Certification Testing Configuration Guidelines

OPC Client Configuration

Compliance

March 12, 2014

Contents

1 Introduction

This document provides the necessary instructions for you to prepare your OPC Client (DA and UA) configuration for certification testing. Submit your configuration to the lab along with installation instructions.

1.1 Terminology

The terms *Node, Item,* and *Tag* mean the same thing, i.e. an item in the address-space of the OPC Server.

1.2 Client Application Types

OPC Clients vary by function and require different configuration and testing:

Follow the guidelines in the applicable section for providing an ideal test-configuration of your OPC Client.

2 Client Configuration Requirements

- A real-world configuration is desired for testing.
- The Client must be configured to allow multiple OPC Server connections.
- A valid license (if applicable) enabling all OPC functionality must be provided to the lab.
- Full tracing/logging of OPC activity enabled.

Cannot provide the configuration? Please send Client configuration instructions per these requirements.

2.1 Server Connections

- **UA Client**: A local connection to the OPC Foundation UA Sample Server:
  opcfoundation.org/developer-tools/developer-kits-unified-architecture/sample-applications/
- **DA Client**: A local connection to the OPC Foundation DA 2.05a/3.0 Sample Server:
  opcfoundation.org/developer-tools/developer-kits-classic/data-access-net-api-sample-code-and-applications/

3 Item Configuration

The Client should be configured with:

- all supported data types (including arrays)
- at least one group configured for deadband testing
- a set of static items to write to - items that won't be changed by the server (Static)
- a small set of dynamic items – one of each data type (Dynamic)
- a large set of dynamic items with a fast change rate (DynamicFast)

The client should be configured with a project/program for testing purposes. Sample project ideas are described in the next section.

4 Specific Client Type Scenarios

The Certification Test Lab will expect to receive a configuration file to help quickly establish a test-environment that can then be tailored to include other OPC Server connections etc.

4.1 HMI/SCADA Clients

HMI clients generally use only a subset of OPC functionality during normal (runtime) operations. OPC functionality used during configuration and during runtime will be tested for certification.

All general (common) functions should be used that affect the Client operations.

1. Screens ....*typically based on Subscriptions*
2. Script Engine...........*typically using Read and Write access*
3. Data Logging...........*typically using cyclic Reads or Subscriptions*
4. Data Logging...........*typically based on Subscriptions*
5. Trending ....*typically based on Subscriptions*

These configuration scenarios must use all supported data types with different access rights, where applicable.

4.1.1 Screens

One or more pre-configured Screens are needed to demonstrate OPC compatibility. The visual aesthetics of the screen are not important (*do not spend time making them look pretty*). The following table shows the functionality needed for testing along with suggestions on how to present them:

Test Requirement	Idea/Suggestions
Able to read/write to Nodes of all supported data-types while displaying: Value, StatusCode, and Timestamp(s). **TIP**: *If possible, use an "Alias" feature that separates the Node Ids from the underlying data-source. For example, in an ideal world a button would be available to enable an end-user to dynamically change the bindings of all of the window controls to use Nodes in a different OPC Server. The Certification Test Lab will expand upon this to include other OPC Servers following your instructions on how to do so.*	Using "Text boxes" in a table format, e.g. | Type	Value	Status	Time Server	Time Device
---	---	---	---	---
Bool				
Int16				
String					 Create a table like above for Dynamic, and separate tables for Static, Read Only and Read/Write etc.
Animated Symbols	Place several symbols that can be animated onto a screen. Show one-way and two-way binding, for numerous data-types.
Picture Switching	Create a screen where the picture displayed is based on the value of a Node, e.g. Picture1=10; Picture2=20 etc. Do this for numerous data-types.
Multiple OPC Connections	Create a screen that contains a copy of the table shown above. Create 4 copies of the table but do not configure any data-bindings. The lab will use them to connect to other OPC Servers.

See Appendix B – Sample HMI Screens.

4.1.2 Script Engine

- Scripts are needed to invoke a Read or Write of multiple Nodes of varying data-types.
- Each script must be activated using a Start/Stop button on the screen.

4.2 Data Logging

- A data logging configuration must connect to a typical number of Nodes and log the data.
- The data logger must log into two different archives (with respect to speed) if possible/applicable, e.g.:
    - High Speed
    - Slow Speed
- The use of OPC functions may vary for each data logging Client. If options are provided, e.g. Subscriptions and/or timed Reads etc. then each must be made available.

4.3 Trending

- A trend of each category type must be defined (e.g. one line graph, one scatter, etc.).
- Each trend must show the typical number of pens with each receiving live data from an OPC node.
- All applicable supported data-types must be accounted for in each chart type.
- The nodes being logged should be based on Dynamic items, and some Static items.

See Appendix C - Trend Charts on page 11.

4.4 Other Scenario Not Listed?

Please contact the Certification Test Lab for more information on how to proceed with your configuration.

5 Appendix A - OPC Client Check-List

Use the check-list below to prepare the information needed by the Certification Test Lab. Once you have collated the information please submit it to the same OPC Certification Test Lab personnel that you have been in communications with, or simply send to compliance@opcfoundation.org and the Compliance Director will forward to the necessary party.

5.1 OPC Client Check List

Use the following checklist to prepare the information needed by the Lab. Do not send this list to the lab.

#	Item	y/n	Initials	YY-MM-DD
OPC Client				
1.	Release version software provided to the Certification Test Lab? *installer and instructions etc.*	☐		
2.	License (activation code) provided? *see 2 Client Configuration Requirements on page 3*	☐		
3.	Clients' Address Space prepared with Static, Dynamic and R/RW/W items? *See 3 Item Configuration on page 4.*	☐		
4.	Clients' Configuration files provided to the lab?	☐		
5.	All additional software and/or device drivers etc. provided to the lab?	☐		
Other Resources				
6.	Special instructions for DCOM are provided? (if applicable)	☐		
7.	Technical support contact(s) provided?	☐		
Other				
8.	Shipping and return instructions provided? (if applicable)	☐		

6 Appendix B – Sample HMI Screens

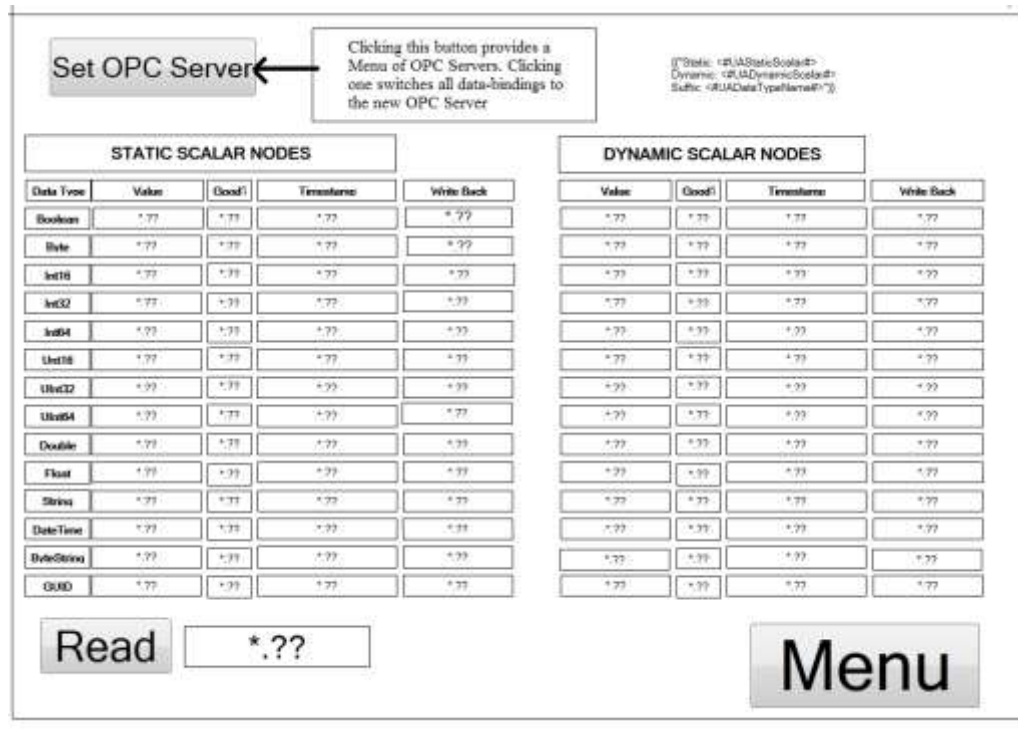The following screens are samples only, and serve as a good example of screens helpful in testing.

Figure 1 - Single Server connection, multiple items

- All supported data types; of static and dynamic items; and the ability to switch OPC Server.
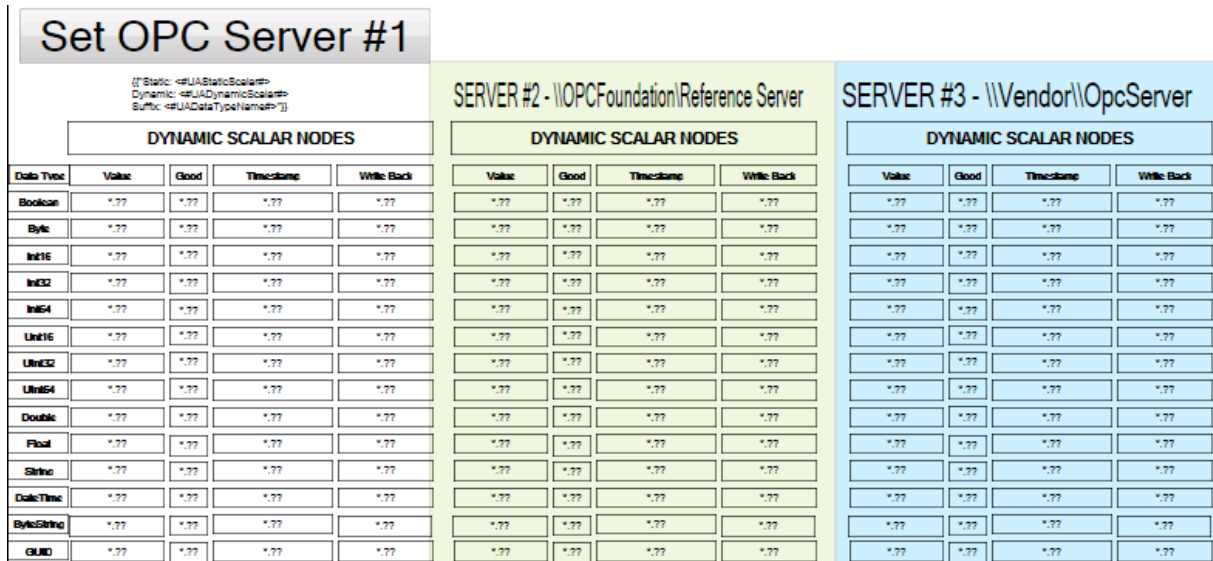- The "Write Back" field on the screen provides the ability to write to the items.

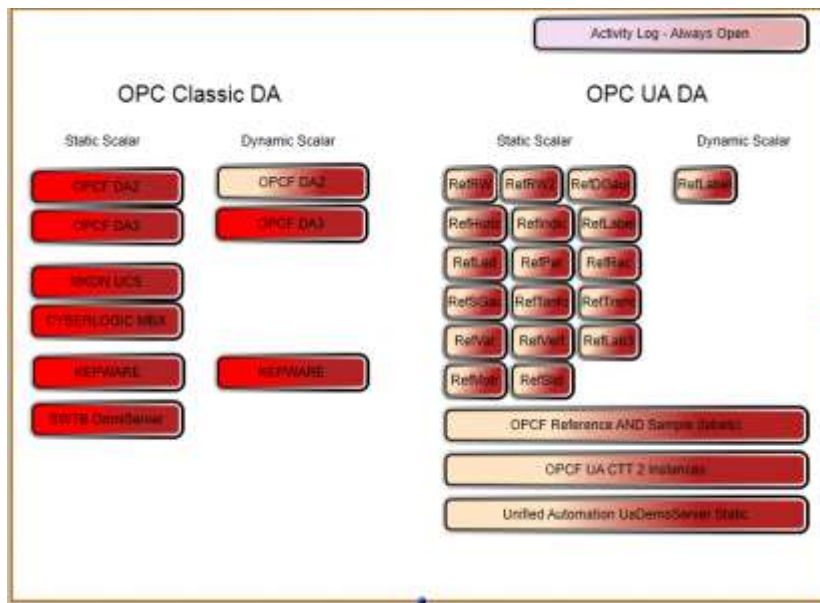Figure 2 - Screen for multiple OPC Server connections

Figure 3 - Multiple OPC Servers

Figure 4 – item configuration based on the memory addresses

6.1 Dynamic OPC Server Switching

It is **highly desirable** to have the ability to dynamically change the OPC Server for a given screen, meaning that all controls within the window receive data from an alternate OPC Server. Here are some suggestions to take into consideration when creating an "Alias" like structure with regards the Node name:

- The "path" of the NodeId. This may or may not be applicable and should therefore be specified.
- The "prefix" of the NodeId. Any text that appears before the NodeId. *See "NodeId"* below.
- The NodeId is the NAME of the node, e.g. Boolean, Int16, Int32 etc.
- The "suffix" of the NodeId. Any text that appears after the NodeId, such as "Value" or ".Value" etc.

6.2 Deadband Functionality

- Figure 4 contains display fields for all items with all supported data types that are of type analog and have EU Limits configured.
- In addition, for each deadband-item a write field is configured to write to the item, depending on the hysteresis (lag/delay) the item should change its value in the related display field.
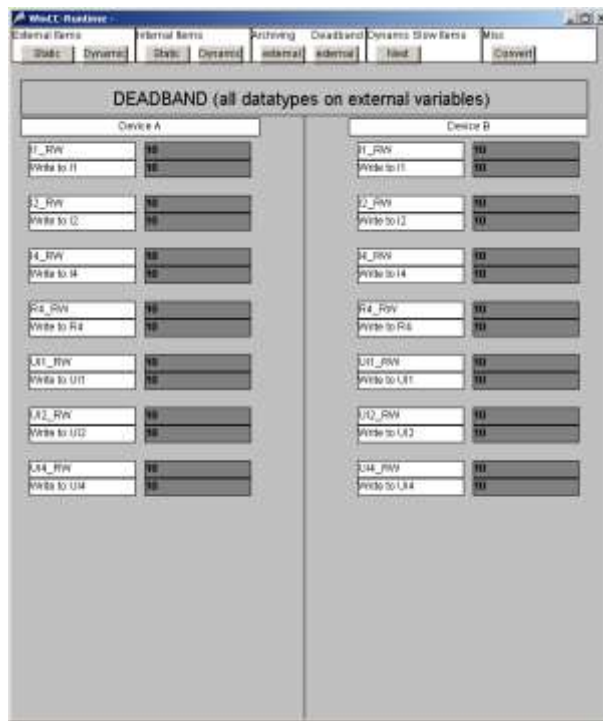

Figure 5 - Screen to test Deadband functionality
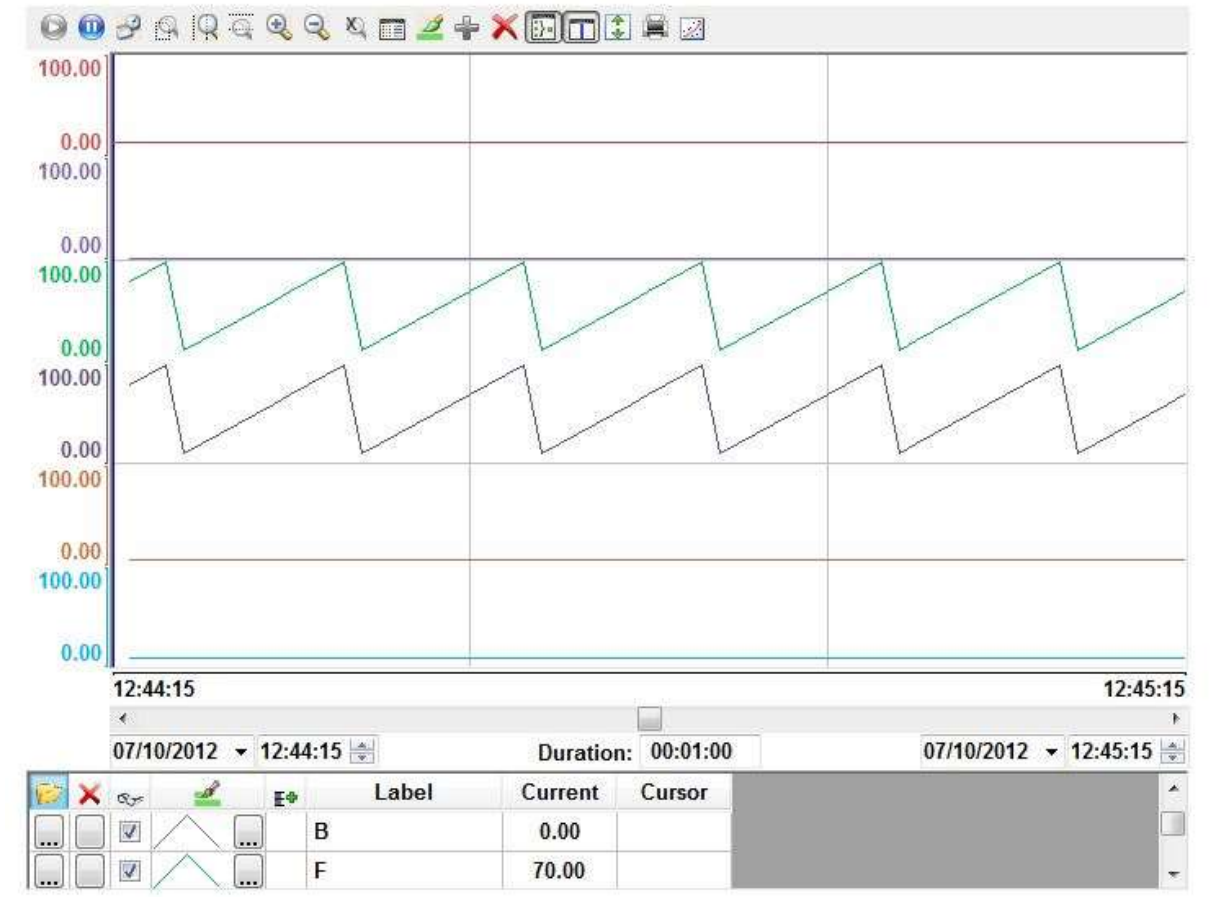
7 Appendix C - Trend Charts

Figure 6 - Trend chart with multiple pens

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Revision History

Version	Date	Author	Change
1	2007	CMP	Initial version.
2	Mar-12, 2014	CMP	Reformatted to use new template.