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Category	■FAQ □SOP	**Related OS**	N/A
Abstract	How to write C# program to develop ADAM-3600 with eCLR		
Keyword	KW, MULTIPROG, eCLR, C#		
Related Product	ADAM-3600		

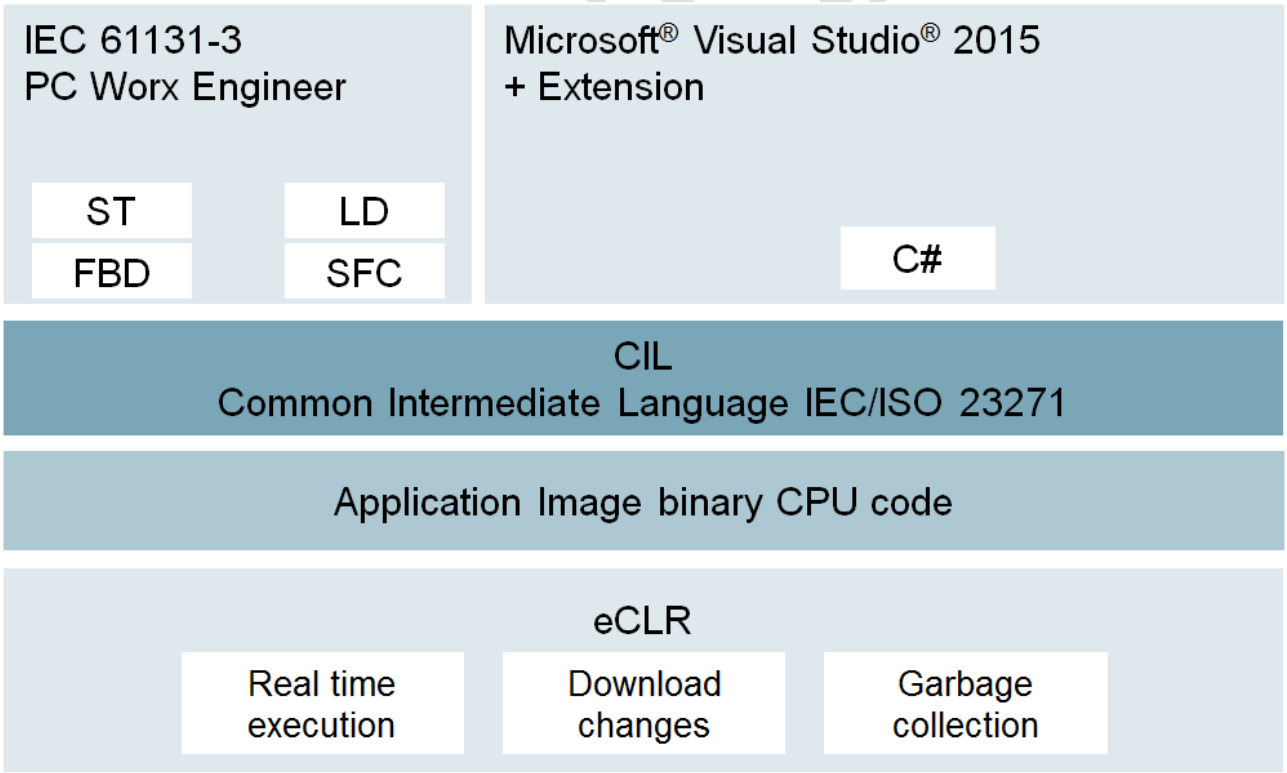
■ **Problem Description:**

This document explains how to write C# program to develop ADAM-3600 with eCLR. Besides KW MULTIPROG Express defined function block, users could implement their complicated algorithm by using C# programming languages.

■ **Answer:**

CLR is the short name of **Common Language Runtime**, which is the runtime of Microsoft .net Framework.

iRTU device needs runtime for KW ProConOS **Embedded** CLR, which is called as **eCLR**.



https://www.plcnext-community.net/index.php?option=com_content&view=article&id=272&catid=74&Itemid=351&lang=en

Besides IEC 61131-3 languages (ST, LD, FBD, SFC), C# programming language is also compatible with eCLR.

With eCLR plug-in (ADAM-3600-C2G_ARM_LE_GCC3_eCLR_3.0.20731.exe) we provided on Advantech official website, after user download KW MULTIPROG project to ADAM-3600 device, the program languages would be transformed into the languages eCLR could

understand.

The eCLR plug-in follows .net Framework 2.0 specification. (eCLR itself is not .net Framework.) The embedded CLR means it can be compatible with ARM operation system.

Therefore, eCLR could be executed on both ARM and x86 operation system.

If user wants to develop with C# program, the traditional method is to install Visual Studio Plug-in, and before downloading to the device, the Visual Studio Plug-in would transfer the program into the language which eCLR Library understands.

Phoenix Contact Software:

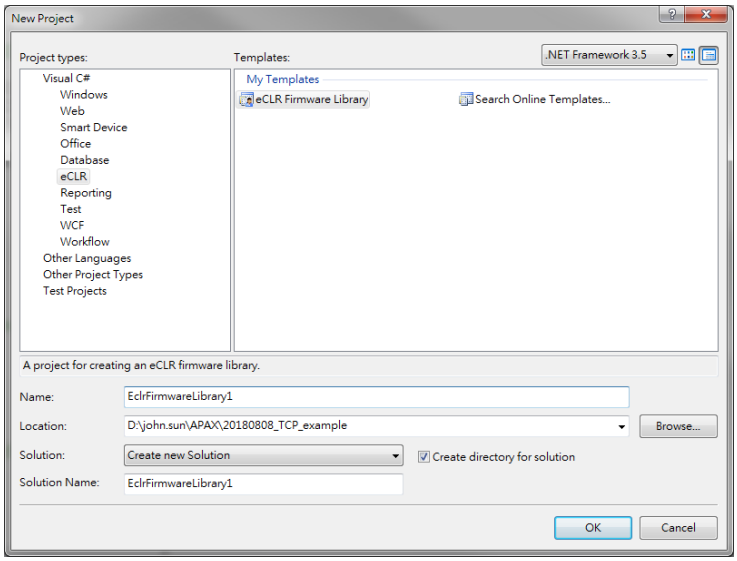
- PC Worx Engineer (at least Version 7.2) You need the engineering software platform for automation controllers to use libraries created with C# for PLCnext Technology devices. Download here (switch to the "Downloads" tab) and configure a license: https://phoenixcontact.net/product/1046008
- Visual Studio ® Dev_Tools Installer Download from the download area of the product information to the AXC F 2152 controller https://phoenixcontact.net/product/2404267 Choose your country - the product page will show in the international catalog. Choose the "Downloads" tab, then choose the category "configuration software".

However, this method is licensed by Phoenix and may not be maintained.

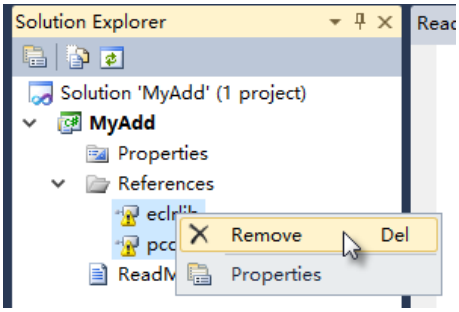
Therefore, we demonstrate another method to use C# to make a function block for ADAM-3600.

1. Install ADAM-3600-C2G_ARM_LE_GCC3_eCLR_3.0.20731.exe.
   http://support.advantech.com/Support/DownloadSRDetail_New.aspx?SR_ID=1-X915XS&Doc_Source=Download

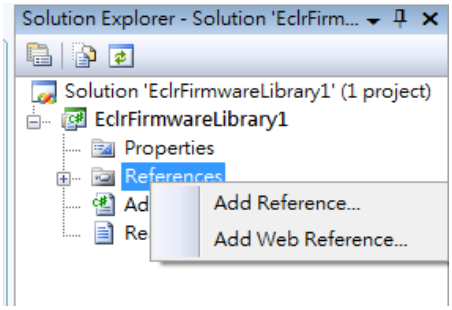
2. In Visual Studio (the version which is compatible with .net Framework 2.0 is workable), choose Visual C# ➔ eCLR ➔ eCLR Firmware Library



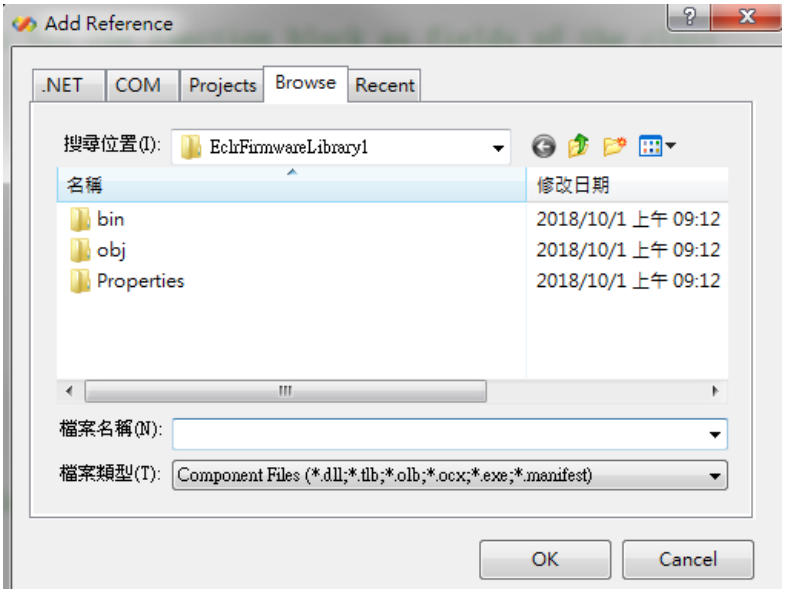
3. In the created project, there are 2 default libraries in References. Remove the default 2 libraries.



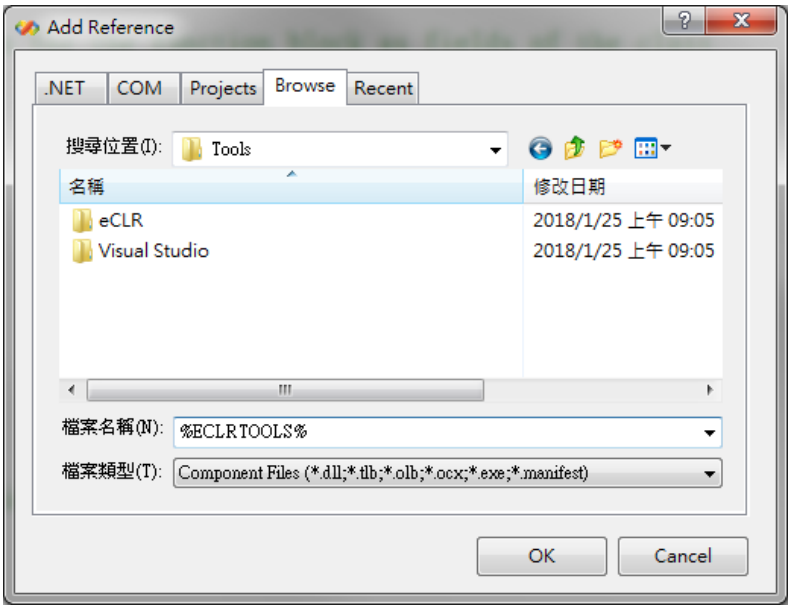
4. Right click on “References” to “Add Reference.”



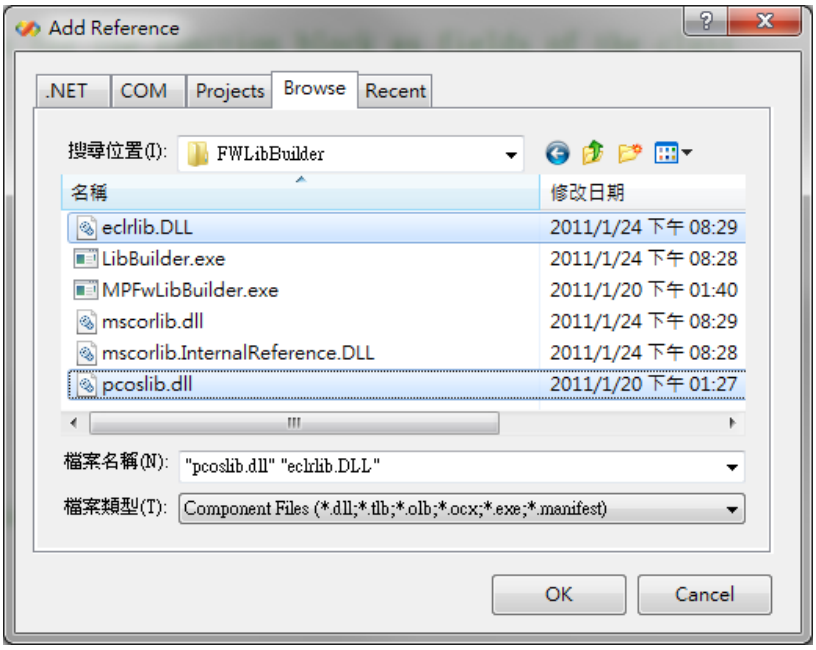
5. In the pop-out diagram, choose “Browse” page.



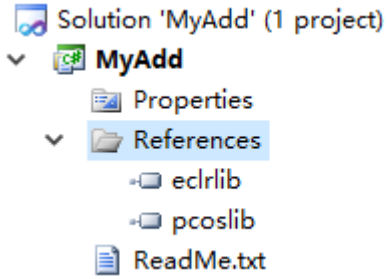
6. Key in “%ECLRTOOLS%” in file name blank, and then press Enter.



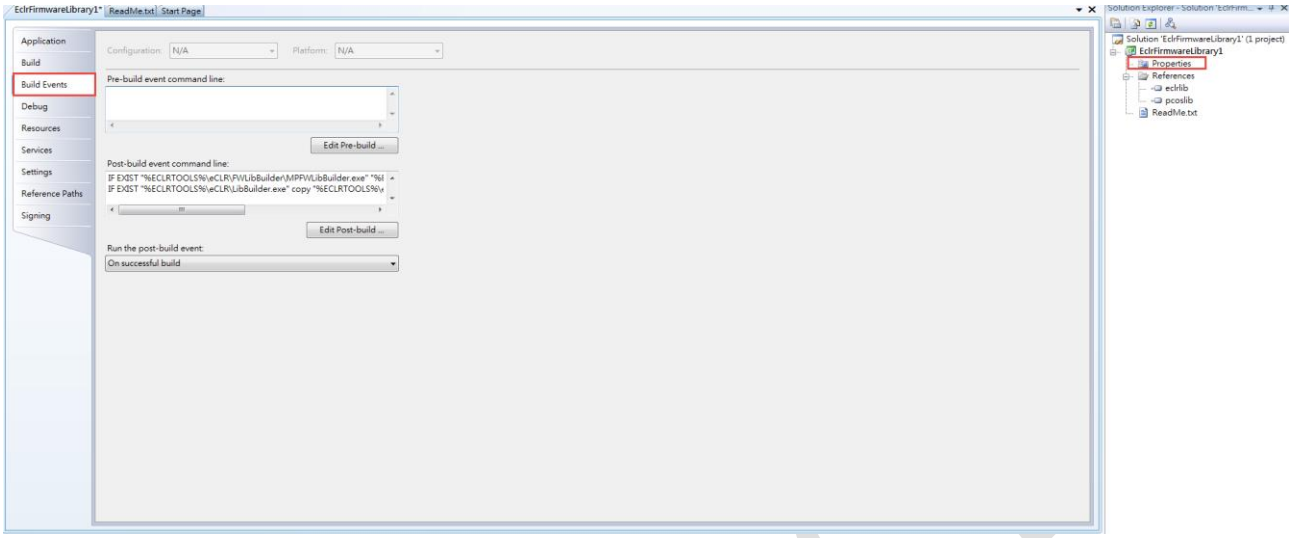
7. In directory eCLR ➔ FWLibBuilder, choose *eclrlib.dll* and *pcoslib.dll* documents.



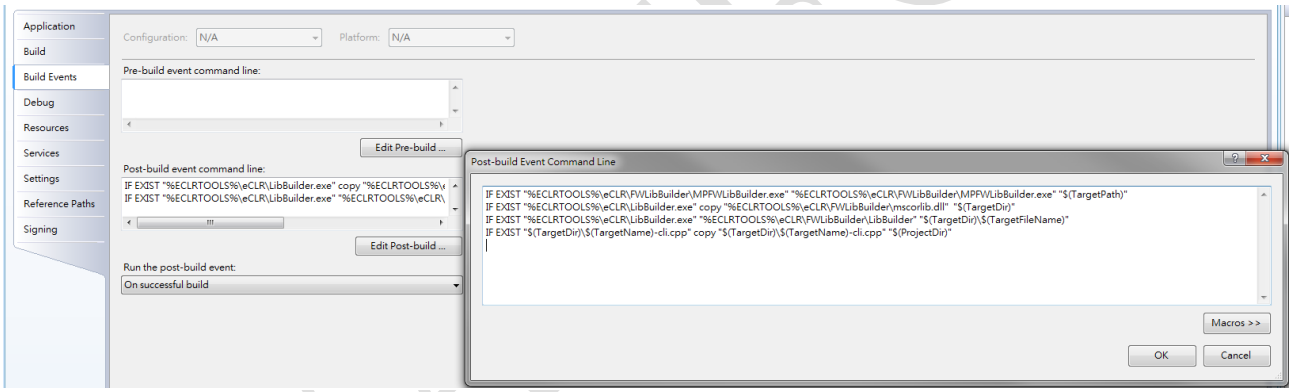
8. Click “OK” to add these 2 DLL files into References. The success result shows as below.



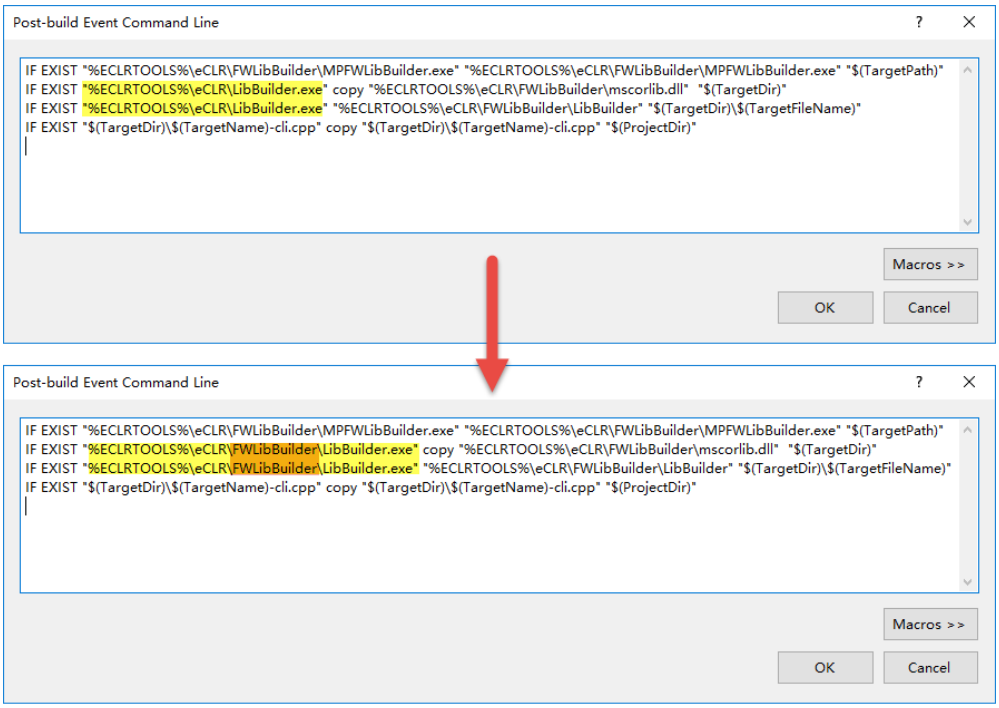
9. Double click “Properties”, choose “Build Events”.



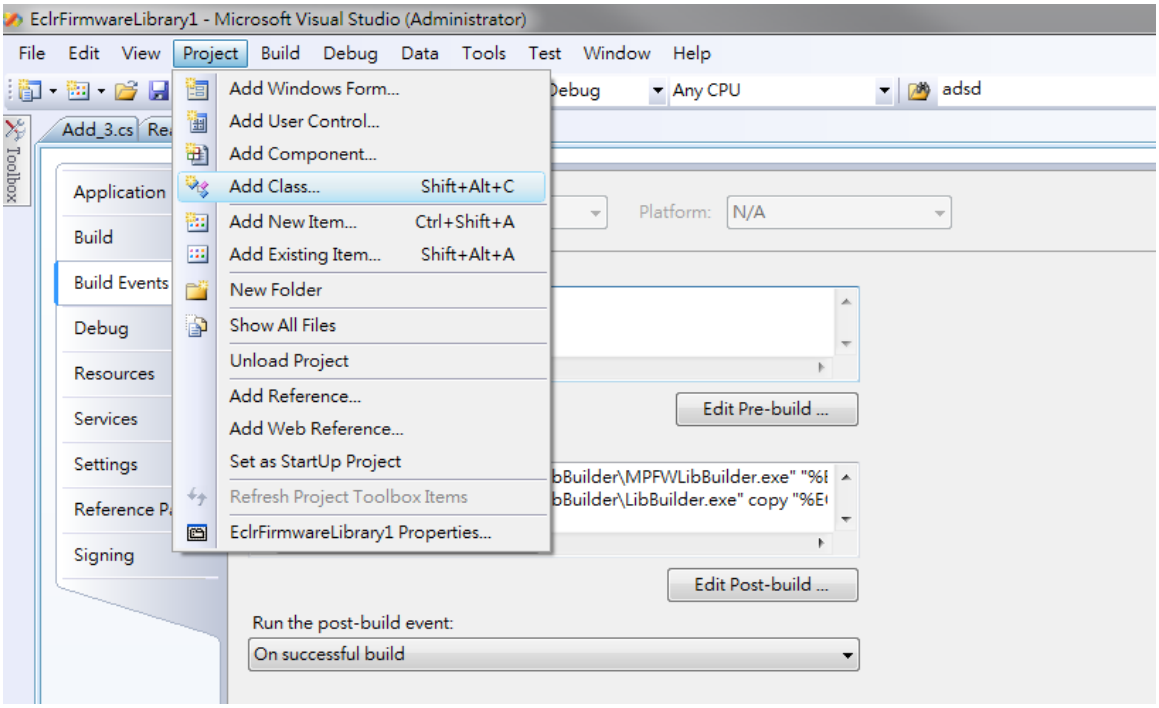
10. Click “Edit Post-build…” to modify.



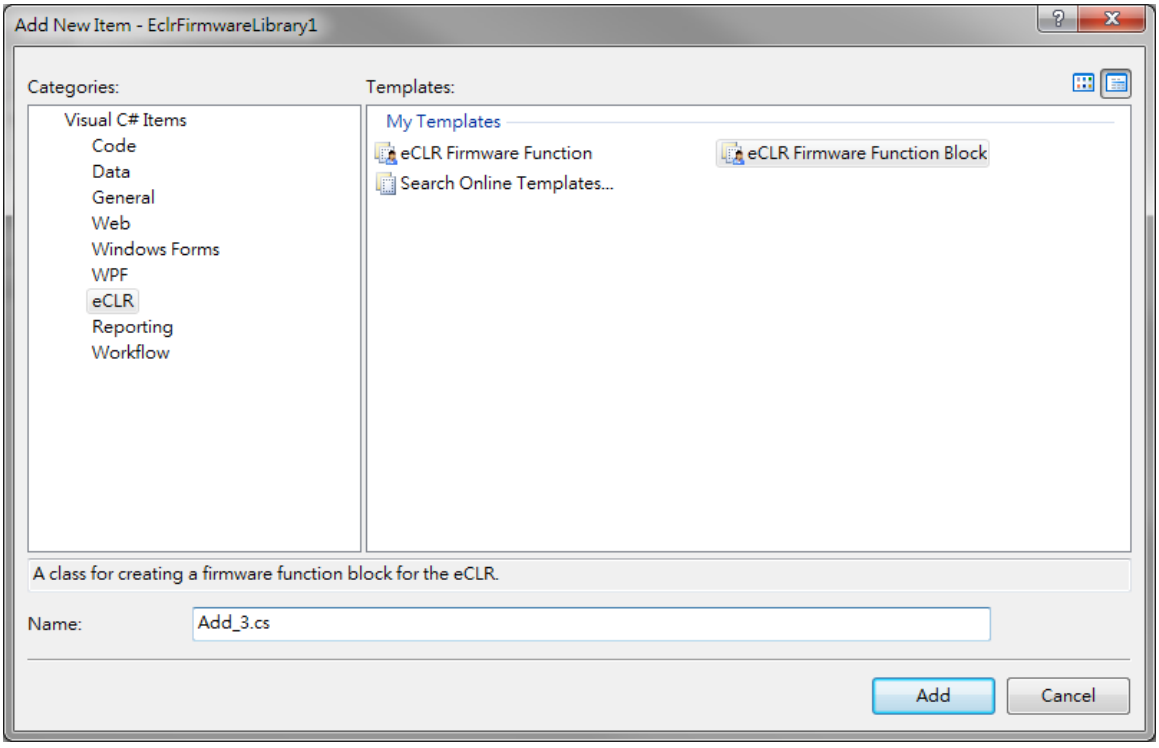
11. In path of LibBuilder.exe, add “FWLibBuilder” as below image illustrates.



12. After preparing the environment, choose “Project” ➔ “Add Class...”



13. In “Visual C# Items”, choose eCLR ➔ eCLR Firmware Function Block. Name your function block.

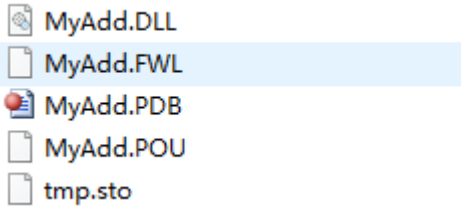


14. Modify Add_3.cs file.

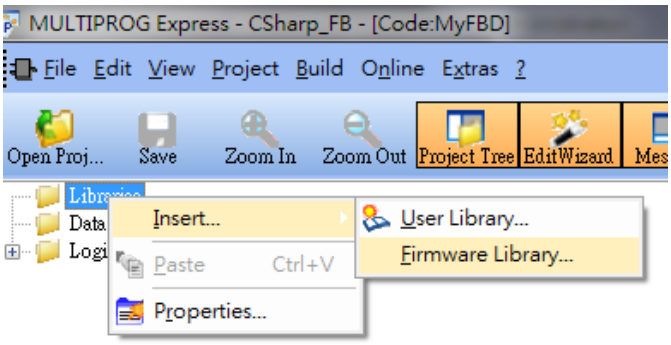
Add 3 input variables and 1 output variable, and complete the summation in __Process function.

```
1. using System;
2. using System.Iec61131Lib;
3. using Eclr;
4.
5. namespace MyAdd
6. {
7.     [FUNCTION_BLOCK]
8.     public class Add_3
9.     {
10.        [VAR_INPUT("REAL")] public Single          IN1 = 0;
11.        [VAR_INPUT("REAL")] public Single          IN2 = 0;
12.        [VAR_INPUT("REAL")] public Single          IN3 = 0;
13.
14.        [VAR_OUTPUT("REAL")] public Single         OUT = 0;
15.
16.        public Add_3()
17.        {
18.        }
19.
20.        public void __Init()
21.        {
22.        }
23.
24.        public void __Process()
25.        {
26.            OUT = IN1 + IN2 + IN3;
27.        }
28.    }
}
```

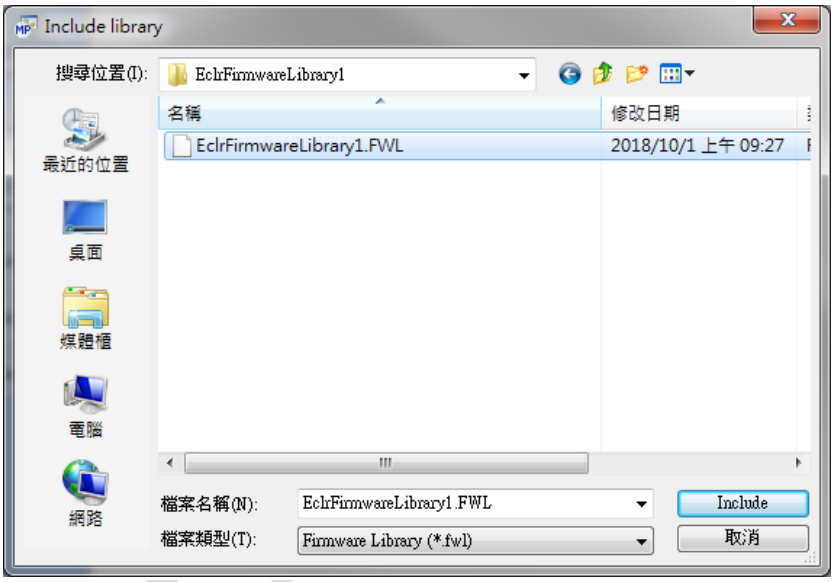
15. If user chooses “Debug” to compile, there are 5 files under bin\Debug directory. In the following setup KW MULTIPROG steps, user may use the files. (FWL means Firmware Library.)



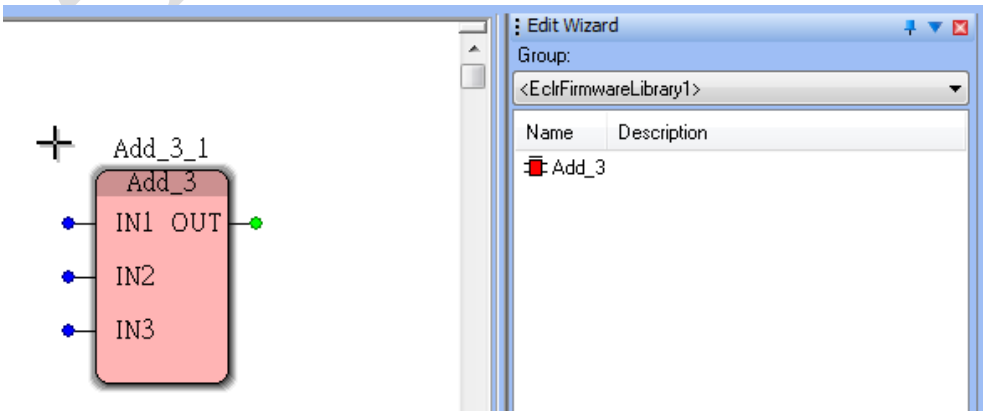
16. Open MULTIPROG Express. Create Taglink Resource project if user wants to import TagLink project.
17. In configure page, right click “Libraries”. Choose “Insert” → “Firmware Library”.



18. Locate the directory to the previous C# compiled output directory. (For example, D:\MyAdd\bin\Debug\EclrFirmwareLibrary1) Choose the file EclrFirmwareLibrary1.FWL.



19. After adding the firmware library, in the Edit Wizard (right side), user could select EclrFirmwareLibrary1 Group. Drag the function block **Add_3** to the coding page.



20. Connect the tags. Compile, download, run the project. User could see the function block works.