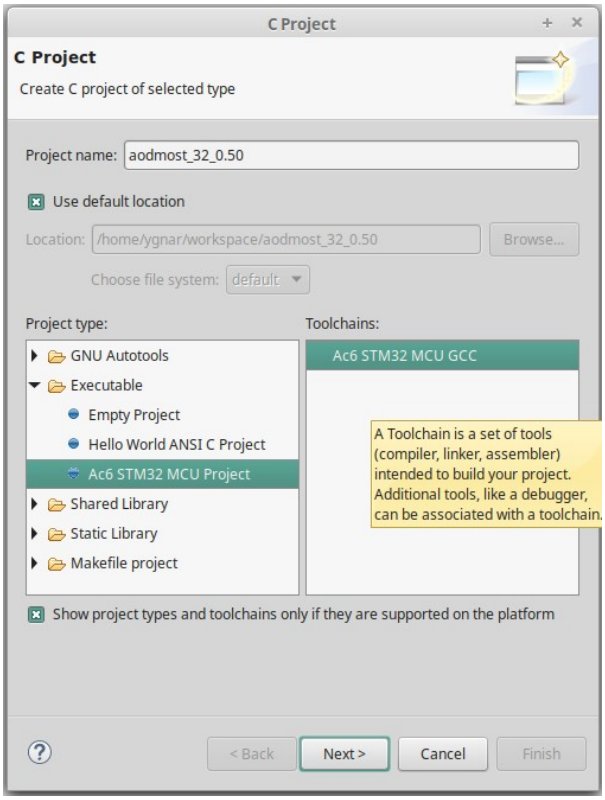
System Workbench for STM32
Making it work with AODMoST 32 source code.

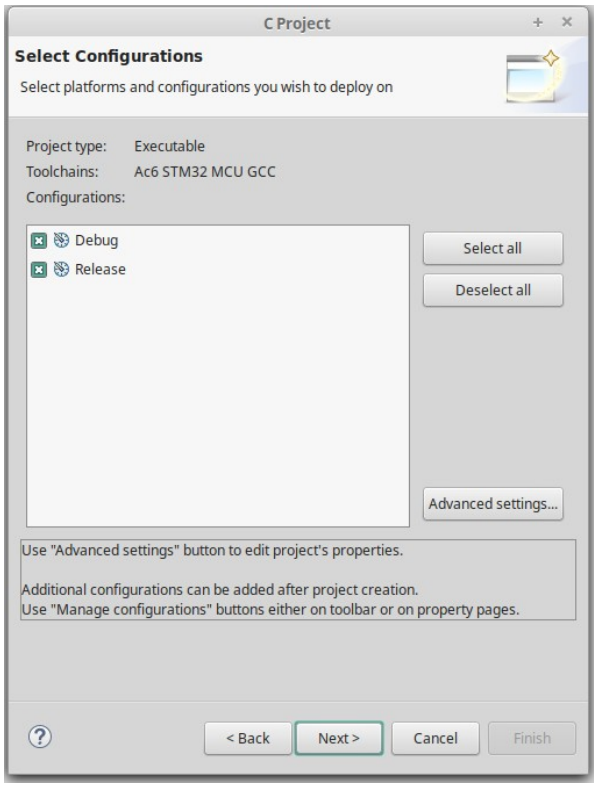
Index

Creating a project.

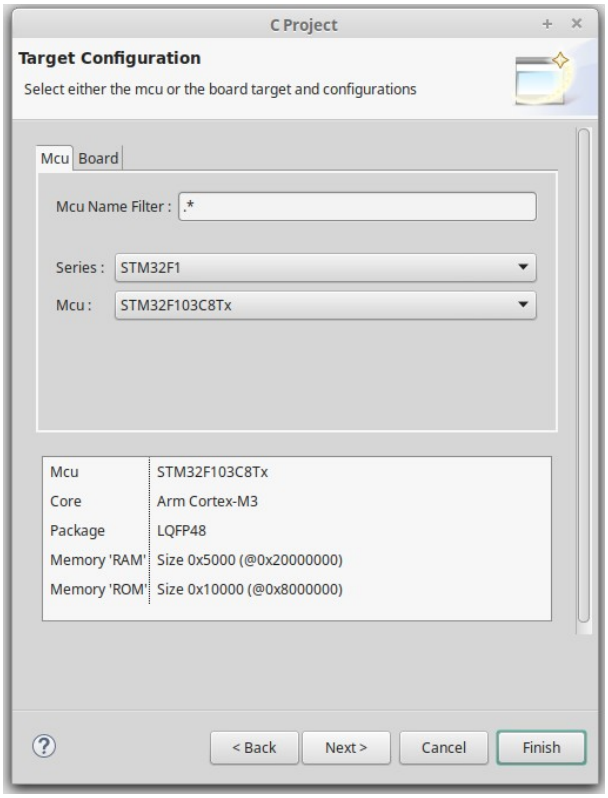
When you installed and configured SW4STM32 (files and instructions can be found here https://www.openstm32.org/HomePage), you need to select File → New → C Project, and in the window that appeared create name of the project and select Ac6 STM32 MCU GCC toolchain. After that, click Next



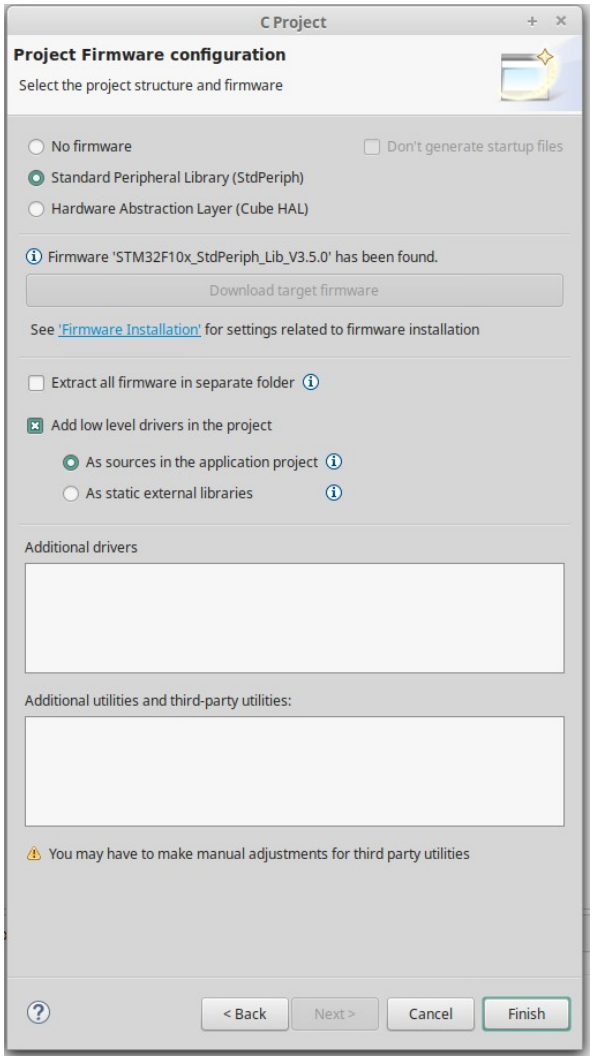
Then select both configurations (Debug, Release) and click Next.



Later choose Mcu from STM32F1 family, STM32F103C8Tx. After that, click Next.



In the last step, choose Standard Peripheral Library (StdPeriph), download it if you need to, and select Add low level drivers in the project, As sources in the application project. Then click Finish.

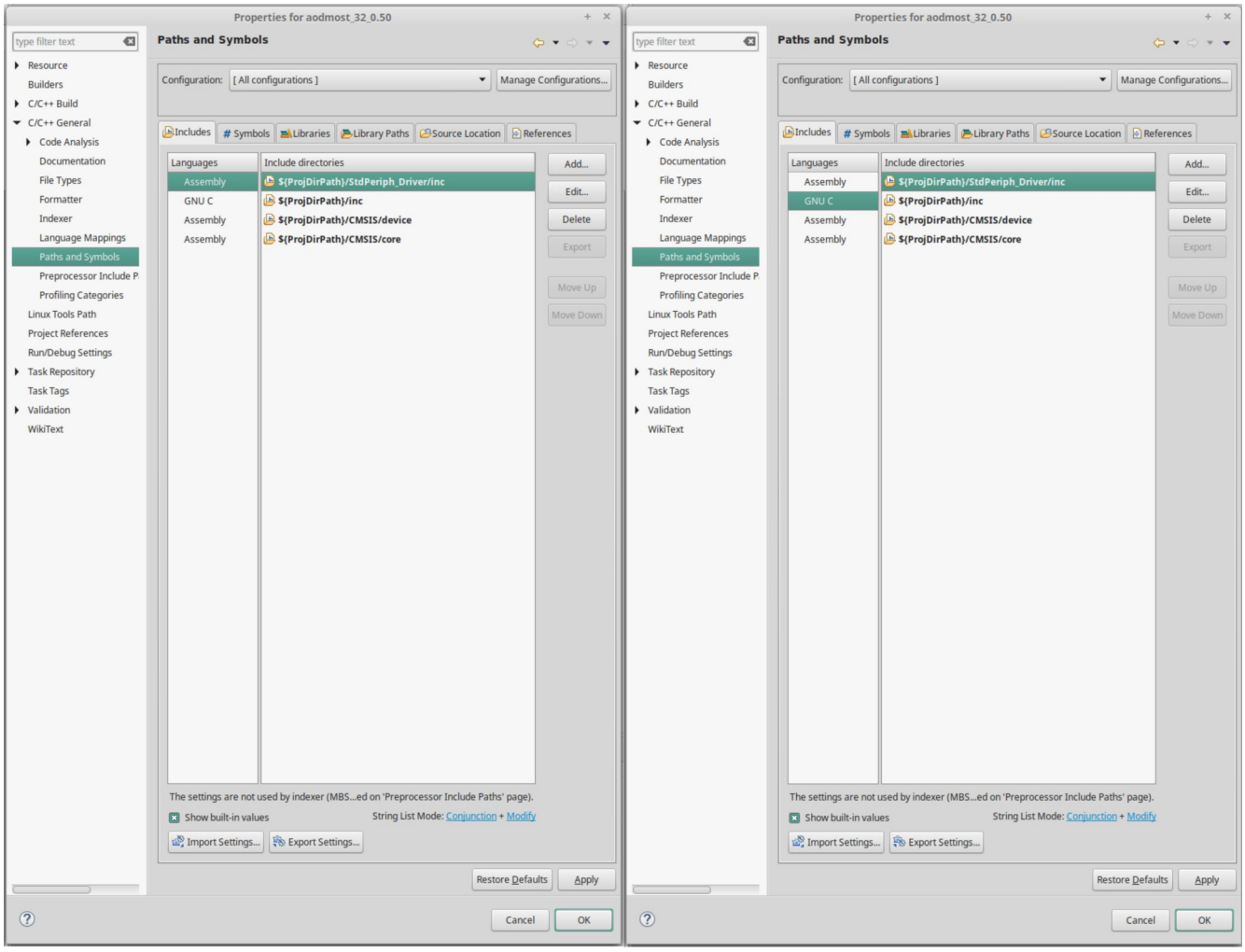


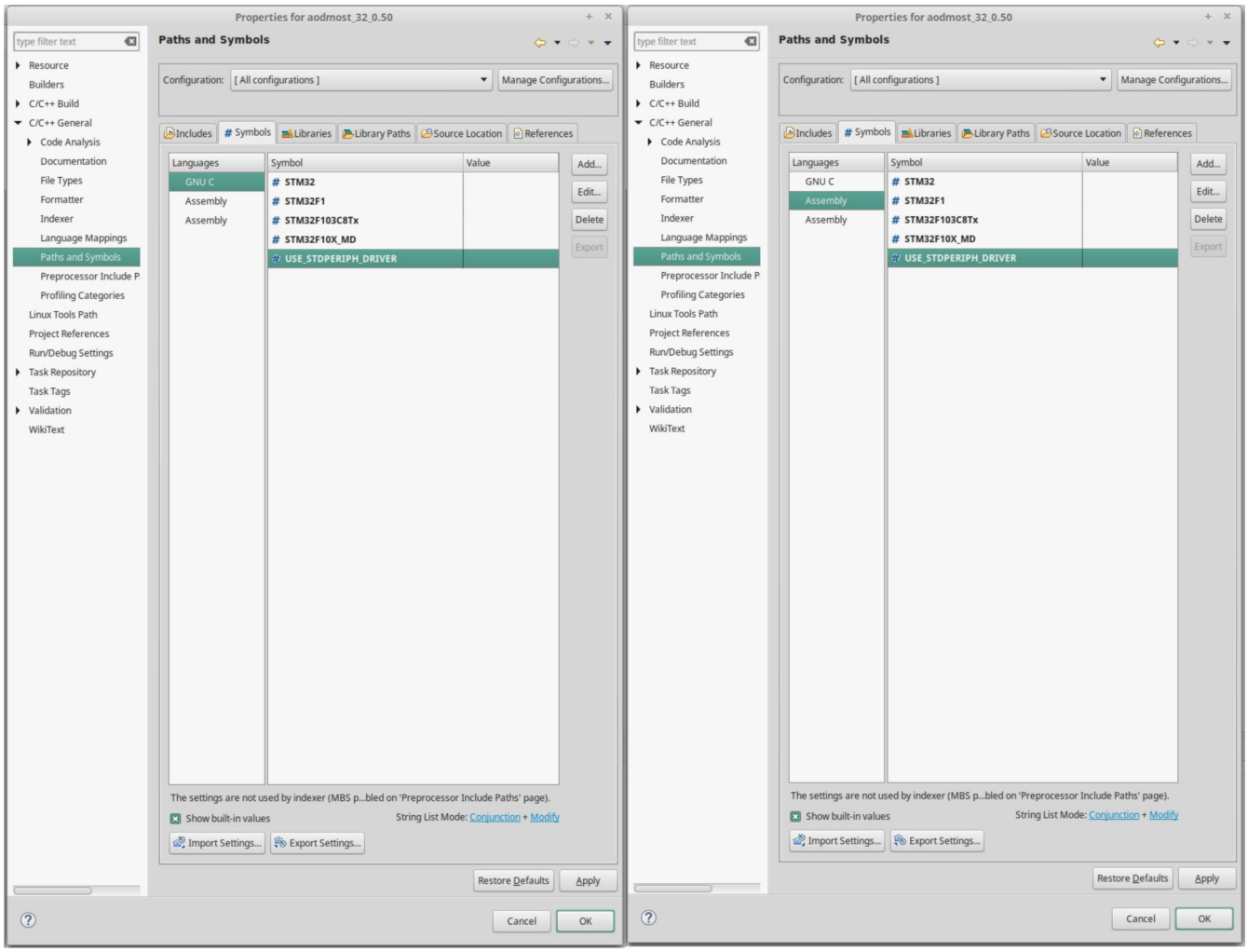
Changing project properties

Right click on the project name (aodmost_32_0.50) in the Poject Explorer on the left and select Properties.

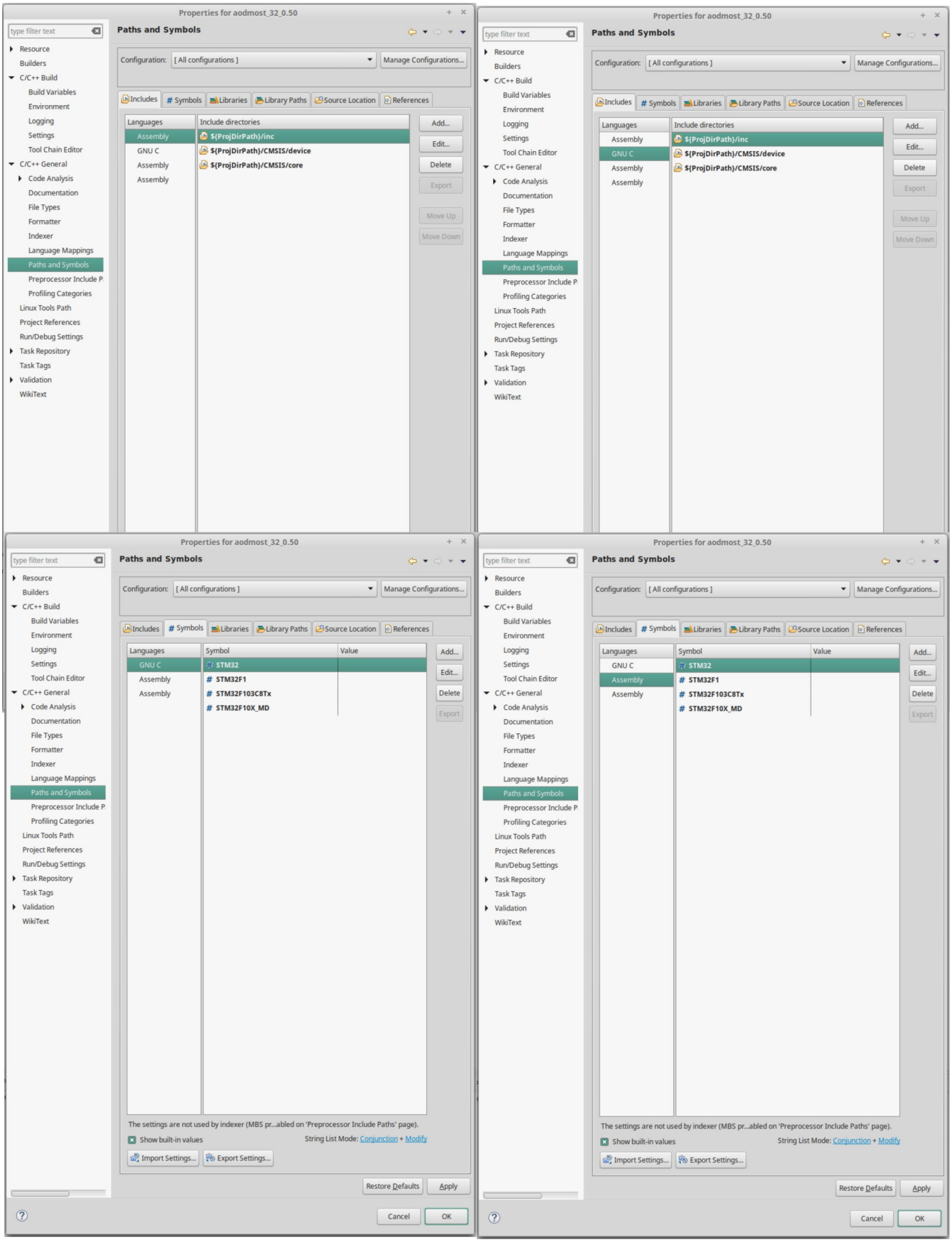
Then navigate to C/C++ General → Paths and Symbols. From the Configuration: menu select [All configurations]. After that, delete all mentions of StdPeriph_Driver and STDPERIPH_DRIVER from Includes and Symbols. This procedure is performed, so that basic functions and register names provided by CMSIS could still be used, while inefficient high level functions of Standard Peripheral Library are eliminated.

Before:

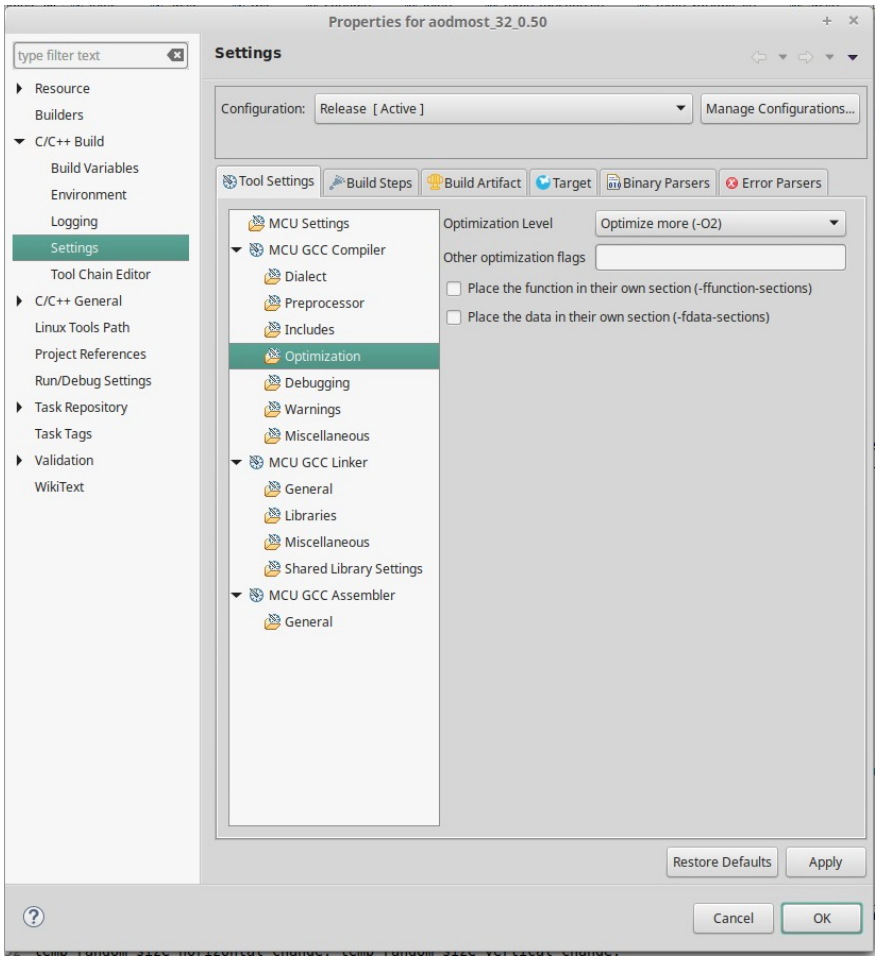



Properties for aodmost_32_0.50
type filter text
Resource
Builders
C/C++ Build
C/C++ General
Code Analysis
Documentation
File Types
Formatter
Indexer
Language Mappings
Paths and Symbols
Preprocessor Include P.
Profiling Categories
Linux Tools Path
Project References
Run/Debug Settings
Task Repository
Task Tags
Validation
WikiText
Paths and Symbols
Configuration: [All configurations]
Manage Configurations...
Includes
Symbols
Libraries
Library Paths
Source Location
References
Languages
GNU C
Assembly
Assembly
Symbol
Value
STM32
STM32F1
STM32F103C8Tx
STM32F10X_MD
USE_STDPERIPH_DRIVER
Add...
Edit...
Delete
Export
The settings are not used by indexer (MBS p...bled on 'Preprocessor Include Paths' page).
Show built-in values
String List Mode: Conjunction + Modify
Import Settings...
Export Settings...
Restore Defaults
Apply
Cancel
OK
Properties for aodmost_32_0.50
type filter text
Resource
Builders
C/C++ Build
C/C++ General
Code Analysis
Documentation
File Types
Formatter
Indexer
Language Mappings
Paths and Symbols
Preprocessor Include P
Profiling Categories
Linux Tools Path
Project References
Run/Debug Settings
Task Repository
Task Tags
Validation
WikiText
Paths and Symbols
Configuration: [All configurations]
Manage Configurations...
Includes
Symbols
Libraries
Library Paths
Source Location
References
Languages
GNU C
Assembly
Assembly
Symbol
Value
STM32
STM32F1
STM32F103C8Tx
STM32F10X_MD
USE_STDPERIPH_DRIVER
Add...
Edit...
Delete
Export
The settings are not used by indexer (MBS p...bled on 'Preprocessor Include Paths' page).
Show built-in values
String List Mode: Conjunction + Modify
Import Settings...
Export Settings...
Restore Defaults
Apply
Cancel
OK

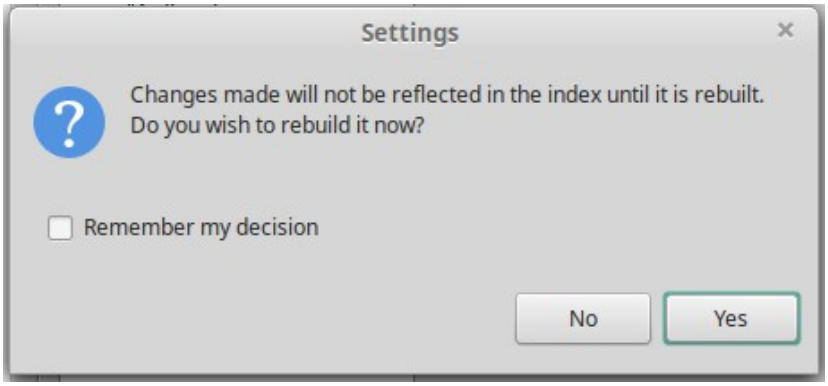
After:


Properties for aodmost_32_0.50
type filter text
Resource
Builders
C/C++ Build
Build Variables
Environment
Logging
Settings
Tool Chain Editor
C/C++ General
Code Analysis
Documentation
File Types
Formatter
Indexer
Language Mappings
Paths and Symbols
Preprocessor Include P.
Profiling Categories
Linux Tools Path
Project References
Run/Debug Settings
Task Repository
Task Tags
Validation
WikiText
Paths and Symbols
Configuration: [All configurations]
Manage Configurations...
Includes
Symbols
Libraries
Library Paths
Source Location
References
Languages
Assembly
GNU C
Assembly
Assembly
Include directories
${ProjDirPath}/inc
${ProjDirPath}/CMSIS/device
${ProjDirPath}/CMSIS/core
Symbol
Value
STM32
STM32F1
STM32F103C8Tx
STM32F10X_MD
Add...
Edit...
Delete
Export
Move Up
Move Down
The settings are not used by indexer (MBS pr...abled on 'Preprocessor Include Paths' page).
Show built-in values
String List Mode: Conjunction + Modify
Import Settings...
Export Settings...
Restore Defaults
Apply
Cancel
OK

Next thing that you need to do is to go to the C/C++ Build → Settings → MCU GCC Compiler → Optimization. From the Configuration: select Release, from the Optimization Level select Optimize More (-O2) and uncheck box next to Place the function in their own section (-ffunction-sections). Then, click OK. Note that AODMoST 32 code is extremely sensitive to optimization settings, and when changes are made to the code, sharpness of vertical edges displayed on the 3D screen may decrease drastically. Modifying optimization settings (this can be even done on a level of functions), can make it better or worse.

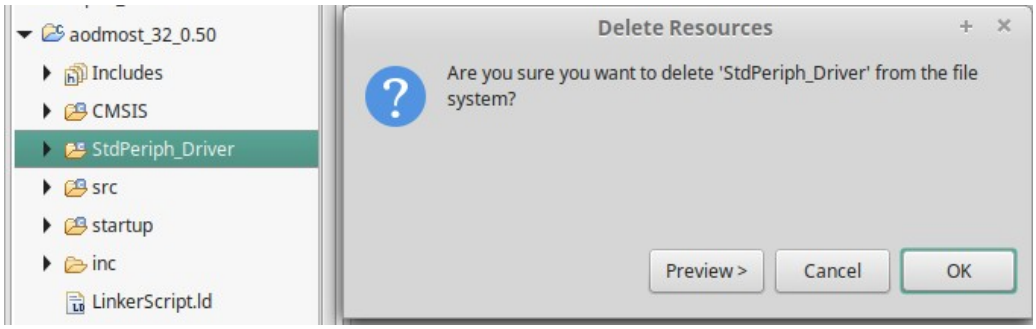


After clicking OK this window may pop out. If it happens, click Yes.

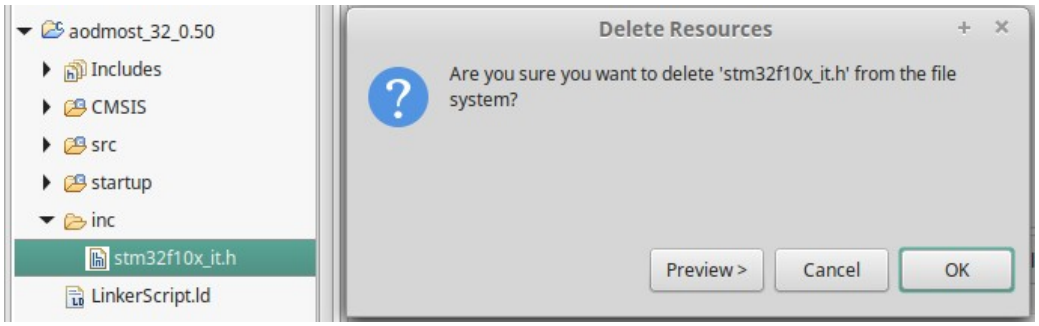


Modifying resources

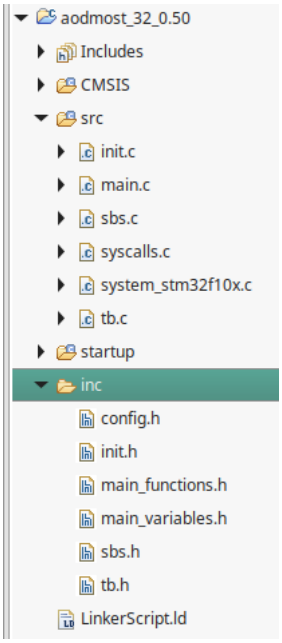
To fully eliminate SPL, you need to delete you need to delete StdPeriph_Driver folder (you can do it by right-clicking on the folder in Project Explorer, selecting Delete and then choosing Yes in a window that pops up).



You should also delete stm32f10x_it.h file from the inc folder.

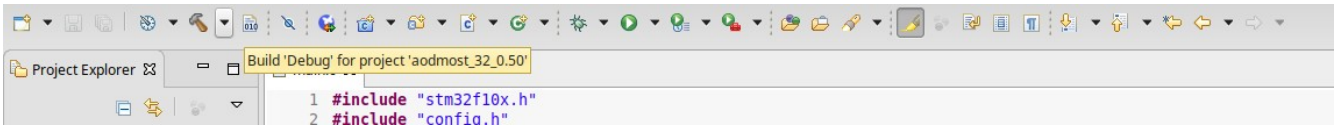


Now you can import AODMoST 32 files into aodmost_32_0.50 project. Copy init.c, main.c (overwrite previous file), sbs.c and tb.c into src folder. Copy config.h, init.h, main_functions.h, main_variables.h, sbs.h and tb.h into inc folder. When you are done it should look like this:

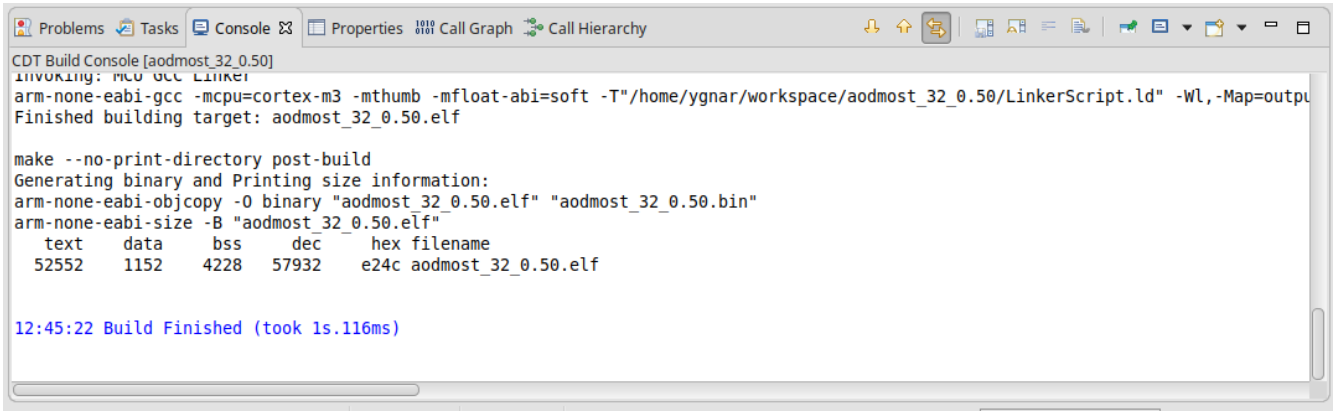


Building project

When every thing is in place, you can built project. Click on the triangle next to a hammer icon and select Release (by default Debug will be selected).

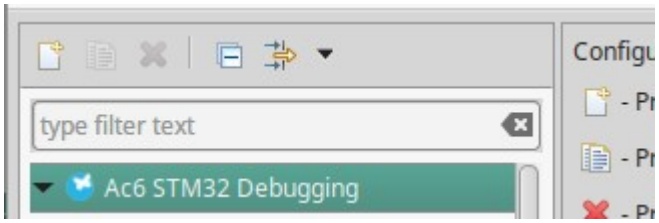


Successful built will be indicated by the Console output that looks like this:

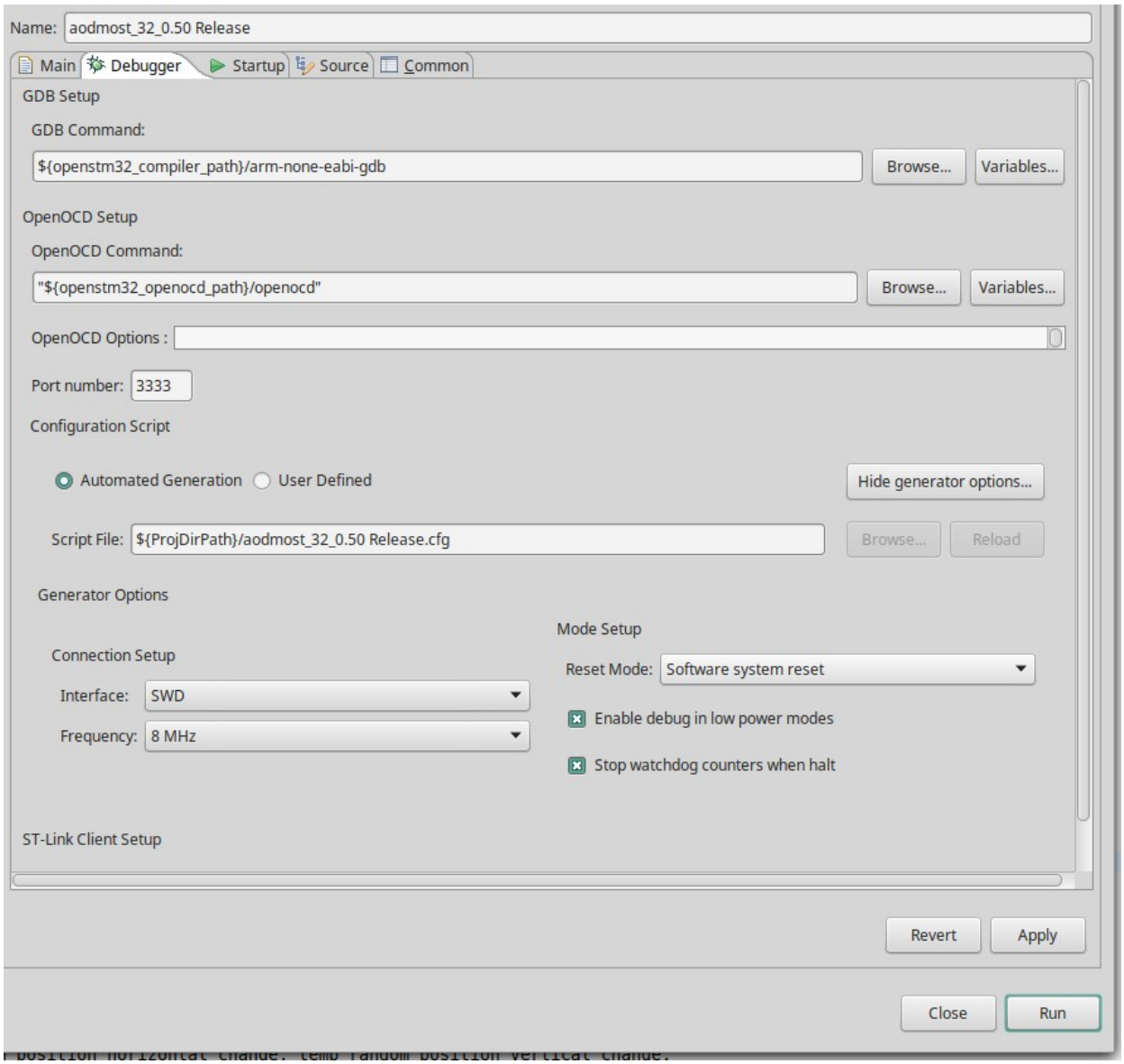


Connecting to the MCU

You have to change OpenOCD Reset Mode to Software system reset. To do it, right-click on a project in Project Explorer and select Run As → Run Configurations. Then, in newly opened window, double-click on Ac6 STM32 Debugging to create new run configuration for the project (Release configuration should be active).



Now, under the Debugger bookmark, you can find Reset Mode menu. When you changed it to Software, click Apply and close the window.



Now you can right-click on the project name an go to Target → Erase Chip if you want to delete contents of MCU's Flash memory or Target →Program Chip to upload binary file that we built a moment ago. When you are doing it, I recommend checking box next to Reset after program.