

Wonderware Operations Integration - Supervisory Wonderware ITME Server (G-1.2 Series) User Guide



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CHAPTER 1

Getting Started

The OI Server is one component of a software system that connects your software application with information on the factory floor.

This OI Server documentation covers only the information you need to configure and run the OI Server component. See the documentation that comes with the related components for details on their operation. You can find installation instructions in a help file on the installation CD.

You use the OI Server Manager to configure, activate, and troubleshoot the OI Server. The OI Server Manager is located in the System Management Console (SMC). For more information, see *Finding Your OI Server in the SMC*

This documentation describes some of the key features of the OI Server Manager. See the *OI Server Manager User's Guide* to find more information on:

- Global parameters
- Configuration sets
- Time zone features
- Icon definitions
- Activation/deactivation
- Configuring as a service
- Importing/exporting device items
- Standard diagnostics

You can troubleshoot problems with the OI Server using the ArchestrA Log Viewer, a snap-in to the SMC. See the Log Viewer help file to find information on:

- Viewing error messages.
- Determining which messages are shown.
- Bookmarking error messages.

You can also troubleshoot problems using your client application, such as the Wonderware InTouch HMI software. The client application can use system device items to determine the status of nodes and the values of some parameters. For more information on system items, see *Standard System Items*.

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Before You Begin

Before configuring the OI Server, verify the following items:

- The OI Server PC is set up with the necessary network cards, and connected to the necessary networks.

- During installation, you set up or identified a Windows administrator account for use by the OI Server.
- The OI Server and any other Wonderware software such as the OI Server Manager is installed with the proper licenses. For more information, see the License Utility documentation on the installation CD.
- The client software is installed.
- The Compact Panel devices that you want to access are accessible over the network.

Before configuring the OI Server, you should know:

- The network configuration and addresses for the Compact Panel devices.
- Which data items are needed for the client application.
- The device name/topic name/group name.
- The desired update intervals.

Supported Client Protocols

Client applications connect to the OI Server using the following different communication protocols:

- OPC
- SuiteLink
- DDE/Fast DDE

For more information, see the Protocols guide that is included with the installation CD.

Supported Device Protocols

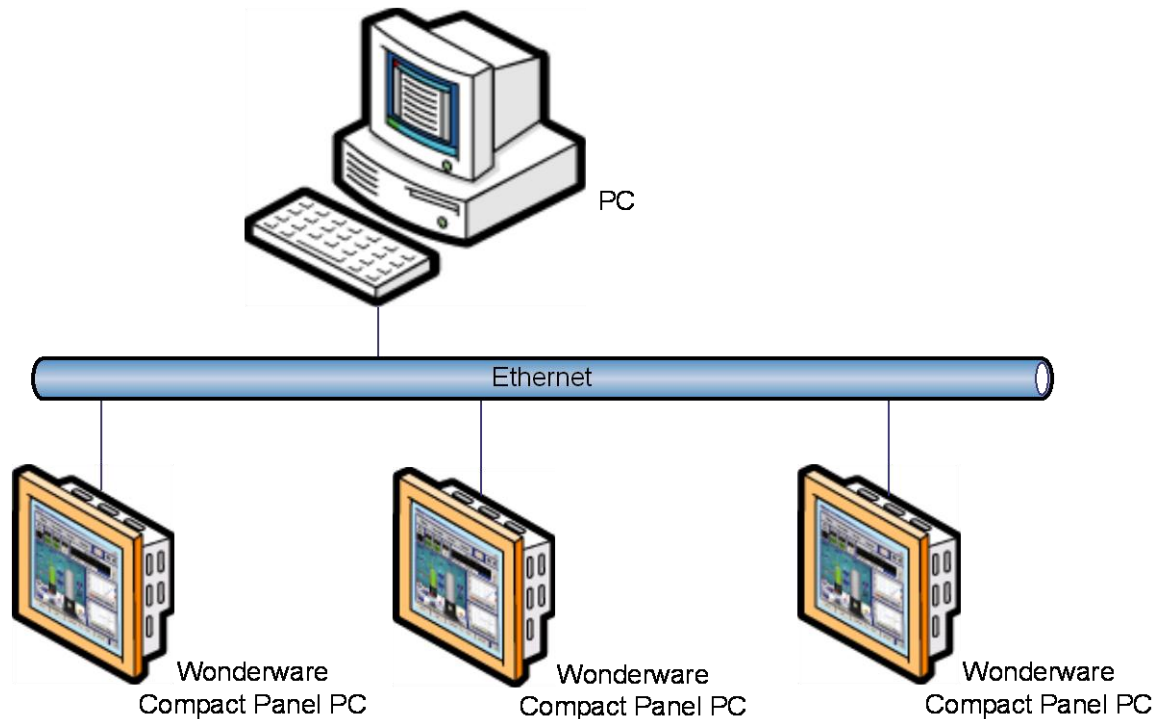
The OI Server connects to the Compact Panel devices using a special proprietary protocol.

Supported Devices

The Wonderware InTouch Machine Edition OI Server supports all Wonderware Compact Panel devices running the InTouch Compact run-time environment.

Supported Topologies

You can install the Wonderware InTouch Machine Edition OI Server on any computer that has an Ethernet connection to the Compact Panel devices that you want to access. Each Wonderware InTouch Machine Edition OI Server can connect to up to 65,535 Compact Panel devices simultaneously.



Windows Firewall Considerations

If the OI Server runs on a computer with a firewall enabled, a list of application names and port numbers must be put in the firewall exception list so the OI Server can function correctly.

By default, the OI Server installation program makes the required entries in the firewall exception list. If you do not want this, you must add the entries manually. For information on how to make entries in the firewall exception list, see your firewall or Windows security documentation.

Put the following applications in the firewall exception list on the computer where the OI Server is installed:

- ITME.exe
- aaLogger.exe
- DASAgent.exe
- dllhost.exe
- mmc.exe
- OPCEnum.exe
- Slssvc.exe

Put the following port numbers in the firewall exception list on the computer where the OI Server is installed:

- 5413 - TCP port for slssvc.exe

- 445 - TCP port for file and printer sharing
- 135 - TCP port for DCOM

Put the following applications in the firewall exception list on the computer where the OI Server Manager is installed:

- aaLogger.exe
- dllhost.exe
- mmc.exe

Put the following port numbers in the firewall exception list on the computer where the OI Server Manager is installed:

- 445 - TCP port for file and printer sharing
- 135 - TCP port for DCOM

Uninstalling the OI Server does not remove the firewall exception list entries. You must delete the firewall exception list entries manually. For more information on how to do this, see your firewall or Windows security documentation.

CHAPTER 2

Managing Compact Panel Devices

To establish a connection to a Wonderware Compact Panel device, you create a WonderwarePanel device object in the OI Server Manager and configure it.

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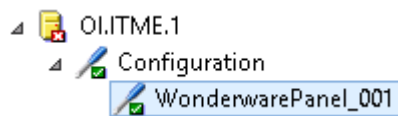
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Adding a Compact Panel Device

You must add a device to the hierarchy before creating device items. A device name cannot contain spaces.

To add a device

1. In the OI Server Manager, navigate to the **Configuration** node.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server.
2. Right-click **Configuration** and click **Add WonderwarePanel Object**. The console tree shows a new node with a default device name.



3. Type a name and press Enter.

Configuring a Device

After you have added a device object, you must configure it by providing the network address of the Compact Panel device you want to connect to. You can also set connection timeout values.

To configure a device

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.

2. Click the device. A configuration page appears in the right pane.

WonderwarePanel_001 Parameters | Device Groups | Device Items

Host Name:

Reply Timeout: ms

Connection Timeout: ms

Max outstanding messages:

Number of Message Retries:

Security configuration:

Enable Security

Username:

Password:

3. Configure the device. Do the following:

- In the **Host Name** box, type the network IP address or host name of the Compact Panel device you want to connect to.
- In the **Reply Timeout** box, type the duration after which messages time out. Valid values are 500 to 10,000 milliseconds.
- In the **Connection Timeout** box, type the duration after which a pending request to initiate a connection times out. Valid values are 500 to 10,000 milliseconds.
- In the **Max outstanding messages** box, type the maximum number of outstanding messages for the Compact Panel device. Valid values are 1 to 20.
- In the **Number of Message Retries** box, type the maximum number of retries you want to make when the message sent to the panel fails. Valid values are 0 to 5. The default value is 3.
- Select **Enable Security** box for providing security configuration credentials for the Compact Panel device. You can enable security configuration, only if security is supported in the Compact Panel device.
- In the **Username** box, type the security username.
- In the **Password** box, type the security password.

Note: If a panel runtime application is enabled with security, the username and password need to be provided to communicate with the panel.

4. Save the configuration.

Renaming a Device

You can change the device name while the OI Server is active. After the device name is changed, client applications using the old name cannot register data with the OI Server. Data for existing queries is set to bad quality. Try not to make changes to the device name after you develop a large client application.

The device name cannot contain spaces.

To rename a device

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Right-click the device whose name you want to change and then click **Rename**.
3. Type a name and press Enter.

Deleting a Device

Deleting a device removes the node and all device group and device item information. Deleting a device is not reversible. If you make a mistake, you must re-enter the device information.

New requests for data that use the deleted device name are rejected. Data for existing queries is set to bad quality.

To delete a device

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Right-click the device and then click **Delete**.
3. Read the warning and then click **Yes**.

CHAPTER 3

Managing Device Groups

Device groups are labels used by client applications when accessing the OI Server. The device group update interval determines how often the OI Server polls the device and sends data to the client application. If you configure multiple device groups with different update intervals, the client application can receive data at various intervals.

Small update intervals mean fast turnaround for data changes and a high overhead because a large amount of data is moving. Large update intervals mean slow turn around for data changes and a low overhead because not as much data is being passed to the client application.

For DDE/SuiteLink clients, the device group is the same as the DDE/SuiteLink topic. DDE/SuiteLink clients require at least one device group to be created for each device.

For OPC clients, the device group equals the OPC access path. The OI Server has a default device group for each device, and this device group cannot be deleted. If you are using OPC client applications, creating a device group is optional.

Device group names must be unique within the OI Server.

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Adding a Device Group

Device groups allow you to specify an update interval for a set of device items. The device group does not contain any device items. The linkage is made when the client makes a request.

To add a device group

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Select the device.
3. In the right pane, click the **Device Groups** tab.

- Right-click the column field, and click **Add**. A **Name** field appears with a default name.

Name	Update Interval (ms)
Topic_0	1000

- Type a unique name and press Enter. The device group is added. The **Update Interval** field has a default value of 1000 milliseconds (ms).
- Click the **Save** icon.

Renaming a Device Group

If you change the name of a device group, you must also change any client queries pointing to that device group. Requests for data accepted by the OI Server before the change are not affected.

To change a device group name

- In the OI Server Manager, navigate to the device.
 - Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - Expand the OI Server, and then expand **Configuration**.
- Select the device.
- Click the **Device Groups** tab.
- Right-click the group name and then click **Rename**. The name is selected.

Name	Update Interval (ms)
Topic_0	1000

- Type a name and press Enter.
- Click the **Save** icon.

Setting the Update Interval for a Device Group

The update interval is the time interval at which the OI Server reads items that are accessed through that device group. You can specify any interval between 0 and 2147483646 milliseconds (596.52 hours).

To set the update interval

- In the OI Server Manager, navigate to the device.
 - Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - Expand the OI Server, and then expand **Configuration**.
- Select the device.
- In the right pane, click the **Device Groups** tab.

4. Right-click the interval and click **Modify Update Interval**. The current update interval is selected.

Update Interval (ms)	
1000	

5. Type an interval and press Enter.
6. Click the **Save** icon.

Deleting a Device Group

When you delete a device group, the quality of items being accessed using the device group changes to BAD. The OI Server rejects new requests for data using the device group.

To delete a device group

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Select the device.
3. In the right pane, click the **Device Groups** tab.
4. Right-click the group to be deleted and click **Delete**.
5. Read the warning and then click **Yes**.
6. Click the **Save** icon.

CHAPTER 4

Managing Device Items

A device item name is an alternative name, or "alias," for an item reference. Defining device items provides a more user-friendly way to name data in the device. When you define a device item name for an item, clients can access the item either by using that device item name or the original item reference.

Defining device items is optional. To access data, you can always use the item reference directly. However, when you define device items, you can browse them from a suitable OPC client, so you can select items more easily.

In the Wonderware InTouch Machine Edition OI Server 2014, an item reference identifies a tag in an InTouch application running on the Compact Panel device. For more information, see *Format and Syntax*.

To provide diagnostic and operational information, the OI Server has several system items that do not access data in a device. For more information, see *Standard System Items*.

You can add device items while the OI Server is active. These new items are immediately available to client applications.

You can make changes to items while the OI Server is active. Changes take effect immediately. OPC clients that are already connected to the item are not affected until they release and re-acquire the item.

For information on how to subscribe to system items or data items in the device, see *Accessing the Data in Your OI Server* on page 27.

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Creating Aliases for Item References

The device item name is an alias for the item reference. Device item names can be 256 characters long. Long names may be more explanatory, but your client application may have limited screen space.

To set a device item name

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.

2. Select the device.
3. In the right pane, click the **Device Items** tab.
4. Right-click the column and click **Add**. A **Name** field is selected with a default name.

New_Device_000 Parameters Device Groups Device Items	
Name	Item Reference
Item_0	

5. Type the name and press Enter.
6. Click the **Save** icon.

Renaming a Device Item

Changing a device item name affects new client requests for data. Requests for data already accepted by the OI Server are not affected.

To change a device item name

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Select the device.
3. In the right pane, click the **Device Items** tab.
4. Right-click the device item name, and click **Rename**.
5. Type the new name and press Enter.
6. Click the **Save** icon.

Deleting a Device Item

Deleting a device item name affects new client requests for data. Requests for data already accepted by the OI Server are not affected.

To delete a device item name

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Select the device.
3. In the right pane, click the **Device Items** tab.
4. Right-click the item to be deleted and click **Delete**.
5. Read the warning and click **Yes**.
6. Click the **Save** icon.

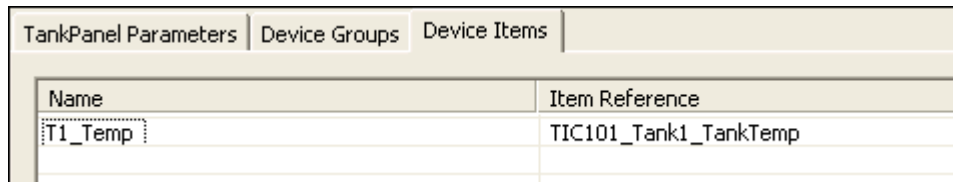
Setting the Item Reference

Before you specify a reference for a device item, you must know which item you need. For more information, see *Format and Syntax*.

You can enter the actual item reference as the device item name. In this case, you can leave the item reference value empty.

To set an item reference

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Select the device.
3. Click the **Device Items** tab.
4. Right-click the **Item Reference** field to be set and click **Rename**.



Name	Item Reference
T1_Temp	TIC101_Tank1_TankTemp

5. Type the item reference and press Enter.
6. Click the **Save** icon.

Exporting and Importing CSV Files

To help you manage item references (tags) and device item names outside of the OI Server Manager, the OI Server supports importing and exporting device item data in a comma separated value (CSV) file. The CSV functions are only available when a device items tab is selected.

To export a device item list

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Select the device.
3. In the right pane, click the **Device Items** tab.
4. Right-click the columns field and click **Export**.
5. In the **Save As** dialog box, type a file name, select a directory, and click **Save**.

To import a device item list

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Select the device.

3. In the right pane, click the **Device Items** tab.
4. Right-click the columns field and click **Import**.
5. In the **Open** dialog box, select the file containing the items to be imported, and click **Open**. Items contained in the file are now listed on the **Device Items** tab.

Clearing All Device Item Names

You can delete all device items for a device.

To clear all device item names

1. In the OI Server Manager, navigate to the device.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server, and then expand **Configuration**.
2. Select the device.
3. In the right pane, click the **Device Items** tab.
4. Right-click the columns field and click **Clear All**.
5. Read the warning and click **Yes**.
6. Click the **Save** icon.

CHAPTER 5

Managing Your OI Server

After you configure the OI Server, there are two steps to take before you can access data with your client application.

The first step is to determine what kind of client applications are to be used with this OI Server. If any of your client applications use DDE/SuiteLink, you must configure the OI Server as a service. If only OPC client applications will be used, you can configure the OI Server as a service or as not a service.

The second step is to activate the OI Server. Some client applications can programatically activate the OI Server. If you configure the OI Server as an automatic service, the OI Server is started and activated when the computer on which the OI Server is installed starts up. If you configure the OI Server as a manual service, the OI Server is not started when the computer starts up. Instead, it is started upon the first connection from an OPC client or when activated from the OI Server Manager.

After a OI Server is running as an automatic or manual service, it stays running until explicitly stopped in the OI Server Manager or the computer shuts down.

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Configuring the OI Server as Service

To support DDE/SuiteLink clients, the OI Server must be configured as a service.

To configure the OI Server as a service

1. In the OI Server Manager, navigate to the OI Server.
 - o Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
2. Right-click **OI.ITME.1** and then click **Configure As Service**.
3. Click either **Auto Service** or **Manual Service**.
4. Read the warning message and click **Yes**.

Configuring the OI Server as Not a Service

The OI Server can only be set to run as not a service when the OI Server is in the deactivated state.

To configure the OI Server as not a service

1. In the OI Server Manager, navigate to the OI Server.
 - o Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
2. Right-click **OI.ITME.1** and then click **Configure As Service**.
3. Click **Not a Service**.
4. Read the warning message and click **Yes**.

Archiving Configuration Sets

A configuration set includes the OI Server's global parameters, as well as each device and its parameters, device groups, and device items. Configuration sets let you manage the settings of different OI Server configurations.

The OI Server contains a default configuration set named Wonderware - ITME. You cannot delete the default configuration set.

You can create multiple configuration sets and switch between them. Archiving, clearing, and switching configuration sets can only be done when the OI Server is deactivated.

Before you create a configuration set, verify that you have saved any changes you made to the global parameters. If you change a parameter and then immediately create a configuration set, the original parameter value is saved as part of the configuration set, not the changed value.

To save a global parameter, click the **Save** icon.

To archive a configuration set

1. In the OI Server Manager, navigate to the configuration node.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server.
2. Right-click **Configuration** and click **Archive Configuration Set**.
3. In the dialog box, type the configuration set name, and click **Archive**. All the current configuration values are saved to the set.

After you archive at least one configuration set, you can select it for use.

To select a configuration set

1. In the OI Server Manager, navigate to the configuration node.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server.
2. Right-click **Configuration**, point to **Use Another Configuration Set**, then click the desired name.

To change the parameter values saved in a configuration set, make sure the desired configuration set is shown, then follow this procedure.

To change the parameter values in a configuration set

1. In the OI Server Manager, navigate to the configuration node.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server.

2. Click **Configuration**.
3. Change the parameters that you want to change.
4. Click the **Save** icon.

Clearing a configuration set returns the parameters to their default values.

To clear a configuration set

1. In the OI Server Manager, navigate to the configuration node.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server.
2. Right-click **Configuration** and then click **Clear Configuration Set**.
3. Read the warning message, then click **Yes**. The parameters are set to the default values.

To delete a configuration set

1. In the OI Server Manager, navigate to the configuration node.
 - a. Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
 - b. Expand the OI Server.
2. Right-click **Configuration**, point to **Delete Configuration Set** and select the configuration set to delete.
3. Read the warning message, then click **Yes**.

Activating/Deactivating the OI Server

When you activate the OI Server, it starts communicating and accepting requests from client applications. If a OI Server is configured as an automatic service, the OI Server is started and activated when the computer starts up. Also, a OI Server can be activated by an OPC client connection request.

To activate the OI Server

1. In the OI Server Manager, navigate to the OI Server.
 - o Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
2. Right-click **OI.ITME.1** and then click **Activate Server**.

Deactivating your OI Server stops it from communicating with client applications.

A OI Server with active OPC clients does not stop until the last OPC client shuts down.

To deactivate the OI Server

1. In the OI Server Manager, navigate to the OI Server.
 - o Expand **OI Server Manager**, expand the node group, and then expand **Local** or the remote computer name.
2. Right-click **OI.ITME.1** and then click **Deactivate Server**.
3. Read the warning message and click **Yes**.

Out-of-Proc

The OI Server can run as a stand-alone process.

When the OI Server is running out-of-proc, it supports requests from both DDE/SuiteLink and OPC client applications.

If the OI Server is running as a service, the icon on the OI Server node in the SMC is yellow. If the OI Server is running as not a service, the icon is white. For more information, see the OI Server Manager User's Guide.

Hot Configuration

The following actions take effect immediately while the OI Server is running:

- Modifying global configuration parameters
- Adding, deleting, or modifying device nodes
- Adding, deleting, or modifying device groups and device items
- Modifying server configuration parameters (except the network address of the Compact Panel device)

Changes to other settings don't take effect until you restart the OI Server.

Demo Mode

You can install the OI Server without a license. The OI Server runs without a license in Demo mode for 120 minutes. While in demo mode the OI Server checks for a license every 30 seconds. When the 120 minutes expire:

- The OI Server stops updating items.
- All non-system items have a Bad quality status.
- New items are rejected.

After the 120 minutes the OI Server checks for a license every thirty seconds. If a license is not found, the OI Server logs a warning.

You can use the `$$SYS$Licensed` system item to check the status of your license. This item returns true if the proper license is found or the OI Server is in demo mode (the 120 minutes). Otherwise, it returns false.

After the OI Server finds a valid license, it logs a message, stops looking for a license, and begins running normally. For more information, see the license utility documentation.

CHAPTER 6

Accessing the Data in Your OI Server

Client applications can read and write to data items that are internal to the OI Server, as well as to the items located in the Compact Panel devices. Client applications communicate with the OI Server using either the OPC or DDE/SuiteLink protocols. The client application may or may not be on the same computer as the OI Server.

Caution: The Wonderware InTouch Machine Edition OI Server 2014 allows read/write access to all items in the InTouch Compact application. This also applies to items that are configured as read-only in the InTouch Compact application.

You do not need to create device items in the OI Server for your OPC client application. However, when you define device items, you can browse them from a suitable OPC client, so you can select items more easily.

For information on how to specify item references, see *Format and Syntax*.

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Accessing Data Using OPC

The following parameters are used for connections between the OI Server and an OPC client application:

- node name: The name of the computer where the OI Server is located. Only required for remote access.
- program name: OI.ITME.1
- link name: The name of the Compact Panel device that you want to access, as defined in the configuration hierarchy.
- item name: The specific data element. This can be the device item name or the item reference.
- access path: You can optionally specify one of the device groups defined on the OI Server as the OPC access path. If omitted, the default device group is assumed.

To get the OPC data path for an item, combine the link name with the item name. For example, to access a tag named "ReactTemp" on the Compact Panel device named "Line1," use the following OPC data path: Line1.ReactTemp. To access the update interval of the device group "Group1," use the data path "Line1.\$SYS\$updateInterval" with an access path of "Group1."

If the specified item is not valid, the OI Server does not accept the item. The OI Server returns bad quality and generates a warning message in the Logger.

Accessing Data Using DDE/SuiteLink

The DDE/SuiteLink address has four fields:

- node name: The name of the computer where the OI Server is located. Only required for remote access.
- application name: ITME
- topic name: A device group that you defined for the device.
- item name: The specific data element. This can be the device item name or the item reference.

CHAPTER 7

Item Reference Descriptions

You use item references to access system items and read and write data from devices.

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Standard System Items

System items provide you easy access to OI Server status and diagnostics information. Client applications can read data from them just like ordinary items. However, in most cases the system item values are not directly acquired through the communications layer. System item values are usually generated through internal calculations, measurements, and tracking by the OIS Engine.

You access system items like any other item. For more information, see *Accessing the Data in Your OI Server* on page 27.

All system items follow the same naming convention:

- All system items start with \$SYS\$.
- Names are case-insensitive.

All system items can be accessed through subscriptions to a device group. However, while some system items return data for that device group, others are server-wide.

Global System Item

The following system item refers to specific information regarding a global condition of the OI Server.

System Item Name	Type/Access Rights	Description	Values
\$SYS\$Licensed	Boolean/Read	Indicates whether a valid license is present for the OI Server. If FALSE, this item causes the OI Server to stop updating existing tags, to refuse activation of new tags, and to reject write requests in addition to setting quality for all items to BAD. If TRUE, the OI Server functions as configured. All instances have the same value.	RANGE: 0, 1 0: No valid license exists. 1: Valid license exists.

Device-Group-Specific System Items

The following system items refer to specific information regarding device groups that are configured in the OI Server.

System Item Name	Type/Access Rights	Description	Values
\$SYS\$updateInterval	DWord/ReadWrite	Accesses the current update interval of the device group in milliseconds. A client can write new values into this item. The value of zero indicates that non-system items on that topic are not updated. Data for these items are not acquired from the device.	RANGE: 1...2147483647 0: Topic inactive, no items are updated. Data acquisition is stopped. >0: Expected update interval for all items in the device group.

System Item Name	Type/Access Rights	Description	Values
\$SYS\$MaxInterval	DWord/Read	Accesses the currently measured maximum update interval in milliseconds of all items of the corresponding device group. This item is read-only. It shows the time between two consecutive updates on the item that is updating the slowest.	RANGE: 0...2147483647 0: If update interval is 0 or if the status is false. >0: Measured update interval.

System Item Name	Type/Access Rights	Description	Values
\$SYS\$WriteComplete	Integer/ReadWrite	<p>Accesses the state of pending write activities on the corresponding device group. On device group creation (adding items to an OPC group), the value of this system item is initially 1, indicating all write activities are complete – no pokes are pending.</p> <p>If values are poked into any items of the device group, the value of this item changes to 0, indicating write activity is currently in progress.</p> <p>If the server has completed all write activities, the value of this item changes to 1 if all pokes were successful or to -1 if at least one poke has failed.</p> <p>If the value of this item is not zero, you can poke 1 or -1 to it. Poke a 1 to clear errors, or a -1 to test a client reaction on write errors.</p> <p>If the value of this item is zero, it cannot be poked.</p>	<p>RANGE: -1, 0, 1</p> <p>-1: Writes completed with errors.</p> <p>0: Writes are pending.</p> <p>1: Write complete. No writes are pending – initial state.</p>

System Item Name	Type/Access Rights	Description	Values
\$SYS\$ReadComplete	Integer/ Read Write	<p>Accesses the state of initial reads on all items in the corresponding device group. The value is 1 if all active items in a device group have been read at least one time.</p> <p>If at least one item in the device group is activated, this item changes to 0. It changes to 1 if all items have been read successfully, or to -1 if at least one item has a non-good quality.</p> <p>Poking a 0 to this item resets the internal read states of all items in this device group. This resets this item to 0. If all items are read again after this poke, this item changes back to 1 or -1.</p>	<p>RANGE: -1, 0, 1</p> <p>-1: All values were read but some have a non-good quality.</p> <p>0: Not all values were read.</p> <p>1: Read complete. All values were read.</p>
\$SYS\$ItemCount	DWord/Read	<p>Accesses the number of items in the corresponding device group. This item is read-only.</p>	<p>RANGE: 0...2147483647</p> <p>>=0: Number of items.</p>
\$SYS\$ActiveItemCount	DWord/Read	<p>Accesses the number of active items in the corresponding device group. This item is read-only.</p>	<p>RANGE: 0...2147483647</p> <p>>=0: Number of active items.</p>

System Item Name	Type/Access Rights	Description	Values
\$SYS\$errorCount	DWord/Read	Accesses the number of all active and inactive items that have non-good OPC quality errors in the corresponding topic. If the communications status of a device group is bad, all items have errors. This item is read-only.	RANGE: 0...2147483647 >=0: Number of all active and inactive items with errors.
\$SYS\$PollNow	Boolean/ReadWrite	Poking a 1 to this item forces all items in the corresponding device group to be read immediately (all messages in this device group become due). This is useful if you want to force getting the newest values from the device, regardless of its update interval. This also works on device groups with a zero update interval (manual protocol triggering).	RANGE: 0, 1

Device-Specific System Items

The following system items refer to specific information regarding the device(s) the OI Server is connected to.

System Item Name	Type/Access Rights	Description	Values
\$SYS\$Status	Boolean/Read	<p>Binary status indication of the connection state to the device (hierarchy level) the item is attached to. The device group (OPC access path/topic) does not affect the value.</p> <p>The status can be good even if individual items have errors.</p> <p>For DDE/SuiteLink clients, \$SYS\$Status always comes from the leaf level of a DAServer hierarchy branch, which is the destination Compact Panel node. For OPC clients, \$SYS\$Status can be accessed at all hierarchy levels. \$SYS\$Status at the root level of the whole hierarchy tree is always good, as it represents the quality status of the local computer itself. For practical application, OPC clients should access \$SYS\$Status at any hierarchy levels other than the root.</p>	<p>RANGE: 0, 1</p> <p>0: Error communicating with the device.</p> <p>1: OI Server connection to the device is intact.</p>

System Item Name	Type/Access Rights	Description	Values
\$SYS\$ErrorCode	Longint/Read	Detailed error code of the communications state to the device. The device group (OPC access path/topic) does not affect the value.	>= 0: Good status. 0 is the default state – connected. >0: Some device state, such as connecting, initializing, and so on. <0: Error status. Value indicates the error.
\$SYS\$errorText	String/Read	Detailed error string of the communications state of the device. The device group (OPC access path/topic) does not affect the value.	Descriptive text for the communications state corresponding to the error code.
\$SYS\$EnableState	Integer/Read only	Returns the current state of the hierarchy node.	RANGE: 0 to 3 0: Disabled. 1: Enabled. 2: Transitioning to Disabled. 3: Transitioning to Enabled.

System Item Name	Type/Access Rights	Description	Values
\$SYS\$StoreSettings	Integer/ReadWrite	<p>Makes the temporary update interval changes through the \$SYS\$updateInterval item permanent. If the client pokes a value of 1 into this system item, the currently set update interval is written to the server's configuration file.</p> <p>The value of this system item clears to 0 after being set, if the configuration file write is successful. If the write fails, then the value is set to -1.</p> <p>If the update interval changes via the \$SYS\$updateInterval item and this item is not poked to 1, the OI Server uses the original update interval for that device group the next time it is started.</p> <p>Reading the item always provides 0. Read/Write values are persisted only if you set this system item. The values other than this persist only for the life of the OI Server.</p>	<p>RANGE: -1, 0, 1</p> <p>-1: Error occurred while saving the configuration file.</p> <p>0: Read value always if status is OK.</p> <p>1: Persist settings. Cleared immediately.</p>

Supported Data Types

The Wonderware InTouch Machine Edition OI Server 2014 maps InTouch item data types to the following data types.

InTouch Data Type	DAServer Data Type	Description
Discrete	VT_BOOL	Boolean value (0 = FALSE, -1 = TRUE).

InTouch Data Type	DAServer Data Type	Description
Integer	VT_I4	4-byte signed integer.
Real	VT_R4	32-bit IEEE floating point value.
Message	VT_BSTR	Null-terminated ASCII string.

I/O message tags for the InTouchCE application have a size limit as specified in the InTouchCE documentation. Memory message tags for the InTouchCE application have a size limit of 1024 characters.

Format and Syntax

To access data in an InTouch application running on a Compact Panel device, simply use the InTouch tagname (or any defined device item name) as the item name. For an OPC client, the item data path is this item name combined with the name of the Compact Panel device node. Item names are not case-sensitive.

In addition to the regular item tags, the Wonderware InTouch Machine Edition OI Server 2014 supports the following categories of panel tags:

- System tags
- Array tags
- User-defined tags
- Indirect tags

For the exact syntax of the above categories of tags, see the Wonderware InTouch Compact Panel documentation.

Caution: The Wonderware InTouch Machine Edition OI Server 2014 allows read/write access to all items in the InTouch Compact application. This also applies to items that are configured as read-only in the application.

For example, you set up the Wonderware InTouch Machine Edition OI Server 2014 on a node named "OIServer.1." You configure one Compact Panel device in the OI Server and give it the name "Panel1." For this device, you set up a device group named "Group1." You want to access a tag named "ReactTemp" on the Compact Panel device.

Using a SuiteLink client, you specify the following connection information:

- **Node name:** OIServer1
- **Application name:** ITME
- **Topic name:** Group1
- **Item name:** ReactTemp

Using an OPC client, you specify the following connection information:

- **Node name:** OIServer1
- **Program name:** OI.ITME.1
- **Access path (optional):** Group1

- **Item data path:** Panel1.ReactTemp

CHAPTER 8

Troubleshooting

You can troubleshoot problems with the OI Server using these tools:

- Windows Task Manager
- Windows Performance and Alerts (PerfMon) application also called Performance Monitor
- OI Server Manager
- ArcestrA Log Flag Editor
- ArcestrA Log Viewer

Your client application may let you view error messages, monitor the status of requests, and allow you to request data on the status of the OI Server and connected devices. For more information, see your client application documentation.

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Troubleshooting with Windows Tools

Windows has two tools that may be useful in troubleshooting performance problems.

You can quickly verify that the OI Server process is running by looking at the Windows Task Manager. It also provides information on the user, CPU, and memory usage of the processes.

If you need more information, or need to gather data while not logged in, you can use the Performance and Alerts application. For more information, see the Microsoft Management Console (MMC) help files on the Performance application. The Performance application is one of the administrative tools found in the Windows Control Panel.

Troubleshooting with the OI Server Manager

The OI Server Manager has information that may be useful in troubleshooting problems. When the OI Server is active, a diagnostic node is present below the configuration node in the console tree of the System Management Console.

Each diagnostic leaf contains information about OI Server activity. For more information, see the OI Server Manager User Guide or Help files.

Finding Version Information

If you contact Technical Support, you may need to supply version information.

To determine the OI Server Manager version

- In the OI Server Manager, right-click **OI Server Manager**, and then click **About OI Server Manager**. An **About** box appears showing the version and build date of the OI Server Manager.

To determine version information for OI Server components

- In the OI Server Manager, select the OI Server name in the console tree. The version information for each OI Server component is shown in the details pane.

Using the Wonderware Log Viewer

Error messages are created by the OI Server and logged by the Logger. You can view these messages with the Log Viewer. The Log Viewer help files explain how to view messages and how to filter which messages are shown.

Log Flags are categories of messages. The Log Flag Editor User Guide contains an explanation of the categories. Using the Log Flag Editor, you can specify which log flags the OI Server creates.

Note: Generating large numbers of diagnostic messages can impact OI Server performance. You should not run in production with any more flags than those set when the OI Server is installed. To troubleshoot you can turn on more flags, but there is a performance impact. For more information, see the Log Flag Editor User Guide.

To open the Log Flag Editor

1. In the System Management Console, expand **Log Viewer** and then expand the log viewer group.
2. Select **Local**.
3. On the **Action** menu, click **Log Flags**.

In general, look at error and warning messages to determine if a problem exists. To determine whether the OI Server is communicating with a device, you can enable the DASSend and DASReceive log flags. These flags can help you determine whether or not the device is responding.

Basic Log Flags

The basic log flags for all ArchestrA components are:

- **Error:** A fatal error, the program cannot continue. By default, the Logger sets this flag to on.
- **Warning:** The error is recoverable. A client called with a bad parameter, or the result of some operation was incorrect, but the program can continue. By default, the Logger sets this flag to on.
- **Start-Stop:** Each main component logs a message to this category as it starts and stops.
- **Info:** General diagnostic messages.
- **Ctor-Dtor:** C++ classes of interest log messages to this category as they are constructed and destructed.
- **Entry-Exit:** Functions of interest log messages to this category as they are called and return.
- **Thread Start-Stop:** All threads should log messages to this category as they start and stop.

OI Server Log Flags

Messages created for these log flags are for OI Server common components and contain information about internal OI Server activities.

- **DACmnProtFail:** Some failure occurred in the common components while sending a message, updating an item, or otherwise moving data. Typically, this represents some unexpected behavior in the server-specific DLL.

- **DACmnProtWarn:** Some problem occurred that interfered with sending messages, updating items, or otherwise moving data. Common examples are slow poll, value limiting during type conversion, and transaction timeout messages.
- **DACmnTrace:** Normal processing of client program requests and data movement to and from the server-specific DLL are traced on this log flag. Use this in conjunction with **DACmnVerbose** to get the most information.
- **DACmnVerbose:** Many log flags used by the OIS common components are modified occasionally by **DACmnVerbose**. When **DACmnVerbose** is set, the logging of messages on other log flags includes more information.
- **DACmnSend:** Operations within the OIS Engine DLL that revolve around sending messages to the server-specific DLL.
- **DACmnReceive:** Events surrounding messages that are returned to the OIS Engine by the server-specific DLL, including the blocking and unblocking of hierarchies.

OI Server-Device Interface Log Flags

Messages created for the following log flags are specific to an individual OI Server and contain information about communications between the OI Server and device.

- **DASProtFail:** An error in the protocol occurred. For example, the device disconnected. The program can continue, and, in fact, this category is expected during normal operation of the program. Must be set on by the generic OIS code when the OI Server starts.
- **DASProtWarn:** Something unexpected occurred in the protocol. For example, a requested item with an otherwise valid item name is not supported by this device. Must be set on by the generic OIS code when the OI Server starts.
- **DASTrace:** General diagnostic messages of a protocol-specific nature. For example, you can provide the number of items in a message for a specific protocol and then optimize based on the number.
- **DASVerbose:** Modifies all other OIS logging flags. When on, provides detailed messages.
- **DASSend:** Protocol messages sent to the device are logged to this category.
- **DASReceive:** Protocol messages received from the device are logged to this category.
- **DASStateCat1, DASStateCat2, DASStateCat3, DASStateCat4:** These are general categories for use by the server developer. As DeviceEngine-generated state machines are created by the OI Server, they can be told to log state machine messages to one of the following: **DASStateCat1**, **DASStateCat2**, **DASStateCat3**, or **DASStateCat4**. These messages indicate when a state is made active, when a state handler is run, when a state handler completes, and when a timeout occurs for a state machine.
- **DASStateMachine:** By default, DeviceEngine-generated state machines created by the OI Server log to this category unless specifically told to log to one of the **DASStateCatN** categories. In addition, general state machine messages are logged to this category. These messages indicate when a state machine is created and deleted.

Specific Log Messages for the Wonderware InTouch Machine Edition OI Server 2014

These messages are specific to the Wonderware InTouch Machine Edition OI Server 2014. When you enable the specified log flag, these messages are generated and logged.

Message	Log Flag	Solution
Item:<Item_name> created for the Panel:<Panel_name>, but advised Item is Invalid.	DASProtWarn	Make sure the advised item name and data type are correct.
Panel<Panel_name> StateChart not yet initialized	DASProtWarn	These messages are informational only.
Reply Timeout is hot-configured to <New_timeout> millisecs for the Panel '<Panel_name>'	DASProtWarn	
Connection Timeout is hot-configured to <New_timeout> millisecs for the Panel '<Panel_name>'	DASProtWarn	
Max outstanding messages is hot-configured to <New_Value> messages for Panel node '<Panel_name>'	DASProtWarn	
Number of Message retries is hot-configured to <New_value> for Panel node '<Panel_Name>'	DASProtWarn	
Value of '<Attribute_names>' field for a Panel Node has been changed from '<Old_value>' to '<New_value>'. Need to restart the server or reset the node for the change to take effect	DASProtWarn	Restart the OI Server or reset the node so that your new settings can take effect.
Connecting to Panel: API connection Failed	DASProtWarn	Check that: The network connection to the Compact Panel device is working.
Read operation from the Panel failed, Error: <Windows_error_code>	DASProtWarn	InTouch Compact is correctly installed on the Compact Panel device.
Item handle failed while poking to the tag index: <Tag_index>	DASProtWarn	The InTouch application is running on the Compact Panel device.
Item <Item_name> advised is invalid	DASProtWarn	
Connection attempt for the Panel:<Panel_name> has failed	DASProtFail	Check the valid Windows error code returned by the message and take necessary action.
Connection to the Panel failed	DASProtFail	
Caching tag database::Connection to the Wonderware Panel:<Panel_name> has failed	DASProtFail	
Connection to the Panel failed;re-try after slowpoll interval	DASProtFail	Informational only.

Message	Log Flag	Solution
Read operation failed with error code: <Windows_error_code>: from the Panel:<Panel_name>;retrying after slowpoll	DASProtWarn	Check the Windows error code returned by the message for more information.
Failed to get the item handle from the Panel,re-trying after slowpoll	DASProtWarn	
Failed to get the item handle after <Value> re-tries;re-trying operation to the Panel:<Panel_name> after slowpoll	DASProtWarn	
Failed to get the item handle;re-trying operation to the Panel:<Panel_name> after slowpoll	DASProtWarn	
Failed to get the item handle with error code: <Windows_error_code>: from Panel:<Panel_name>;retrying after slowpoll	DASProtWarn	
Read operation from the Panel failed,re-trying after slowpoll	DASProtWarn	
Read operation from the Panel failed after <Value> re-tries;re-trying operation to the Panel:<Panel_name> after slowpoll	DASProtWarn	
Re-trying connection for the Panel:<Panel_name> after slowpoll interval	Info	Informational only.
SvIoStateChart ASSERT failure at line <line_no> of file '<File_name>'	Error	Contact Wonderware Technical Support if this error occurs.
Lost connection to the Panel	DASProtWarn	Check the network connection to the Panel. Check if the Panel is being reprogrammed. Check if Panel is shutdown.