

Sub Programs and UDFBs

straton user guide – Rev. 6

sales@straton-plc.com



straton



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1. Overview

This document will guide you through creating and using functions and function blocks developed with IEC languages.

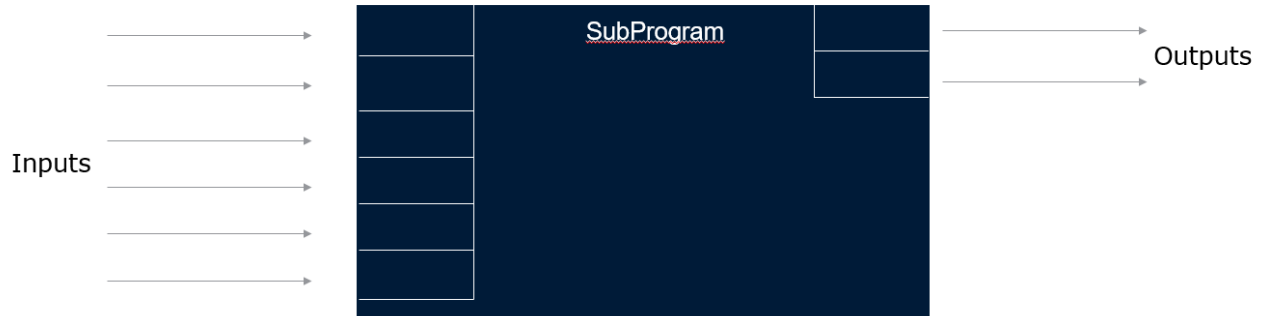
This document refers to straton version 8.3 or later.

NAMING CONVENTIONS:

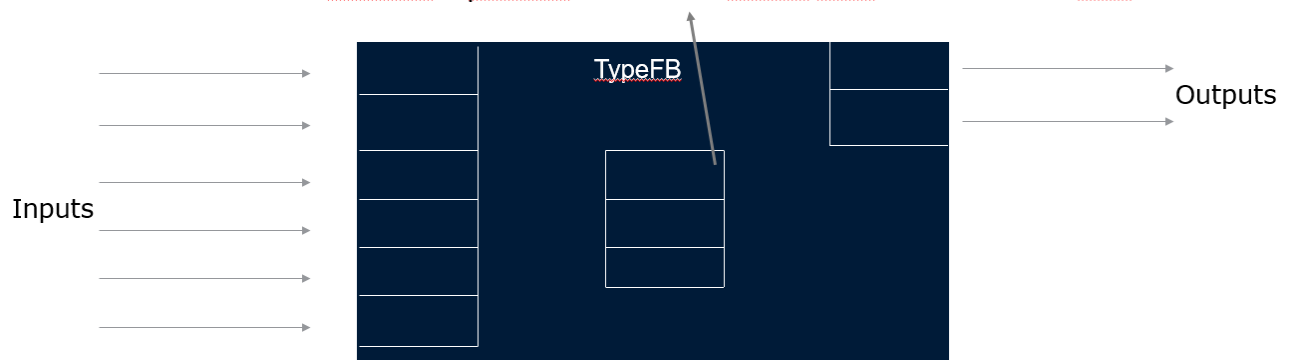
- ▶ Functions written with IEC languages are called sub-programs.
- ▶ Function blocks developed with IEC languages are called UDFBs.
- ▶ UDFB stands for "User Defined Function Block".

REMINDER:

- ▶ **Function (IEC standard)** : One output parameter
- ▶ **Sub-program (straton extension)** : 0 to N output parameters



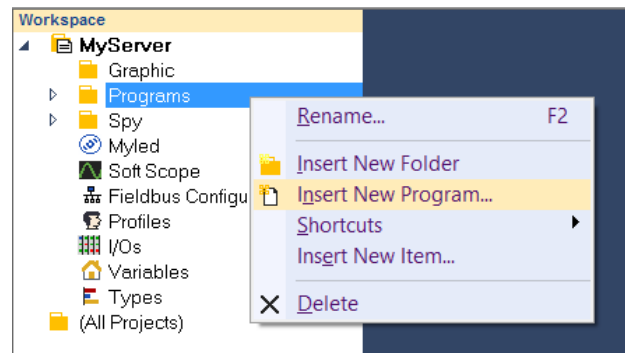
- ▶ **UDFBs:** It contains « private variables » stored from one call to the next one



2. Tutorial

2.1. Create and use a Sup-program

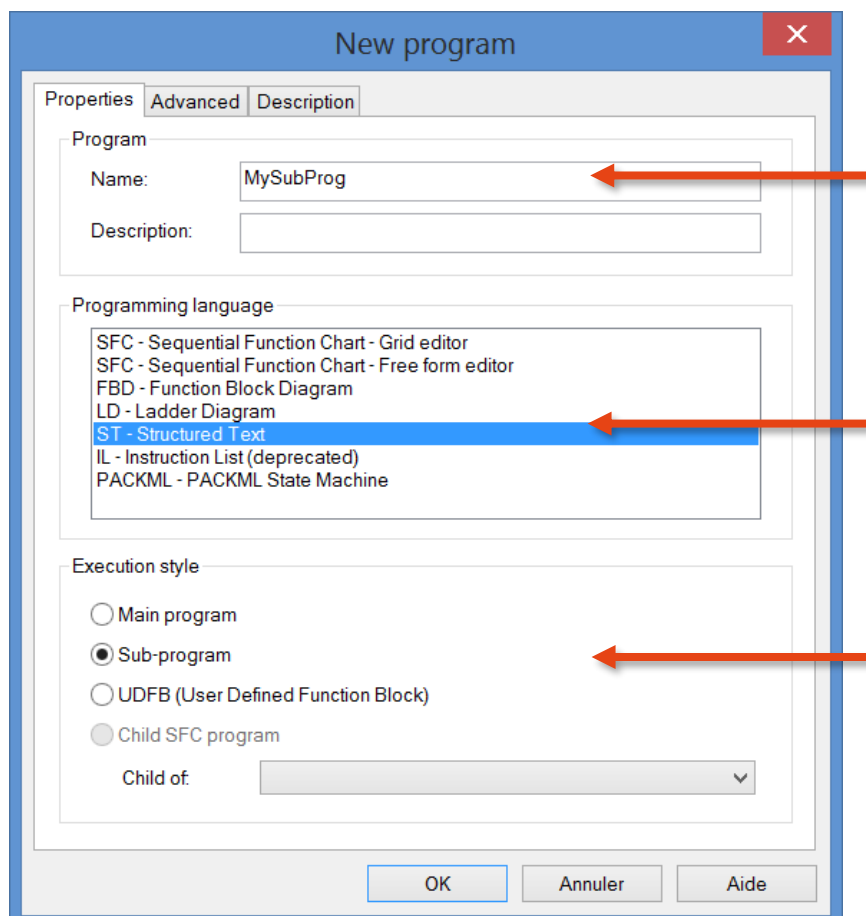
From the contextual menu of the Editor, click on "Insert New Program":



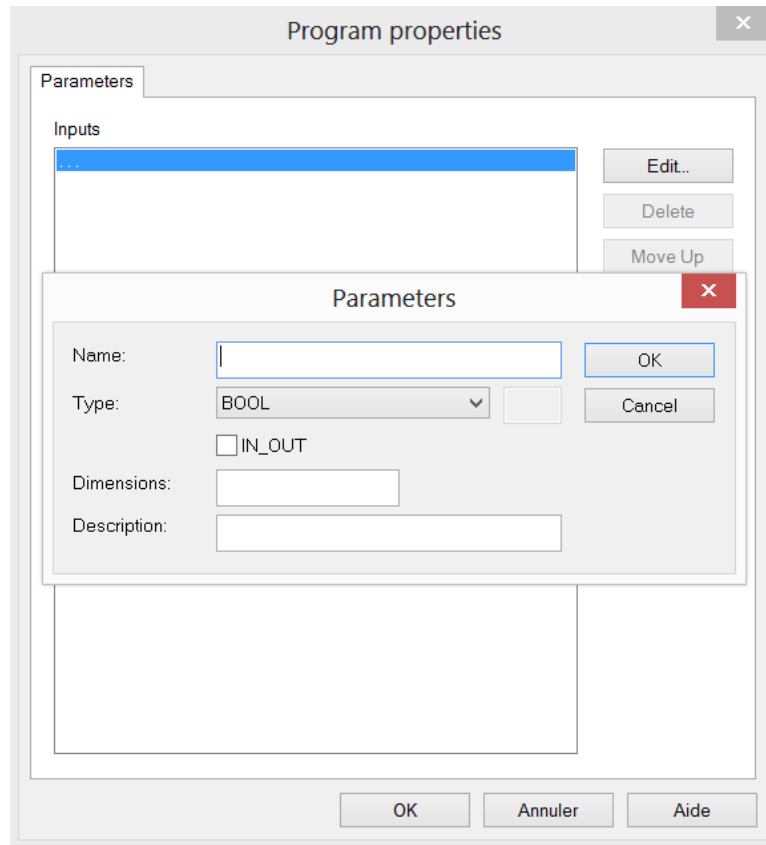
This will open the "New Program" dialog box which is shared for programs, sub-programs and UDFBs.

Give a name to your sub program, select a language for it and select the "Sub-program" choice.

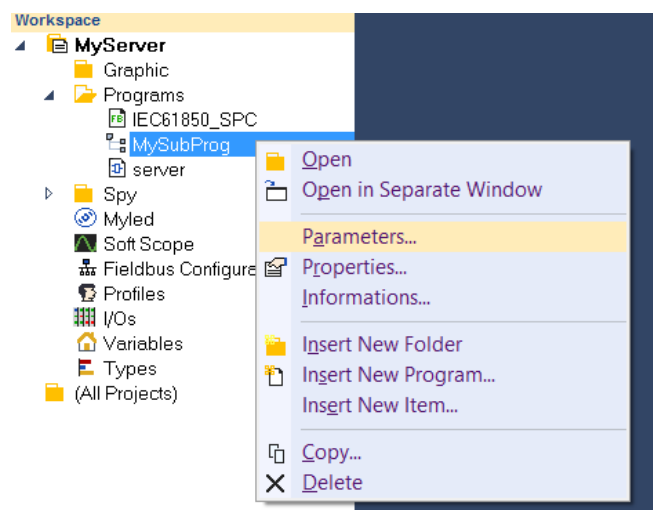
Note: The language cannot be SFC



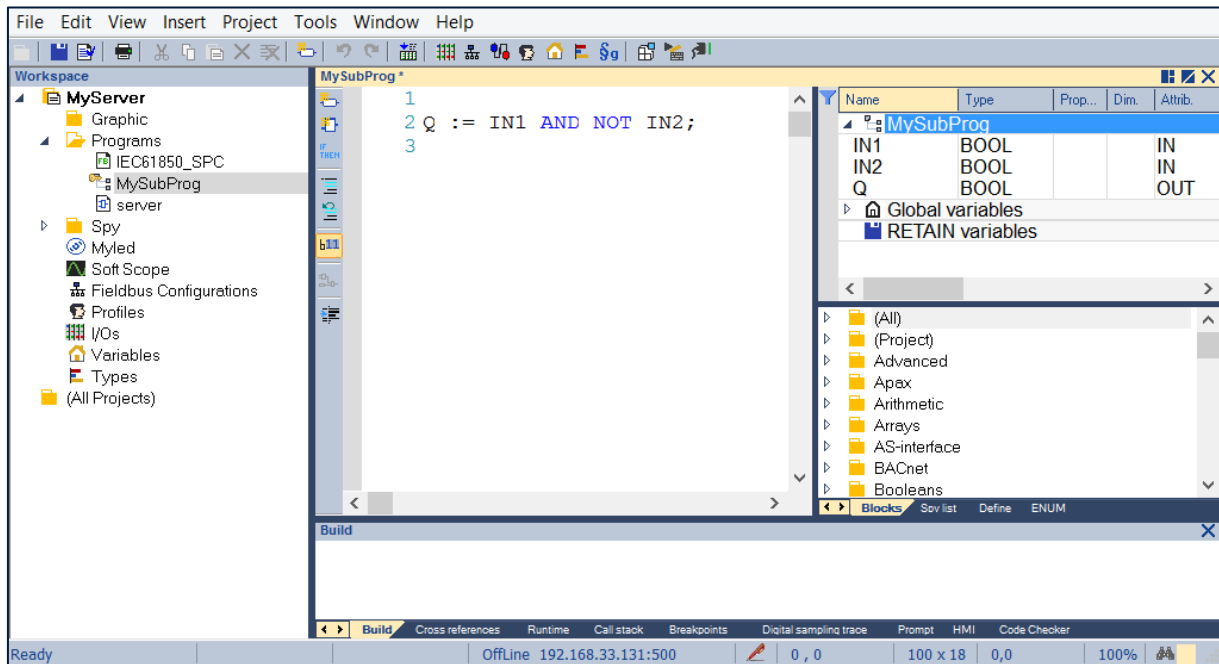
Press OK and another box will open, you can define the inputs and outputs of the sub-program. Double click on “...” to add either an input or an output:



Later on, you will be able to change parameters using the contextual menu of the Editor:

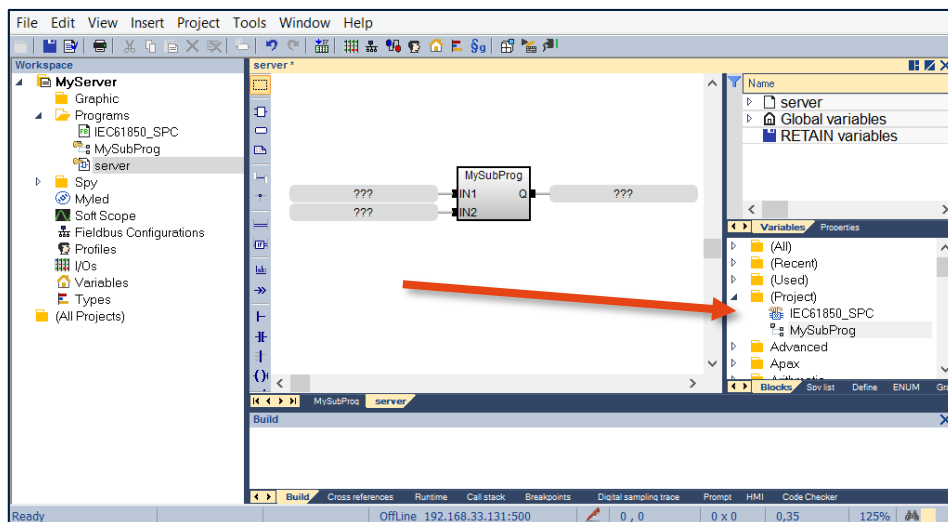


Double click on the sub program name in the Editor to edit it:



Parameters are visible in the local variable editor and can be changed here. From the variable editor, you can also add some new parameters or local variables.

The sub-program can now be called from other POU. It appears in the "(Project)" section of the list of blocks:



2.2. Create and use an UDFB

The same method applies to User Defined Function Blocks. You must select the “UDFB” choice in the New Program dialog box:

The screenshot shows the 'New program' dialog box with the following configuration:

- Properties** tab is selected.
- Program** section:
 - Name: MyFB
 - Description: (empty)
- Programming language** section:
 - Selected: FBD - Function Block Diagram
 - Other options: SFC - Sequential Function Chart - Grid editor, SFC - Sequential Function Chart - Free form editor, LD - Ladder Diagram, ST - Structured Text, IL - Instruction List, PACKML - PACKML State Machine.
- Execution style** section:
 - Selected: ☒ UDFB (User Defined Function Block) (indicated by a red arrow)
 - Other options: ☐ Main program, ☐ Sub-program, ☐ Child SFC program.
 - Child of: (empty dropdown)
- Buttons: OK, Annuler, Aide.

When editing a “UDFB” you have the possibility to insert “private” variables. These are the internal variables of the UDFB that will be instantiated.

Note: An UDFB can also be programmed with the SFC language, because once it is called in a program, it is instantiated.

3. Frequently Asked Questions

WHAT IS THE “INOUT” CHOICE FOR AN INPUT?

If INOUT is not checked, the input can be only read by the sub-program or function block. If checked, then the block can change the value of the input. An INOUT parameter must have a single data type (neither array nor structure)

WHAT ABOUT ARRAYS AND STRUCTURES FOR PARAMETERS?

Parameters being arrays of structures must always be declared as INPUTs. However, they are always considered implicitly as INOUT, so the block can read and write within the array or structure. Declaring complex parameters for a sub-program or block can have some limitations if the “Complex variables in a separate segment” option is not enabled in the project settings.