

Synerduino STM Fork of INAV and the Synerduino Target

Synerduino STM Target Compilation into Hexfile Download the INAV Release 5.1.0 Release 6.0.0 Release 7.0.0 Release 8.0.0

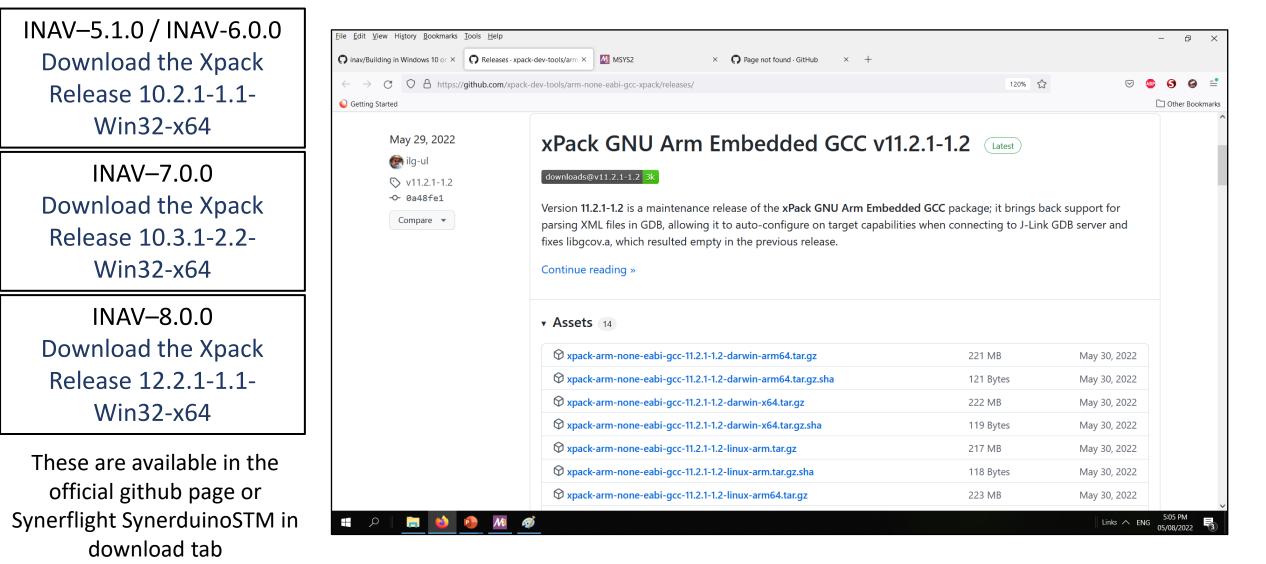
First you need to download the INAV release version

These are available in the official github page or Synerflight SynerduinoSTM in download tab

# Prepare to Build the Hex File

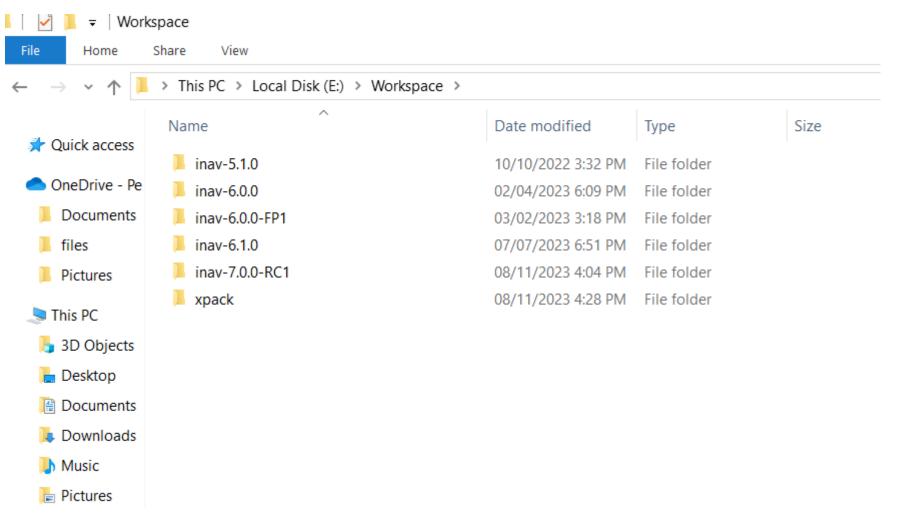
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https://github.com/iNavFlight/inav/tree/release 5.1.0 https://github.com/iNavFlight/inav/tree/6.0.0 https://github.com/iNavFlight/inav/tree/7.0.0



https://github.com/xpack-dev-tools/arm-none-eabi-gcc-xpack/releases/

https://github.com/xpack-dev-tools/arm-none-eabi-gcc-xpack/releases/download/v9.2.1-1.1/xpack-arm-none-eabi-gcc-9.2.1-1.1-win32-x64.zip https://github.com/xpack-dev-tools/arm-none-eabi-gcc-xpack/releases/download/v10.2.1-1.1/xpack-arm-none-eabi-gcc-10.2.1-1.1-win32-x64.zip https://github.com/xpack-dev-tools/arm-none-eabi-gcc-xpack/releases/download/v10.3.1-2.2/xpack-arm-none-eabi-gcc-10.3.1-2.2-win32-x64.zip https://github.com/xpack-dev-tools/arm-none-eabi-gcc-xpack/releases/download/v13.2.1-1.1/xpack-arm-none-eabi-gcc-13.2.1-1.1-win32-x64.zip After installation Go Create a Workspace folder in your local Drive in my case Drive E, and extract and place the following directories INAV-5.1.0 / INAV-6.0.0 / INAV-7.0.0 /INAV8.0.0 Folder, Xpack folder

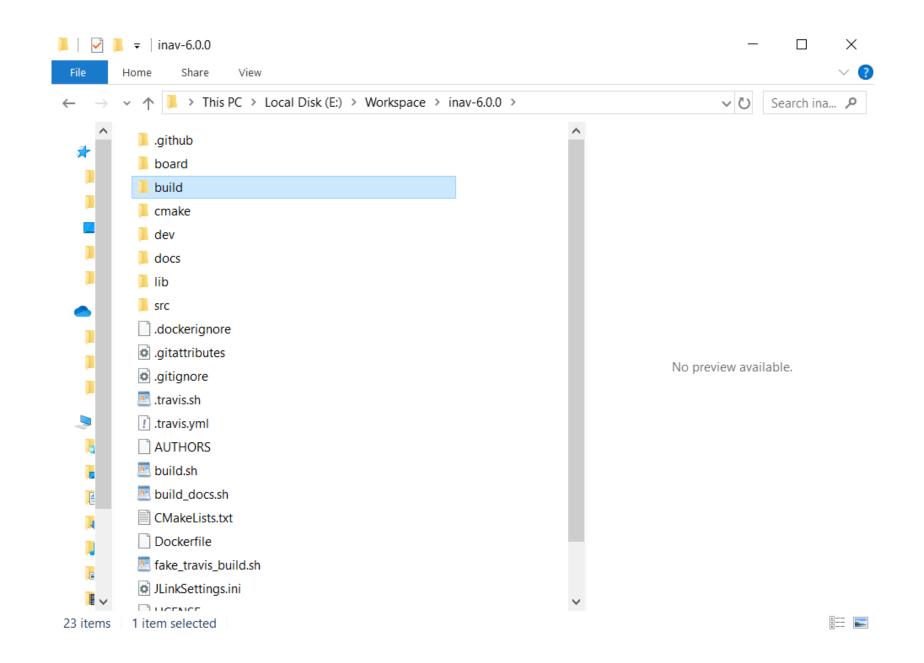


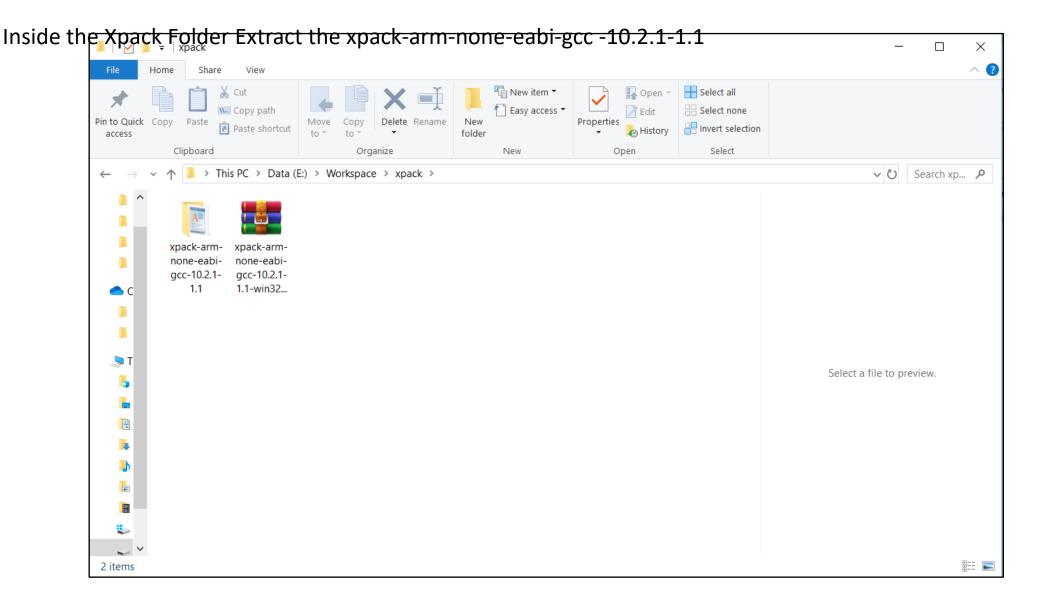
Note: I place my Workspace Folder on Drive E: as I was using SSD on my Drive C so not to fill it up

Create new folder inside

INAV 5.1.0 INAV 6.0.0 INAV 7.0.0 INAV 8.0.0

Directory and Name it **build** 





Create an xplack folder in Workspace folder and place it in there INAV 5.1.0 INAV 6.0.0xpack-arm-none-eabi-gcc-10.2.1-1.1 is extracted to the Xpack folderINAV 7.0.0xpack-arm-none-eabi-gcc-10.3.1-2.2 is extracted to the Xpack folderINAV 8.0.0xpack-arm-none-eabi-gcc-13.2.1-1.1 is extracted to the Xpack folder

Download the Synerduino Target Folder and Extract to Local drive and place it in the following (E/Workspace/inav-5.1.0/scr/main/target) (E/Workspace/inav-6.0.0/scr/main/target) (E/Workspace/inav-7.0.0/scr/main/target) (E/Workspace/inav-8.0.0/scr/main/target)

Readme file is also available in the download System\_stm32f4xx.c – is modify to suit the Synerduino STM INAV 7.0.0 when F411 BP became official) INAV 8.0.0 F411 discontinued due to size limitation

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Other Download of the Synerduino Target Folder is the sensor driver this is also Extract to Local drive and place it in the following

(E/Workspace/inav-5.1.0/scr/main/drivers/accgyro),

(E/Workspace/inav-6.0.0/scr/main/drivers/accgyro),

(E/Workspace/inav-7.0.0/scr/main/drivers/accgyro)

(E/Workspace/inav-7.1.0/scr/main/drivers/accgyro)

(E/Workspace/inav-8.0.0/scr/main/drivers/accgyro)

Readme file is also available in the download (accgyro\_BMI160) is also modify to use with the SynerduinoSTM shield

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# **General Info**

This is a guide on how to use Windows MSYS2 distribution and building platform to build iNav firmware. This environment is very simple to manage and does not require installing docker for Windows which may get in the way of VMWare or any other virtualization software you already have running for other reasons. Another benefit of this approach is that the compiler runs natively on Windows, so performance is much better than compiling in a virtual environment or a container.

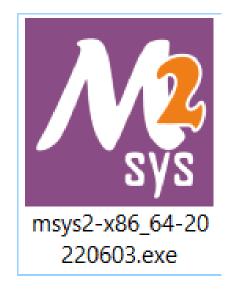
Download Arm Embedded GCC toolkit from The xPack Project

https://xpack.github.io/arm-none-eabi-gcc/

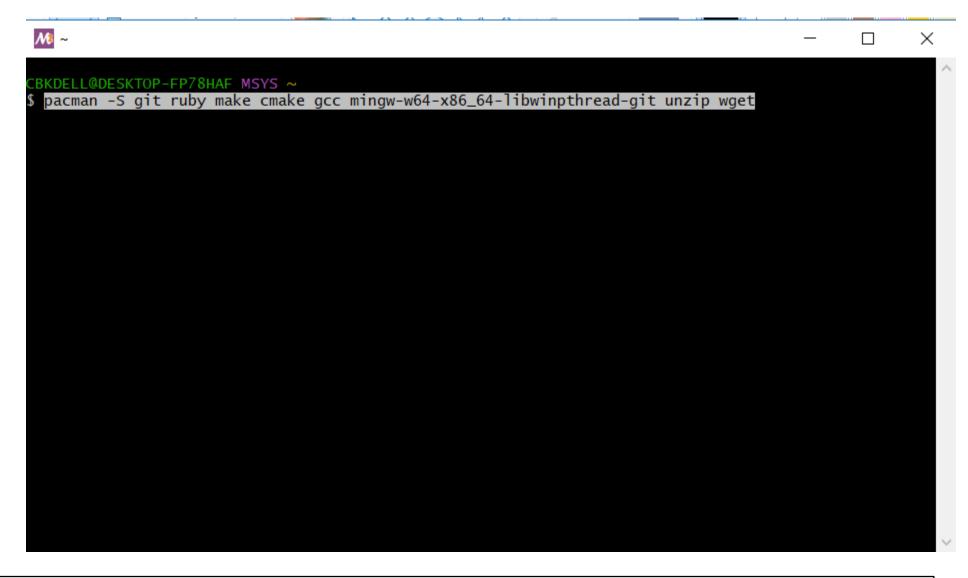
Download MSYS2 for your architecture (most likely 64-bit)

https://www.msys2.org/wiki/MSYS2-installation/

Install and Run msys2-x86



Copy and paste this script to install Ruby ,Cmake , Make and Gcc



pacman -S git ruby make cmake gcc mingw-w64-x86\_64-libwinpthread-git unzip wget

# Y to Proceed installation

<i>№</i> ~	_		$\times$
CBKDELL@DESKTOP-FP78HAF MSYS ~ \$ pacman -S git ruby make cmake gcc mingw-w64-x86_64-libwinpthread-git unzip wget warning: git-2.36.1-1 is up to date reinstalling warning: ruby-2.7.2-1 is up to date reinstalling warning: make-4.3-3 is up to date reinstalling warning: cmake-3.22.1-3 is up to date reinstalling warning: gcc-11.3.0-1 is up to date reinstalling warning: mingw-w64-x86_64-libwinpthread-git-10.0.0.r32.g89bacd2be-1 is up to date warning: unzip-6.0-2 is up to date reinstalling warning: wget-1.21.3-1 is up to date reinstalling warning: gcc-11.3.0-1 is up to date reinstalling warning: no date reinstalling warning: unzip-6.0-2 is up to date reinstalling warning: wget-1.21.3-1 is up to date reinstalling warning: gcc-11.3.0-1 is up to date reinstalling warning: gcc-11.3.0-1 is up to date reinstalling warning: gcc-11.3.0-1 is up to date reinstalling warning: unzip-6.0-2 is up to date reinstalling warning: gcc-11.3.0-1 is up to date reinstalling	- reins	talling	^
Packages (8) cmake-3.22.1-3 gcc-11.3.0-1 git-2.36.1-1 make-4.3-3 mingw-w64-x86_64-libwinpthread-git-10.0.0.r32.g89bacd2be-1 ruby-2.7.2 wget-1.21.3-1	2-1 unz	ip-6.0-2	2
Total Installed Size: 241.71 MiB Net Upgrade Size: 0.00 MiB			
:: Proceed with installation? [Y/n]			
			$\sim$

pacman -S git ruby make cmake gcc mingw-w64-x86\_64-libwinpthread-git unzip wget

### After installation

<u>₩</u> ~	_		$\times$
resolving dependencies looking for conflicting packages			^
Packages (8) cmake-3.22.1-3 gcc-11.3.0-1 git-2.36.1-1 m mingw-w64-x86_64-libwinpthread-git-10.0.0.r32 wget-1.21.3-1		ip-6.0	-2
Total Installed Size: 241.71 MiB Net Upgrade Size: 0.00 MiB			
<pre>:: Proceed with installation? [Y/n] (8/8) checking keys in keyring (8/8) checking package integrity (8/8) loading package files (8/8) checking for file conflicts (8/8) checking available disk space :: Processing package changes (1/8) reinstalling git (2/8) reinstalling ruby (3/8) reinstalling make (4/8) reinstalling make (4/8) reinstalling cmake (5/8) reinstalling gcc (6/8) reinstalling mingw-w64-x86_64-libwinpthread-git (7/8) reinstalling unzip (8/8) reinstalling wget :: Running post-transaction hooks (1/1) Updating the info directory file</pre>		<pre>####] : #####] : #####</pre>	100% 100% 100% 100% 100% 100% 100% 100%
CBKDELL@DESKTOP-FP78HAF MSYS ~			~

pacman -S git ruby make cmake gcc mingw-w64-x86\_64-libwinpthread-git unzip wget

#### To get the toolkit version you need for your INAV version

# for INAV version 5.0.0, 6.1.0 toolchain version needed is 10.2.1
# for INAV version 7.0.0 , 7.1.2 toolchain version needed is 10.3.1
# for INAV version 8.0.0 , 8.1.1 toolchain version needed is 13.2.1

Generating done Build files have	oeen written to: /e/Workspace/inav-5.1.0	0/build	
	AF MSYS /e/Workspace/inav-5.1.0/build	<i>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</i>	
BKDELL@DESKTOP-FP78 cat /e/Workspace/i   cut -d\" -f2 10.2.1	HAF MSYS <mark>/e/Workspace/xpack</mark> nav-5.1.0/cmake/arm-none-eabi-checks.cma	ake   grep "set(arm_none_eabi_go	c_version"
	HAF MSYS /e/Workspace/xpack		

Source the version number that needs to be downloaded

Go to Xpack directory by typing

cd /e/Workspace/xpack

cat /e/Workspace/inav-8.0.0/cmake/arm-none-eabi-checks.cmake | grep "set(arm\_none\_eabi\_gcc\_version" | cut -d\" -f2

cat /e/Workspace/inav-7.1.2/cmake/arm-none-eabi-checks.cmake | grep "set(arm\_none\_eabi\_gcc\_version" | cut -d\" -f2

cat /e/Workspace/inav-7.1.0/cmake/arm-none-eabi-checks.cmake | grep "set(arm\_none\_eabi\_gcc\_version" | cut -d\" -f2

cat /e/Workspace/inav-7.0.0/cmake/arm-none-eabi-checks.cmake | grep "set(arm\_none\_eabi\_gcc\_version" | cut -d\" -f2

cat /e/Workspace/inav-6.0.0/cmake/arm-none-eabi-checks.cmake | grep "set(arm\_none\_eabi\_gcc\_version" | cut -d\" -f2

cat /e/Workspace/inav-5.1.0/cmake/arm-none-eabi-checks.cmake | grep "set(arm\_none\_eabi\_gcc\_version" | cut -d\" -f2

	/e/Workspace/xpack	_	×
	CBKDELL@DESKTOP-FP78HAF MSYS /e/Workspace/inav-8.0.0/build \$ cd /e/Workspace/xpack		^
Go to Xpack directory by typing			
cd /e/Workspace/xpack			
			~

Build Folder

E/Workspace/INAV-8.0.0/build

If you have an old CMakeFiles folder of a different versions Delete it before Exporting a new path

Image: Copy Paster Copy Paster Copy Copy Copy Copy Copy Copy Copy Copy	t none
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Set a Path for the Exported GCC to the Environment PIs make sure the directory is same name as the folder

<b>M</b> ~			×	
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	oceed with installation? [Y/n]	<b>.</b>		$\mathbf{A}$
	checking keys in keyring		100%	
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(8/8)	loading package files	Ĺ <i>₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩</i> Ĺ <i>₩₩₩₩₩₩₩₩₩₩</i>	100%	
(8/8)	checking for file conflicts checking available disk space	[ <i>####################################</i>	100% 100%	
	ocessing package changes	[######################################	100%	
	reinstalling git	[ <i>####################################</i>	100%	
	reinstalling ruby	[ <i>####################################</i>	100%	
	reinstalling make	[ <i>####################################</i>	100%	
	reinstalling cmake	[#####################################	100%	
	reinstalling gcc	[ <i>####################################</i>	100%	
	reinstalling mingw-w64-x86_64-libwinpthread-git	[ <i>##################################</i> ]	100%	
	reinstalling unzip	[######################################	100%	
(8/8)	reinstalling wget	[######################################	100%	
	nning post-transaction hooks			
(1/1)	Updating the info directory file			
CRKD	ELL@DESKTOP-FP78HAF MSYS ~			
	port PATH=/e/Workspace/xpack/xpack-arm-none-eabi-gcc-1	0 2 1-1 1/hin·\$PATH		
5 CX	or c PATH=/ c/ workspace/ xpack/ xpack-arm-none-eab1-gcc-1	.0.2.1-1.1/D11.9FATH		
				v
INAV 5.1.0 – 6.1.0	export PATH=/e/Workspace/xpack/xpack-arm-no	one-eabi-gcc-10.2.1-1.1/bin:\$PATH		
	· · · · ·	-		
INAV 7.0.0 – 7.1.2	export PATH=/e/Workspace/xpack/xpack-arm-no	one-eabi-acc-10.3.1-2.2/bin:\$PATH		
INAV 8.0.0	export PATH=/e/Workspace/xpack/xpack-arm-nd	ne-eahi-acc-13 2 1-1 1/hin \$PATH		

## Go to the build directory by entering this command

M /e/Workspace/inav-6.0.0-FP1/build	- 🗆 X	cd /e/Workspace/inav-5.1.0/build
CBKDELL@DESKTOP-FP78HAF_MSYS ~ \$ cd /e/Workspace/inav-6.0.0-FP1/build		cd /e/Workspace/inav-6.1.0/build
CBKDELL@DESKTOP-FP78HAF MSYS /e/Workspace/inav-6.0.0-FP1/build \$		cd /e/Workspace/inav-7.0.0/build
		cd /e/Workspace/inav-7.1.0/build
		cd /e/Workspace/inav-7.1.1/build
		cd /e/Workspace/inav-7.1.2/build
		cd /e/Workspace/inav-8.0.0/build
		cd /e/Workspace/inav-8.0.0-RC3/build
	~	

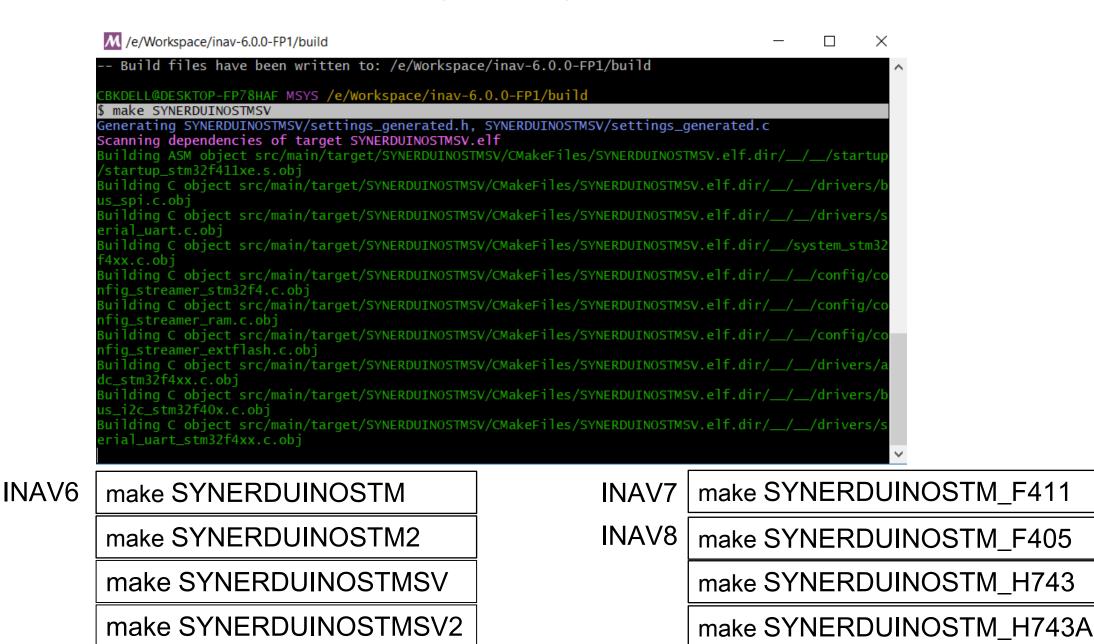
# This will extract the Cmake into the build folder creating the Environment

M /e/Workspace/inav-6.0.0-FP1/build	_		$\times$
CBKDELL@DESKTOP-FP78HAF MSYS <mark>/e/Workspace/inav-6.0.0-FP1/build</mark> \$ export PATH=/e/Workspace/xpack/xpack-arm-none-eabi-gcc-10.2.1-1.1/bin:\$PATH			
CBKDELL@DESKTOP-FP78HAF MSYS /e/Workspace/inav-6.0.0-FP1/build \$ Cmake			
found arm-none-eabi-gcc 10.2.1 at /e/Workspace/xpack/xpack-arm-none-eabi-gcc-10.2 one-eabi-gcc.exe	.1-1.1,	/bin/ar	m-n
The C compiler identification is GNU 10.2.1			
The CXX compiler identification is GNU 10.2.1 Detecting C compiler ABI info			
Detecting C compiler ABI info - done Check for working C compiler: /e/Workspace/xpack/xpack-arm-none-eabi-gcc-10.2.1-1	.1/bin,	/arm-no	ne-
eabi-gcc.exe - skipped Detecting C compile features			
Detecting C compile features - done Detecting CXX compiler ABI info			
Detecting CXX compiler ABI info - done Check for working CXX compiler: /e/Workspace/xpack/xpack-arm-none-eabi-gcc-10.2.1	-1.1/b	in/arm-	non
e-eabi-g++.exe - skipped Detecting CXX compile features			
Detecting CXX compile features - done The ASM compiler identification is GNU			
Found assembler: /e/Workspace/xpack/xpack-arm-none-eabi-gcc-10.2.1-1.1/bin/arm-no	ne-eab <sup>-</sup>	i-gcc.e	xe
toolchain: arm-none-eabi, WARNINGS_AS_ERRORS: OFF Could not find openocd, debugging won't be available			
DEBUG_HARDFAULTS: OFF, SEMIHOSTING: OFF			



You may need to run rm -rf \* in build directory if you had any failed previous runs now run cmake

This will build the Hexfile Targeted the Synerduino board and its settings to the Build Folder the Hexfile is use as Firmware when loading the configurator



# Once completed the Hexfile can be found on the Build folder

M /e/Workspace/inav-6.							X
ibus_shared.c.obj uilding C object sı	rc/main/target/	SYNERDUTNOS	TMSV/CMakeFile	s/SYNERDUTNOSTMSV	.elf.dir/ /	/teleme	etrv
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mavlink.c.obj uilding C object sı	ne/main/tangat/				alf din/ /	/tolom/	
msp_shared.c.obj	rc/main/largel/	SYNERDUINUS	імбу/смакентте	S/SYNERDUINUSIMSV	.en.ar/_/_	_/ Le reme	erry
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uilding C object s	rc/main/target/	SYNERDUINOS	TMSV/CMakeFile	s/SYNERDUINOSTMSV	.elf.dir/_/_	_/teleme	etr
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<ul> <li>Quick access</li> <li>build</li> <li>SynerduinoSTM hex INA</li> <li>SYNERDUINOSTMSV</li> <li>SYNERDUINOSTMSV</li> <li>OneDrive - Personal</li> <li>Documents</li> <li>Pictures</li> </ul>	<ul> <li>bin</li> <li>CMakeFiles</li> <li>src</li> <li>SynerduinoSTM hex INAV 6.0.0</li> <li>SynerduinoSTM Target INAV 6.0.0</li> <li>cmake_install.cmake</li> <li>CMakeCache.txt</li> <li>inav_6.0.0_SYNERDUINOSTMSV.hex</li> <li>Makefile</li> <li>Synerduino DIFF 6.0.0.txt</li> </ul>
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And... its here .

INAV\_5.1.0 SYNERDUINOSTM.hex INAV\_5.1.0 SYNERDUINOSTMSV.hex INAV\_6.0.0\_SYNERDUINOSTM.hex INAV\_6.0.0\_SYNERDUINOSTMSV.hex INAV\_7.0.0\_SYNERDUINOSTM\_F411.hex INAV\_8.0.0\_SYNERDUINOSTM\_F405.hex

Open this file in the Configurator as this is the firmware Find it in the Build folder of the INAV directory

cd /e/Workspace/inav-5.1.0/build

cd /e/Workspace/inav-6.0.0/build

cd /e/Workspace/inav-7.0.0/build

cd /e/Workspace/inav-7.1.0/build

cd /e/Workspace/inav-7.1.1/build

cd /e/Workspace/inav-8.0.0/build