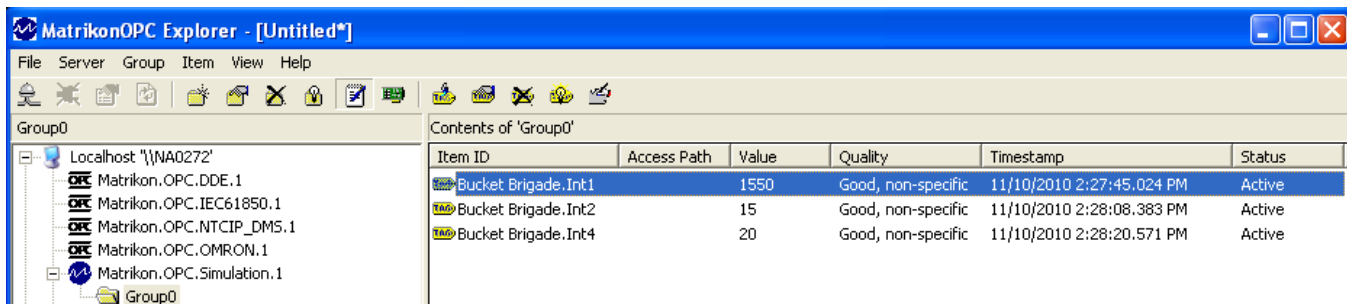


Figure 31 - Verified Value Change in MatrikonOPC Server for Simulation and Testing

## Modify Values in Microsoft Excel

The intention of this test is to verify the behaviour of the OPC architecture when a value changes in **Microsoft Excel**. The expected behaviour of changing a value in **Excel** would be that the **OPC Server for DDE** would be updated with the current value in **Excel**. This value change in the OPC server would cause an OPC Read to occur, sending the new value to **OPC Data Manager**. A subsequent OPC Write would occur in **OPC Data Manager**, sending the new value to the associated data point in the **OPC Server for Simulation**.

### To test the value change in Microsoft Excel:

1. In the **Microsoft Excel Book1.xls** file, change the value for **FIC101** to **2000** (Figure 32).

	A	B
1	FIC101	2000
2	PIC204	15
3	TIC306	20

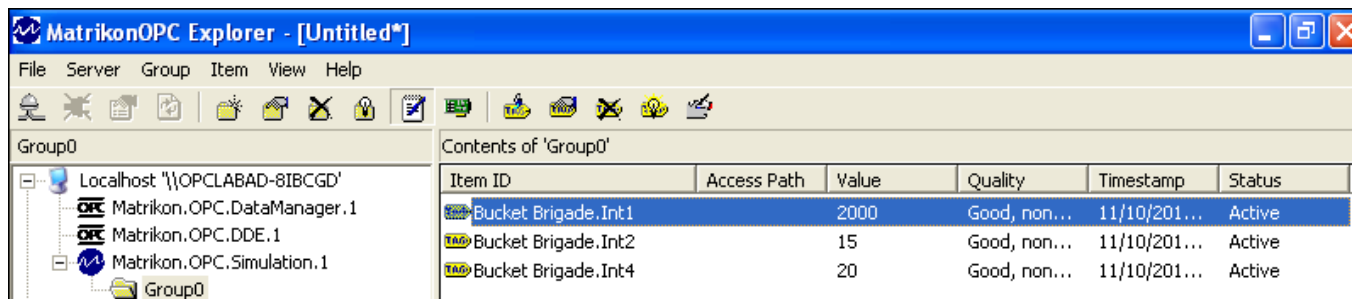
Figure 32 - Changed Excel Value

2. View the **OPC Data Manager Configuration** window and confirm that the **FIC101** shared data point value has changed to **2000** (Figure 33).

Data Manager Groups	Tag Name	Input (Master)	Output (Slave)	Value	Quality	Timestamp	Stat...	Stat
group1	itemtag 1	localhost\Matri...	localhost\Matriko...	2000	Good, Non-Specific	11/10/2010 14:48:30	[Good]	[Go

Figure 33 - Value Change in MatrikonOPC Data Manager

3. To ensure the values were written to the **OPC Server for Simulation**, establish another connection to the OPC server using **OPC Explorer**. Browse and add the **Bucket Brigade** items that **OPC Data Manager** is referencing (e.g., **Int1**, **Int2**, and **Int4**).
4. Verify the value of the **FIC101** data point has changed to **2000** (Figure 34).



Item ID	Access Path	Value	Quality	Timestamp	Status
Bucket Brigade.Int1		2000	Good, non...	11/10/201...	Active
Bucket Brigade.Int2		15	Good, non...	11/10/201...	Active
Bucket Brigade.Int4		20	Good, non...	11/10/201...	Active

Figure 34 - Verified Value Change in MatrikonOPC Server for Simulation and Testing

## Modifying Values in the MatrikonOPC Server for Simulation and Testing

The intention of this test is to verify the behaviour of the OPC architecture when a value changes in the **OPC Server for Simulation and Testing**. The expected behaviour of changing a value in the **OPC Server for Simulation** would be that an OPC Read would occur sending the new value to **OPC Data Manager**. A subsequent OPC Write would occur in **OPC Data Manager** sending the new value to the associated data point in the **OPC Server for DDE** and eventually **Microsoft Excel**.

### To test the value change in MatrikonOPC Server for Simulation and Testing:

1. In **OPC Explorer**, right-click your mouse on the top tag (**Bucket Brigade.Int1**) and select **Write Values** from the displayed menu.
2. The **Write Values** window (Figure 35) appears.



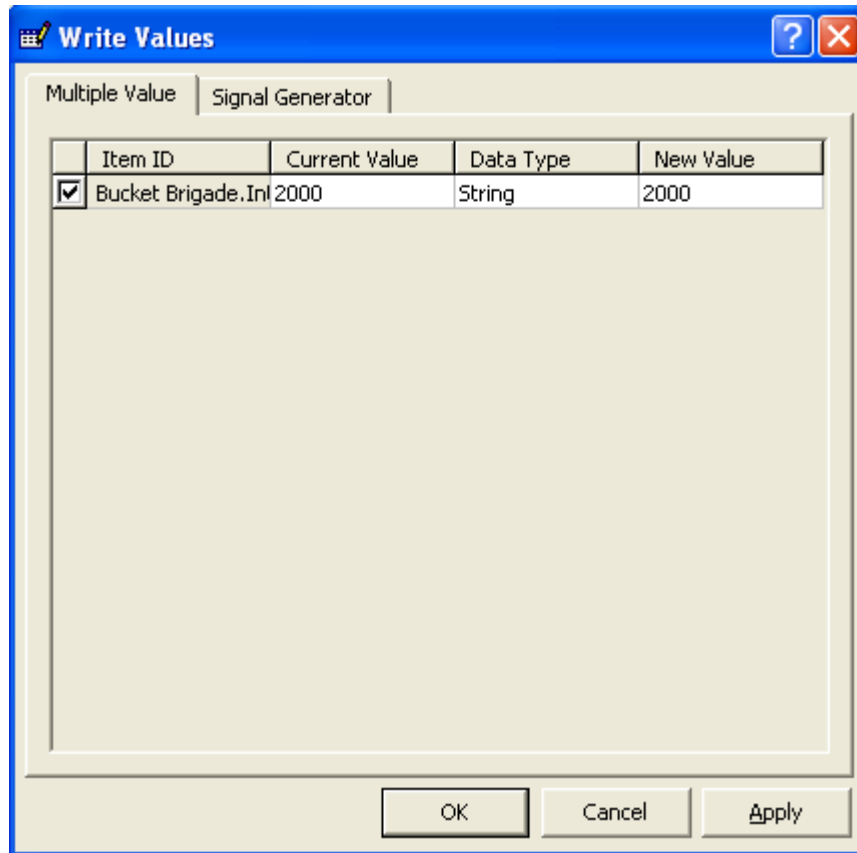


Figure 35 - Write Values Window

3. Select the current tag value in the **New Value** field.
4. Change the tag value to **2513** and click on the **OK** button.

**Note:** This operation issues an OPC Write to the **OPC Server for Simulation** from **OPC Explorer**. By viewing **OPC Explorer** after the write and witnessing the value for that item change to **2513**, this confirms that the value was successfully changed in the OPC server.

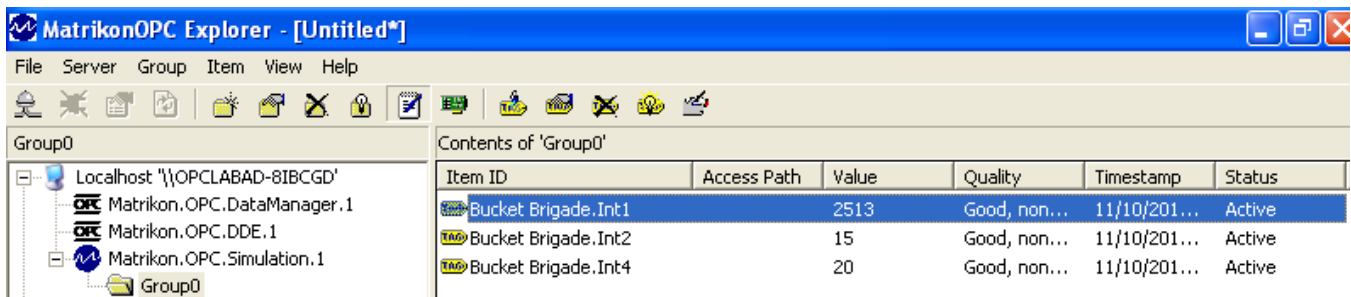


Figure 36 - Changed Value in MatrikonOPC Server for Simulation and Testing

5. View the **OPC Data Manager Configuration** screen and check the **FIC101/Bucket Brigade.Int1** shared data point value. The value of the shared point is displayed as **2513**.
6. In Microsoft Excel, verify the value for **FIC101** changed to **2513** (Figure 37).

	A	B
1	FIC101	2513
2	PIC204	15
3	TIC306	20

**Figure 37 - Verified Value Change in Excel**

## Troubleshooting

This section is intended to assist you by providing **licensing** information and **MatrikonOPC Support** contact information. Also addressed here are 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 MatrikonOPC Support team.

### Problems and Solutions

#### "aprxdist" error on install

**Problem:** What is this "aprxdist" error on install?

**Solution:** For our installations to work correctly, the install must be able to access the **C:\WINDOWS\system32** directory to add, use, and remove the file called *aprxdist.exe* and add the file *opcenum.exe*. Generally, we will see this error on Windows 2003 SP1 system where this is not possible. To resolve the issue, **download these files**, and place them in **C:\WINDOWS\system32**, and rerun the install.

#### Logged in as Administrator to run install

**Problem:** Why do I need to be logged in as an Administrator to run the install?

**Solution:** For MatrikonOPC software to install correctly, you must be logged in as a user with access to the registry. If you are not an Administrator on the system, the installation will not be able to register the software correctly.

#### PSTCFG error

**Problem:** After my OPC server died, I tried to access the **Configuration** screen and now I am experiencing access violations and PSTCFG errors.

**Solution:** If your OPC server process stops and you leave the PSTCFG running, when you attempt to access the **Configuration** screen to do anything to your configuration items (add, change, delete, and so on), you will experience access violations. You will need to kill the configuration and restart the server.

#### Server stops updating client with item values after two hours

**Problem:** The server stops updating the client with item values after two hours.

**Solution:** The server may be licensed with a hardware key and the hardware key may not be properly detected, or the software license has expired. Alternatively, try running the **MatrikonOPC Licensing** utility from the shortcut menu. Click on the **Check Licenses** button to see the status of all MatrikonOPC product licenses. Check that the correct HASP hardware key is securely fastened to the parallel port. If it is, run the HINSTALL program that is located in the **Program Files\Common Files\MatrikonOPC\Common** directory.

## Server stops updating client with item values after 30 days

**Problem:** The server stops updating the client with item values after 30 days.

**Solution:** The evaluation period for the license has expired. Please contact **MatrikonOPC Support**.

## Server shuts down after five minutes when no clients connected

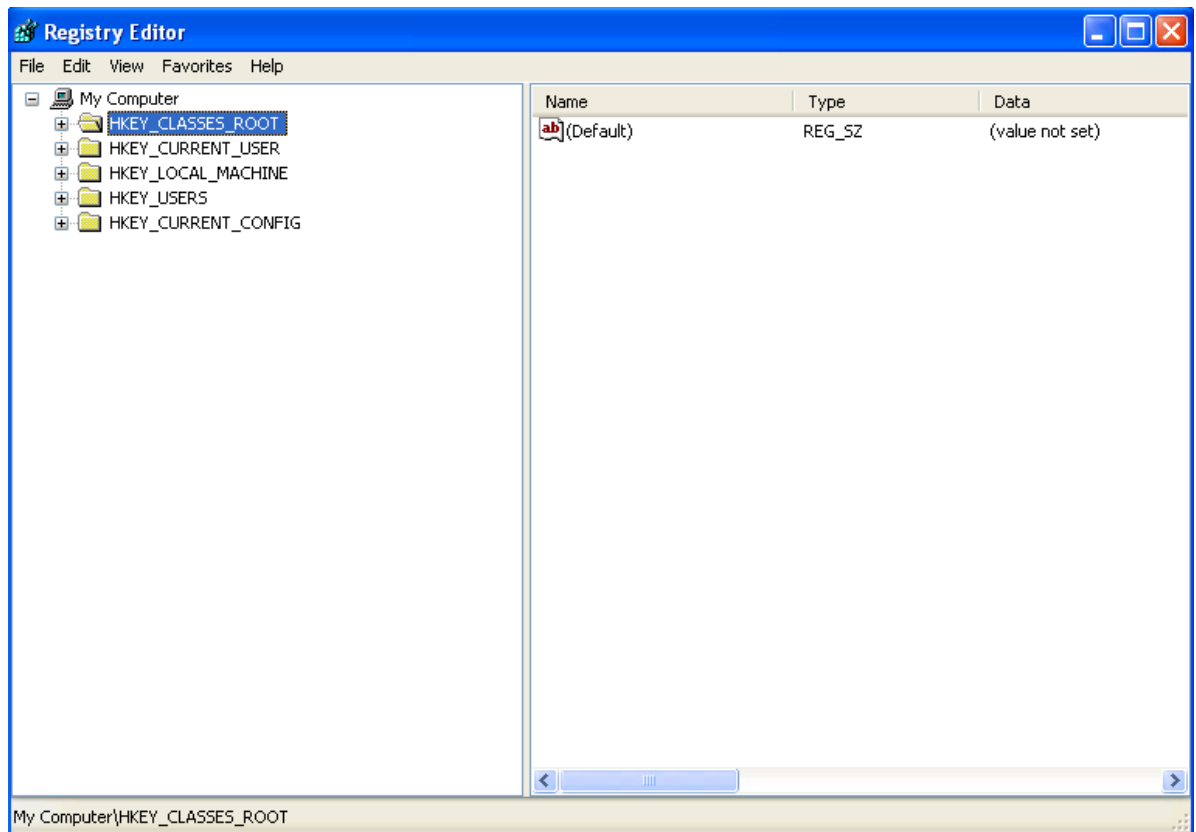
**Problem:** The server automatically shuts down after five minutes when there are no clients connected.

**Solution:** This is standard behaviour for COM servers. However, this behaviour can be overridden as shown in the following example:



**Note:** Microsoft highly recommends that you back up the registry before editing it or making changes to it.

1. From the **Run** command, enter **REGEDIT**.
2. The **Registry Editor** (Figure 38) is launched.
3. In the **Registry Editor**, under **HKEY\_CLASSES\_ROOT**, look for the required program ID (e.g., *Matrikon.OPC.Simulation.1*).



**Figure 38 - Registry Editor**

4. Expand the program ID branch.
5. Click on the CLSID branch.

6. Record the global universal ID (GUID).

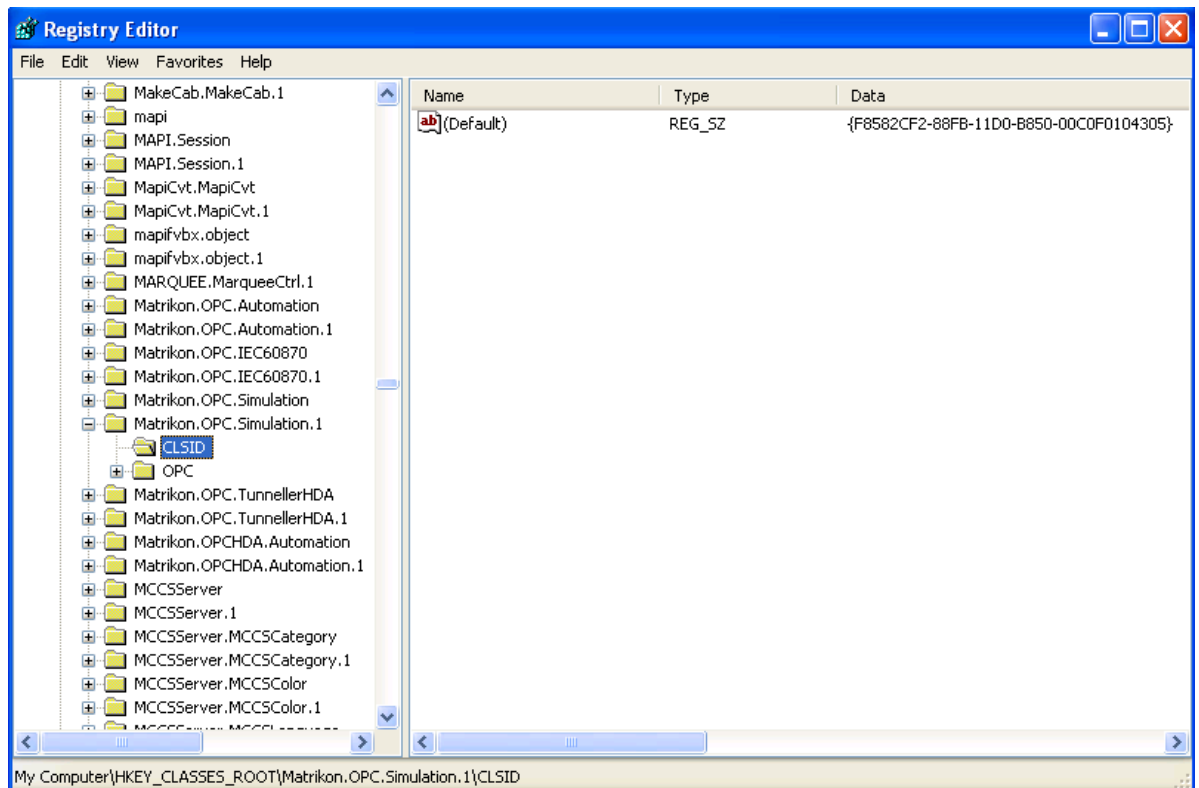


Figure 39 - Program ID Branch

7. Under the **HKEY\_CLASSES\_ROOT\CLSID** branch, search for the GUID retrieved in the previous step (e.g., **HKEY\_CLASSES\_ROOT\CLSID\{024C7FFC-9CC3-476f-867A-BC3CAD79F4FE}**).
8. Create a string value called **LockServer** in the **Options** branch underneath the GUID (e.g., **HKEY\_CLASSES\_ROOT\CLSID\{024C7FFC-9CC3-476f-867A-BC3CAD79F4FE}\Options**).
9. Create a new value using the context menu and choose **New String Value** from the menu.
10. Set the value of the **LockServer** entry to **1**.
 

**Note:** To edit the value, select the entry and select the **Modify** menu option from the **Edit** menu.
11. Shut down the server and restart it for the change to take effect.

### Cannot configure client access paths, so cannot configure item options

**Problem:** The OPC client does not provide a means to configure access paths, making it difficult to correctly specify the data acquisition options for the items.

**Solution:** The server provides a global parameter for configuring an escape character, to allow users to append communication options to the end of an item ID which would accommodate clients that do not support access paths.

Perform the following steps as shown (with example) below:



**Note:** Microsoft highly recommends that you back up the registry before editing it or making changes to it.


1. From the **Run** command, enter **REGEDIT**.
2. The **Registry Editor** is launched.
3. In the **Registry Editor**, under **HKEY\_CLASSES\_ROOT**, look for the required program ID (e.g., Matrikon.OPC.Simulation.1).
4. Expand the program ID branch.
5. Click on the CLSID branch.
6. Record the global universal ID (GUID).
7. Under the **HKEY\_CLASSES\_ROOT\CLSID** branch, search for the GUID retrieved in the previous step (e.g., **HKEY\_CLASSES\_ROOT\CLSID\{024C7FFC-9CC3-476f-867A-BC3CAD79F4FE}**).
8. Create a string value called **ItemIDEscapeCharacter** in the Options branch underneath the GUID (e.g., **HKEY\_CLASSES\_ROOT\CLSID\{024C7FFC-9CC3-476f-867A-BC3CAD79F4FE}\Options**).  
**Note:** To create a new value, use the context menu and select the **New String Value** menu option.
9. Set the value of **ItemIDEscapeCharacter** to a single character, such as "|" (pipe).  
**Note:** To edit the value, select the entry and select the **Modify** menu option from the **Edit** menu.
10. Shut down the server and restart it for the change to take effect.
11. Configure the **ItemIDEscapeCharacter Item ID** in the OPC client with the access path appended to the end with the configured escape character (e.g., **ITEMID|ACCESSPATH**).


### More than one HASP attached to parallel port, but only first one is recognized

**Problem:** There is more than one HASP hardware key from Matrikon attached to the parallel port, but the software recognizes only the first one.

**Solution:** HASP keys from the same vendor cannot be chained together. Send an email to the MatrikonOPC Support team to obtain a HASP key containing the combined codes of all installed MatrikonOPC servers.

### Server cannot be configured; no Matrikon logo in Tool Tray

**Problem:** The server cannot be configured because there is no Matrikon logo  in the **Tool Tray**.

**Solution:** If the server is running as a service, the Matrikon logo  does not appear in the **Tool Tray**.  
To configure the server, 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).



**Note:** If the server configuration utility generates an “access denied” error on launch, the DCOM permissions have not been configured properly.

### OPC client unable to create or read items under configured object (device)

**Problem:** The OPC client is unable to create or read items under a configured object (device).

**Solution:** Check the object configuration (for more information, refer to the *Server Configuration* section in the applicable product’s *User’s Manual* that accompanies the software). Ensure the **Enabled** checkbox is selected.

### Server does not retain settings

**Problem:** The server 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 configuration on start-up** checkbox is selected and that the correct file name appears in the edit box (for more information, refer to the *General Options* section in the applicable product’s *User’s Manual* that accompanies the software).

### Server cannot save configuration in XML format

**Problem:** The OPC server 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 in the list of locally available program IDs in OPC client application

**Problem:** The server does not show up in a list of locally available program IDs in the OPC client application.

**Solution:** Make sure that a user with local administrative rights installs the OPC server so that it can create the necessary entries in the registry. Ensure OPCEnum is registered as a service, DCOM permissions are configured properly, and the OPCEnum service is running. Also, especially for older OPC clients that do not use the OPC server browser, make sure the client is running as a user that has *read* access to the registry.

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

**Problem:** The OPC server does not show up in a list of remotely available program IDs in my OPC 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 remote 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:** A 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 (for more information, refer to the *OPC Compliance - Installation* section in the applicable product's *User's Manual* that accompanies the software).

### Server is using a large portion of CPU resources

**Problem:** Server is using 99% of CPU resources.

**Solution:** Check the server's Time Granularity settings in the server's Advanced Options (for more information, refer to the *Advanced Options* section in the applicable product's *User's Manual* that accompanies the software. Ensure the granularity is not set to **0**. It is recommended that you not set the value lower than **100**.

### Trouble communicating through a network

**Problem:** Experiencing problems communicating to the product's device through a network.

**Solution:** Make sure users can ping the device. Use the **Start -> Run** with command **CMD** to bring up a command window and type:

```
Ping ipaddress ( e.g., C:\temp>ping 127.0.0.1
Pinging 127.0.0.1 with 32 bytes of data:
Reply from 127.0.0.1: bytes=32 time<10ms TTL=128
```



```

Reply from 127.0.0.1: bytes=32 time<10ms TTL=128
Reply from 127.0.0.1: bytes=32 time<10ms TTL=128
Reply from 127.0.0.1: bytes=32 time<10ms TTL=128
Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms)

```

Where ipaddress is the IP address of the user's <System X> device. If it says "no response", then there are likely network issues between user's computer and the product.

**Note:** Refer to the **DCOM Manual** to further diagnose any DCOM issues.

### Events are not being generated

**Problem:** Aliases have been configured to generate events, but a subscribed A&E client is not receiving events as expected.

**Solution:** It is possible to disable event generation at the Alias Group level. Make sure that all of the Alias Groups are set to have events enabled.

## Questions and Answers

### How do I remove the server as a service?

**Problem:** How do I remove the server as a service?

**Solution:** Re-register the OPC server executable using the **/REGSERVER** command-line switch.

### Does the server need to be started manually when installed as a service?

**Problem:** Does the server need to be started manually when it is installed as a service?

**Solution:** No, the first OPC client that tries to connect will start the OPC server.

### 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 MatrikonOPC **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.

### How can I access individual bits from an integer item?

**Problem:** How can I access individual bits from an integer item?

**Solution:** In order to do this, users will have to apply a mask to the value, which will null all of the bits in the integer value except the one that users want to keep.

For example, if the user wanted to isolate the third bit, they would have to apply a mask that is in binary which will only have the third bit present. In binary, this is the

number 4 (0100).

To apply the mask, users must use the AND operator, which will leave a 1, if and only if, both the bits in that position are 1.

$$\begin{array}{r}
 0110\ 1\mathbf{1}00 \\
 +\ 0000\ 0\mathbf{1}00 \\
 \hline
 \end{array}
 =\ 0000\ 0\mathbf{1}00$$


  
 Data bit we want to access

In decimal notation, this would be expressed as  $108\ \text{AND}\ 4 = 4$ .

To do this in an OPC server, users would configure an alias to use the IF operator. With the example above, where the user wishes to access the third bit in the integer, the statement would appear as:

IF (INPUT AND 4 = 4, 1, 0)

Therefore, if the bit in position 3 is a 1, since  $1\ \text{AND}\ 1 = 1$ , the IF statement would be true and would return a 1. If the bit in position is 0,  $0\ \text{AND}\ 1 = 0$ , the IF statement would return a false value, which is a 0.

Search the *MatrikonOPC Support Knowledge Base* at [www.opcsupport.com](http://www.opcsupport.com) to find the answers to other commonly-asked connectivity questions.

## Licensing

Most MatrikonOPC products require that some form of licensing criteria be met for it to function correctly.

Depending on the MatrikonOPC server, it supports either software licensing only or, both software and hardware licensing. Refer to the necessary licensing information available in the *Licensing Procedures* document which accompanies the MatrikonOPC server software and *User's Manual*.

**Note:** Alias Events needs to be licensed separately, and by default, is delivered with only a 30-day demo. To purchase a full Alias Events license, please contact your MatrikonOPC Account Manager.

## Contacting Support

The MatrikonOPC Customer Services department ([www.opcsupport.com](http://www.opcsupport.com)) is available 24 hours a day, seven days a week.

Contact MatrikonOPC Support using the information below, or send an email ([support@MatrikonOPC.com](mailto:support@MatrikonOPC.com)).

For Monday to Friday **daytime support** requests, contact MatrikonOPC Support using the regional phone numbers provided in Table 1.

Region	Office Hours	Contact Information
<b>North America</b> UTC/GMT -7 hours (MST)	8:00 am-5:00 pm	<b>+1-877-OPC-4-ALL</b>
<b>Europe /Africa *</b> UTC/GMT +1 hours (CET)	9:00 am-5:00 pm	<b>+49-221-969-77-0</b> <b>(Request OPC Support)</b>
<b>Australia/Asia *</b>	9:00 am-5:00 pm	<b>+61-2-4908-2198</b>

Region	Office Hours	Contact Information
UTC/GMT +10 hours (AEST)		<b>(Request OPC Support)</b>

\* Toll-free regional numbers coming soon!

**Table 1 - MatrikonOPC Support Regional Contact Information**

For **after-hours support** in all regions, please use either of the following numbers. There is no extra charge from MatrikonOPC for calling their after-hours support numbers.

Region	Contact Information
<b>All</b>	+1-780-231-9480 +1-780-264-6714

**Table 2 - After-Hours Support**

## 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>.

### Notes:



- The following steps are suggestions only. Ask your Windows Network Administrator for more information about the settings that you 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, please refer to the MatrikonOPC 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 do not 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.

- First of all, ensure that the **Enable Distributed COM on this computer** is selected in 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 your 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 whether servers can ascertain the identity of calling clients and whether they can then perform 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 actually 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 you 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, be certain that the access and launch permissions are correct for the server.

## Setting Security Permissions

**To set the security permissions for an OPC Server:**

1. Open the DCOM configuration utility.
2. Select the OPC server, and then click **Properties**.
3. The **Distributed COM Configuration Properties** window (Figure 40) appears.

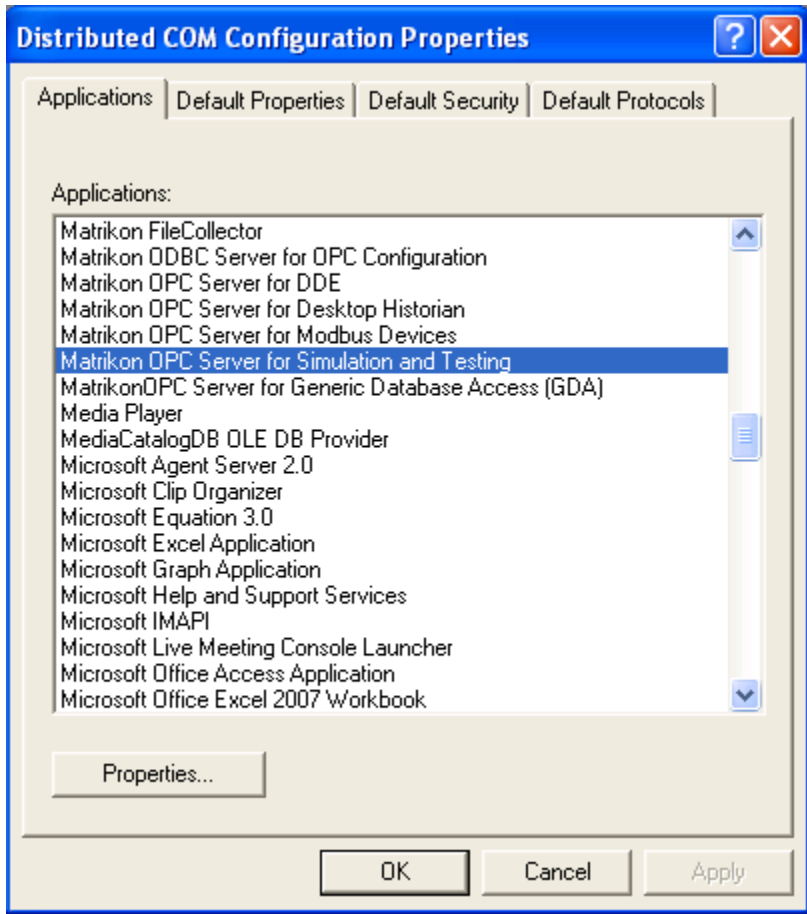
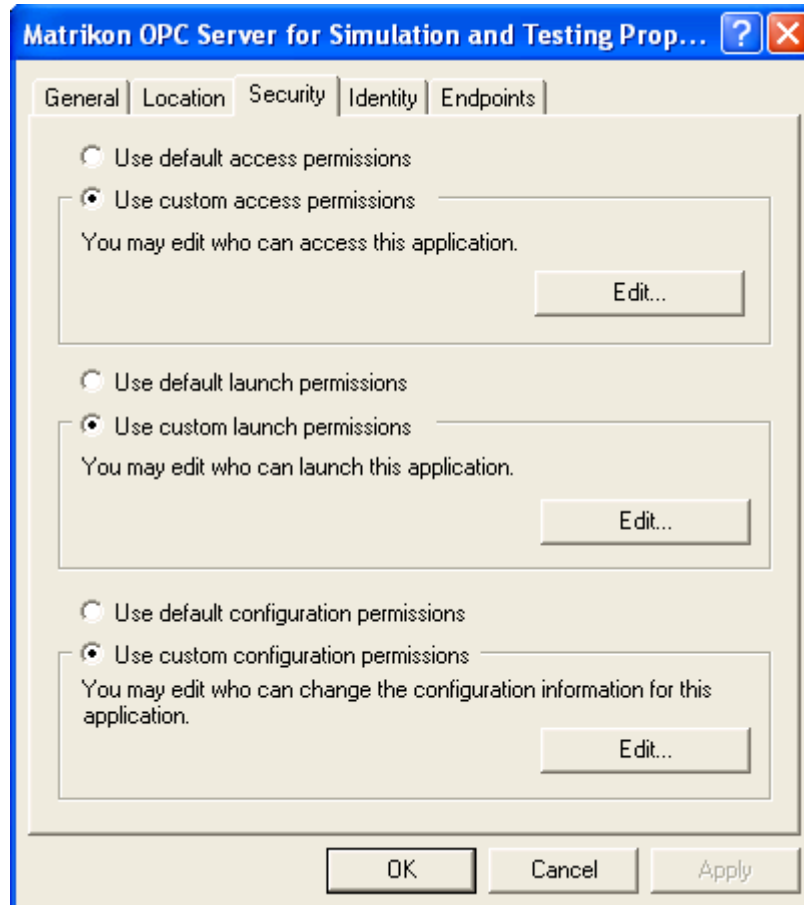


Figure 40 - Distributed COM Configuration Properties Window

4. Click on the **Security** tab to set the security for the server.
5. The **Distributed COM Configuration Security** tab (Figure 41) appears.



**Figure 41 - Distributed COM Configuration Security Tab**

**Notes:**

- The **Access Permissions** contain an *Access Control List* of principals that are allowed to interact with objects supplied by a server.
  - The **Launch Permissions** contain an *Access Control List* of principals that are allowed to start up a server process or service.
6. Include the names of users or user groups from trusted domains that you wish to be able to use the OPC server on this machine. Include the **Everyone** group to allow access to all users on a particular domain.
  7. To set the Access permissions, click **Use custom access permissions** and then click **Edit**.
  8. The **Registry Value Permissions** window (Figure 42) appears.

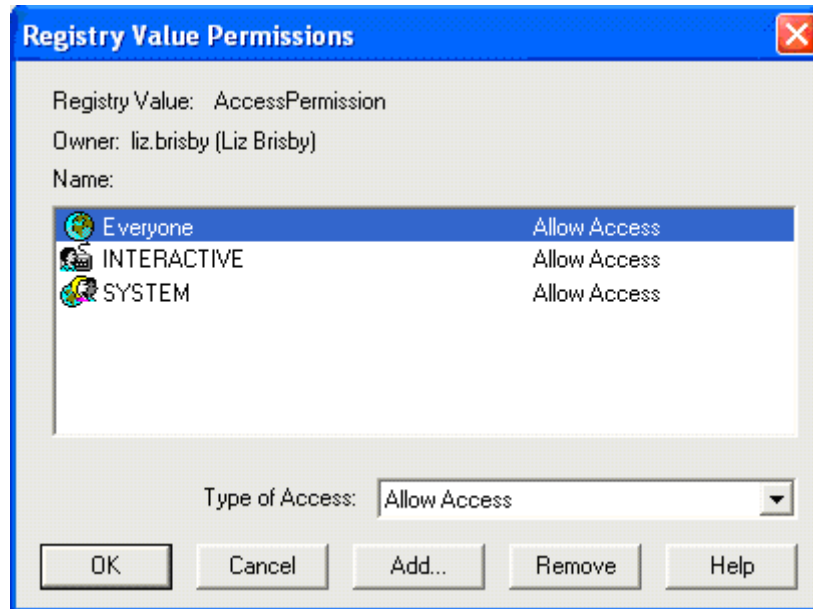


Figure 42 - Registry Value Permissions Window

9. To add users to the list click **Add**.
10. The **Add Users and Groups** window (Figure 43) appears.

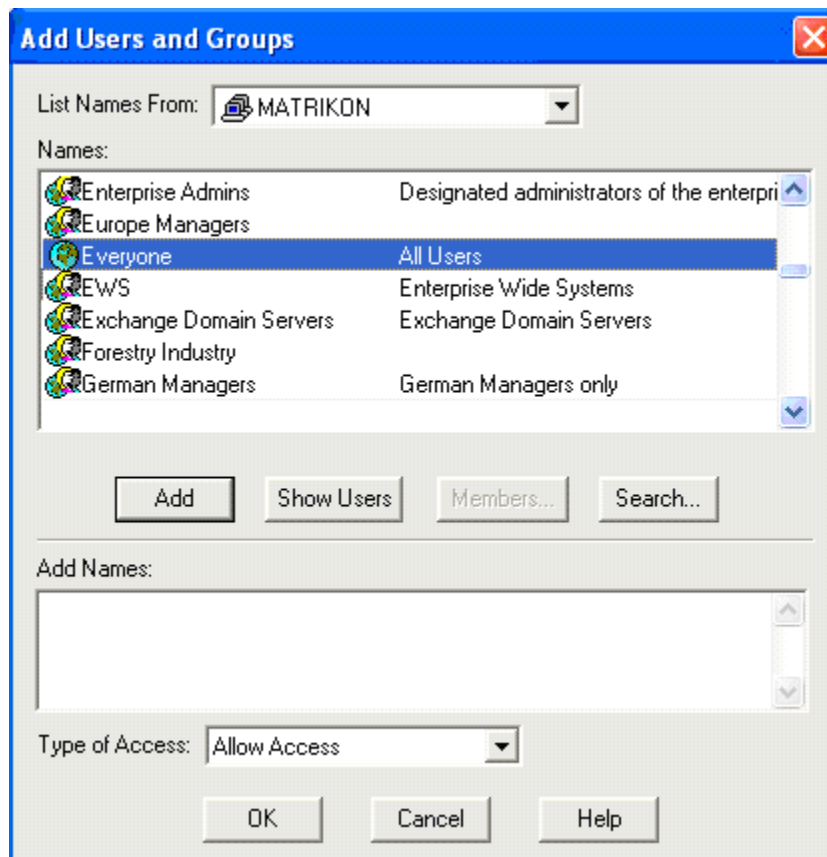


Figure 43 - Add Users and Groups Window

11. To add a user to the list, select the user, and then click **Add**. If the user you wish to add does not appear then click **Show Users**.



12. When you are done adding users, click **OK** to close the **Add Users and Groups** window. You can then choose to **Allow Access** or **Deny Access** for each user.

**Notes:**

- The procedure to set the launch permissions is similar to the above, but instead of choosing **Allow Access** for a user you would choose **Allow Launch**.
- The Configuration Permissions contain an *Access Control List* of principals that are allowed to modify the configuration information for a server. In other words, it indicates who is allowed to alter the registry entries for installed servers as well as who is able to 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.

13. To connect to an OPC server from outside of the domain, create a local user account on both the server and the client machine with identical *username* and *password*. 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 a greater degree of security in terms of who is able to 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, the better 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 has to 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 your network. For example, on a TCP/IP network, one would include the **Connection-oriented TCP/IP** protocol. Contact your IT personnel for more information about your 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 you 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 in order to connect to a particular 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. Please check the client documentation for more information.



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

1. Back up your registry.
2. On the server machine, run **REGEDIT** as a user that has access rights to the local registry.
3. Expand the **HKEY\_CLASSES\_ROOT** key.
4. Find the program ID(s) for the desired OPC server(s).
 

**Note:** In the case of MatrikonOPC servers, the ID has the form *Matrikon.OPC.Device*. If you quickly type 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. For each program ID, select the key and choose **Export Registry File** from the **Registry** menu. Enter a file name, and then click **Save**. Be careful not to overwrite other export files that you are creating.
6. Copy the exported **REG** files to the client machine.
7. Merge the **REG** files into the registry of the client machine.
 

**Note:** This should simply be a matter of 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.