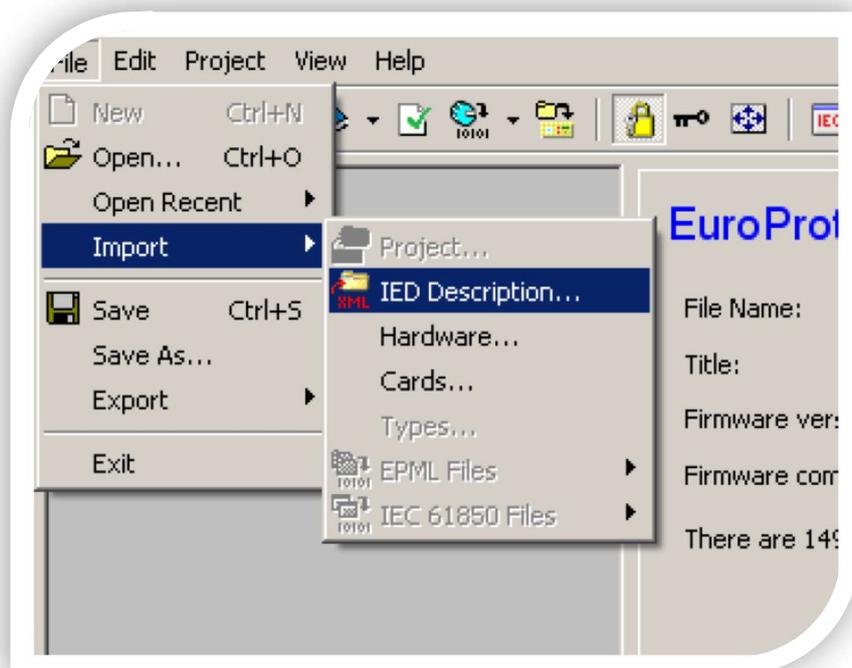


Instruction booklet

IEC 61850 configuration for AQtivate 300



IEC 61850 configuration for AQtivate 300

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Version: 1.02 EN

Revision	1.00
Date	12.02.2015
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Revision	1.02
Date	21.02.2023
Changes	<ul style="list-style-type: none">• The visuals updated.• Content rewritten to be easier to read and understand.• The “Introduction” chapter updated.• Added a few images throughout the document for clarification.

Please read these instructions carefully before using the equipment or taking any other actions with respect to the equipment. Only trained and qualified persons are allowed to perform installation, operation, service, or maintenance of the equipment. Such qualified persons have the responsibility to take all appropriate measures, including e.g., use of authentication, encryption, anti-virus programs, safe switching programs etc. necessary to ensure a safe and secure environment and usability of the equipment. The warranty granted to the equipment remains in force only provided that the instructions contained in this document have been strictly complied with.

Nothing contained in this document shall increase the liability or extend the warranty obligations of the manufacturer Arcteq Relays Ltd. The manufacturer expressly disclaims any and all liability for any damages and/or losses caused due to a failure to comply with the instructions contained herein or caused by persons who do not fulfil the aforementioned requirements. Furthermore, the manufacturer shall not be liable for possible errors in this document.

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The manufacturer reserves the right to update or amend this document at any time.

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1 INTRODUCTION

This guide will show you the basic steps for configuring IEC 61850 communication in AQ 300 series devices. This document is applicable to all models in the AQ 300 product family.

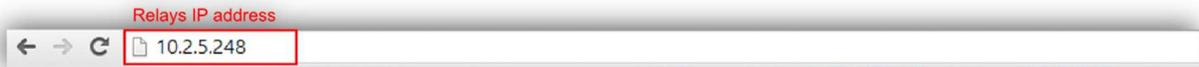
You need the AQtivate 300 software to set up the IEC 61850 configuration. This software is freely available at our website: www.arcteq.fi/documents-and-software → "Software" → "Installation files". Please note that downloading the AQtivate 300 installer requires registration but that is also free of charge.

Some relay functions require you to connect to it online via the relay's web server interface. Most web browsers work with the software, such as Mozilla Firefox, Google Chrome, and Opera.

As noted, this instruction booklet is only for the IEC 61850 communication configuration. For more detailed instructions on the AQtivate 300 configuration and setting tool, please see the AQtivate 300 instruction manual. This is also available on our website: www.arcteq.fi/documents-and-software → "Software" → "Instruction manuals".

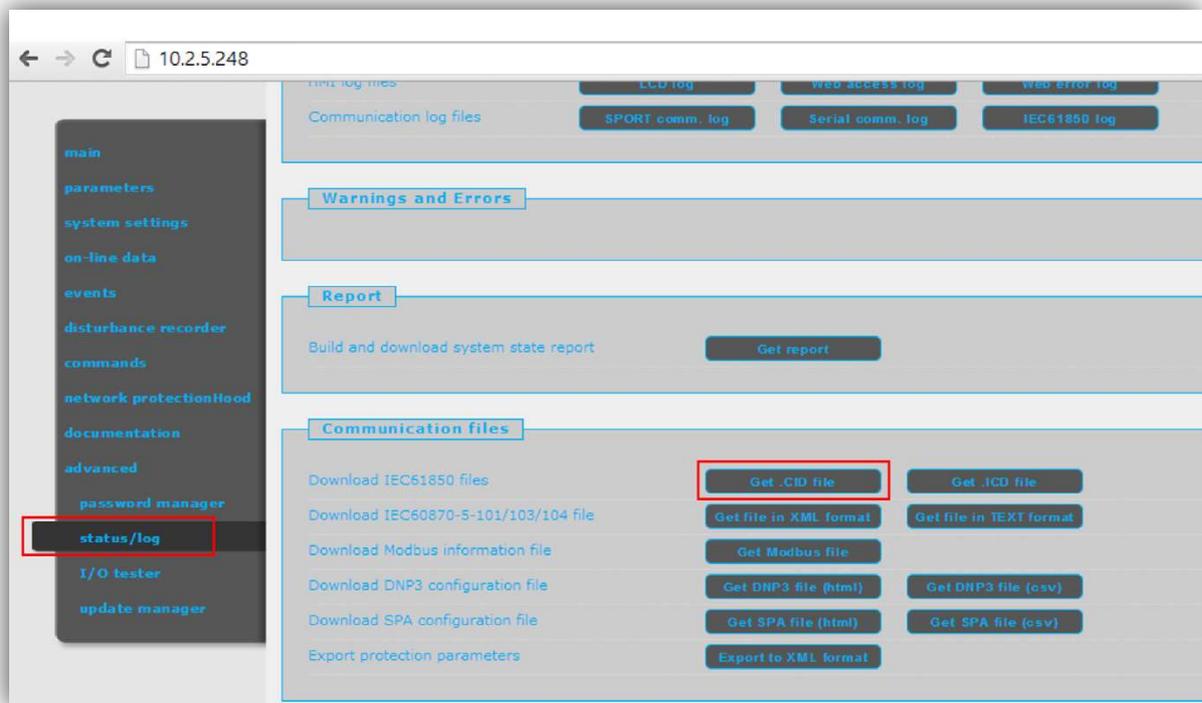
2 WEB SERVER

The AQ 300 series relays have a web server interface which can be accessed via a web browser. Open your browser and enter the relay's IP address into the browser's URL address bar (see the image below).



2.1 Downloading CID files

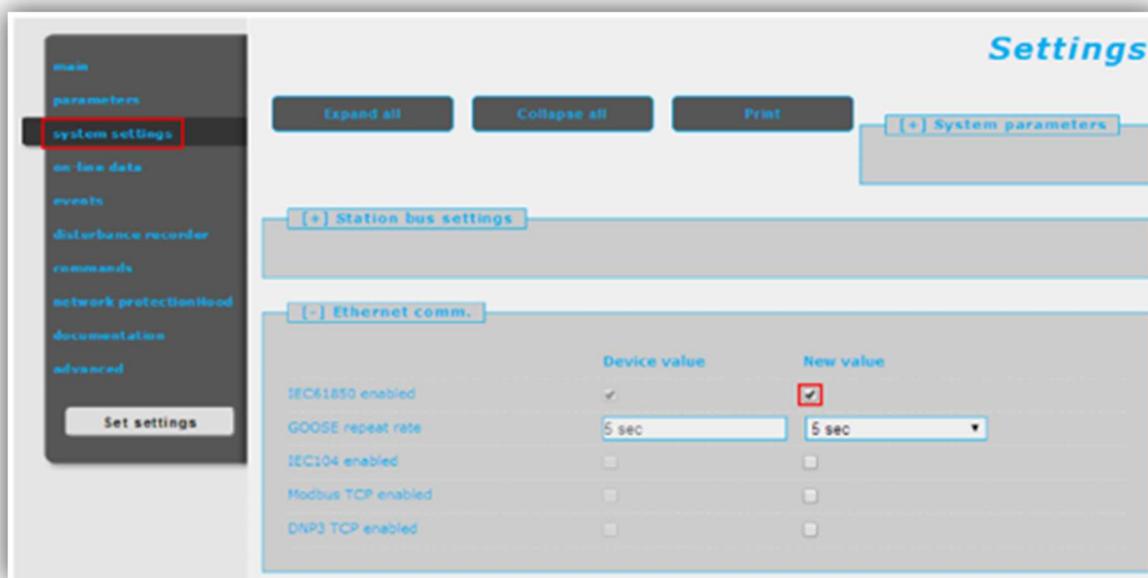
You can download CID files (file extension .cid) by following the path **Advanced** → **Status/log** and then clicking the "Get .CID file" button in the *Communication files* pane (see the image below).



2.2 Enabling IEC 61850

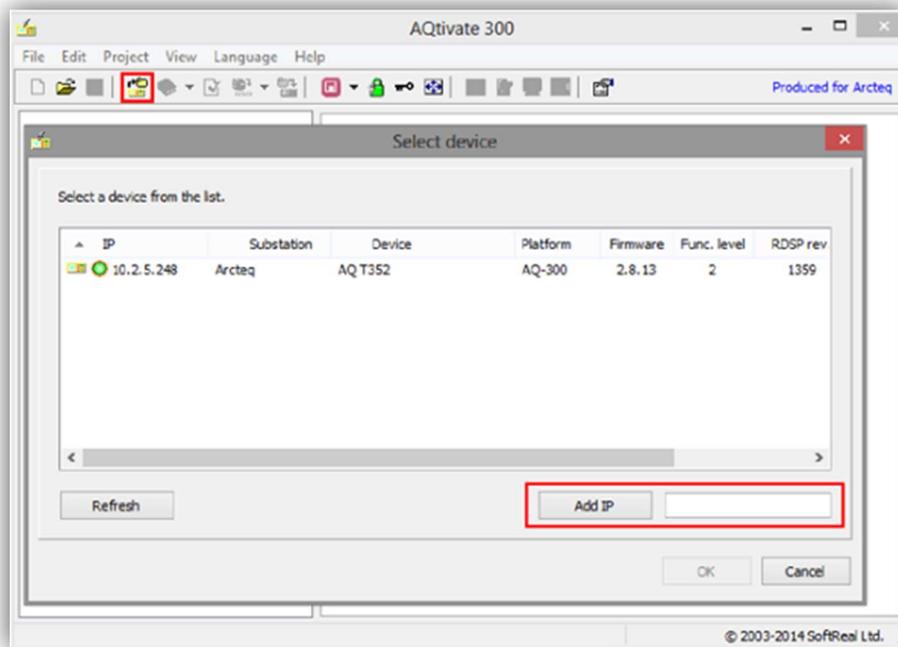
Before IEC 61850 communication can function in an AQ 300 series relay, you must first enable it with the relay's web server interface. However, this is the only step that is required to get IEC 61850 started in the device: after this you can set up the IP address information and connect to the device with an IEC 61850 client.

You can enable IEC 61850 in the interface's **System settings** and by clicking the checkbox for "IEC61850 enabled" under the column titled "New value" in the *Ethernet comm.* pane (see the image below).



3 AQTIVATE 300 SOFTWARE

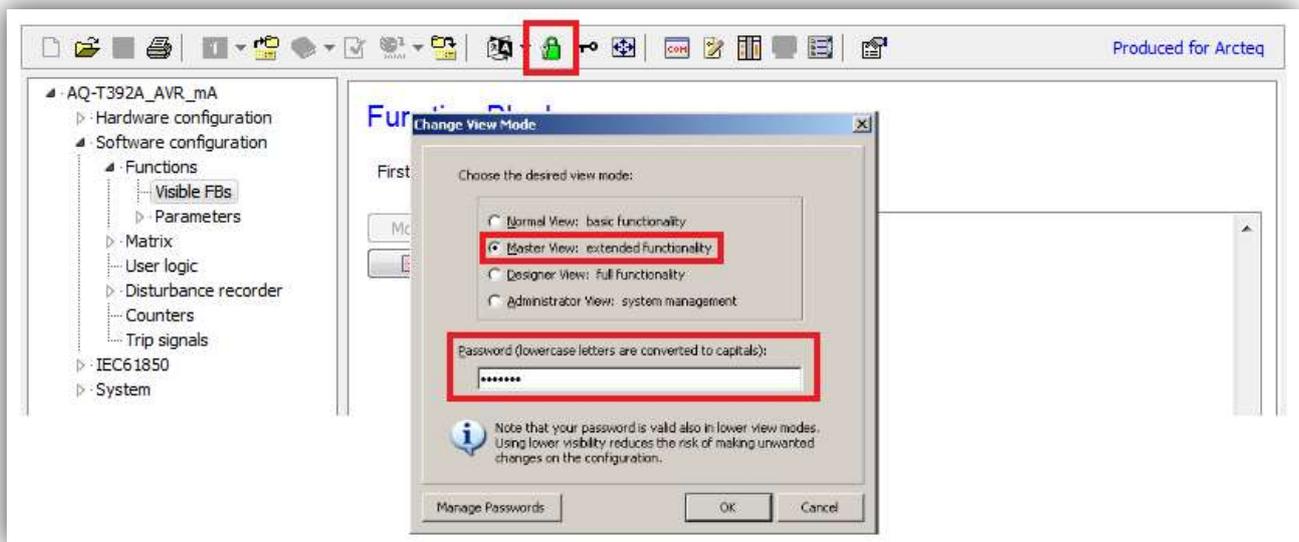
You can get a configuration file from an AQ 300 series device by opening the AQtivate 300 software and by pressing the "Upload" icon in the main toolbar (see the image below). This opens a new dialog window called *Select device* that lists all the connected devices the software finds in the network. However, in some cases your computer can have trouble finding relays in the network. If this happens, you can insert the device's IP address manually by writing the IP in the text field and clicking the "Add IP" button.



We advise you to always log into using the password-protected Master view operating mode. This allows you to change configurations as you like. When you start the software, click the "Change View Mode" icon in the main toolbar. In the dialog window that opens, choose Master view as the preferred operating mode, enter the password in its reserved text field, and press "OK" (see the image on the following page).

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3.1 Communication configurator

IEC 61850 configuration can be opened by clicking the "Communication Configurator" icon (see the image below).

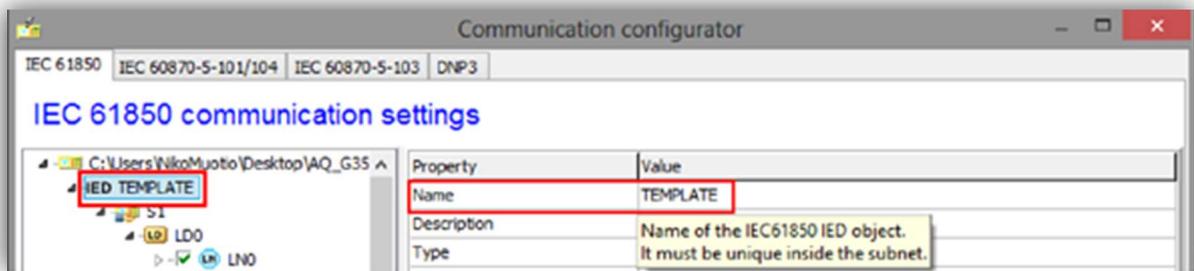


Select the "IEC 61850" tab in the opening dialog window to access further communication settings (see the image below).



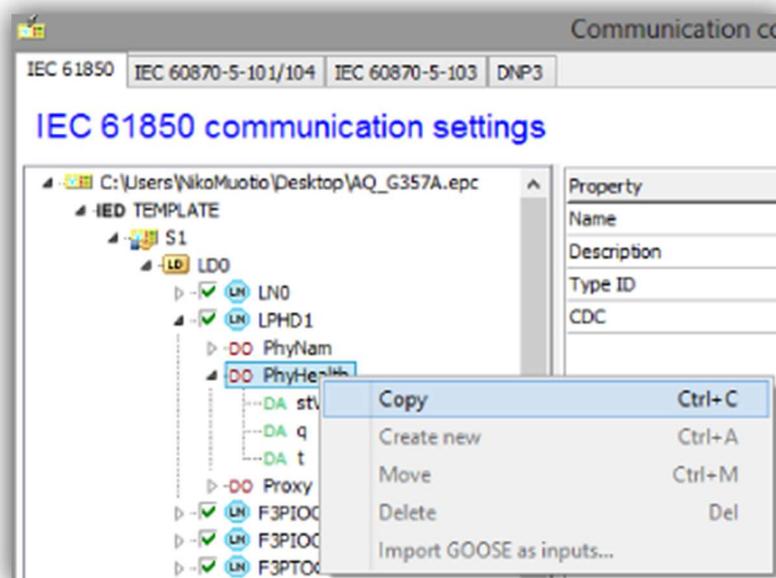
3.1.1 Adding a device name

Your relay must have a unique name. Open the Communication Configurator, open the "IEC 61850" tab in the dialog window, and click on the "IED TEMPLATE" in the topic tree panel on the left-hand side of the dialog window. Next, replace the default name "TEMPLATE" with your selected relay name (see the image below). Please note that the name must be unique within the subnet!



3.1.2 Adding a dataset

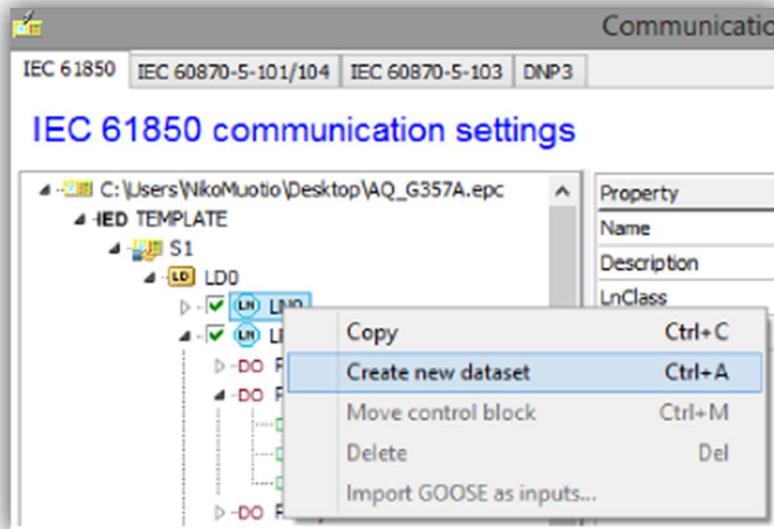
To create a new dataset, you can use an existing dataset as a basis by copying the dataset. As an example, let's imagine we want to use the dataset "DO PhyHealth" from the report control block "LPHD1" as the basis for a new dataset that is meant for the report control block "LN0" (see the image below). Find the "DO PhyHealth" dataset in the topic tree, click its name with the right mouse button, and click the "Copy" menu item from the temporary menu that appears. Alternatively, you can click the dataset's name with the left mouse button to highlight it and then use the established Windows shortcut command **Ctrl + C** to copy it.



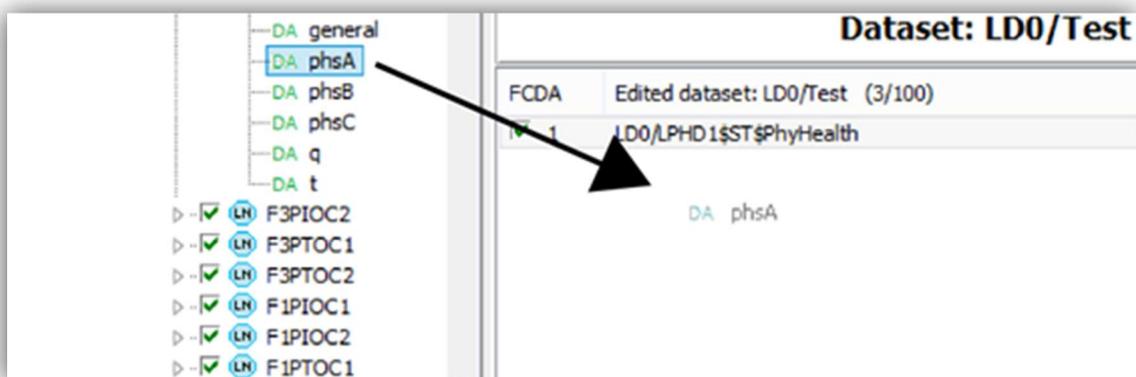
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Next, find "LN0" in the topic tree, click its name with the right mouse button, and click the "Create new dataset" menu item from the temporary menu that appears (see the image below). Alternatively, you can click the name with the left mouse button to highlight it and then use the shortcut command **Ctrl + A** to create a new dataset.

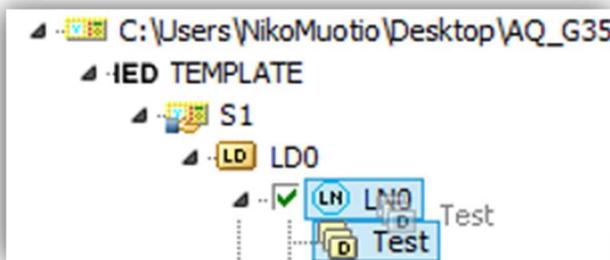


After this, you can rename the dataset and start adding other objects into it. You can add objects to a dataset by clicking the dataset you want to add objects into, and then drag-and-dropping the needed objects from the topic tree panel into the dataset's view area in the bottom-right corner of the dialog window (see the image below).

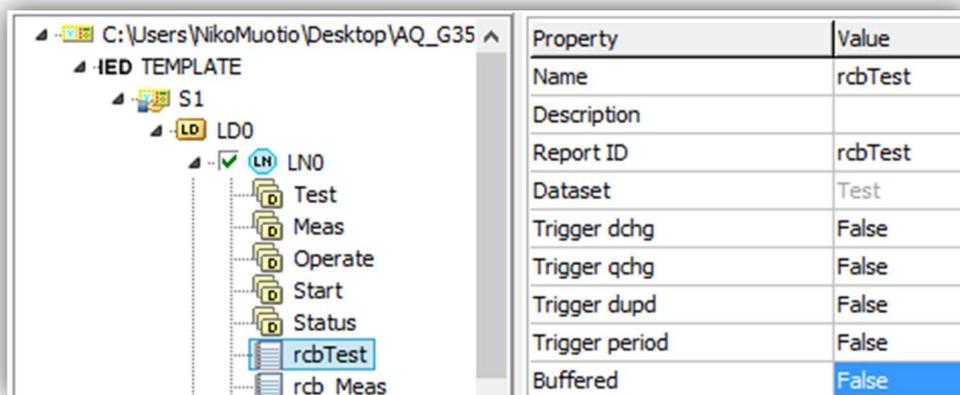


3.1.3 Adding a report control block

Next, the new dataset must be linked to a report control block. To continue with the example from before, drag the new dataset into the report control block "LN0" (see the image below).



This establishes the link and now you can rename it; here it has been renamed as "RCB". Finally, you need to make a choice whether or not the report control block is buffered or not by setting its value to "True" or "False", respectively (see the image below).



Please note that unbuffered control blocks report only when there is a subscription from the client, whereas the server collects, buffers, and reports buffered control block information even if there is no subscription from the client!

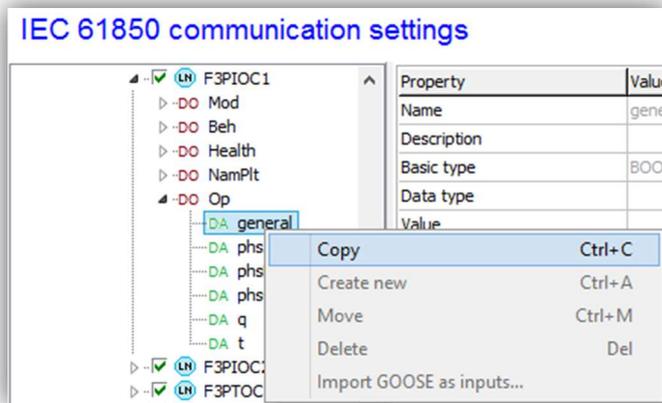
3.2 GOOSE publisher

Making a GOOSE control block with a linked dataset for publishing follows the same steps as making a new dataset and linking it to a report control block. There are two main differences to pay attention to: items must be added to the dataset on the data attribute level, and the dataset name must include the word "GOOSE". To avoid any unnecessary mishaps, the instructions below offer detailed steps for making a GOOSE publisher.

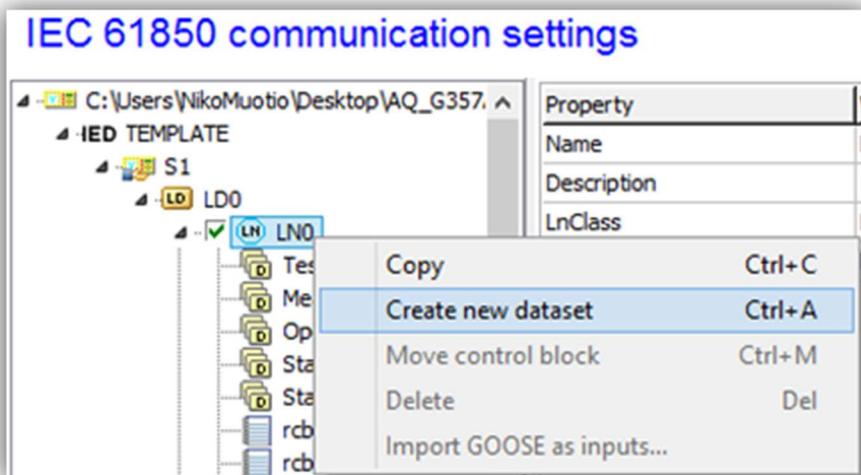
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Firstly, copy the first signal on the data attribute level (see the image below). The data attribute level is signified by the green letter "DA" before the item's name.



Secondly, create a new dataset by clicking "LN0" with the right mouse button and click on the menu item "Create new dataset" (see the image below).



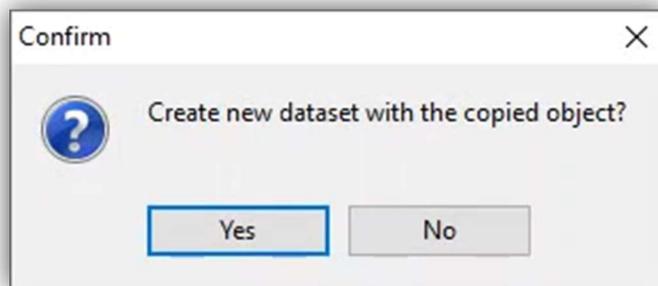
Thirdly, rename the new dataset. Remember to include "GOOSE" somewhere in the name, such as in this example where the new name is "GOOSE_test" (see the image below).



Fourthly, drag-and-drop the newly named dataset into the report control block "LN0" (see the image below).



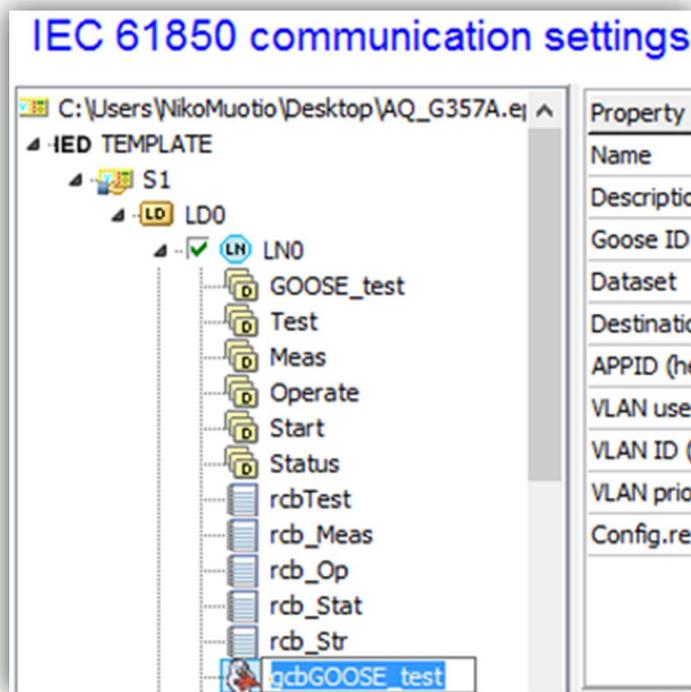
Fifthly, the software pops up a new dialogue window wanting to know whether to create a new, non-GOOSE dataset with the copied object. Deny this request with "No" (see the image below).



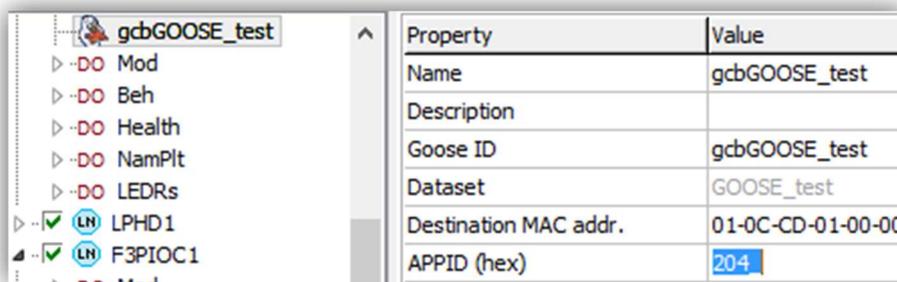
Sixthly, the software pops up another new dialogue window. This time the program wants to know whether to create a new GOOSE control block with the dataset. Accept this request with "Yes" (see the image below).



Seventhly, give the GOOSE publisher a name. In the example image below, the selected name is "gcbGOOSE_test".

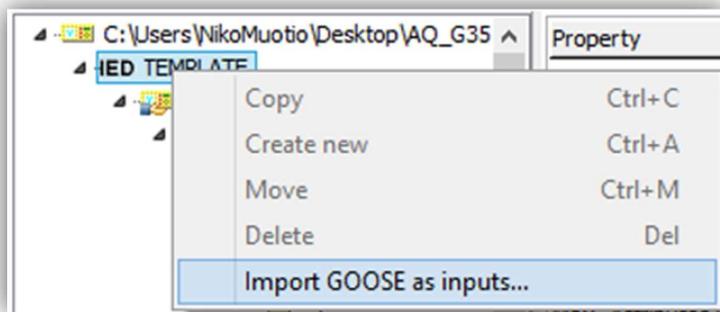


Eighthly, and finally, the control block's property "APPID (hex)" requires a value. This value must be a unique number, written in hexadecimal (see the image below).

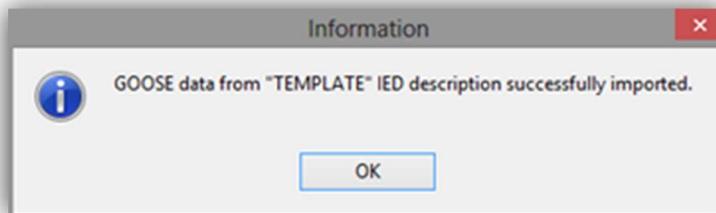


3.3 GOOSE subscriber

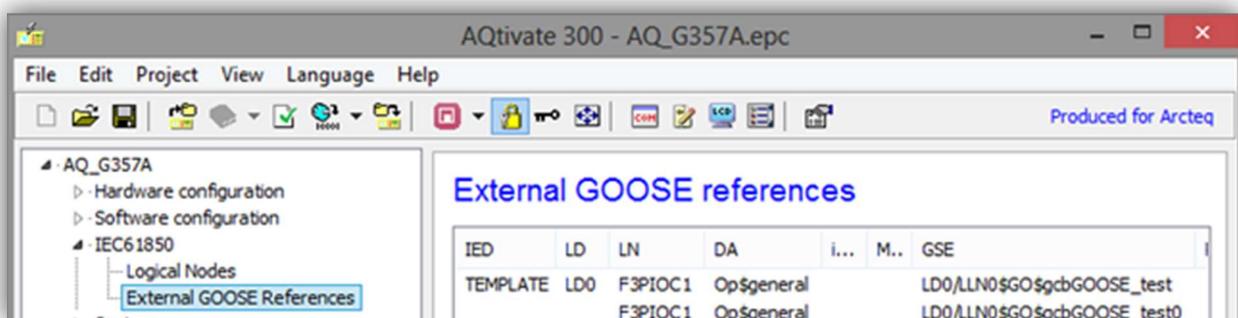
Before you can configure the GOOSE subscriber, you have to import a CID file from a device with a GOOSE publisher. You can do this by clicking the device level of the topic tree panel with the right mouse button. The device level is titled "IED [device name]". Then, click the "Import GOOSE as inputs..." option in the menu that appears (see the image below).



When the importation has been completed successfully, you receive the following confirmation pop-up window (see the image below). Click "OK"; you can now close the Communication Configurator dialog window and continue in the AQtivate 300 setting tool.



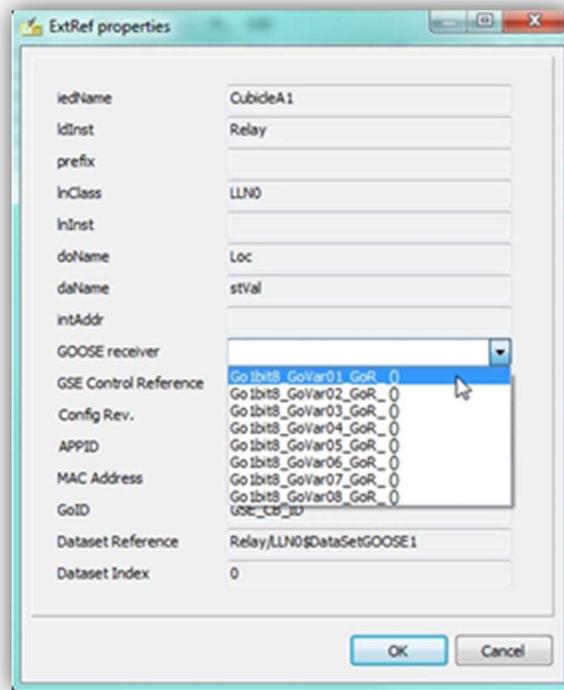
Please note that the subscribed data must be linked in the relay configuration. Find "IEC61850" in the topic tree panel on the left side of the setting tool window and open its sublevels with the small triangle in front of its name. Open the "External GOOSE References" sublevel to view its data (see the image below).



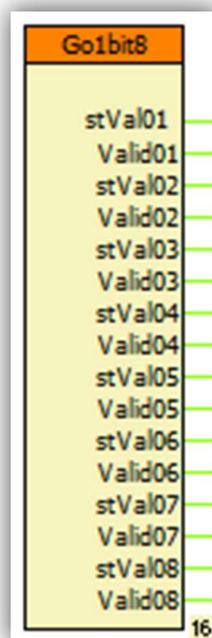
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Next, double-click on the data that you wish to link. This opens a new dialog window, titled *ExtRef properties*. In this window you can select the destination for the data linkage. The GOOSE function block has eight (8) one-bit GOOSE inputs available, and here you can determine which data is linked to which function block input (see the image below).



Afterwards, you can use the outputs of this function block in relay configuration. Below you can see the image of the GOOSE subscriber function block as it is represented in the logic editor in AQtivate 300.



4 REFERENCE INFORMATION

Manufacturer information

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