Appendix 8: Creating a function block

Contents

Introduction

This guide will go over the steps to create a user-defined function block.

Objectives

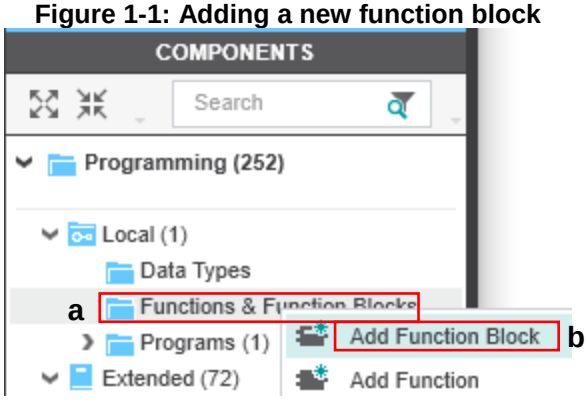
- Create a new function block
- Understand special variable usages
- Use new function block

1 – Create a New Function Block

A function block can be used for repeatable code, make a program more understandable and easier to debug. Function blocks can contain many variable types, other functions and function blocks.

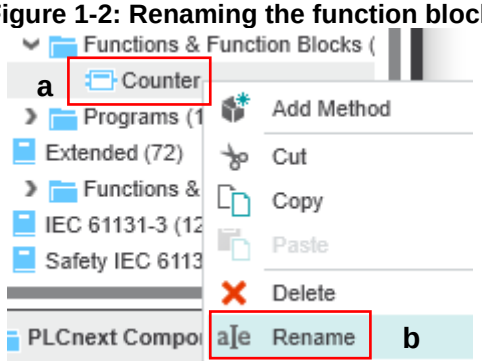
1. Go to Components > Programming > Local and **right-click** on “Functions and Function Blocks” (a) and select the option that says “Add Function Block” (b). See figure 1-1.

Figure 1-1: Adding a new function block



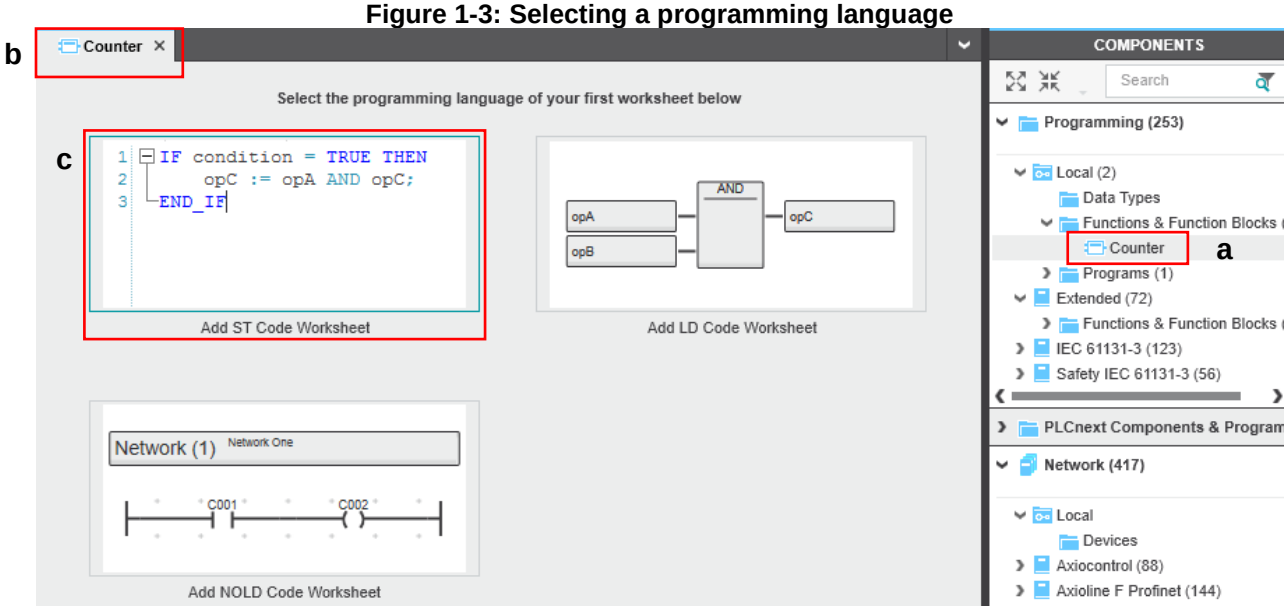
2. Rename the function block by immediately typing the name after adding it or right-click it (a) and select rename (b) and begin typing the new name. Press ENTER when complete. See figure 1-2. In this example, it will be called “Counter”

Figure 1-2: Renaming the function block



3. Now choose the programming language. **Double-click** on the new function block (a) and a new window will appear (b). In this window select the desired programming language (c). See figure 1-3 – This example uses Structured Text (ST).

Figure 1-3: Selecting a programming language



4. Now the new function block is ready for some code.

2 – Variable Types

To use a function block appropriately in a program it will need various inputs and outputs to interact with the program. There are many variable types and this procedure will discuss the recommended types to use.

1. There are two places to create new variables.

    a. Code sheet – here variables can be added and declared by right-clicking on the new name and selecting the usage. NOTE: The datatype may need changed in the variable table.

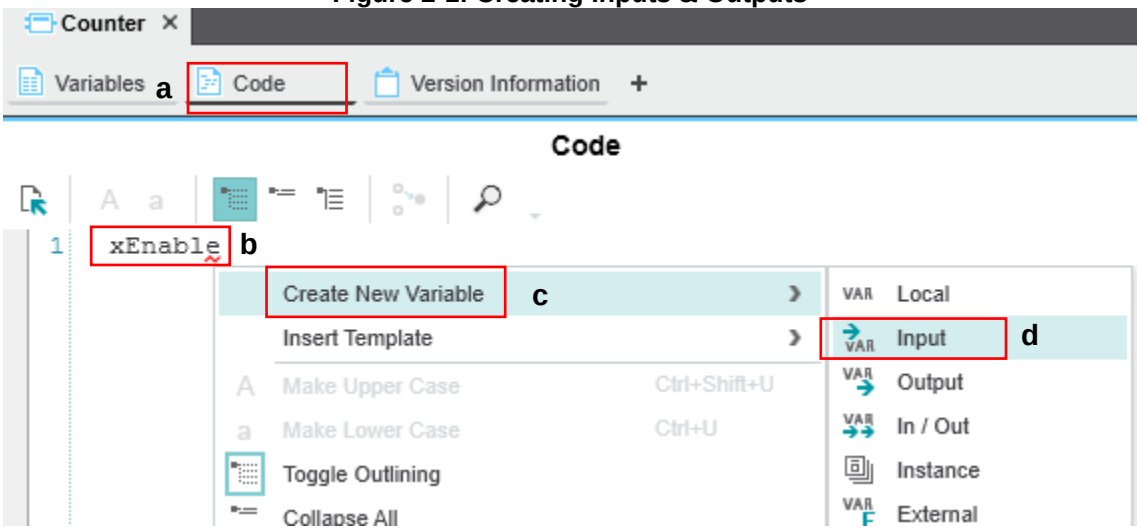
    b. Variable Table – here variables can be created quickly and then used in the code sheet accordingly

2. Choose a method to create a variable and now select a variable type. There are three important types for function blocks.

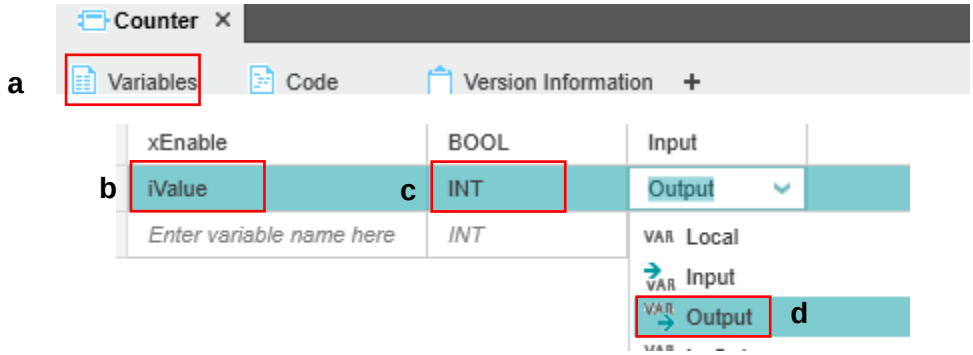
- Local – This variable will only access within the function block.
- Input – This variable creates an input for the block and allows for values to be passed into the function block
- Output – This variable creates an output for the block and allows data from the block to be returned to the program that it is used in.

In this example, a simple counter will be created. The function block will have one input and one output. See figure 2-1 – shows both methods.

Figure 2-1: Creating Inputs & Outputs

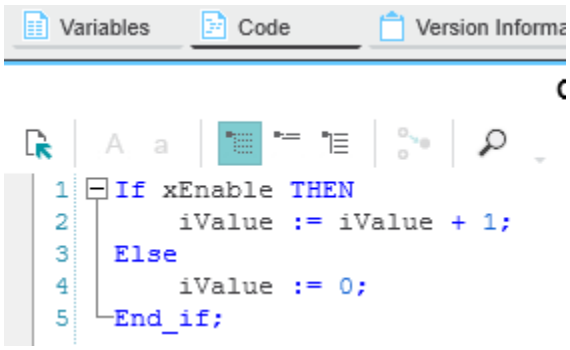


OR



3. Once all variables have been appropriately declared and the program is written the function block is complete. See figure 2-2.

Figure 2-2: Final Function Block Code



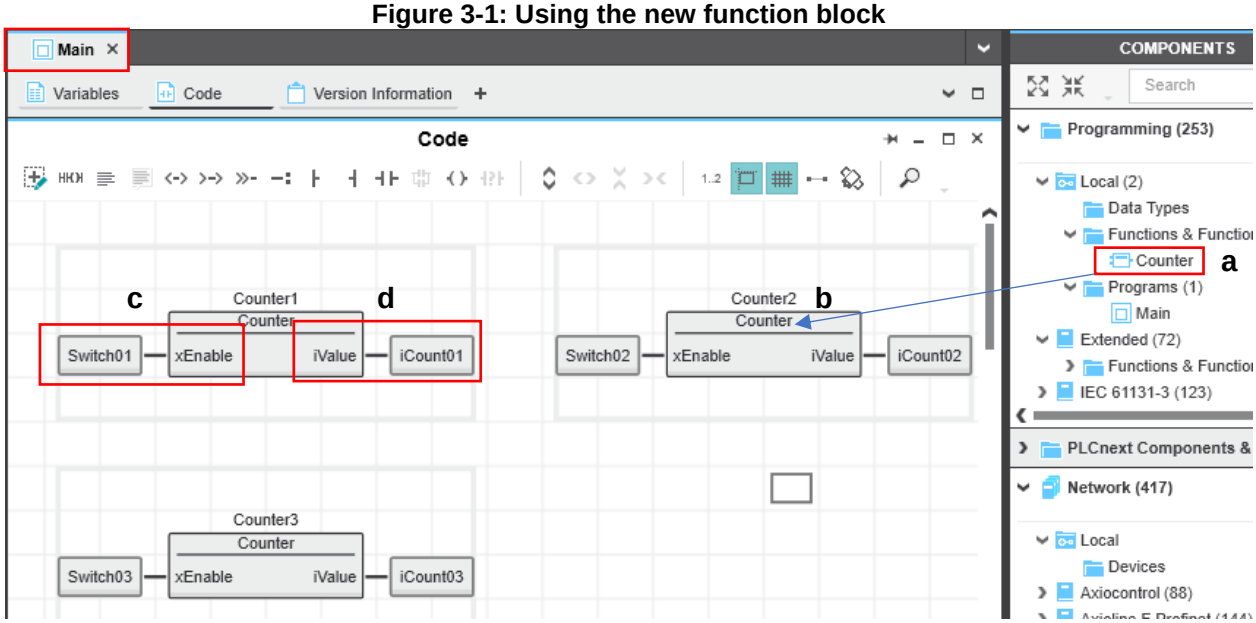
3 – Using the function block

1. Drag'n Drop the newly created function block from Components > Programming > Local > Functions & Function Blocks (a) to a program or function block (b). See figure 3-1.

2. Each time the block is added a new instance is created. The block can be added as much as needed, limited to the resources of the controller. See figure 3-1.

3. Tie variables to the inputs and outputs of the new function block added in the program (c,d) See figure 3-1

Figure 3-1: Using the new function block



4. Finally, download and debug the new code.