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

Version 1.00

Index

Creating a project	1
Changing project properties	
Modifying resources	
Building project	
Connecting to the MCU	

Creating a project.

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



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

C Project	+ X
Select Configurations Select platforms and configurations you wish to deploy on	
Project type: Executable Toolchains: Ac6 STM32 MCU GCC Configurations:	
🖾 🛞 Debug	Select all
🛛 🛞 Release	Deselect all
Use "Advanced settings" button to edit project's properties	Advanced settings
Additional configurations can be added after project creati Use "Manage configurations" buttons either on toolbar or	on.
? < Back Next > Ca	Finish

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

-

	C Project	+ ×
arget Confi	guration he mcu or the board target and configurations	
Mcu Board Mcu Nam Series :		
	STM32F103C8Tx Arm Cortex-M3 LQFP48 AM' Size 0x5000 (@0x20000000) OM' Size 0x10000 (@0x8000000)	
0	< Back Next > Cancel	Finish

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.

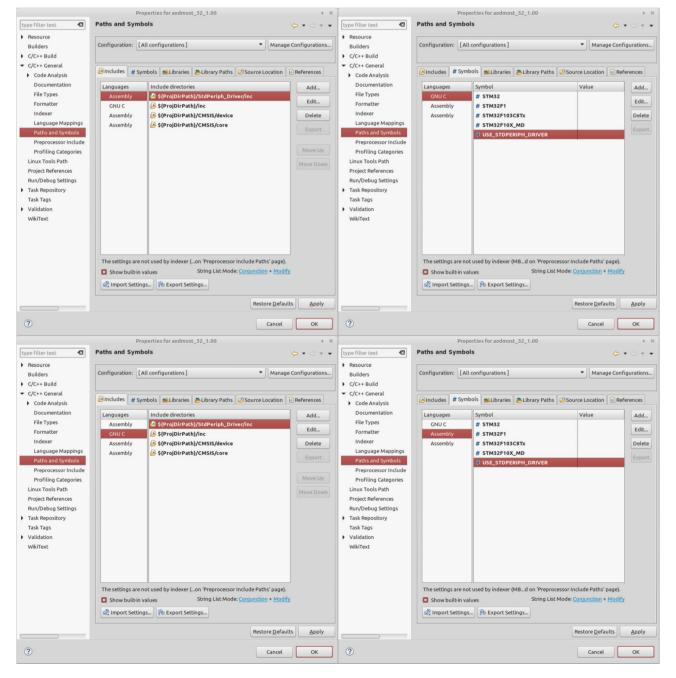
C Project +	×
Project Firmware configuration	
Select the project structure and firmware	
O No firmware Don't generate startup file	25
Standard Peripheral Library (StdPeriph)	
O Hardware Abstraction Layer (Cube HAL)	
IFIN TERMINAL STATE TO THE TO THE TERMINAL STATE TO THE TERMINAL STATE TO THE TO THE TERMINAL STATE TO THE TO T	
Download target firmware	
See <u>'Firmware Installation'</u> for settings related to firmware installation	
Extract all firmware in separate folder ①	
Add low level drivers in the project	
• As sources in the application project ①	
 As static external libraries 	
Additional drivers	
Additional utilities and third-party utilities:	
4 You may have to make manual adjustments for third party utilities	
? < Back Next > Cancel Finish	

Changing project properties

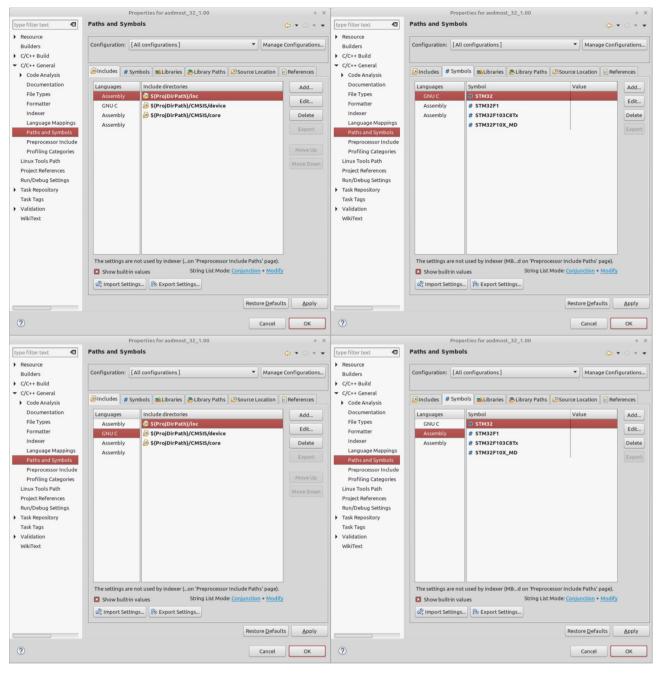
Right click on the project name (aodmost_32_1.00) in the Project Explorer on the left and select Properties.

Then navigate to C/C++ General \rightarrow 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.

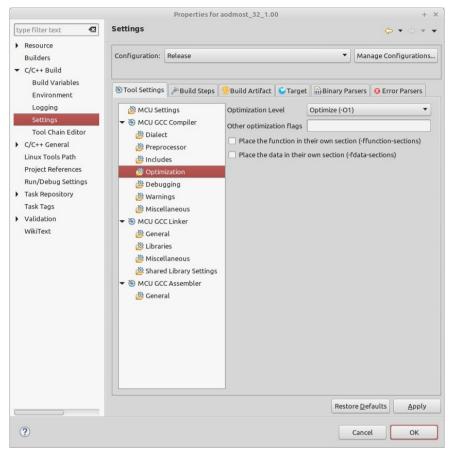
Before:



After:



Next thing that you need to do is to go to the C/C++ Build \rightarrow Settings \rightarrow MCU GCC Compiler \rightarrow Optimization. From the Configuration: select Release, from the Optimization Level select Optimize (-O1) 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.

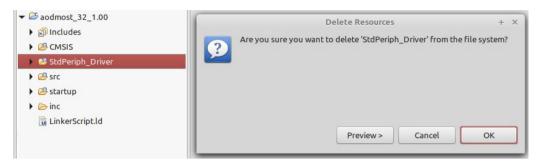


After clicking OK this window may pop out. If it happens, click Yes.



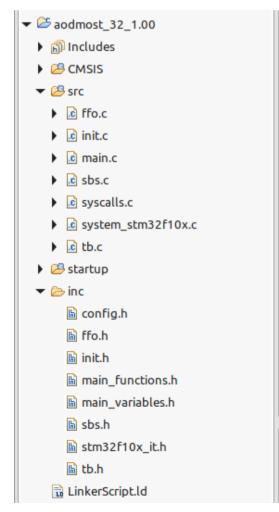
Modifying resources

To fully eliminate SPL, you need to delete 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).



Now you can import AODMoST 32 files into aodmost_32_1.00 project. Copy ffo.c, init.c, main.c (overwrite previous file), sbs.c and tb.c into src folder. Copy config.h, ffo.h, init.h,

main_functions.h, main_variables.h, sbs.h and tb.h into inc folder. You can either drag and drop the files files into Project Explorer or use some file manager to put them into right folders (after you do that you may need to refresh list of files in Project Manager). 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).

File Edit Source Ref.	actor Navigate Sear	ch Project Run	Window Help			
🖻 🕶 🖬 🕼 🛯 🛞 🔹	• 🐔 💽 🗟 💊 🧯	1 🗇 🕶 🕶 🔹	€ • @ •	☆・○・6	} • 💁 • 😕	🗁 🛷 👻
🔁 Project Explorer 🛿						
	□ 🔄 🐌 🔻					

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 \rightarrow Run Configurations. Then, in newly opened window, double-click on Ac6 STM32 Debugging (or click on a New launch configuration) to create new run configuration for the project (Release configuration should be active).



Now, under the Debugger bookmark, you can find "Show generator options..." button. Click on it, then change Reset mode to Software system reset, click Apply and close the window.

Name:	aodmost_3	32_1.00 Release				
📄 Mai	in 🏇 Debu	ugger 🕞 Startup 🦃 Source 🔲 Common				
GDB S	Setup					
GDB	Command:					
\${o	penstm32_	compiler_path}/arm-none-eabi-gdb			Browse	Variables
Open	OCD Setup					
Oper	nOCD Comr	nand:				
"\${	openstm32_	_openocd_path}/openocd"			Browse	Variables
Oper	nOCD Optic	ons :				0
Port	number: 3	333				
Conf	iguration S	cript				
	Automate	ed Generation 🔿 User Defined			Hide generator	options
Sc	ript File: \$	{ProjDirPath}/aodmost_32_1.00 Release.cfg			Browse	Reload
Gen	erator Opti	ons				
			Mode Setup			
Co	onnection S	etup	Reset Mode	Software system rese		-
1	nterface:	SWD 👻	hescemode.	Joreware System rese		
F	Frequency:	8 MHz 🗸	Enable debug in low power modes			
	Stop watchdog counters when halt					
ST-Lin	k Client Set	up				
	Charashla	ST-Link ST-Link Server not installed on this mach	ina. Masa datails is	Hele Contents		
	Shareable .	SPEINK SPEENK Server not instanted on this mach	ine. More details i	Help contents.		
				,		
					Revert	Apply
					Close	Run

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

Select binary file + 3	×			
Program				
Binaries				
aodmost_32_1.00.elf				
Qualifiers				
🐞 armle - /aodmost_32_1.00/Release/aodmost_3	2			
Reset after program				
(?) Cancel OK	J			