

AADvance Controller

Catalog Numbers T9110 T9300 T9310 T9401/2 T9431/2 T9451 T9481/2



Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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Throughout this manual, when necessary, we use notes to make you aware of safety and other considerations.



WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.



CAUTION: Identifies information about practices or circumstances that can cause property damage or economic loss.

IMPORTANT Identifies information that is critical for successful application and understanding of the product.

NOTE Provides key information about the product or service.

TIP Tips give helpful information about using or setting up the equipment.

Labels may also be on or inside the equipment to provide specific precautions.



SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).



Issue Record

This manual contains new and updated information as indicated in the following table.

Issue	Date	Comments
01	Dec 2008	First Issue
02	March 2011	Baseline for Release 1.2 and Translation
03	June 2013	Release 1.3 version
04A	March 2015	Release 1.34 in Rockwell format
E	April 2018	Style Update

Summary of changes in this Document Issue

Topic	Page
Update Preface to AAdvantage Release 1.40	7
Update hypertext links in Preface	7 & 8
Replace first instance of "OPC" with "Open Platform Communication (OPC) in Chapter 1	11
First paragraph following Figure 1 , Change last sentence of paragraph to "This protocol is proprietary to Rockwell Automation."	12
Update chapter 5 Additional Resources with Rockwell Automation document references and format with hypertext links	33 - 35

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DISCLAIMER

It is not intended that the information in this publication covers every possible detail about the construction, operation, or maintenance of a control system installation. You should also refer to your own local (or supplied) system safety manual, installation and operator/maintenance manuals.

REVISION AND UPDATING POLICY

This document is based on information available at the time of its publication. The document contents are subject to change from time to time. The latest versions of the manuals are available at the Rockwell Automation Literature Library under "Product Information" information "Critical Process Control & Safety Systems".

DOWNLOADS

The product compatibility and download center is

www.rockwellautomation.com/rockwellautomation/support/pcdc.page?

Select the Find Downloads option under Download

In the Product Search field enter "AADvance" and the AADvance option is displayed.

Double click on the AADvance option and the latest version is shown.

Select the latest version and download the latest version.

AADVANCE RELEASE

This technical manual applies to AADvance Release: 1.40

LATEST PRODUCT INFORMATION

For the latest information about this product review the Product Notifications and Technical Notes issued by technical support. Product Notifications and product support are available at the Rockwell Automation Support Center at

<http://rockwellautomation.custhelp.com>

At the Search Knowledgebase tab select the option "By Product" then scroll down and select the ICS Triplex product AADvance.

Some of the Answer ID's in the Knowledge Base require a TechConnect Support Contract. For more information about TechConnect Support Contract Access Level and Features please click on the following link:

https://rockwellautomation.custhelp.com/app/answers/detail/a_id/898272

This will get you to the login page where you must enter your login details.

IMPORTANT A login is required to access the link. If you do not have an account then you can create one using the "Sign Up" link at the top right of the web page.

PURPOSE OF THIS MANUAL

This technical manual describes how to install and use the OPC Portal Server for an AADvance controller.

WHO SHOULD USE MANUAL

This technical manual is for qualified control system engineers who install, commission or operate OPC clients or the AADvance controller.

Environmental compliance

Rockwell Automation maintains current product environmental information on its website at:

<http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>

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Introduction

This chapter provides a brief overview of Open Platform Communication (OPC) and the ICS Triplex OPC Portal Server.

The OPC Portal Server

The OPC Portal Server is a windows-based application that allows OPC compatible clients, such as HMIs and SCADA systems, to connect to one or more AADvance controllers to access process data. It conforms to version 1.10 of the Alarms and Events Standard published by the OPC Foundation.

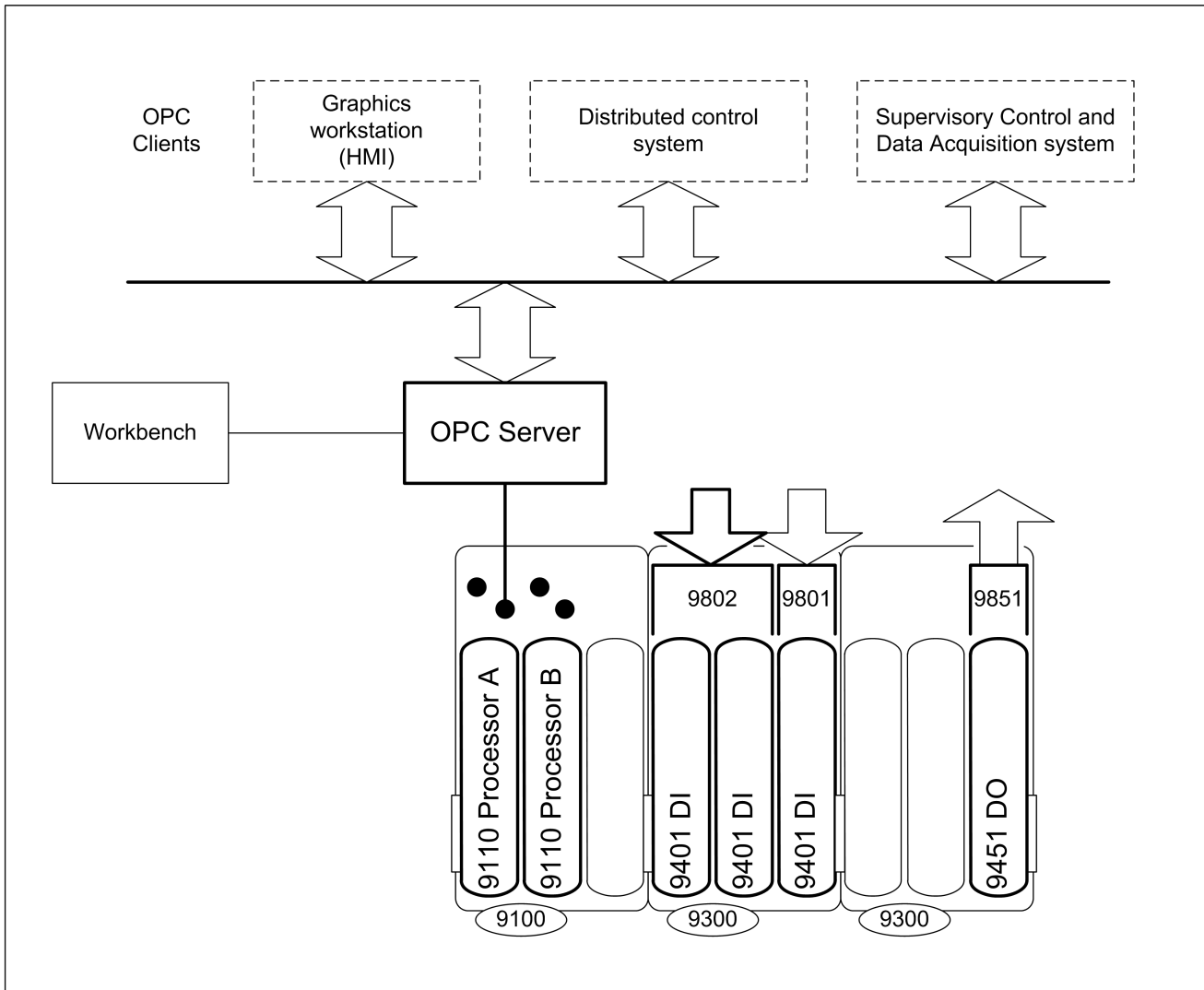
- A PC implementation of SNCP supports 50 connections of which the OPC server uses 2 per controller.
- The current OPC implementation supports 6 controllers without significant degradation of performance, however more than that number might degrade the service.

The OPC Portal Server supports:

- OPC Data Access, often known as 'DA', which provides real-time data from AADvance controllers to OPC clients.
- September 2012 OPC Alarms and Events, often known as 'AE', which provides time stamped alarm and event notifications.

A typical arrangement is shown in the illustration:

Figure 1 - OPC Server in an AADvance System



OPC clients connect to the server using Microsoft COM or, if located on a different host, Distributed COM (DCOM). The OPC Portal Server and the controller communicate using a secure protocol which is transparent to OPC clients. This protocol is proprietary to Rockwell Automation.

The OPC Portal Server runs as a Windows service. This means that it has no application window, does not appear on the task bar and is not started using an icon. The server will automatically start on boot up and continue to run without needing a user to log in.

This manual describes the use of the OPC Portal Server under Microsoft Windows XP Professional with Service Pack 2, Vista, Windows 7 or Server 3 32-bit or 64-bit.

OPC Data Access Interface

The OPC Data Access interface allows multiple Data Access clients to access any AADvance controller tag.

A Data Access client can do the following:

- Query the value of a specific tag.
- Subscribe to a tag to receive updates when the value of that tag changes.
- Change the value of a tag in an AADvance controller.

The OPC Portal Server conforms to version 3.00 of the Data Access Custom Interface Standard published by the OPC Foundation.

OPC Alarm and Event Interface

The OPC Alarm and Event interface provides a source of alarm and event information to clients. Each time an event occurs, the OPC Portal Server informs the client of the event. The information provided by the OPC Portal Server includes the tag name, value and time, which the client can use for example to trigger an alarm or record in an event log.

OPC Alarm and Event clients subscribe to the server by controller name and receive all events originating from subscribed controllers.

TIP The OPC Portal Server generates events only for variables that you have configured for Sequence of Event updates within the AADvance Workbench application.

Table 1 - SOE Conditions Reported BY the OPC Server

Condition	VA	Ref Variable VA	Ref Variable Value
SOE_Condition_Falling (0)	VA of SOE'd Variable	VA of reference variable or VA of SOE'd variable if no reference variable configured	Value of reference variable, or value of variable being SOE'd if no reference variable configured
SOE_Condition_Rising (1)	VA SOE'd	VA of reference variable, or VA of SOE'd variable if no reference variable configured	Value of reference variable, or value of variable being SOE'd if no reference configured
SOE_Condition_Unlock (2)	VA of Variable being unlocked	VA of Variable being unlocked	Value of Variable being unlocked
SOE_Condition_Lock (3)	VA of Variable being locked	VA of Variable being locked	Value of Variable being locked
SOE_Condition_Force (4)	VA of Variable being forced	VA of Variable being forced	Value of Variable being forced
SOE_Condition_Div_By_Zero (5)	VA of divisor - value that is 0	POU number	0
SOE_Condition_Max_Pou_exe_Time (6)	0	0	0
SOE_Condition_Call_Depth (7)	0	0	0
SOE_Condition_TIC_Unknown_Code (8)	0	0	0
SOE_Condition_Array_Bounds (9)	VA of index variable	Latest resource CRC	Value of Index

Condition	VA	Ref Variable VA	Ref Variable Value
SOE_Condition_Start (10)	Original resource CRC	Latest resource CRC	Resource compilation
SOE_Condition_Resource_Stop (11)	Original resource CRC	Latest resource CRC	Resource compilation
SOE_Condition_Online_Change (12)	Original resource CRC	Latest resource CRC	Resource compilation
SOE_Condition_Online_Change (12)	Original resource CRC	Latest resource CRC	Resource compilation

Table 2 - SOE Variables and there Meaning

Condition	Remarks
SOE_Condition_Falling (0)	A BOOLEAN has transitioned from a True to a False
SOE_Condition_Rising (1)	A BOOLEAN has transitioned from a False to a True
SOE_Condition_Unlock (2)	A locked variable has been unlocked
SOE_Condition_Lock (3)	A variable has been locked
OE_Condition_Force (4)	A variable has been forced
SOE_Condition_Div_By_Zero (5)	The application has performed a divide by zero. There is a special function block the application can use to monitor this condition.
SOE_Condition_Max_Pou_exe_Time (6)	Not implemented - the watchdog terminates the application in this case
SOE_Condition_Call_Depth (7)	A function has called a function that has called a function etc. to a depth greater than that which can be managed by the target.
SOE_Condition_TIC_Unknown_Code (8)	The resource has detected an instruction code that is not valid
SOE_Condition_Array_Bounds (9)	An application has attempted to access an array element outside of the bounds of the array
SOE_Condition_Resource_Start (10)	A resource has started
SOE_Condition_Stop (11)	A resource has stopped
SOE_Condition_Online_Change (12)	A successful online update has been performed
SOE_Condition_Online_Change (12)	A new application was downloaded to the resource

Software Installation

This chapter describes the installation process for the OPC Portal Server. You can install the OPC Portal Server as an upgrade from a previously installed version or as a new installation.

Preparing to Install the OPC Portal Server

You need these items to install the OPC Portal Server:

- Distribution CD.

The installation process requires that you complete a number of tasks in the following order:

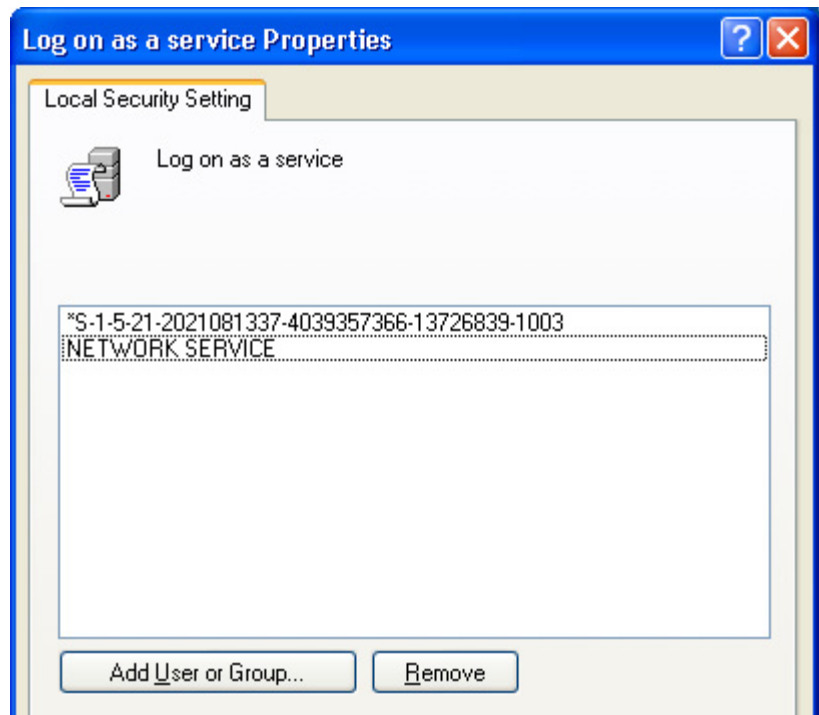
1. Make sure you have a Windows administrator account with the privilege to start a service.
2. Synchronize the real-time clock.
3. Install the OPC Core Components Redistributable.
4. Install the OPC Portal Server.
5. Set up Distributed COM (DCOM) if required.

Set Administrator Privileges to Start a Service

To ensure that a user of Windows XP can start a service, do the following:

1. Open the **Windows Control Panel** and navigate to **Administrative Tools**. Select **Local Security Policy**.
 - The Security Settings dialog box opens.
2. Select **Local Policies** → **User Rights Assignment**.
3. Open the item **Log on as a service**.

- The Properties window shows the users that are allowed to start a service.



4. If the chosen user does not appear in the list, add the user by clicking **Add User or Group**. Clicking **Advanced** and **Find Now** displays a list of all available users.

Synchronizing the Real-time Clock

The OPC Data Access data type includes a time stamp, which the OPC Portal Server derives from the real-time clock of the computer which is running the OPC Portal Server. If you use Data Access, you may wish to synchronize the clock with the clocks of the AADvance controllers.

Install the OPC Core Components Redistributable

IMPORTANT Before you begin this task, you must have a Windows administrator account.

To install the OPC Core Components Redistributable, do the following:

1. Log onto Windows using an administrator account.
2. Insert the distribution CD.
 - The OPC Products Installer window opens.
 - If the disk does not start (Windows settings can cause this), locate and select the file named **autorun.exe**.

- Click this **button** to install the OPC Core Components Redistributable:



- The OPC Core Components Redistributable Setup Wizard starts.
- Click **Next**.
 - At the Select Installation Folder step, do the following:
 - Accept the **default folder** for the installation.
 - Select the **radio button** for Everyone.
 - Click **Next**.
 - Review and accept the **License Agreement**, click **Next**.
 - At Confirm Installation, click **Next** to start the installation.
 - When Installation Complete appears, click **Close**.
 - You have now installed the OPC Core Components Redistributable.

Install the OPC Portal Server

IMPORTANT Before you begin this task, you must have a Windows administrator account and you must have installed the OPC Core Components Redistributable.

To install the OPC Portal Server, do the following:

- Log onto Windows using an administrator account.
- Insert the distribution CD and wait a few seconds for the disc to autorun.
 - The OPC Products Installer window opens.
 - If the disk does not start (Windows settings can cause this), locate and select the file named **autorun.exe**.
- Click this **button** to install the OPC Portal Server:



- The AADvance Products Installer starts.
- Review and accept the **License Agreement** step, click **Next**.
 - At the Select Features step, accept the **default components**, click **Next**.
 - At the Review installation settings step, click **Next**.
 - Click **Install** to start the installation process.
 - The installer offers the opportunity to place a shortcut to the product folder on your desktop, click **Yes**.
 - The installer will complete its tasks after a few seconds.

- You have now installed the OPC Portal Server.
9. Accept the default item **Yes I want to restart my computer now**, click **Finish**.
 10. Wait for Windows to restart and then **log on** using an administrator account.

Using a Client on a Separate Computer

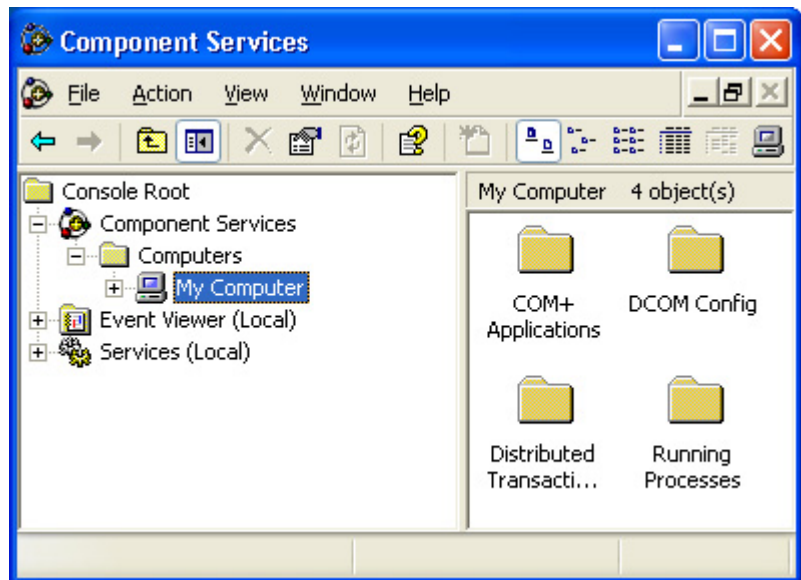
You can use the OPC Portal Server in a system with the clients and the server on separate computers. To do this, you need to set up the Distributed COM (DCOM) protocol on each computer. This will enable the remote clients to communicate with the OPC Portal Server.

IMPORTANT You must use the same user name and password for the Windows accounts on each computer.

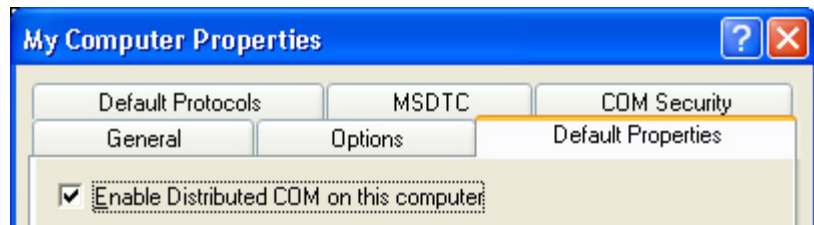
Configure DCOM for Windows XP

To configure DCOM, do the following:

1. Log onto Windows using an administrator account.
 - Open the **Windows Control Panel** and navigate to **Administrative Tools**. Select **Component Services**.
2. The Component Services applet starts.
3. Within the Component Services applet, navigate to **Component Services** → **Computers** → **My Computer**.

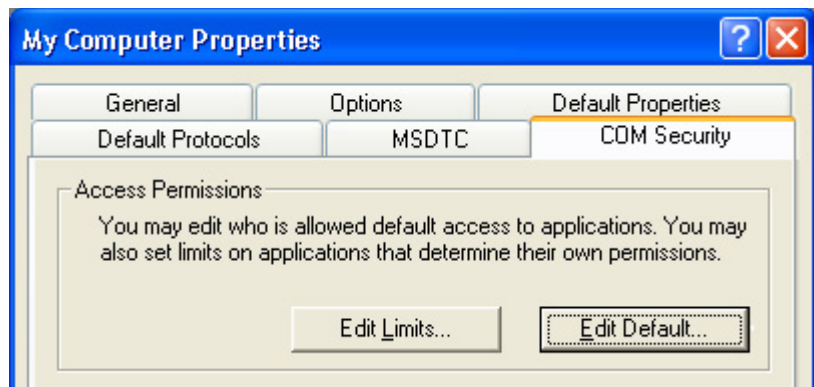


4. Right-click on **My Computer** to display the **My Computer Properties**, select the **Default Properties** tab.



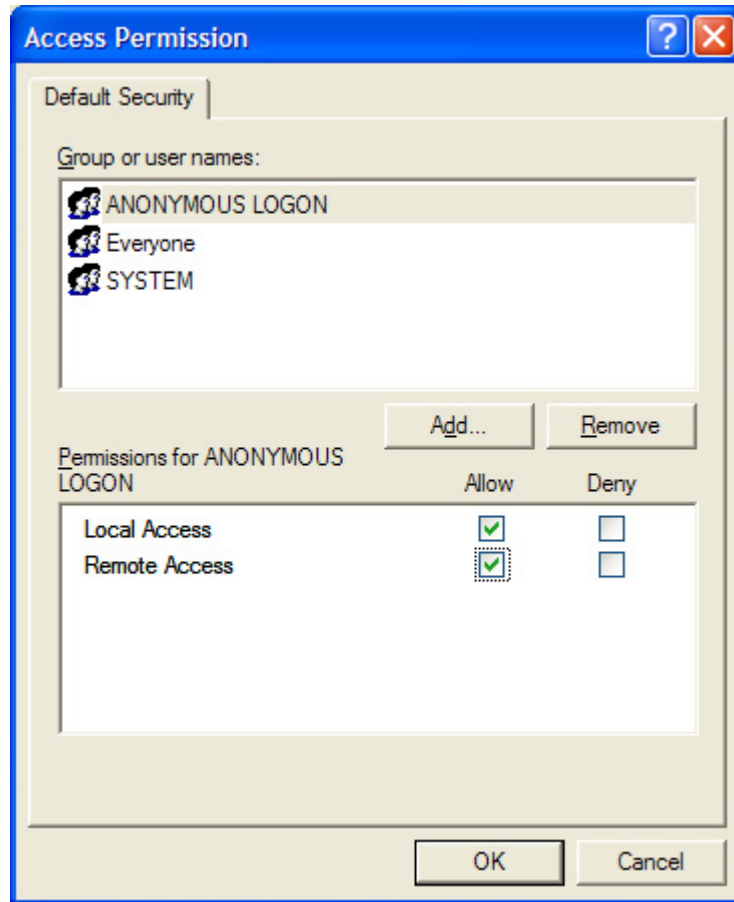
Do the following:

- Put a tick in the **box** labelled Enable Distributed COM on this computer.
 - Set the Default Authentication Level to **None**.
 - Set the Default Impersonation Level to **Identify**.
5. Select the **COM Security** tab.



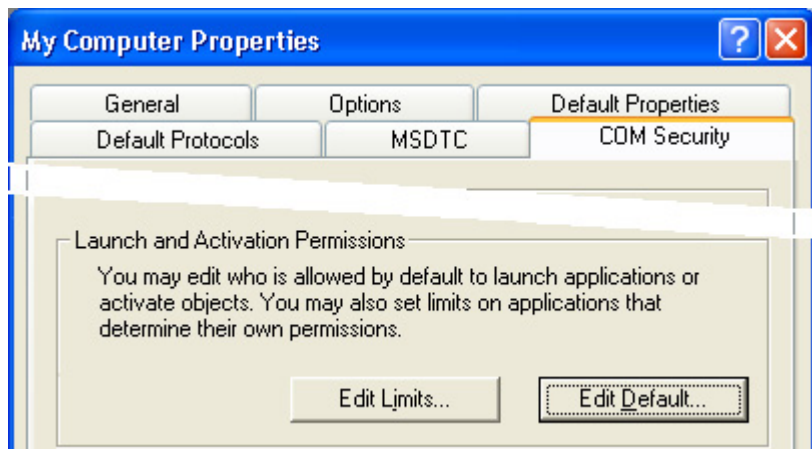
- Go to the **Access Permissions** area, click **Edit Default**.

6. The Access Permission dialog box opens.

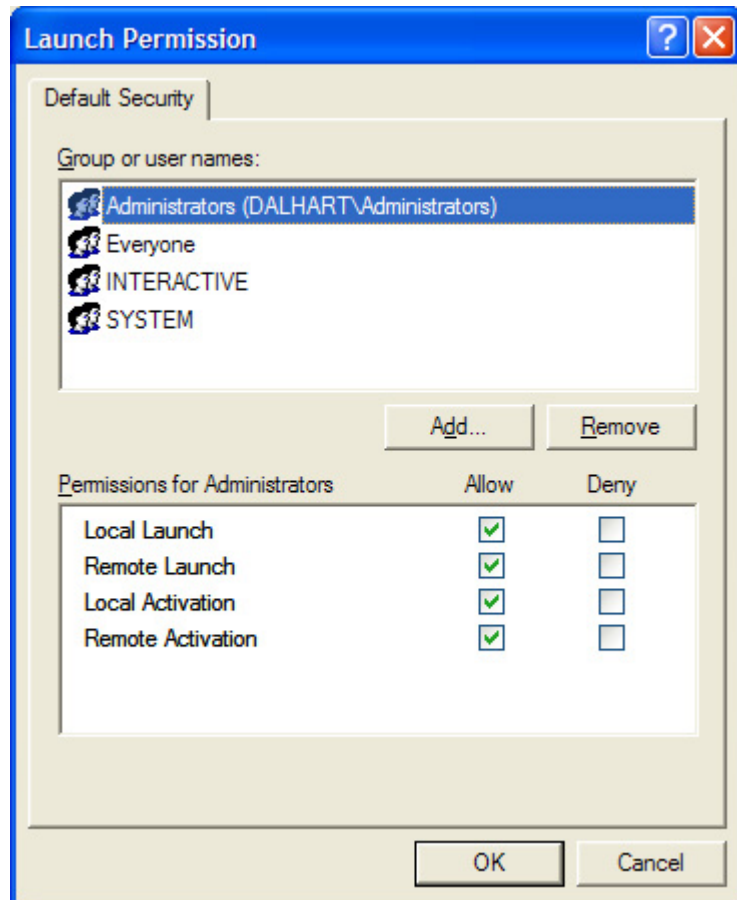


Do the following:

- Add a group named **ANONYMOUS LOGON** and allow **Local Access** and **Remote Access**.
 - Similarly add a group named **Everyone** and allow **Local Access** and **Remote Access**.
 - Click **OK** to close the Access Permission dialog box.
7. Return to the **COM Security** tab of the My Computer Properties dialog box.



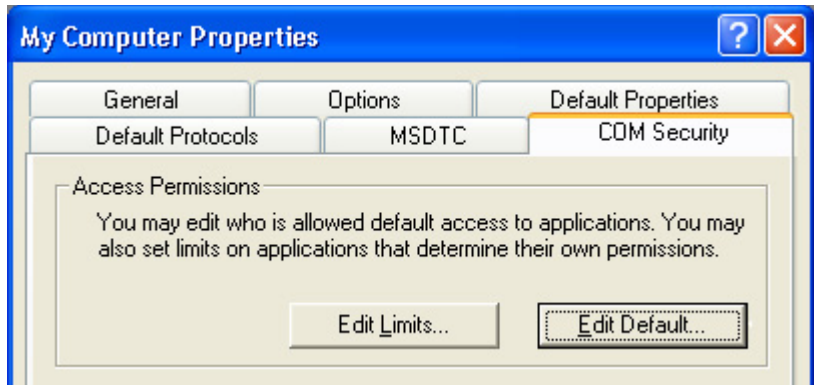
- Go to the **Launch and Activation Permissions** area, click **Edit Default**.
8. The Launch Permission dialog box opens.



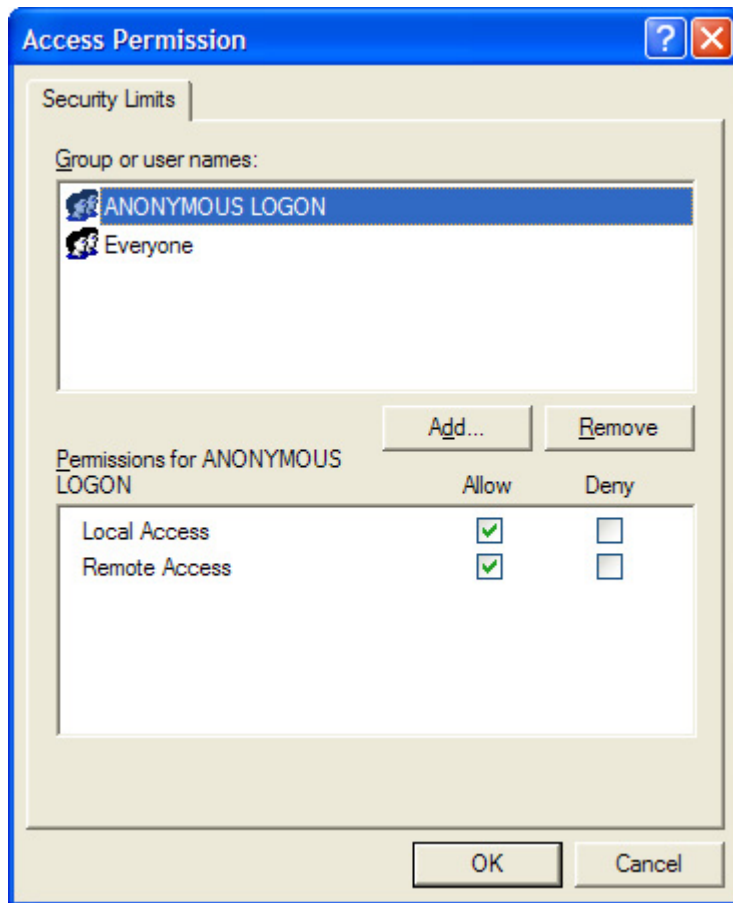
Do the following:

- Add the group **ANONYMOUS LOGON** you created earlier and allow all permissions — **Local Launch, Remote Launch, Local Activation and Remote Activation**.
- Similarly add the group **Everyone** and allow **all options**.
- Click **OK**.

- Return to the **COM Security** tab of the My Computer Properties dialog box.



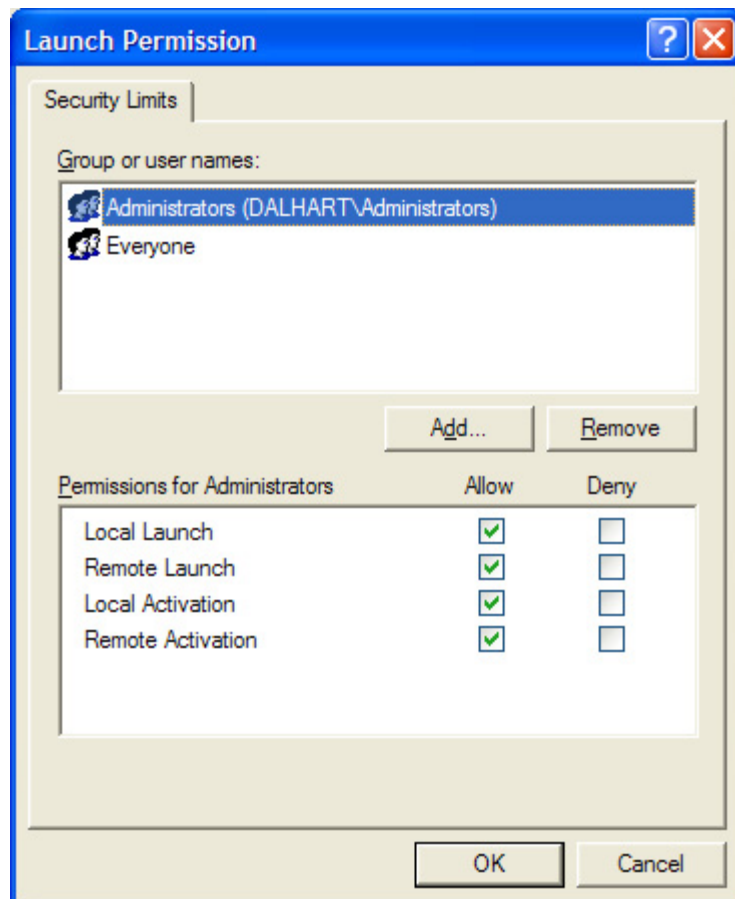
- Go to the **Access Permissions** area, click **Edit Limits**.
- The Access Permission window opens.



Do the following:

- Set the group **ANONYMOUS LOGON** to allow **Local Access** and **Remote Access**.
- Similarly set the group **Everyone** to allow **local** and **remote access**.
- Click **OK**.

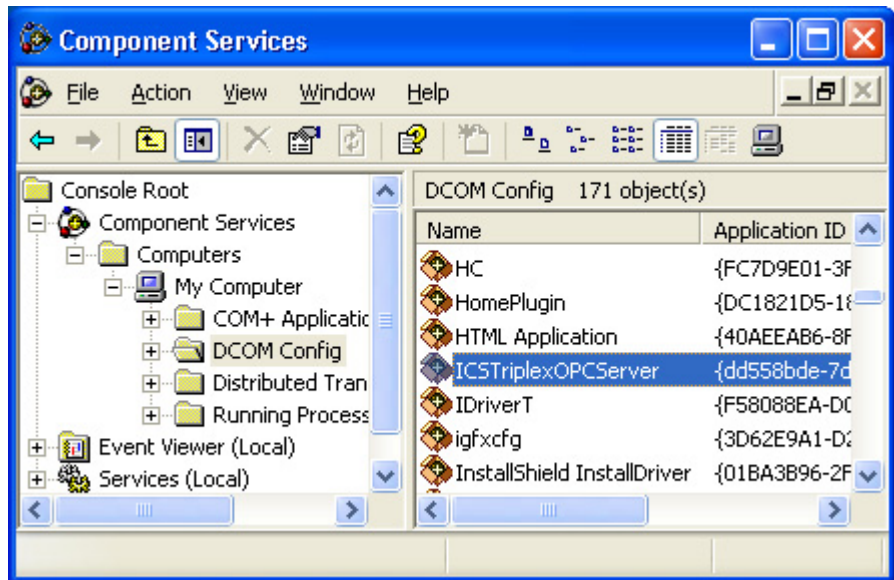
11. Return to the **COM Security** tab of the My Computer Properties dialog box.
 - Go to the **Launch and Activation Permissions** area, click **Edit Limits**.
12. The Launch Permission window opens.



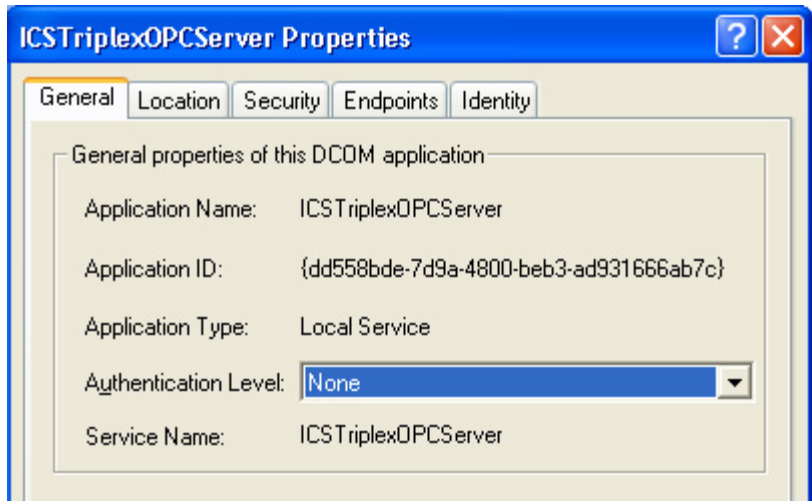
Do the following:

- Set **all four permissions** for both **Administrators** and **Everyone**.
 - Click **OK**.
13. Return to the **COM Security** tab of the My Computer Properties dialog box.
 - Click **OK** to save the changes made so far.
 14. Return to the **Component Services** applet.

- Expand the **My Computer** item and select **DCOM Config**. Locate the **ICSTriplexOPCServer** in the list.

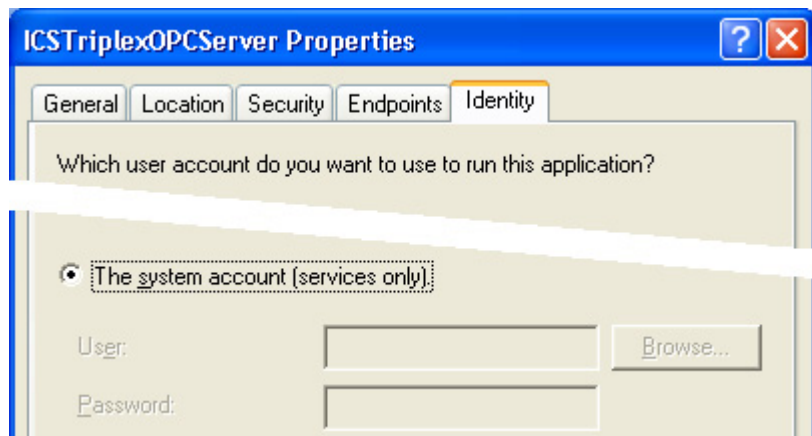


15. Right-click to open the properties for the server, select the **General** tab.



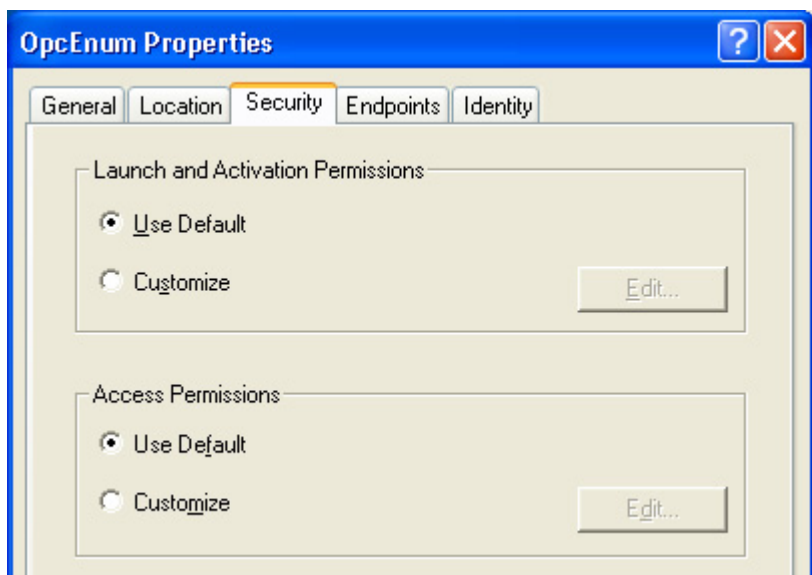
- Set the Authentication Level to **None**.

16. Go to the **Identity** tab.



Do the following:

- Select the **radio button** labelled **The system account (services only)**.
 - Click **OK** to save the new settings and close the OPC Portal Server Properties.
 - If you are not configuring a work group to use DCOM, **reboot the computer**. The configuration of DCOM is complete.
17. If you are configuring a workgroup to use DCOM, you must set the OPCEnum properties. Do the following:
- Return to the **DCOM Config** section of the Component Services applet.
 - Scroll down to locate **OpcEnum**.
 - Right-click to open the properties for OpcEnum, select the **Security** tab.



- In the Launch and Activation Permissions, select **Use Default**.
- Similarly, in the Access Permissions, select **Use Default**.

- Click **OK**.
- **Reboot the computer.** The configuration of DCOM is complete.

Setting Up

This chapter explains how to configure the OPC Portal Server to work with your project.

Setting the OPC Portal Server to Match Your AADvance Workbench Project

The configuration of the OPC Portal Server needs to accurately reflect the contents of the application which is running on the AADvance controllers. When you build or rebuild a project, the AADvance Workbench application automatically launches the OPC Server Configuration Wizard to prompt you to configure the OPC Portal Server.

You may need to configure the OPC Portal Server to suit an existing AADvance Workbench project which is already built. You can run the wizard manually to do this.

Build or Rebuild a Project

NOTE Before you begin this task, you must have installed the OPC Portal Server and rebooted the computer.

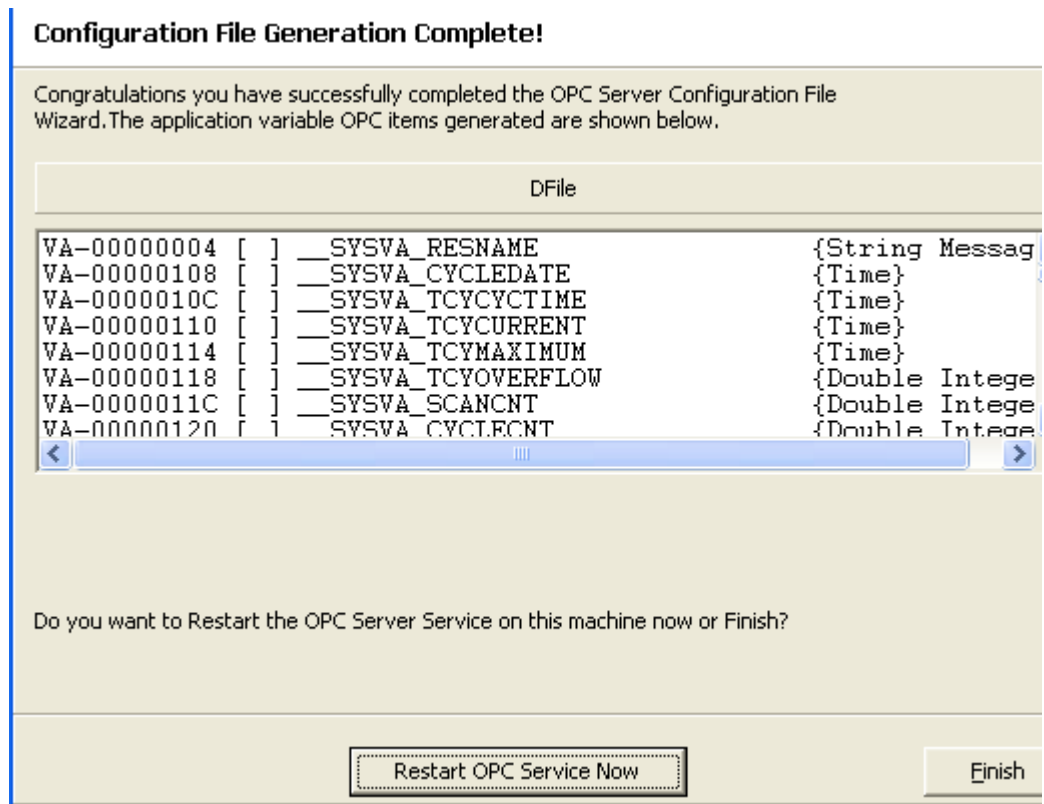
The Workbench application prompts you to configure the OPC Portal Server when you build or rebuild a project. Do the following:

1. Click the Build  or Rebuild  button within the AADvance Workbench application.
 - A Start ConfigGen Tool message appears.



2. You can suppress this message for your current AADvance Workbench session. To do this, put a tick in the **box** labelled Don't Ask Again.
 - The message will reappear the next time you start the AADvance Workbench application and build or rebuild a project.
3. Click **Yes**.
 - The OPC Server configuration wizard starts.
 - The wizard provides a series of screens. Work through the screens in sequence.
4. The Source ISaGRAF Project step identifies your AADvance Workbench project file, click **Next**.
5. At the Include ISaGRAF Internal Variables step, select the box Generate OPC items for ISaGRAF internal variables, click **Next**.
6. At the Include Server Constants step, put a tick in the **box** labelled Include automatic Server Constants.
 - The wizard populates the list of server constants automatically.
7. Click **Next**.
8. At the Include Server Functions step, select the **box** Include automatic Server Functions.
 - The wizard populates the list of server functions automatically.
9. Click **Next**.
10. At the Where to place the generated configuration file step, do the following:
 - If you wish to change the disk location of the file, for example to specify a network drive, use the Destination Folder to specify the location. Otherwise, leave this field blank to use the default location.
 - If you wish the OPC Portal Server to ignore the new file, for example because the server is supporting another project, remove the tick in the **box** labelled Update. Otherwise, make sure there is a tick in the **box** labelled Update.
11. Click **Next**.
 - The wizard generates the configuration file.

12. Configuration File Generation Complete! The final step shows the contents of the configuration file, click **Restart OPC Service Now**.



13. Click **Finish**.

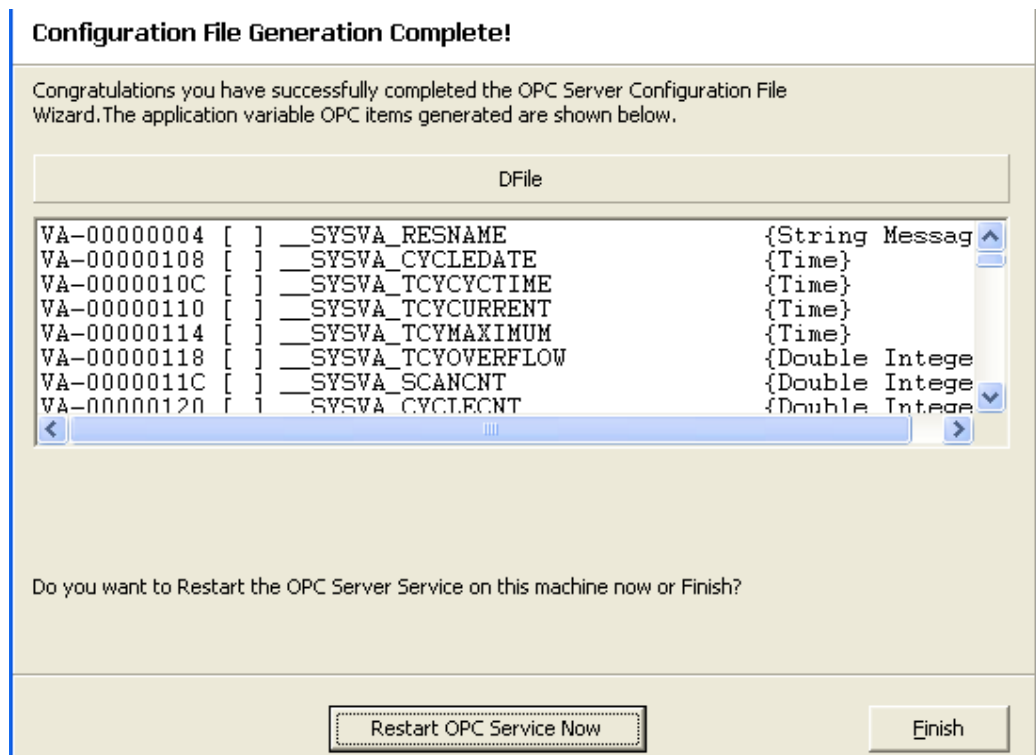
Manually Configure the OPC Portal Server

IMPORTANT Before you begin this task, you must have installed the OPC Portal Server and rebooted the computer.

To configure the OPC Portal Server manually, without building or rebuilding a project, do the following.

1. Open the **Tools** menu within the AADvance Workbench application and click **ConfigGenTool**.
 - The OPC Server configuration wizard starts.
 - The wizard provides a series of screens. Work through the screens in sequence.
2. At the Source ISaGRAF Project Selection step, click **Browse...** and locate your AADvance Workbench project file.
3. If the ISaGRAF file has password protection, complete the **Password field**.
4. Click **Next**.

5. At the Include ISaGRAF Internal Variables step, select the box **Generate OPC items for ISaGRAF internal variables**, click **Next**.
6. At the Include Server Constants step, put a tick in the **box** labelled Include automatic Server Constants.
 - The wizard populates the list of server constants automatically.
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11. Click **Next**.
 - The wizard generates the configuration file.
12. Configuration File Generation Complete! The final step shows the contents of the configuration file, click **Restart OPC Service Now**.



13. Click **Finish**.

Using the OPC Portal Server

This chapter provides instructions on using the OPC Portal Server. These instructions supplement the specific instructions for your OPC clients.

Identifying the OPC Portal Server

OPC clients that allow browsing of the available servers see the OPC Portal Server as ICSTriplexOPCServer.

Running the OPC Portal Server

The OPC Portal Server starts automatically on boot up. However, you can stop and restart the server manually or through a batch file if necessary.

Managing the OPC Portal Server from a Command Prompt

You can start and stop the OPC Portal Server by issuing commands in a Command Prompt window or from a batch file.

NOTE Use cmd.exe, not command.exe.

The recommended command is net:

```
C:\>net stop icstriplexopcservice
```

```
The ICSTriplexOPCServer service is stopping.
```

```
The ICSTriplexOPCServer service was stopped successfully.
```

```
C:\>net start icstriplexopcservice
```

```
The ICSTriplexOPCServer service is starting.
```

```
The ICSTriplexOPCServer service was started successfully.
```

If Service Control is installed, you can use the sc command:

```
C:\>sc stop icstriplexopcservice
```

```
SERVICE_NAME: icstriplexopcservice
```

```
TYPE : 10 WIN32_OWN_PROCESS
```

STATE : 3 STOP_PENDING

(STOPPABLE,NOT_PAUSABLE,ACCEPTS_SHUTDOWN)

WIN32_EXIT_CODE : 0 (0x0)

SERVICE_EXIT_CODE : 0 (0x0)

CHECKPOINT : 0x0

WAIT_HINT : 0x1388

There are two related commands:

- C:\>sc query icstriplexopcservice
(reports whether the service is running).
- C:\>sc start icstriplexopcservice

Manage the OPC Portal Server from the Windows Services Management Console

You can start and stop the OPC Portal Server from the Windows services management console.

To use the Windows services management console to control the server, do the following:

1. Open the **Windows Control Panel** and navigate to **Administrative Tools**. Select **Services**.
 - The services management console displays a list of all available Windows services.
2. Scroll down the list of services to locate the item **ICSTriplexOPCServer**.
3. Use the console to **start**, **stop** or **restart** the service.

Managing the OPC Portal Server from the Windows Task Manager

You can start and stop the OPC Portal Server from the Windows Task Manager. The OPC Portal Server is visible in the Windows Task Manager as **ICSTriplex OPC_Server.exe** in the Processes tab.

Additional Resources

Associated AADvance Publications

For more information about the AADvance system refer to the associated Rockwell Automation technical manuals shown in table below.

Resource	Document Number
Safety Manual	ICSTT - RM446
System Build Manual	ICSTT - RM448
* Configuration Guide	ICSTT - RM405
* Configuration Guide	ICSTT - RM458
OPC Portal Server User Manual	ICSTT - RM407
PFH and PFD _{avg} Data Manual	ICSTT - RM449
Solutions Handbook	ICSTT - RM447
Troubleshooting and Maintenance Manual	ICSTT - RM406

* Actual configuration guide applicable is dependent upon version of AADvance Workbench used.

Publication	Purpose and Scope
Safety Manual	This technical manual defines how to safely apply AADvance controllers for a Safety Instrumented Function. It sets out standards (which are mandatory) and makes recommendations to make sure that installations satisfy and maintain their required safety integrity level.
Solutions Handbook	This technical manual describes the features, performance and functionality of the AADvance controller and systems. It gives guidance on how to design a system to satisfy your application requirements.
System Build Manual	This technical manual describes how to assemble a system, switch on and validate the operation of your system.
Configuration Guide	This software technical manual defines how to configure an AADvance controller using the AADvance Workbench to satisfy your system operation and application requirements.
Troubleshooting and Maintenance Manual	This technical manual describes how to maintain, troubleshoot and repair an AADvance Controller.
OPC Portal Server User Manual	This manual describes how to install, configure and use the OPC Server for an AADvance Controller.
PFH and PFD _{avg} Data	This document contains the PFH and PFD _{avg} Data for the AADvance Controller. It includes examples on how to calculate the final figures for different controller configurations.

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Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

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