How to use the X-CUBE-MEMS2 software package and X-NUCLEO-IKS01A1 + NUCLEO-F401RE

NOTE: this explanation is for Windows 7 (64bit – Pro.) and KEIL v.5.13.0 the full version (this because the FW is around 80K)

- How to install the SW (X-CUBE-MEMS2) for using the X-NUCLEO-IKS01A1 and NUCLEO-F401RE
- Sensor Fusion GUI
- Directory where is installed the SW
- Copy the directory of the original installation in another directory
- Use the SW

The explanations, **How to install the SW (X-CUBE-MEMS2) for using the X-NUCLEO-IKS01A1 and NUCLEO-F401RE** are <u>here</u>

Enrico M.

Sensor Fusion GUI

On the **PC** if you select: START \rightarrow ALL PROGRAMS \rightarrow STMicroelectronics \rightarrow OpenSoftwareX \rightarrow **Open.MEMS–MotionFX for STM32**

you must see something like the BLUE box below



ſ

Directory where is installed the SW

On your PC in the directory: C:\Program Files (x86)\STMicroelectronics\OpenSoftwareX You must have the subdirectory: Open.MEMS - MotionFX for STM32

STMicroelectronics ► OpenSoftwareX ►						
Organize 🔻 Include in library 🖛 Share with 🖛 Burn New folder						
 ★ Favorites ■ Desktop ♦ Dropbox ■ Recent Places ■ Downloads ■ Box Sync 	Name Open.MEMS - MotionFX for STM32	Date modified 26/12/2014 23:51	Type File folder			

Please copy the directory: Open.MEMS - MotionFX for STM32

(that is in: C:\Program Files (x86)\STMicroelectronics\OpenSoftwareX)

in an other directory because in the next step, we will use the STM32 SW examples that are present in the Open.MEMS - MotionFX for STM32.

In this way we preserve the original installation of the X-CUBE-MEMS2.

ATTENTION: at the end of the copy is necessary remove the attribute: **Read only....** if it is present, below there is the right configuration.

NOTE:

I copied the: Open.MEMS - MotionFX for STM32 in: C:\ESEMPI-SW\Open.MEMS - MotionFX for STM32



Use the SW

In our case we use the NUCLEO-F401RE and the X-NUCLEO-IKS01A1. For this reason go in the directory:

C:\ESEMPI-SW\Open.MEMS - MotionFX for STM32\Projects\STM32F4xx-Nucleo\Examples\MDK-ARM

and double click on the:

Project.uvprojx

Now build all and you must see something like below.



ATTENTION: the compilation exceeded the 32K of exe for this reason is necessary a full version of KEIL.

Now verify the configurations 🔊 shown below.

💟 Options for Target 'STM32F401XX-NUCLEO'				
Device Target Output Listing User C/C++ Asm Linker Debug Utilities				
Software Packs Vendor: STMicroelectronics Device: STM32F401RETx Toolset: ARM Search: URL:				
Search:				
OK Cancel Defaults Help				

Options for Target 'STM32F401XX-NUCLEO'	×				
Device Target Output Listing User C/C++ Asm	Linker Debug Utilities				
C Use Simulator Settings	 Use: ST-Link Debugger Settings 				
Load Application at Startup Initialization File: Load Application at Startup Initialization File: Load Application at Startup Edit	Load Application at Startup Initialization File: Initialization File: Initialization File:				
Restore Debug Session Settings Image: Breakpoints Image: Toolbox Image: Watch Windows & Performance Analyzer Image: Memory Display Image: System Viewer	Restore Debug Session Settings Image: Session Settings				
CPU DLL: Parameter: SARMCM3.DLL -REMAP -MPU	Driver DLL: Parameter: SARMCM3.DLL -MPU				
Dialog DLL: Parameter: DCM.DLL -pCM4	Dialog DLL: Parameter: TCM.DLL -pCM4				
OK Car	ncel Defaults Help				

<u>INDEX</u>

options for larger 31M52	2F401XX-NUCLEO'	
Device Target Output List	ting User C/C++ Asm Linker Debug Utilities	
C Use Simulator	Settings 🛛 🕫 Use: ST-Link Debugger 🗨 Se	ttings
Limit Speed to Real-Time		
ex-M Target Driver Setup		
Dug Trace Flash Download		
Debug Adapter	SW Device	1 -
Unit: ST-LINK/V2-1	IDCODE Device Name Move	
Serial Number: 0670FF55535575	SWDIO 0x2BA01477 ARM CoreSight SW-DP	
HW Version: V2-1	Down	
FW Version: V2J23M7	Automatic Detection ID CODE:	
Port: SW 💌	C Manual Configuration Device Name:	
Max Clock: 4MHz 💌	Add Delete Update IR len:	
Connect & Reset Options	Cache Options Download Options	
Connect: Normal Rese	et: Autodetect Cache Code Verify Code Download	
I Reset after Connect		
		Ιp
	OK Cancel Apoly	
	OK Cancel Apply	
	OK Cancel Apply	
otions for Target 'STM32F401XX-NU	JCLEO'	
otions for Target 'STM32F401XX-NU	OK Cancel Apply UCLEO' C/C++ Asm Linker Debug Utilities	
otions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command	OK Cancel Apply UCLEO' SS C/C++ Asm Linker Debug Utilities	
otions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command • Use Target Driver for Flash Program	OK Cancel Apply UCLEO' C/C++ Asm Linker Debug Utilities mming Use Debug Driver	
otions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command • Use Target Driver for Flash Program Use Debug Driver	OK Cancel Apply JCLEO' S3 C/C++ Asm Linker Debug Utilities nming Image: Use Debug Driver Settings Image: Update Target before Debugging	
otions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command • Use Target Driver for Flash Program Use Debug Driver Init File:	OK Cancel Apply	
otions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Rash Menu Command • Use Target Driver for Rash Program Use Debug Driver Init File: Cortex-M Target Drive	OK Cancel Apply JCLEO' S3 C/C++ Asm Linker Debug Utilities nming If Use Debug Driver Settings If Update Target before Debugging Edt	
otions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command Ise Target Driver for Flash Program Use Debug Driver Init File: Contex-M Target Driver Command Debug Trace	OK Cancel Apply JCLEO' S3 C/C++ Asm Linker Debug Utilities mning If Use Debug Driver Settings If Update Target before Debugging Edt ter Setup sh Download]
otions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command Ise Target Driver for Flash Program Use Debug Driver Init File: Command: Command: Arguments:	OK Cancel Apply	
otions for Target 'STM32F401XX-NU ce Target Output Listing User configure Rash Menu Command Isse Target Driver for Rash Program Use Debug Driver Init File: Command Command Arguments:	OK Cancel Apply UCLEO' X3 C/C++ Asm Linker Debug Utilities nming If Use Debug Diver Settings If Update Target before Debugging Edt ter rer Settings Image: Setting setting RAM for Algorithm rase Sectors Verify Stat:	
ations for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command Interview of the second se	OK Cancel Apply JCLEO' \$3 C/C++ Asm Linker Debug Utilities mning If Use Debug Driver Settings If Update Target before Debugging Image: Setting Image: Se	
otions for Target 'STM32F401XX-NL ice Target Output Listing User Configure Flash Menu Command Ise Target Driver for Flash Program Use Debug Driver Init File: Command: Arguments: Configure Image Configure Image Programming Algori	OK Cancel Apply UCLEO' 23 C/C++ Asm Linker Debug Utilities nming If Use Debug Driver Settings If Update Target before Debugging Edt rer Setup sh Download n RAM for Algorithm start: Dx20000000 Size: Dx1000	
Detions for Target 'STM32F401XX-NL ice Target Output Listing User Configure Rash Menu Command Ise Target Driver for Rash Program Use Debug Driver Init File: Command Command Arguments: Download Function Configure Imag Output File: Description STM32F401XX-NL	OK Cancel Apply UCLEO' X3 C/C++ Asm Linker Debug Use Debug Utilities nming If Use Debug Settings If Update Target before Settings If Update Target before Image: Settings Image: Settings Image: Settings Image: Settings Image: Settings Image: Setings Image: Setings Ima	
ations for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command Ice Target Driver for Flash Program Ice Target Driver for Flash Program Ice Target Driver for Flash Program Init File: Command Command Arguments: Configure Imag Output File: Programming Algori Description STM32F4ox 5124	OK Cancel Apply UCLEO' \$3 C/C++ Asm Linker Debug Utilities nming If Use Debug Driver Settings If Settings If Update Target before Debugging If sh Download If If Edt n Edt Edt rase Full Chip If Program rase Sectors If Verify No not Erase Reset and Run Start: ithm Device Size Device Type Address Range KB Flash 512k	
otions for Target 'STM32F401XX-NU ice Target Output Listing User configure Flash Menu Command Image Files R	OK Cancel Apply UCLEO' 23 C/C++ Asm Linker Debug uming If Use Debug Driver Settings If Update Target before Debugging Image: Settings Image: Settings Image: Settings I	
otions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command Ise Target Driver for Flash Program Use Debug Driver Init File: Contex-M Target Driver Command: Arguments: Configure Imag Output File: Programming Algori Image Files R	OK Cancel Apply UCLEO' X3 C/C++ Asm Linker Debug Iming Image: Use Debug Driver Image: Use Debug Driver Settings Image: Update Target before Debugging Image: Use Debug Image: Use Debug Driver Image: Settings Image: Update Target before Debugging Image: Image: Image: Image: Use Debug Image: Image: Use Debug Image: Image	
ptions for Target 'STM32F401XX-NU ice Target Output Using User Configure Flash Menu Command • Use Target Driver for Flash Program Use Debug Driver Init File: Command Arguments: Configure Imag Output File: Image Files R Image Files R	OK Cancel Apply JCLEO' 33 Image: C/C++ Asm Linker Debug Utilities Image:	
ptions for Target 'STM32F401XX-NU ice Target Output Listing User Configure Flash Menu Command • Use Target Driver for Flash Program Use Debug Driver Init File: Contex-M Target Driver Command: Arguments: Configure Imag Output File: Image Files R Image Files R	OK Cancel Apply JCLEO' X3 C/C++ Asm Linker Debug Utilities nming IV Use Debug Driver IV Settings IV Update Target before Debugging IV er Setup IV Edt Edt rer Setup Statt: David David n RAM for Algorithm Statt: David rer Setup Statt: David David n Device Size Device Type Address Range kB Flash 512k On-chip Flash 08000000H - 0807FFFFH Statt: Size: Size: Size:	

<u>INDEX</u>

ОК

Cancel Apply

Now download with the FW in your NUCLEO-F401RE.

At this point you must run the: **Sensor Fusion GUI** that is here:

> STMicroelectronics BlueNRG Current Consumption Estim BlueNRG DK 1.6.0 DfuSe odSPIN Discovery Kit Embedded Resource Editor GUI Event and Data Logger Application 📗 FlashLoader FOCGUI Application MicroXplorer NucleoF4_BlueNRG_Shield OpenSoftwareX Open.MEMS - MotionFX for STM3 🔁 License agreement (OSX M1 LL License file (.h) The MotionFX databrief Ξ MotionFX demo project (IAR E OSX_LicenseWizard Release Notes Sensor Fusion GUI X-CUBE-MEMS2 databrief SPC5Studio SPINFamily Evaluation Tool SPIRIT1 DK_1.0.7 4 Back Search programs and files Q MDK-ARM 0

> > <u>INDEX</u>

From the first page that appears press START.

577 Sensors Data Log - STMicroele	ectronics							- • ×
Settings COM Devices: COM29	√ Log	Save	Clear	Plot 2]			
Speed: 921600 🔻	Timestamp	P	T	н	AccX	AccY	AccZ	GyrX
Interval [ms]: 500 🚔	•							•
Pressure [mbar] 📝								
Temperature [ºC] 🔽								
Humidity [%] 🔽								
Accelerometer XYZ [mg] 🔽								
Gyroscope XYZ [mdps] 📝								
Magnetometer XYZ [mgauss] 💟								
Start								
Start Sensor Fusion								

Now the acquisition is running, see below.

