

ELEC-E8113 Information systems in industry

Homework 4. Max 3 points.

Deadline is 5.12.2022 (last lecture). Send a screenshot and the modified source file to ilkka.seilonen@aalto.fi.

The purpose of this assignment is to familiarize yourself a little with the basic techniques of OPC UA PubSub. You are supposed to implement small parts of a simple OPC UA server application with PubSub functionality. The assignment requires some familiarity with Java programming and using an IDE.

It is assumed in these instructions that you can use your own computer to do this assignment. If you have issues with the software tools, please, contact the teacher.

You need to download and install several of the same software tools and libraries than in OPC UA teamwork (and homework 4). Check the OPC UA teamwork document about these.

- Java version 8 (newer ones might be fine as well)
- Eclipse IDE for Java Developers, version 2019 or later. <http://www.eclipse.org>.
- Prosys OPC UA Java SDK 4.9.0. Available from a company Prosys OPC based on request. <https://www.prosysopc.com/products/opc-ua-java-sdk/> (mention Aalto University and ELEC-E8113 course in your request, ask for SDK version 4.9.0)
- DataServer and ControlServer. Zip-files are available at Mycourses / Assignments / Homeworks.

Step 1. Run DataServer. Download DataServer.zip from the homework website. It contains a Java project from Eclipse. You can run DataServer.bat from Command Prompt after setting the SDK path properly in the bat file. Open DataServer.uap from UaExpert and observe the result.

Step 2. Modify ControlServer. Download ControlServer.zip from the homework website. It contains a Java project that you should open with Eclipse: File -> New -> Java Project and uncheck the Use default location checkbox. Modify the project properties (Project -> Properties -> Java Build Path) to match your installation. Check the paths also in ControlServer.bat. Open the source file ControlServer.java in Eclipse (in folder `src\fi\aalto\control\server`). Parts of the source has been removed and you should write them. Look for a string "TODO" in the source. You should implement the following simple PubSub configurations: set a subscribed variable, set a published variable, identify writers at two different situations. Comments in the source file should help you. Otherwise you need to use the Javadoc documentation from Prosys provided with the SDK.

Step 3. Test ControlServer. First run "DataServer.bat and then ControlServer.bat both from Command Prompts. You could also run your application from Eclipse by selecting a project and giving a command Run As -> Java Application. Observe the operation of the ControlServer by opening DataServer.uap with UaExpert. In Data Access View you should see variables P300_MeasVal and M200_CurCtrlVal being updated in both servers. Create

a History Trend View (unless it already exists) and observe the trend of variables P300_MeasVal and M200_CurCtrlVal from ControlServer. You should see something similar than in the figure below.

Send your ControlServer.java file and a screenshot of the UaExpert History Trend View to the teacher.

