AVEVA™ Communication Drivers Pack – Internal - SIM Driver

User Guide

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Chapter 1

Introduction to the Simulator Communication Driver

The Simulator Communication Driver installs the Communication Driver components that provide random simulated data for client applications to use in basic testing of their graphics and logic during development.

- About the PLC_Test Connection
- Supported Data Simulation Algorithms

About the PLC_Test Connection

The PLC_Test Connection provides simulated data for the Communication Driver by setting the simulated data parameters.

Supported Data Simulation Algorithms

The Communication Driver generates simulated data using the following algorithms:

- Sine
- Cosine
- Square
- Toggle (Binary)
- Triangular
- String
- Random
- None (No data simulation)

Additionally, a Process Variable simulation is provided to simulate a process control variable operation.

Chapter 2

Using the Simulator Communication Driver

Adding a PLC_Test Connection

Add a PORT_TEST Connection that enables you to add a PLC_Test connection.

To add a PORT_TEST Connection

1. In the OI Server Manager, expand Default Group, and then expand **Local**.
2. Expand the Simulator Communication Driver, then expand **Configuration**.
3. Right-click Configuration, then select **Add PORT_TEST Connection** from the shortcut menu.

   The **New_PORT_TEST_000** object appears in the hierarchy. Rename it, if desired

To add a PLC_TEST connection

- Right-click PORT_TEST connection in the hierarchy, then select **Add PLC_TEST Connection** from the shortcut menu.

  The **New_PLC_TEST_000** object appears in the hierarchy. Rename it, if desired.

Note: The PLC_Test hierarchy name cannot contain spaces.

Configuring a PLC_Test Connection

The PLC_Test configuration view allows you to configure the signal. There are seven configurable parameters, as described below.

1. **Algorithm**

   Indicates the default signal type. The options available in the list are:

- **None**: If **None** is specified in the algorithm at the faceplate, data simulation is disabled, and no simulated data is generated regardless of the algorithm suffix specified at the tag level. You can use it to test and validate your poking values.
- **Sine Wave**: The data value follows a sine wave.
- **Cosine Wave**: The data value follows a cosine wave.
- **Saw Tooth**: The data value follows a sawtooth wave.
- **Toggle**: The data value toggles between 1 and 0.
- **Triangular**: The value value follows a triangular wave.
- **String**: The data value contains a string with a serial number of the syntax "TEST: { SerialNumber }".
- **Random**: The data value is generated randomly.

At run time, you can specify the data generation algorithm on a per-item basis by adding the algorithm name as a suffix to the item using '/' as the delimiter. For example, if the default algorithm is Triangular and the tagname is iTest, adding appropriate suffix will force a different set of data values to be generated:

- iTest - Triangular wave is generated
- iTest /sine - Sine wave is generated
- iTest /random - Random value is generated

If you make configuration change in the algorithm, you will need to reset the corresponding hierarchy to take effect. For more information, refer to the section "Activating/Deactivating the OI Server" in the Communication Drivers Pack Help.

2. **Rate of Change**: The rate of change of the value in milliseconds.
3. **Percentage Change Per Interval**: Indicates the change per interval in percentage.
4. **Range/Group**: The range of signal values.
5. **Force Quality**:Force the simulated value to a certain OPC Quality listed - Good, Bad, Bad Configure, Not Connected, Device Fail, Sensor Fail, Last known value, Commfail, Out of service, Last usable value, sensor not accurate, Engineering units, Subnormal, Uncertain, Local Override.
6. **Items Per Message**: The maximum number items can be composed into one message internally inside the Communication Driver.
7. **Unsolicited Updates**: Indicates if unsolicited updates are received. It is recommended to select this check-box.
8. **Late Data Interval(msec)**: Use this field to generate late data. Enter the duration (in milliseconds) that the values will be buffered for. The late data values are then reported to the client after the buffer interval. For example, if you enter 10000 milliseconds as the late data interval, then 10 seconds of current data values are reported to the client, followed by 10 seconds of late data values with old timestamps and Quality=448(0x1C0). Enter 0 if you do not want late data to be generated.

Note: For detailed to manage device groups and device items, see "Managing Device Groups" and "Managing Device Items" in the Communication Drivers Pack Help.

Renaming a PLC_Test Connection

You can change the PLC_Test connection name while the Simulator Communication Driver server is active. After the name is changed, client applications using the old name cannot register data with the Communication Driver. Data for existing queries is set to bad quality. Try not to make changes to the hierarchy name after you develop a large client application.

Note: The PLC_Test hierarchy name cannot contain spaces.

To change an existing PLC_Test hierarchy name

1. In the OI Server Manager, expand the node hierarchy tree to display the target node object you wish to rename.
2. Right-click on the node to be renamed, and select **Rename.**
3. Type the name and press **Enter**.

Deleting a PLC_Test Connection

Deleting a PLC_Test connection removes the node and all defined data simulation configuration. Deleting a simulation hierarchy is not reversible. If you delete a test hierarchy in error, you must re-enter the device information.

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

To delete a PLC_Test connection

1. In the OI Server Manager, expand the node hierarchy tree to display the target node connection you wish to delete.
2. Right-click the node to be deleted, then select **Delete**.
3. Read the warning message and then select **Yes.**

   The PLC_Test connection is deleted from the hierarchy.

Chapter 3

Item Format and Syntax

Simulation Service Data Types

The Simulator Communication Driver uses a simple item naming syntax. The first character of the item name determines the default data type.

Item Name First Character	**Item Data Type**
i or I	32 bit integer
b or B	Boolean
f or F	32 bit real (short float)
d or D	64 bit real (long float)
s or S	string

You can override the above default syntax and define your specific item syntax by specifying the appropriate regular expression in the syntax definition file **TagSyntax.txt** in folder **C:\ProgramData\Wonderware\OI-Server\$Operations Integration Supervisory Servers$\OI.SIM\OI.Sim**. This file contains definition examples for reference.

Note: Item names not following this naming criteria will be rejected as invalid items at run time.

Simulation Server Suffixes

The Simulator Communication Driver allows you to specify suffixes for each item to identify the simulation signal.

- The naming syntax is case insensitive.
- The range, rate and other parameters are configured in the appropriate PLC_Test hierarchy.
- If the suffix is not specified, the configured value of the "Algorithm" parameter in the PLC_Test hierarchy will be used.

For more information, see Configuring a PLC Test Hierarchy (see Configuring a PLC_Test Connection on page 5).

Suffix	Description
/cosine	Generate a cosine wave.
/none	No signal value is to be generated.
/random	Generate a random value between 0 and value of Range/Group configured in the PLC_Test Hierarchy.
/rand.normal	Generate a normalized random value between 0.0 and 1.0.
/sawtooth	Generate a sawtooth wave.
/sine	Generate a sine wave.
/string	Generate a string with changing numeric value of the form TEST:{number}.
/toggle	Toggle value between 0 and 1.
/triangular	Generate a triangular wave.

The Simulator Communication Driver supports suffixes for process variable simulation, listed in the following table. For each simulated process variable, there are three other suffixes, which can be set dynamically at run time to determine the behavior of each simulated process variable. The suffix is case insensitive and does not require any configuration in the PLC_Test hierarchy.

Suffix	Description	Default Value	Example
/sim.pv	This is the process variable for the corresponding tag.	70.0	Tag1 /sim.pv
/sim.sp	Specifies the setpoint for the associated process variable.	60.0	Tag1 /sim.sp
/sim.dev	Specifies the maximum deviation the setpoint and process variable can have. The actual deviation is randomly generated.	6.0	Tag1 /sim.dev
/sim.noise	Specifies the maximum amount of fluctuation the process variable can have. The actual noise level is randomly generated.	3.0	Tag1 /sim.noise

Alternatively, if a tag ends with the pre-defined syntax described in the following table, the Simulator Communication Driver can recognize it as a process variable or as an associated parameter. The syntax for process variable parameters is encoded in the process variable definition file **PVSyntax.txt** in folder **C:\ProgramData\Wonderware\OI-Server\$Operations Integration Supervisory$\OI.SIM\OI.SIM**.

Suffix	Description	Default Value	Example

.pv	This is the process variable for the corresponding tag.	70.0	Tag1.pv
.sp	Specifies the setpoint for the associated process variable.	60.0	Tag1.sp
.dev	Specifies the maximum deviation the setpoint and process variable can have. The actual deviation is randomly generated.	6.0	Tag1.dev
.noise	Specifies the maximum amount of fluctuation the process variable can have. The actual noise level is randomly generated.	3.0	Tag1.noise