

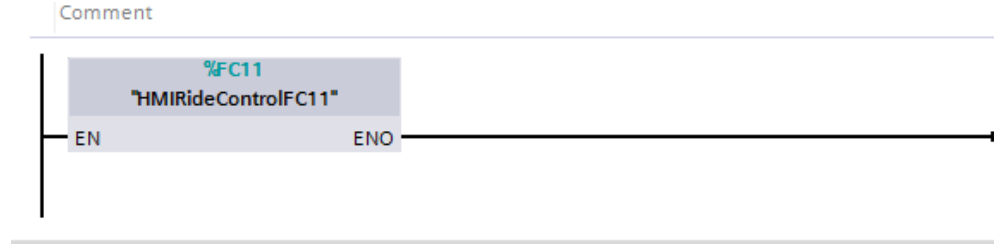
# Lab 5: Function Blocks

We studied about the programming blocks for the last few labs and lab 5 will focus on the function block.

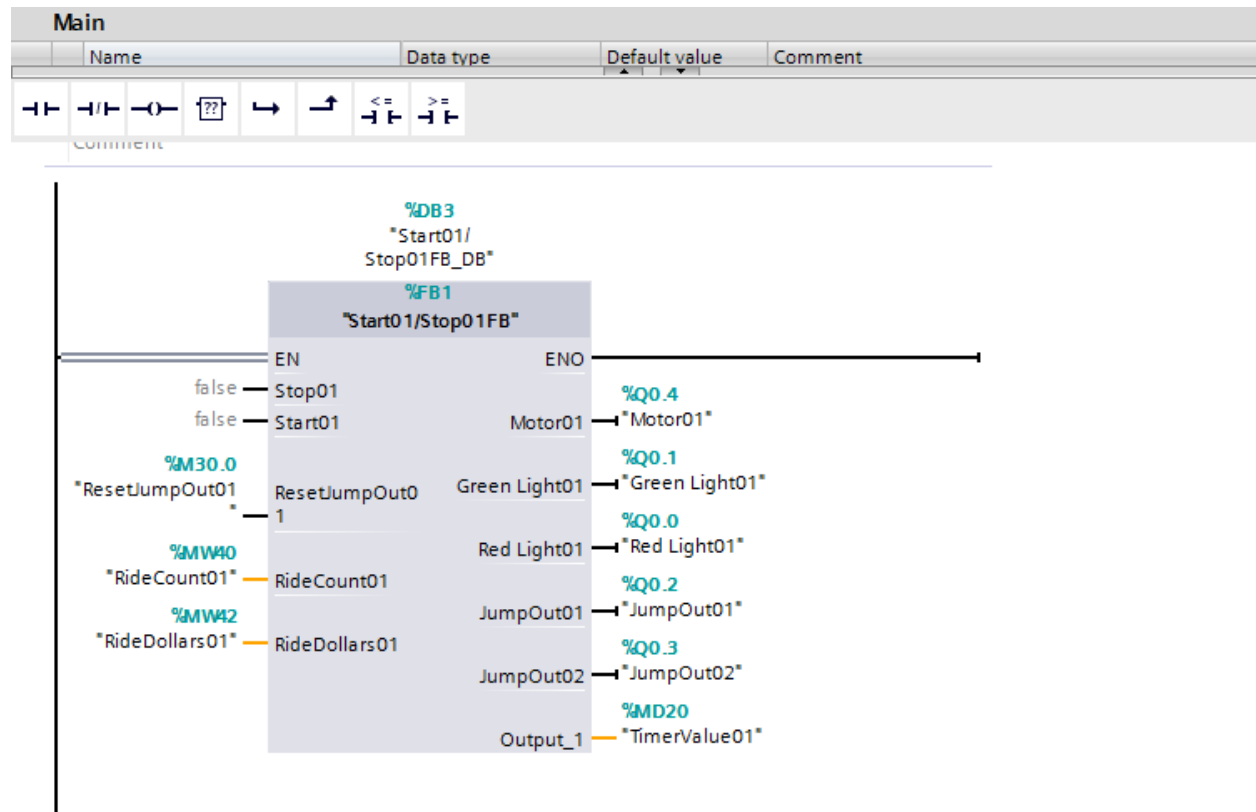
**Function block (FB):** Create function blocks.

The function block is similar to function call, however, there are few notable differences. A function block is a function that "remembers." With function calls, we needed to either create a data block that accompanies it for robustness, for usage with different projects. With function blocks, the data block is created automatically as you call the function block from MainOb1. There are also some visual differences. Function call, in the visual below, is shown in MainOb1.

## Function Call



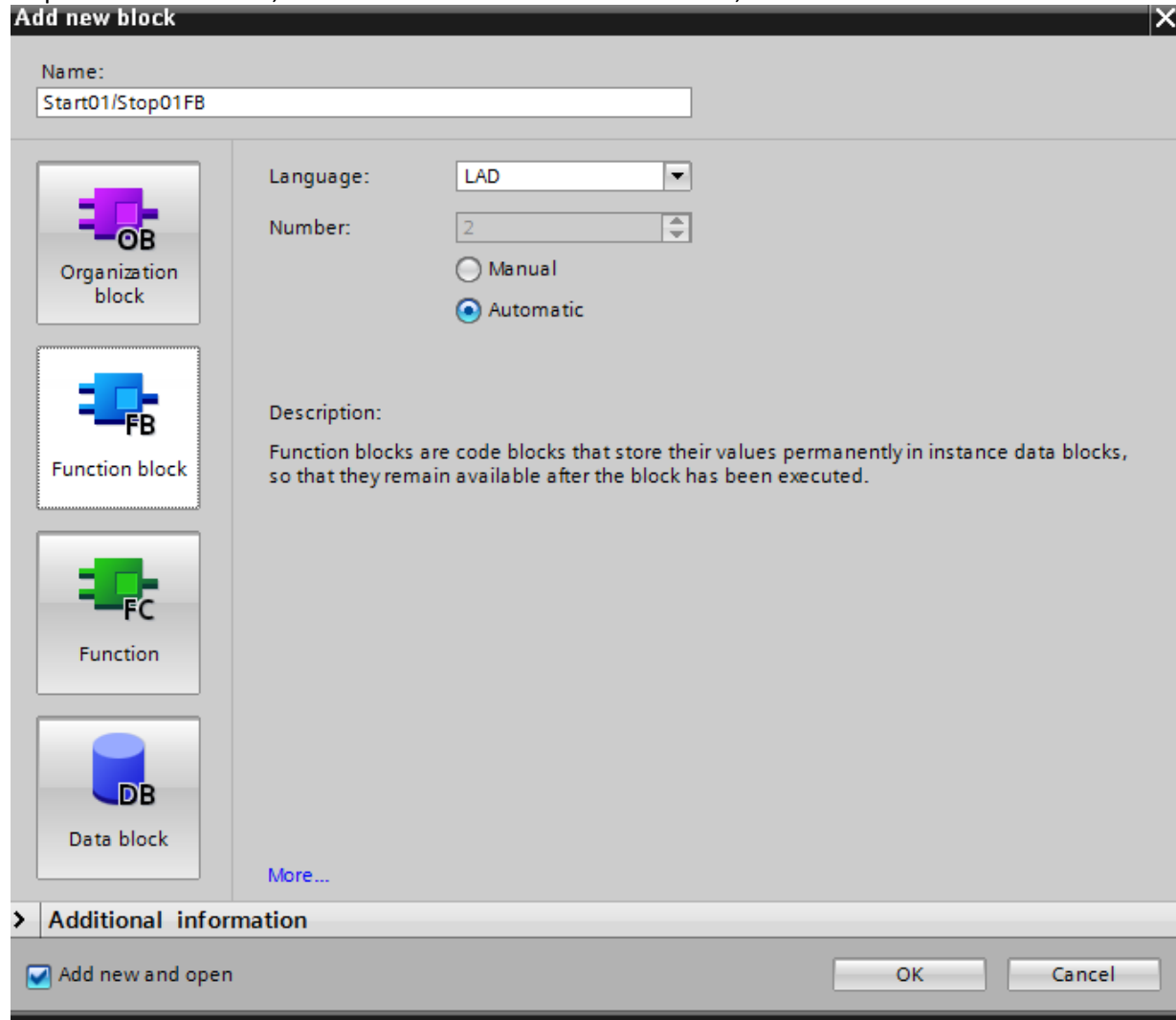
## Function Block



Function block shows more information regarding the programming inside, and as users, we can monitor the data without going to the function block itself. Because of that reason, function blocks are easier to use for more complex programming while function call can be used for quick and frequent functions. In our case, both work fine.

## Creating a function block

As previous labs stated, create a function block as shown below, remember to name it.



After creating the function block, copy all the programming from Start01/Stop01RealIOBlock function call and into the function block. Note: using the global libraries is a good idea if you are creating new projects.

In order to add the input/output/static/temp values to the function block, slide down the network screen and into the data screen, as shown below.

**Start01/Stop01FB**

Name	Data type	Default value	Retain	Accessible f...	Visible in
<div style="border: 1px solid gray; padding: 2px;"> <span>←</span> <span>→</span> <span>↶</span> <span>↷</span> <span>↺</span> <span>↻</span> <span>↵</span> <span>↶</span> <span>↷</span> </div>					
<b>Block title:</b> ..... Comment					
<b>Network 1:</b> Start Stop Circuit Controlling my motor					
<b>Network 2:</b> Green Light Comment					

If you have done it correctly, this screen would slide down. Populate the data as shown.

**Start01/Stop01FB**

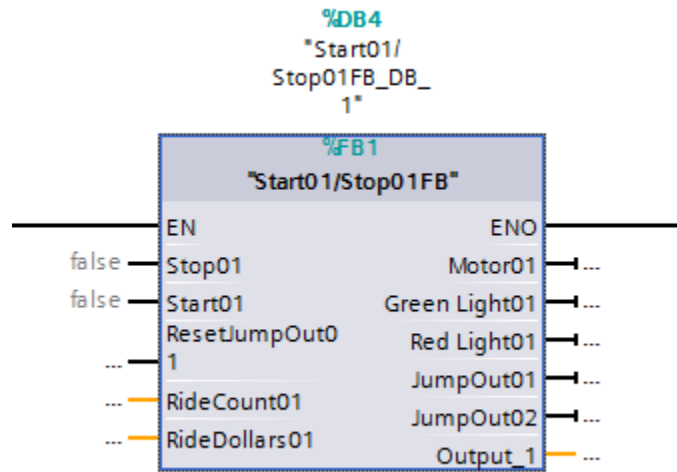
	Name	Data type	Default value	Retain	Accessible f...	Visible in ...	Setpoint
1	▼ Input				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Stop01	Bool	false	Non-ret...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Start01	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	▼ Output				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Motor01	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Green Light01	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	Red Light01	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8	JumpOut01	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9	JumpOut02	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	Output_1	Time	T#0ms	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11	▼ InOut				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	ResetJumpOut01	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13	RideCount01	Int	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14	RideDollars01	Int	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15	▼ Static				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	TimerValue01	Time	T#0ms	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
17	▼ Temp				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	<Add new>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	▼ Constant				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	<Add new>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Next, go back to the left side pane, select OB-Main, and drag our new function to a new network. You should see a Data Block created, or prompted to create one. Click yes.

Start01/Stop01FB\_DB [DB3]

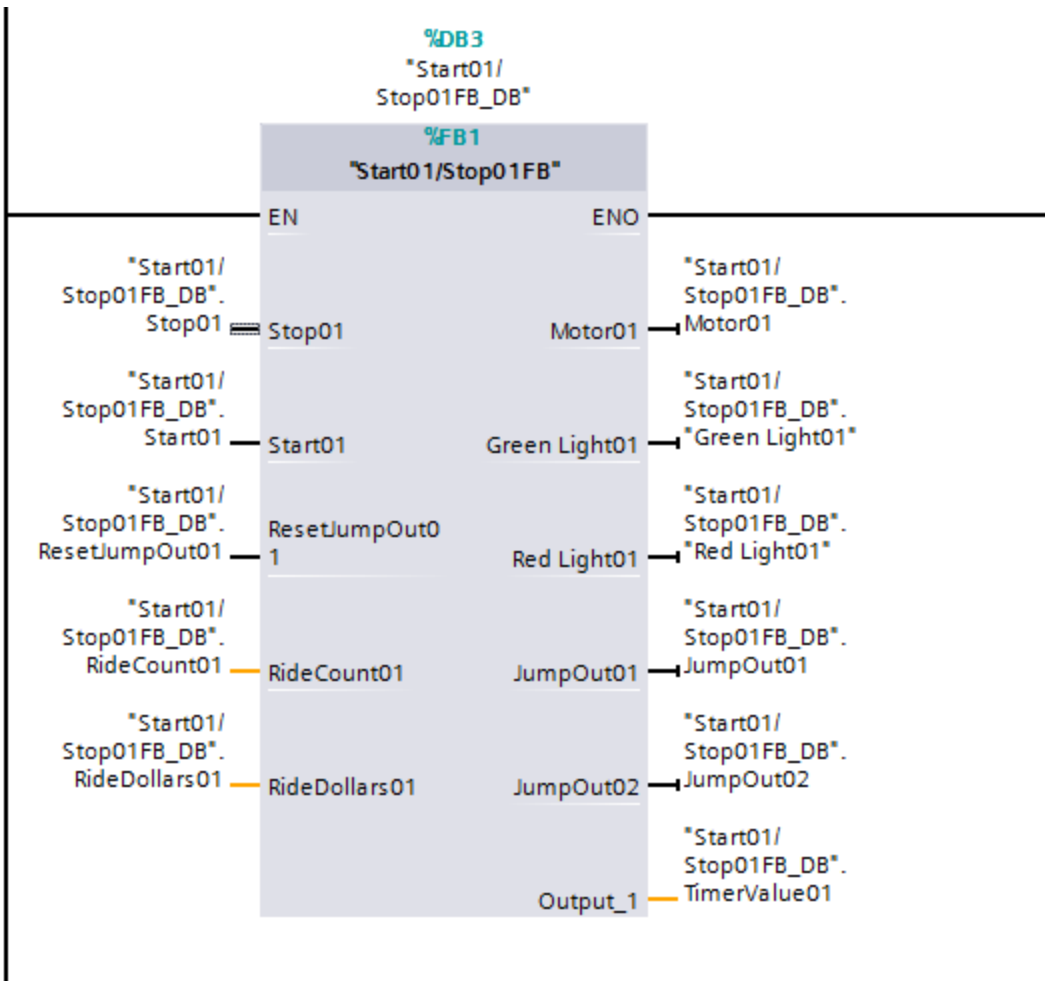
### New Data Block

Click on Main-Ob1, you can see that our function block isn't much at the moment.



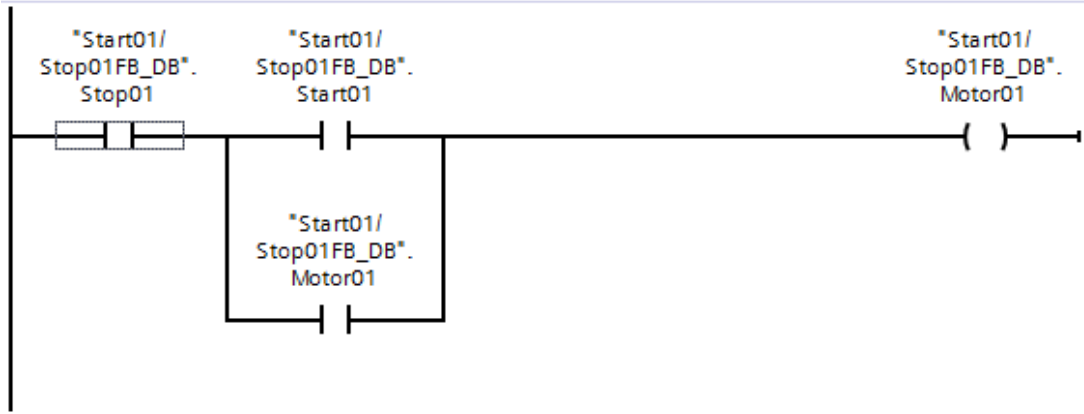
Now you can populate the tags with the new tags from the function block we created to make this. Click on the ... to edit tag if you forgot.

If you fill out the tag, it should look like this.



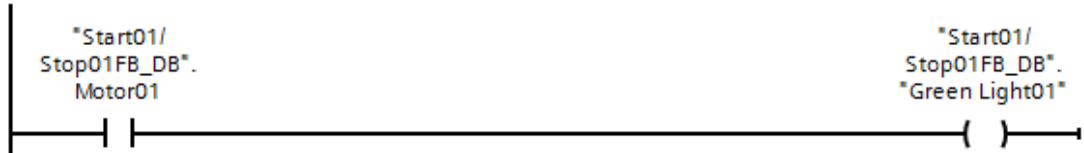
We are linking the data of the function block to our data block.

Next, we have to modify our function block itself, remember when we copied from Start01/Stop01RealIOBlock? The data won't be linked if we leave it alone. You must go into the function block and change all tags to the data block tags. For example:



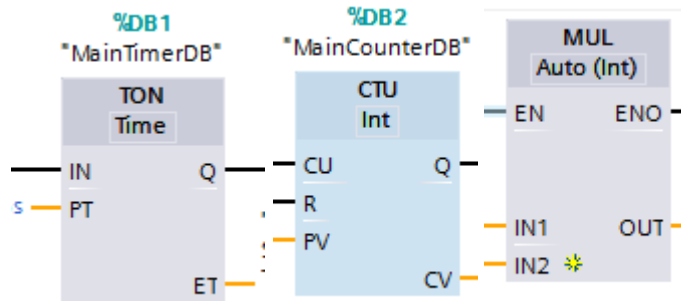
**Network 2: Green Light**

Comment



You should have all the tags from the data block, if not, check the slide down on the function block again.

Exceptions that you don't have to change the tags are the timers or calculators:



With that, we are close to finish with the lab, please compile and simulate your code. The result should look like this:

