Wonderware Operations Integration – Supervisory AutomationDirect ADPRO Server (G-1.2 Series)

Schneider Electric

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This document describes the technical specifications and configuration options for the Wonderware® Operations Integration - Supervisory AutomationDirect ADPRO Server (or ADPRO OI Server, for short).

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Legal Information

Technical Support

Wonderware Technical Support offers a variety of support options to answer any questions on Wonderware products and their implementation.

Before you contact Technical Support, refer to the relevant section(s) in this documentation for a possible solution to the problem. If you need to contact technical support for help, have the following information ready:

• The type and version of the operating system you are using.

• Details of how to recreate the problem.

• The exact wording of the error messages you saw.

• Any relevant output listing from the Log Viewer or any other diagnostic applications.

• Details of what you did to try to solve the problem(s) and your results.

• If known, the Wonderware Technical Support case number assigned to your problem, if this is an ongoing problem.

Introduction to the ADPRO OI Server

These are the technical specifications for Wonderware Operations Integration - Supervisory AutomationDirect ADPRO Server.

Requirements

ADPRO OI Server requires Wonderware Operations Integration – Core G-1.2 or later.

Supported hardware and software

This OI Server enables TCP/IP Ethernet communication with AutomationDirect Productivity Series Programmable Automation Controllers (PACs) with firmware above 1.1.12.14.

To program your PAC, you can use the Productivity Suite Programming Software from AutomationDirect. For more information, go to: support.automationdirect.com/products/p3000.html

Conformance

The following hardware and software was used for conformance testing of this OI Server:

- Equipment: P3-550 CPU
- TCP Port: 502

Configuring the ADPRO OI Server

Each server instance has its own hierarchy of objects, and each object has parameters that you need to configure in order to establish communication between the OI Server and individual devices on the network.

You can view a ADPRO server instance's configuration hierarchy under its **Configuration** node.

This section only describes how to configure object parameters for a ADPRO server instance. For more general information about adding and configuring objects, see "Configuring Your OI Server" in the *Operations Integration Server Manager Help*.

Configuring a Channel's Communication Settings

Configure the communication settings for a selected channel to ensure uninterrupted communication with the device network.

MaxGap

The maximum difference between the addresses that is allowed to read in each block when reading in multiple blocks. The default value is 10. The possible range is 1 to 999999.

Advanced

Click this button to open the *Advanced Settings* dialog box, which provides access to additional communication settings such as timeouts, retries, and buffer sizes. You might need to change these settings if the OI Server behaves unexpectedly during run time, but the default settings should work for most network configurations. For more information about these settings, see "Advanced Settings" in *Operations Integration Server Manager Help*.

Setting a Device's Station ID

Set the station ID for a selected device so that the OI Server can identify and communicate with it on the network.

Syntax

The station ID for a target device must use the following syntax:

```
<IP address>[:port number][;file path]
```

The following syntax diagram shows all of the possible options:
IP address{ | :*port number*{ | ;*file path*}}

IP address

The IP address of the PAC.

port number

The port on which the PAC program is running.

This parameter is optional; if no port is specified, the default port is 502. The port number can be changed in the PAC program — for example, to enable port forwarding.

file path

The absolute file path (on the local computer) of the CSV file that contains the tag information exported from the PAC program. That information is required to access device addresses using tag names (TAG:TagName). For more information, see "Export tag information from an AutomationDirect P Series PAC program".

This parameter is optional.

Examples

Examples of valid station IDs:

```
192.168.1.123


192.168.1.123:503


192.168.1.123:502;C:\ProgramTags.csv
```

ADPRO OI Server Reference

Use item references to access data stored in memory registers in connected devices, as well as to access standard system items in the OI Server itself.

This section only describes the item reference syntax and options for the ADPRO server. For more general information about item references, see "Managing Device Items" and "Item Reference Descriptions" in the *Operations Integration Server Manager Help*.

Item Reference Syntax

Item references in this OI Server use the following syntax.

C:ID

> To access the Internal Bit

SBR:ID

> To access the System Read only Bit

SBRW:ID

> To access the System Read/Write Bit

US8:ID.Bit

> To access the Unsigned 8 bits

S16:ID.Bit

> To access the Signed Integer 16 bits

BCD16:ID.Bit

> To access the BCD 16bits

US16:ID.Bit

> To access the Unsigned Integer 16bits

SWR:ID.Bit

> To access the System Read only Word

SWRW:ID.Bit

> To access the System Read/Write Word

S32:ID.Bit

> To access the Signed Integer 32bits

BCD32:ID.Bit

> To access the BCD 32bits

F32:ID

> To access the Float 32bits

STR:ID.Length

> To access the String

SSTR:ID.Length

> To access the System String

AR1C.ID:Index.Bit

> To access the Array 1D bit

AR1US8.ID:Index.Bit

> To access the Array 1D Unsigned 8bits

AR1S16.ID:Index.Bit

To access the Array 1D Signed Integer 16bits

`AR1US16.ID:Index.Bit`

To access the Array 1D Unsigned Integer 16bits

`AR1BCD16.ID:Index.Bit`

To access the Array 1D BCD 16bits

`AR1S32.ID:Index.Bit`

To access the Array 1D Signed Integer 32bits

`AR1BCD32.ID:Index.Bit`

To access the Array 1D BCD 32bits

`AR1F32.ID:Index`

To access the Array 1D Float 32bits

`AR1STR.ID:Index.Length`

To access Array 1D String

`AR2C.ID:Index1.Index2`

To access Array 2D Bit

`AR2F32.ID:Index1.Index2`

To access Array 2D Float 32bits

`AR2US8.ID:Index1.Index2.Bit`

To access Array 2D Unsigned 8bits

`AR2S16.ID:Index1.Index2.Bit`

To access Array 2D Signed Integer 16bits

`AR2US16.ID:Index1.Index2.Bit`

To access Array 2D Unsigned Integer 16bits

`AR2BCD16.ID:Index1.Index2.Bit`

To access Array 2D BCD16bits

`AR2S32.ID:Index1.Index2.Bit`

To access Array 2D Signed Integer 32bits

`AR2BCD32.ID:Index1.Index2.Bit`

To access Array 2D BCD 32bits

`AR2STR.ID:Index1.Index2.Length`

To access Array 2D String

`DI:Group.Base.Slot.Bit`

To access Discrete In

`DO:Group.Base.Slot.Bit`

To access Discrete Out

`MST:Group.Base.Slot.Module`

To access Module Status Bit

`AIS32:Group.Base.Slot.Channel`

To access Analog In Signed 32bits

`AOS32:Group.Base.Slot.Channel`

To access Analog Out Signed 32bits

`AIF32:Group.Base.Slot.Channel`

>   To access Analog In Float 32bits

`AOF32:Group.Base.Slot.Channel`

>   To access Analog Out Float 32bits

`TAG:TagName`

>   To access device addresses using tag names

Where...

ID

>   The ID portion of the specific System ID to be read.

Index

>   The index position of the specific element of the System ID array to be read.

Index1

>   The first dimension index of the specific element of the System ID array to be read.

Index2

>   The second dimension index of the specific element of the System ID array to be read.

Length

>   The length of the string to be read.

Bit

>   Read a specific bit of the System ID.

>   This is an optional parameter. If no bit is specified, then the entire register will be read.

Group

>   The group number (00 = Local Group, 01 – 99 = Remote system).

Base

>   The base number.

Slot

>   The slot number.

Bit

>   The DI/DO bit number.

Channel

>   The AI/AO channel number.

Module

>   The module information number.

Address Descriptions

The address descriptions consist of the register type, its item name and the allowable range of values, the default data type, allowable suffixes (if any), and allowable access methods.

Register Type	Description
C	Internal Bit
SBR	System Read only Bit
SBRW	System Read/Write Bit
US8	Unsigned 8 bits
S16	Signed Integer 16 bits
BCD16	BCD 16bits
US16	Unsigned Integer 16bits
SWR	System Read only Word

Register Type	Description
SWRW	System Read/Write Word
S32	Signed Integer 32bits
BCD32	BCD 32bits
F32	Float 32bits
STR	String
SSTR	System String
AR1C	Array 1D bit
AR1US8	Array 1D Unsigned 8bits
AR1S16	Array 1D Signed Integer 16bits
AR1US16	Array 1D Unsigned Integer 16bits
AR1BCD16	Array 1D BCD 16bits
AR1S32	Array 1D Signed Integer 32bits
AR1BCD32	Array 1D BCD 32bits
AR1F32	Array 1D Float 32bits
AR1STR	Array 1D String
AR2C	Array 2D Bit
AR2US8	Array 2D Unsigned 8bits
AR2S16	Array 2D Signed Integer 16bits
AR2US16	Array 2D Unsigned Integer 16bits
AR2BCD16	Array 2D BCD16bits
AR2S32	Array 2D Signed Integer 32bits
AR2BCD32	Array 2D BCD 32bits
AR2F32	Array 2D Float 32bits
AR2STR	Array 2D String
DI	Discrete In
DO	Discrete Out
MST	Module Status Bit
AIS32	Analog In Signed 32bits
AOS32	Analog Out Signed 32bits
AIF32	Analog In Float 32bits
AOF32	Analog Out Float 32bits

Examples of Item References

These are examples of valid item references for this OI Server. For more information about the referenced addresses, see the manufacturer's documentation for your device.

System ID	Item Reference
US8-000250	US8:250
AR1S16-000010[15]	AR1S16.10:15

ADPRO OI Server Error Codes

The following tables describe the additional error codes that you might receive when poll/poke requests and operations fail.

Code	Description	Possible Causes	Solution
0	OK	Communication without problems	None required
1	Error sending buffer	If using TCP/IP, the connection with the slave device might have been reset.	Check the switches and network connection for failures.
2	Invalid station on slave response	The response sent by the slave does not match the request made.	• Check for multiple masters on the network. • Check the time out configuration settings (see section "Configuring the communication settings") and increase the time out.
3	Invalid CheckSum	Electrical interference on your connection.	Check the physical connections on your network and verify if it is within the recommended physical layer specifications.
4	Invalid sequence number	The time out configured in the settings is too short.	Check the time out configuration settings (see section "Configuring the communication settings") and increase the time out.
7	Invalid function code on slave response	The slave replied with a function code that does not match the request.	• Check for multiple masters on the network. • Check the time out configuration settings (see section "Configuring the communication settings") and increase the time out.
8	Slave returned exception code	The slave could not comply with the request.	Enable the protocol analyzer to see more details and the exception code returned, the message will help you to identify wrong settings (e.g.: unsupported address range) or list possible errors in the PLC.
9	Invalid tag name	Could not find a tag name in the CSV file.	Check if the tags being used in the application match the CSV file.
10	Bit write not supported	This OI Server does not support writing to bits.	None available.
11	Invalid Max Gap.	MaxGap value shouldbe in the range from 1 to 999999.	Set MaxGap with value in the range 1 to 999999.
101	Illegal function code	Function code used is not supported by device.	Check with device manufacturer to support the function code.
102	Illegal data address	Data address that is accessed by driver is non existent.	Change the address in the driver sheet to address, which is present in the device.
103	Illegal data value	Data value that is read from the address which is non existent.	Change the address in the driver sheet to address, which is present in the device.
104	Slave device failure	Unrecoverable error occurred in the device, performing the requested action.	Device should be restarted, make sure that the requested action is valid.
105	Acknowledge	Device taking more time to process request.	Device will respond with appropriate response once processing is complete.
106	Slave device busy	Device is busy processing other request/command.	Request for read or write once the device is free.
108	Memory parity error	Parity error detected in device while reading the address.	Device requires a service.
110	Gateway path unavailable	Gateway is misconfigured or overloaded.	Check that gateway that is used for internal communication from input port to ouput port is properly configured.
111	Gateway target device failed to respond	Device is not present in the network.	Check if the device is present.

Code	Description	Possible Causes	Solution
0	OK	Communicating without error.	None required.
-15	Timeout waiting for message to start	• Disconnected cables. • PLC is turned off, in stop mode, or in error mode. • Wrong station number. • Wrong parity (for serial communication). • Wrong RTS/CTS configuration (for serial communication).	• Check cable wiring. • Check the PLC mode — it must be RUN. • Check the station number. • Increase the timeout in the driver's advanced settings. • Check the RTS/CTS configuration (for serial communication).

Export tag information from an AutomationDirect P Series PAC program

Export tag information from an AutomationDirect Productivity Series (a.k.a. P Series) PAC program, so that the tags on the PAC can be referenced by name.

The tag information is exported as a comma-separated values (CSV) file, which you will subsequently reference in the station ID of the target device. You can use AutomationDirect's Productivity Suite Programming Software to export the file, and you can download the software from the AutomationDirect website at: support.automationdirect.com/products/p3000.html

To export the tag information from the PAC program:

1. Run the Productivity Suite Programming Software, and then use it to open your PAC program (`.adpro`).

2. Click **File**, and then on the File menu, click **Export** > **Tags**.
   The *Export Tag Database* dialog box is displayed.

3. Click **Browse**, and then use the file browser to locate where you want to save the file.

4. In the **File name** box, type a name for the file.

5. Click **Select**.
   The file browser is closed, and the selected location is displayed in the **To File** box.

6. Select **Include I/O Tags**.

7. Click **Export**.

The file is saved at the specified location.