



## KEB PLC-HMI Communication

Part	Version	Revision	Date	Status
en	6.6.0	001	2021-03-19	Released

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## Introduction

This document describes how to exchange variables between COMBIVIS Studio 6 and Studio HMI through the Symbol Configuration. This allows read/write operations between a PLC and HMI visualization, giving the HMI users the ability to view tag values as well as edit them if desired. The advanced features of Studio HMI such as datalogging, cloud connectivity, and more can also then be performed with the PLC tags. This procedure will overview the setup of variable exchange in both the Studio 6 and the Studio HMI environments.

## Procedure

This section will overview the procedure for setting up PLC-HMI tag communication between a basic Studio 6 PLC project and Studio HMI project. The logic of the PLC project, as well as the basic HMI elements have already been created.

### 1. Link HMI Project

To link a Studio HMI project to a PLC project in Studio 6, right-click on the project in the Navigator and select *Add Object > COMBIVIS studio HMI project... Select Open existing project...* and browse for the HMI project to be linked.

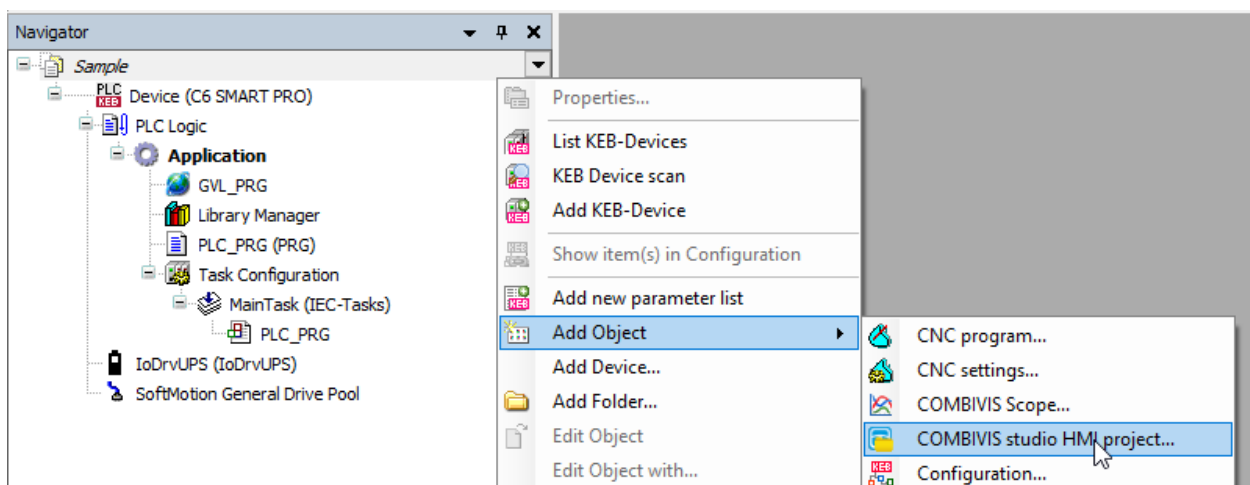


Fig. 1: Add HMI Project

Select *Open*. The HMI project must be in the same directory as the PLC project. Studio

6 will prompt you to move the project if they are in different directories. You may also give the HMI project a name that will be displayed in the Studio 6 Navigator.

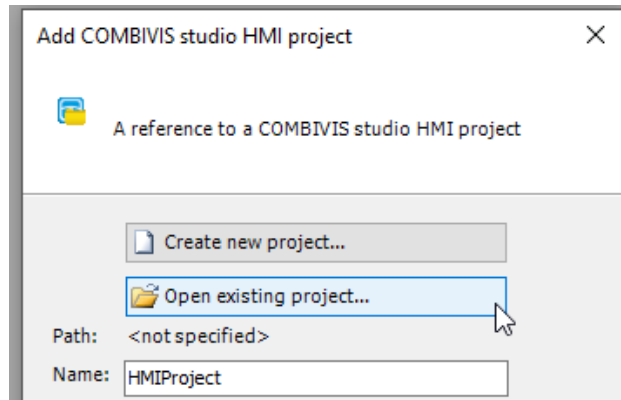


Fig. 2: Link Existing HMI Project

Select *Add*. The HMI project should now appear near the bottom of the project navigator.

## 2. Add Symbol Configuration

Symbol configuration objects allow you to select which tags are available to be exchanged with the HMI project as well as define the access rights of the HMI. To add a symbol configuration to the project, right-click on the *Application* in the Navigator and select *Add Object > Symbol Configuration...*

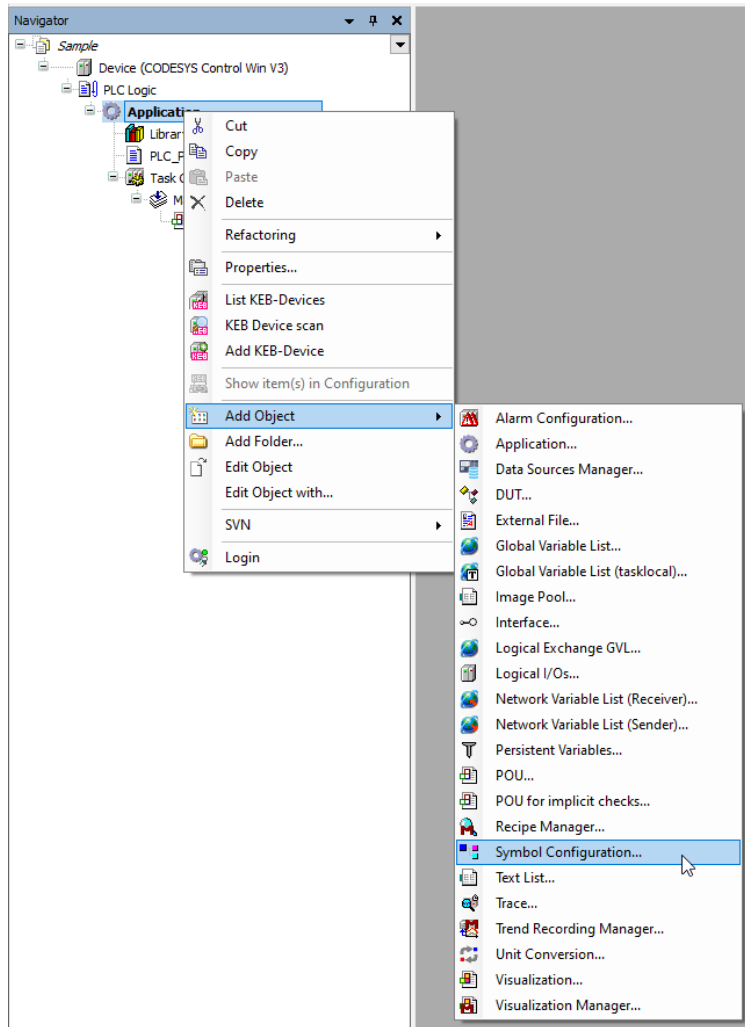


Fig. 3: Add Symbol Configuration

Tags that may be exchanged through the Symbol Configuration include global variable lists, program variables, as well as some system variables. Your available tags will be displayed.

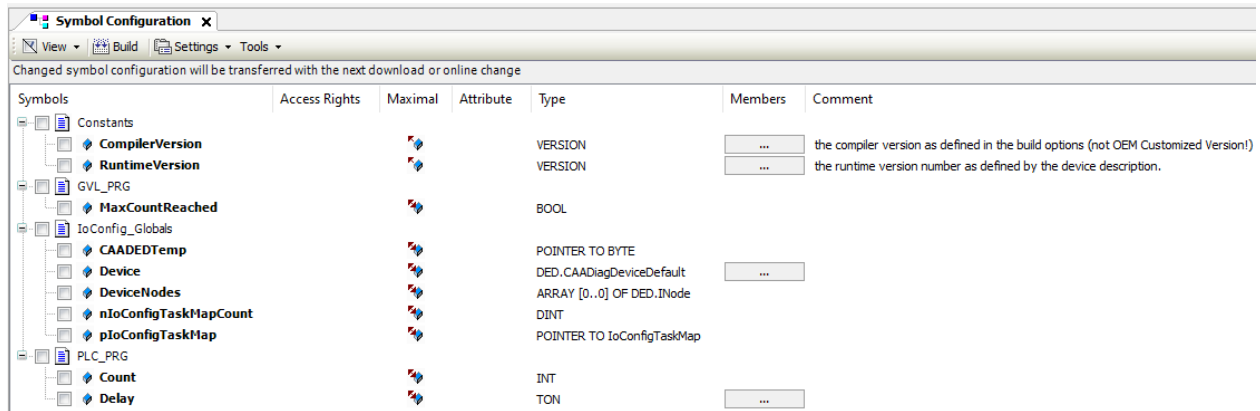


Fig. 4: Symbol Configuration Added

### 3. Select Variables to be Exchanged

You may either select specific tags to import or an entire variable list. Select the checkbox next to (1) the top-level symbol to select the entire list, or (2) expand the drop-down and select specific tags (see below).

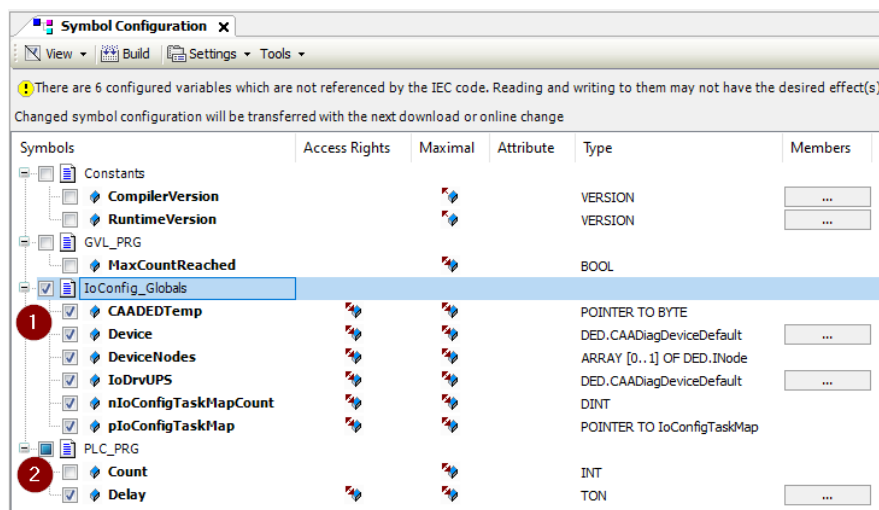


Fig. 5: Select Variables to Exchange

Additionally, you may select specific members of a data type such as a structure or function block instance. Select the “...” icon in the *Members* column to select specific data type members.

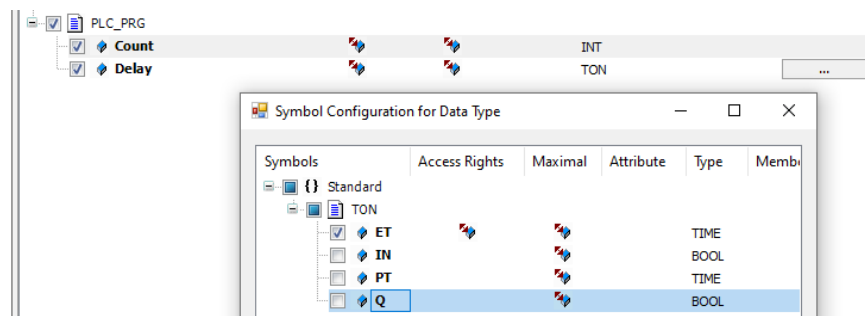


Fig. 6: Data Type Member Selection

## 4. Select Access Rights

The default *Access Rights* for a typical symbol configuration tag that has been selected is read/write. These access rights can be changed by clicking on the symbol next to the variable name.

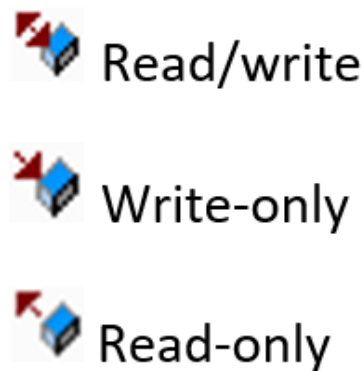


Fig. 7: Tag Access Rights

## 5. Generate Symbol File

A symbol file is used to configure the communication between the PLC and the HMI. This file can be generated two different ways: (1) login and logout of the PLC that is receiving the logic, or (2) execute *Build > Generate Code* in the Studio 6 toolbar at the top of the screen.

## 6. Transfer Communication Settings to HMI

To transfer the communication driver settings to the HMI project, right-click on the HMI project in the Studio 6 Navigator. Select *Transfer communication driver settings to HMI*. You will be prompted to select the PLC device whose application tags are to be exchanged, "Device" in this case. Select *OK*.

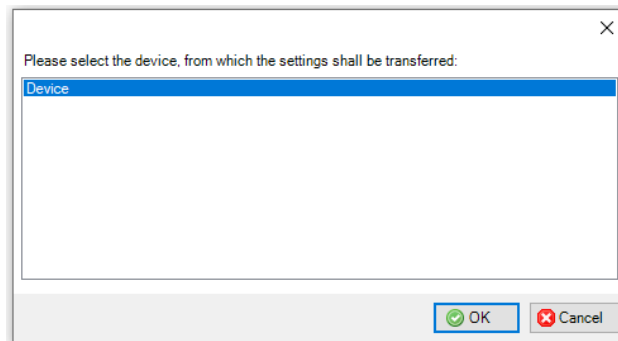


Fig. 8: Select PLC Device

The Studio HMI project will be opened if not already, and a notification will appear that the communication driver settings were transferred successfully. The driver can be seen in the *Real Time DB > Comm. Drivers*.

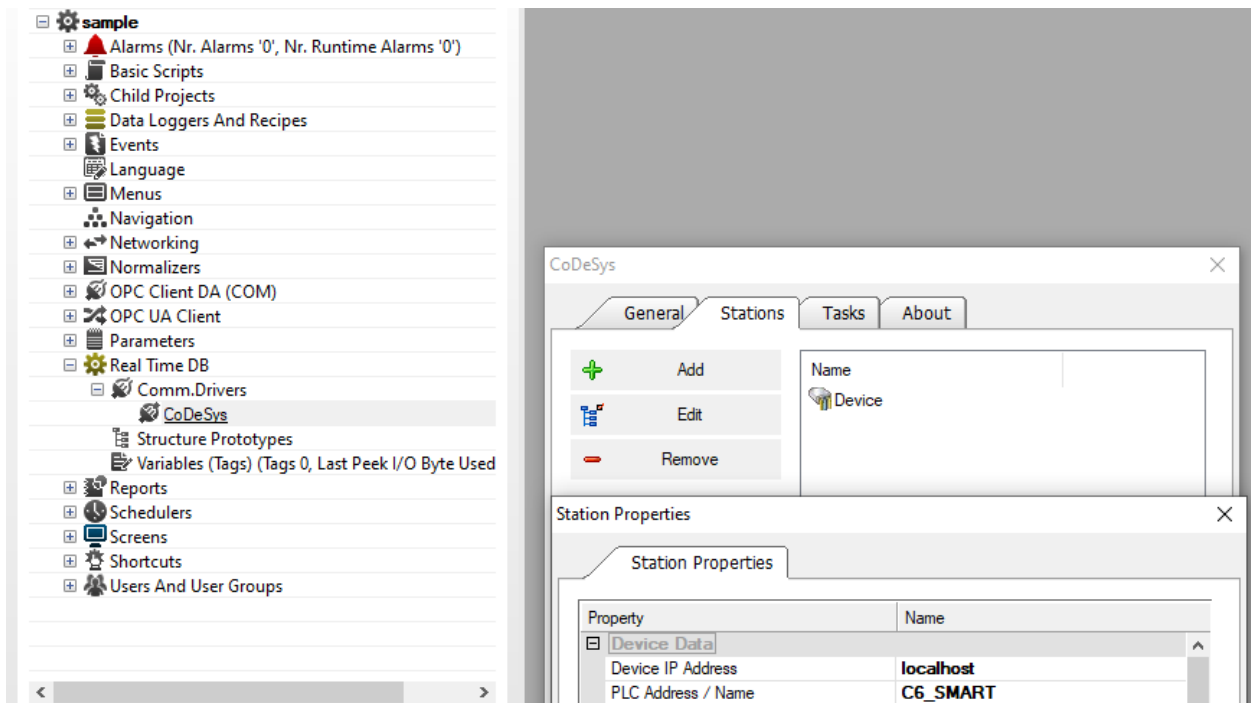


Fig. 9: Communication Driver in HMI Project

## 7. Transfer Variables to HMI

To transfer variables to the HMI project, right-click on the HMI project in the Studio 6 Navigator and select *Transfer variables to HMI*. You will again be prompted to select the PLC device that is affected. The following window will appear in Studio HMI.



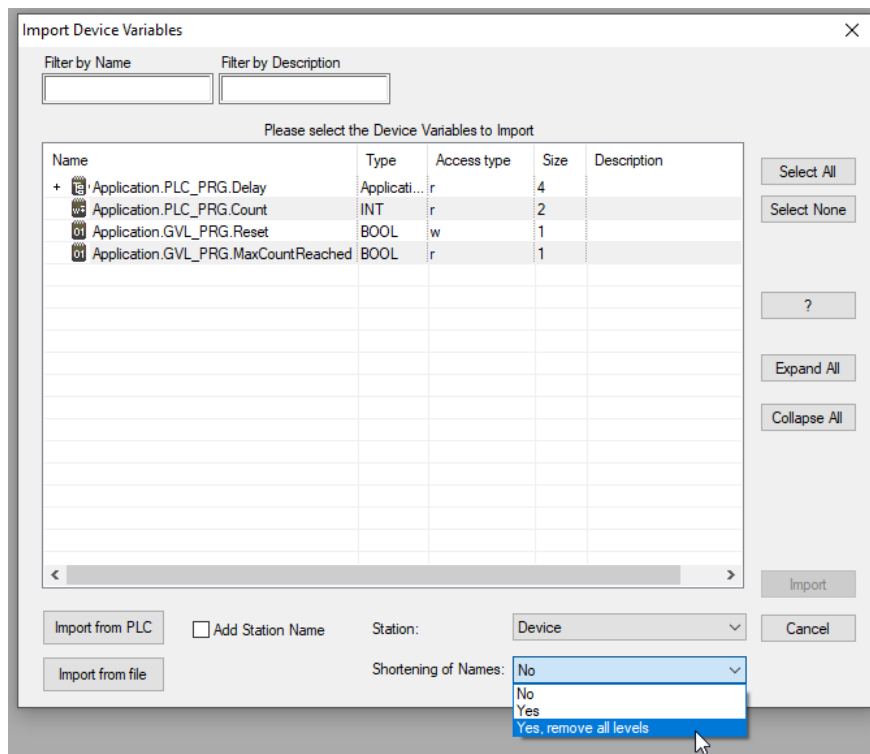


Fig. 10: Variable Import Screen

Select the tags that you would like to import. Choose *Select All* to highlight all, then select *Import*. If you do not wish to import all tags, you may select one to import, or hold CTRL and click on multiple tags to select them and select *Import*. You may also elect to shorten the variable names in the HMI project to remove things like the application name as well as the variable list name or program name. Once you select *Import* the variables will be displayed in the *Real Time DB* under *Variables*.

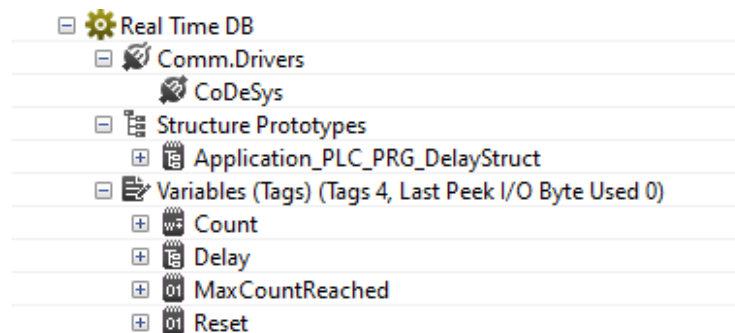


Fig. 11: Real Time DB with Variables Added

These variables may now be used in the HMI project.

## 8. Test Communication

Upload and run the PLC and HMI projects and verify that the variables are being communicated successfully. The project used in this example sends a count, elapsed time, and count reached flag to the HMI with read-only access. It also includes a reset button with read/write access that allows the HMI operator to force a reset of the count.

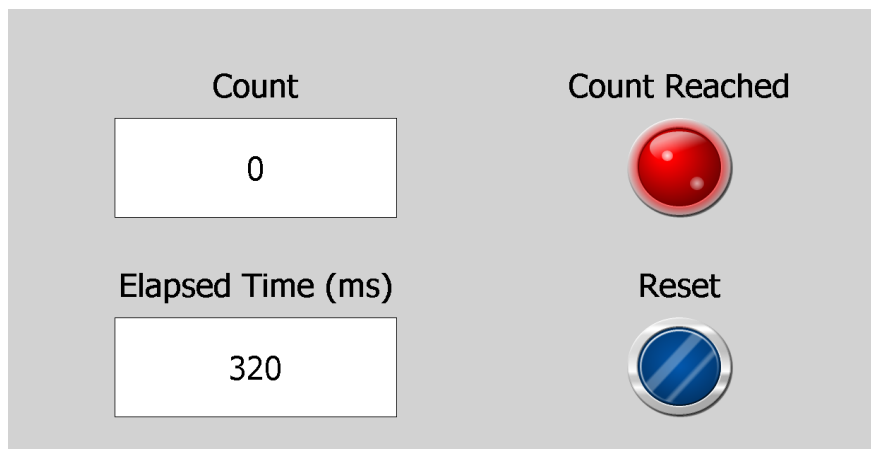


Fig. 12: Test HMI Communication



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