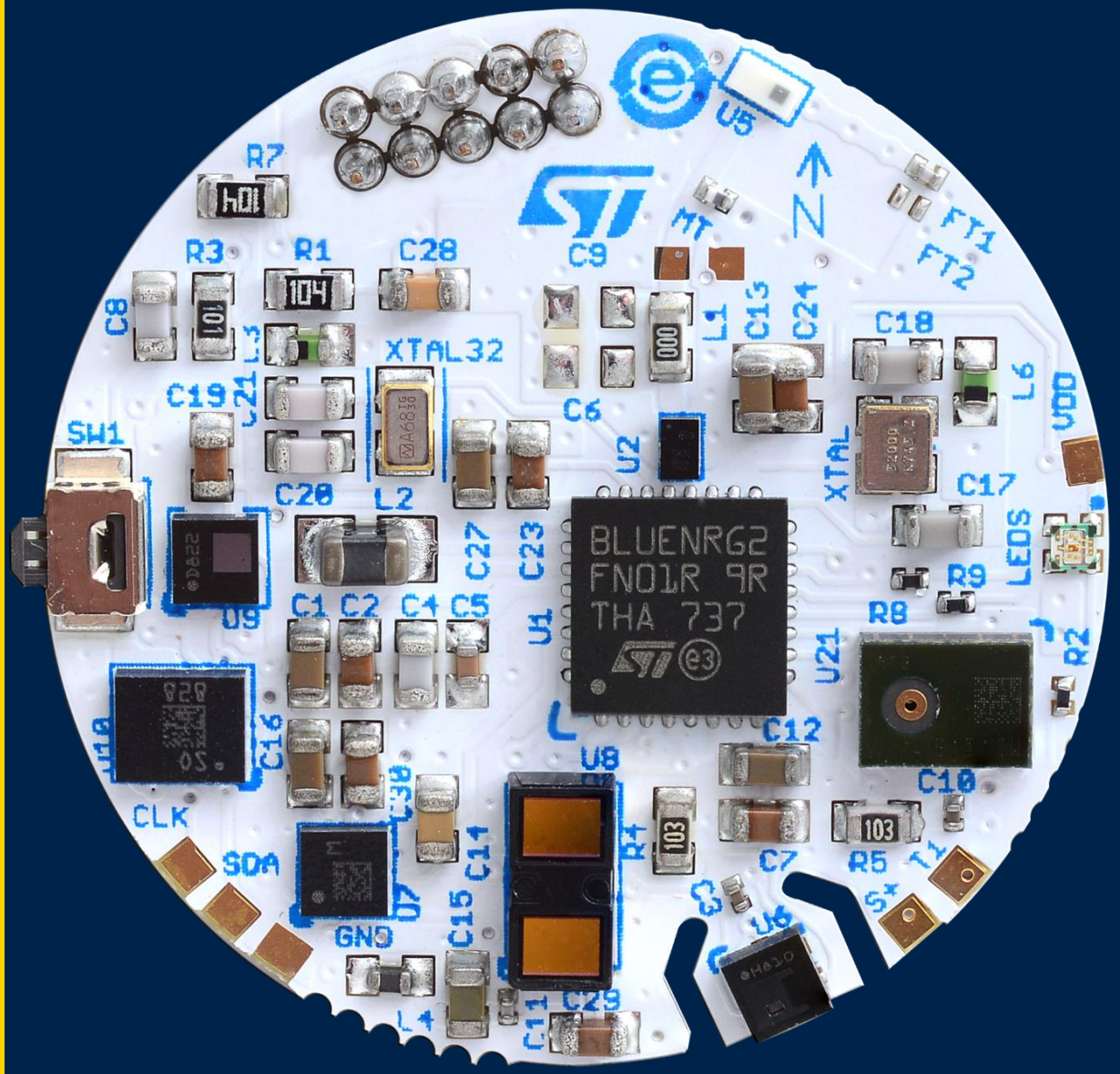

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BlueNRG-2 Getting Started

Mohit ARORA

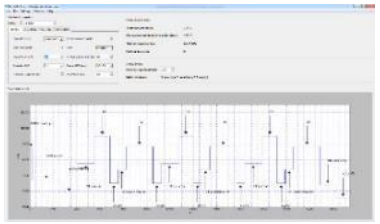
Low-power RF ecosystem

RF chipset

Evaluation Kit and Development Tools

RF modules

Graphical UI



RF Power Simulator

GUI PC application

SW development

IAR SYSTEMS

KEIL Tools by ARM

BlueNRG/Spirit NAVIGATOR

Sensors

MOTION SW libraries

Mic

VOICE SW libraries

6LoWPAN
IPv6-based Low-power Wireless Personal Area Networks

M-Bus wireless

sigfox

iOS/Android SDK

BLUENRG-MESH TRIPLE SDK

BLE SDK

Android SDK

iOS SDK

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Covered in this Presentation

- # Hardware Requirements
- # Install SDK and tools
- # Run BLE Chat Example
- # Install Keil and License
- # Test Debugger connection
- # Compilation and debug test with Keil
- # Install Mobile apps
- # Test BlueNRG-GUI connectivity

Hardware Requirements

BlueNRG-2 Target board with UART/VCOM

ST-Link V2 or ST Nucleo Board

Smart Phone with BLE 4.2 or higher with required apps installed

Your windows 7/10 PC Setup with all required software and setups

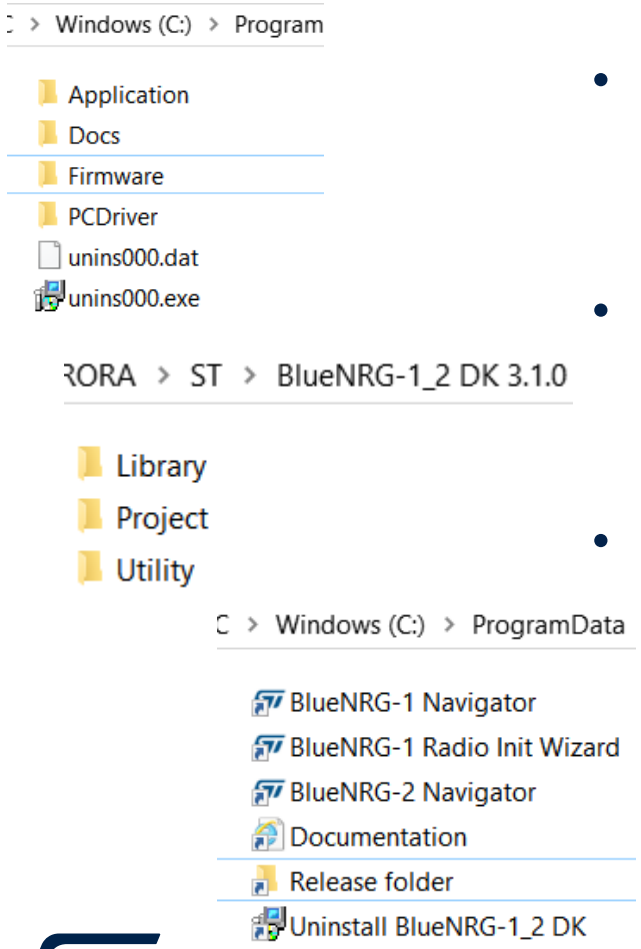
Install ST Software

BlueNRG-2 SDK

- Standard SDK for BlueNRG-1 and BlueNRG-2 devices from ST
- Contains basic tools like Navigator, Radio Init Wizard
- Download and Install BlueNRG-2 SDK from link below(STSW-BLUENRG1-DK)

  https://www.st.com/content/st_com/en/products/embedded-software/evaluation-tool-software/stsw-bluenrg1-dk.html

STSW-BLUENRG1-DK post Install



- Installation of the package creates three directories
- Installation Directory
  - C:\Program Files (x86)\STMicroelectronics\BlueNRG-1_2 DK 3.X.X
  - Contains compiled binary files, doxygen documentation, drivers and installed applications
- Example Projects Path
  - C:\Users\XXXXX\ST\BlueNRG-1_2 DK 3.X.X
  - Contains the example projects for BLE, prop radio and peripheral examples
- Utility launch directory
  - C:\ProgramData\Microsoft\Windows\Start Menu\Programs\ST BlueNRG-1_2 DK 3.X.X
  - Shortcuts to Release folder, Navigator and Radio Init Wizard

STSW-BLUENRG1-DK Examples

BLE Examples

- BLE_ANCS
- BLE_Beacon
- BLE_Beacon_FlashManagement
- BLE_Chat
- BLE_Chat_Master_Slave
- BLE_HID_Peripheral
- BLE_MS_Formula
- BLE_OTA_ResetManager
- BLE_OTA_ServiceManager
- BLE_Power_Consumption
- BLE_Privacy
- BLE_RemoteControl
- BLE_Security
- BLE_SensorDemo
- BLE_SensorDemo_BlueMSapp
- BLE_SensorDemo_Central
- BLE_SensorDemo_Static_Stack
- BLE_Static_Stack
- BLE_Throughput
- BLE_Throughput_EXT
- DTM
- DTM_basic
- DTM_Updater

Peripheral Examples

- ADC
- FLASH
- GPIO
- I2C
- MFT
- Micro
- PKA
- RADIO
- RNG
- RTC
- SPI
- SysTick
- UART
- WDG

Install ST Tools

- Install BlueNRG-GUI (STSW-BNRGUI)

  https://www.st.com/content/st_com/en/products/embedded-software/wireless-connectivity-software/stsw-bnrg1stlink.html

- Install BlueNRG ST-Link Utility (STSW-BNRG1STLINK)

  https://www.st.com/content/st_com/en/products/embedded-software/wireless-connectivity-software/stsw-bnrg1stlink.html

- Install BlueNRG-X Flasher (STSW-BNRGFLASHER)

  https://www.st.com/content/st_com/en/products/embedded-software/wireless-connectivity-software/stsw-bnrgflasher.html

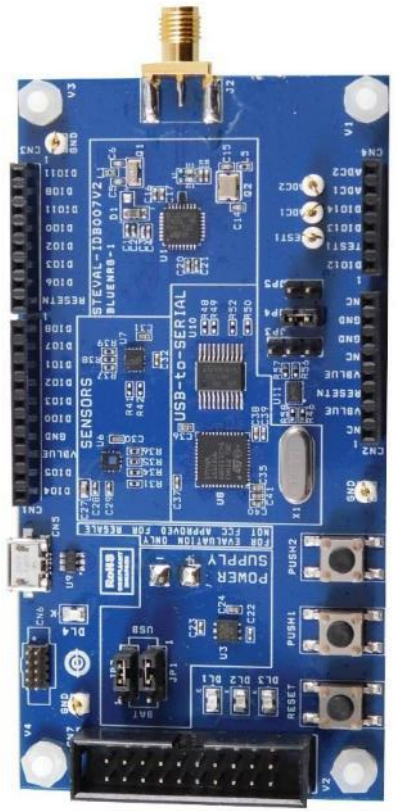
- Install BlueNRG current consumption estimation tool (STSW-BNRG001)

  https://www.st.com/en/embedded-software/stsw-bnrg001.html

Update ST-LINK firmware STSW-LINK007 and USB driver as required STSW-LINK009

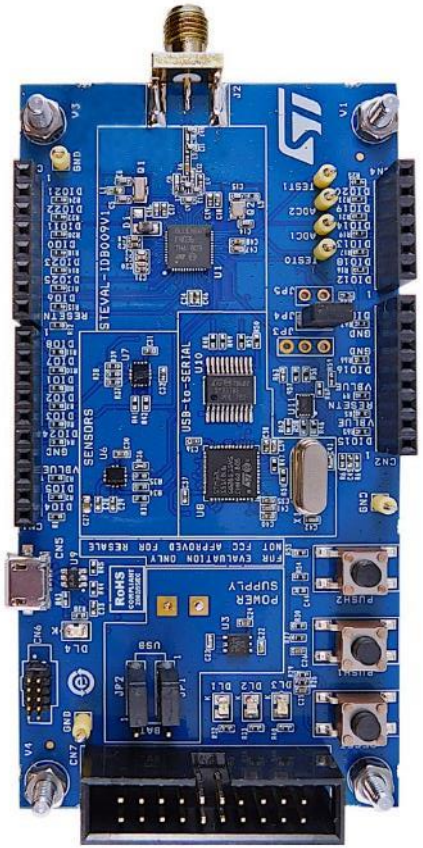
Supported Hardware

STEVAL-IDB007Vx
BlueNRG-1 (32QFN)



STEVAL-IDB008Vx
BlueNRG-2 (32QFN)

STEVAL-IDB009Vx
BlueNRG-2 (48QFN)



STEVAL-IDB008V1M
BlueNRG-M2 Module

STEVAL-FKI001V1
BlueNRG-1 + S2LP

STEVAL-FKI001V1 is supported via STSW-BNRG-S2LP

Quickly Run the BLE_Chat Example

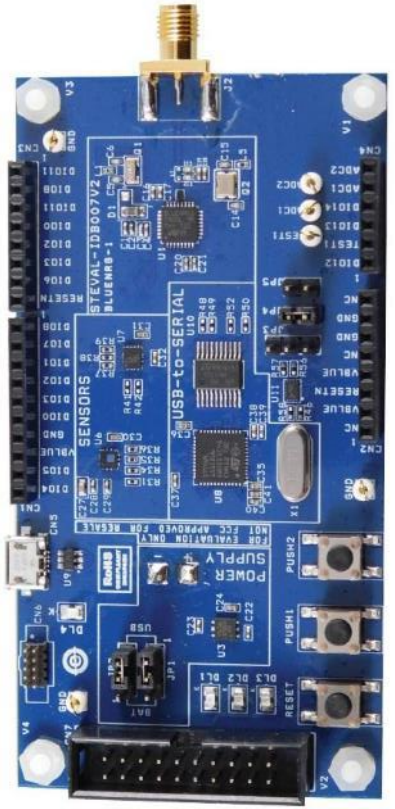
BlueNRG-2 Navigator

- We will use BlueNRG-2 Navigator to quickly run the example
- This software is installed as part of STSW-BLUENRG1-DK
- You would need a STEVAL-IDB008x board to use it
- Supports direct flash write of example codes on STEVAL with UART Bootloader

BlueNRG-2 Navigator: Hardware Setup

PC running BlueNRG-2 Navigator

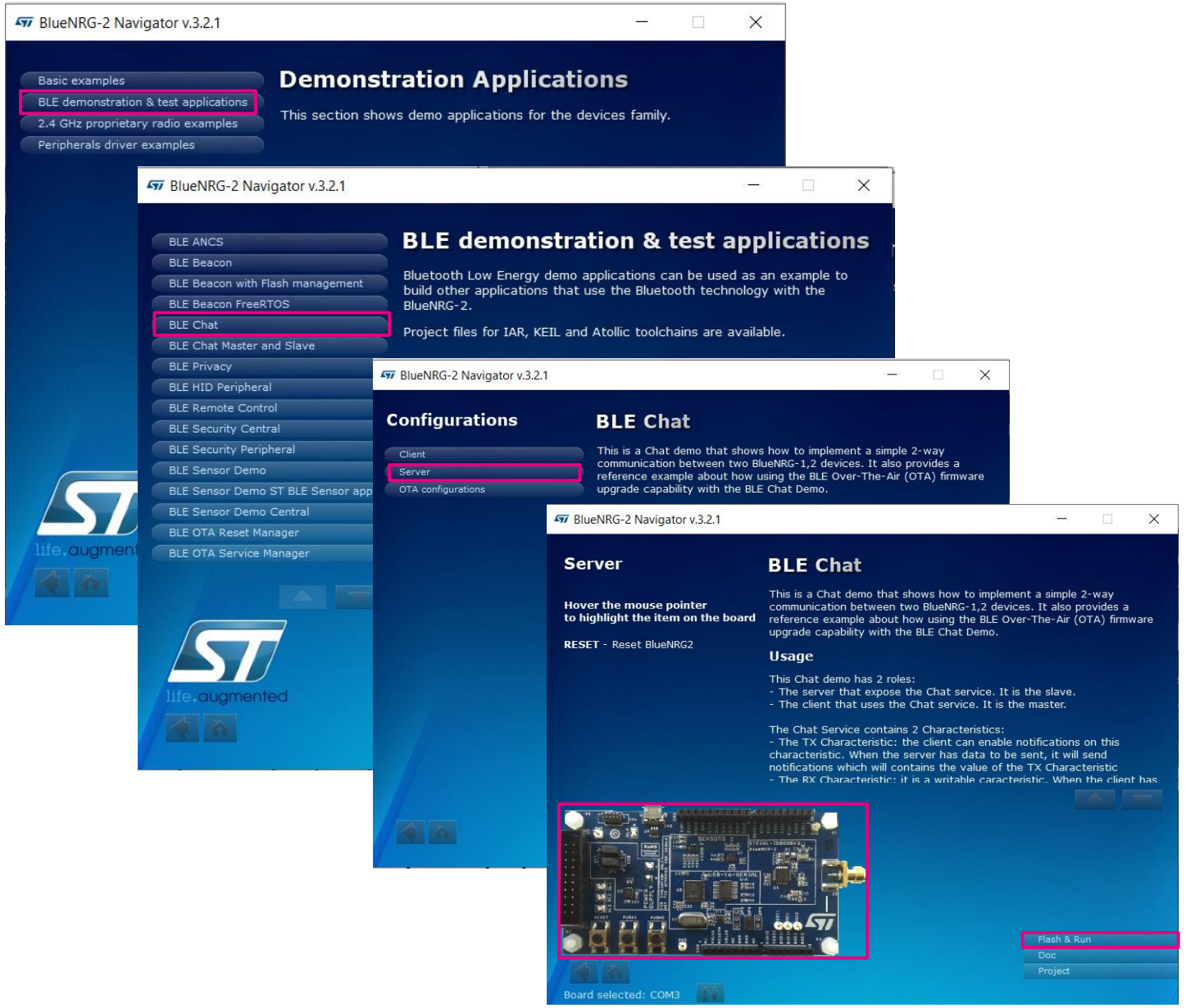
Micro USB Cable



STEVAL-IDB008Vx

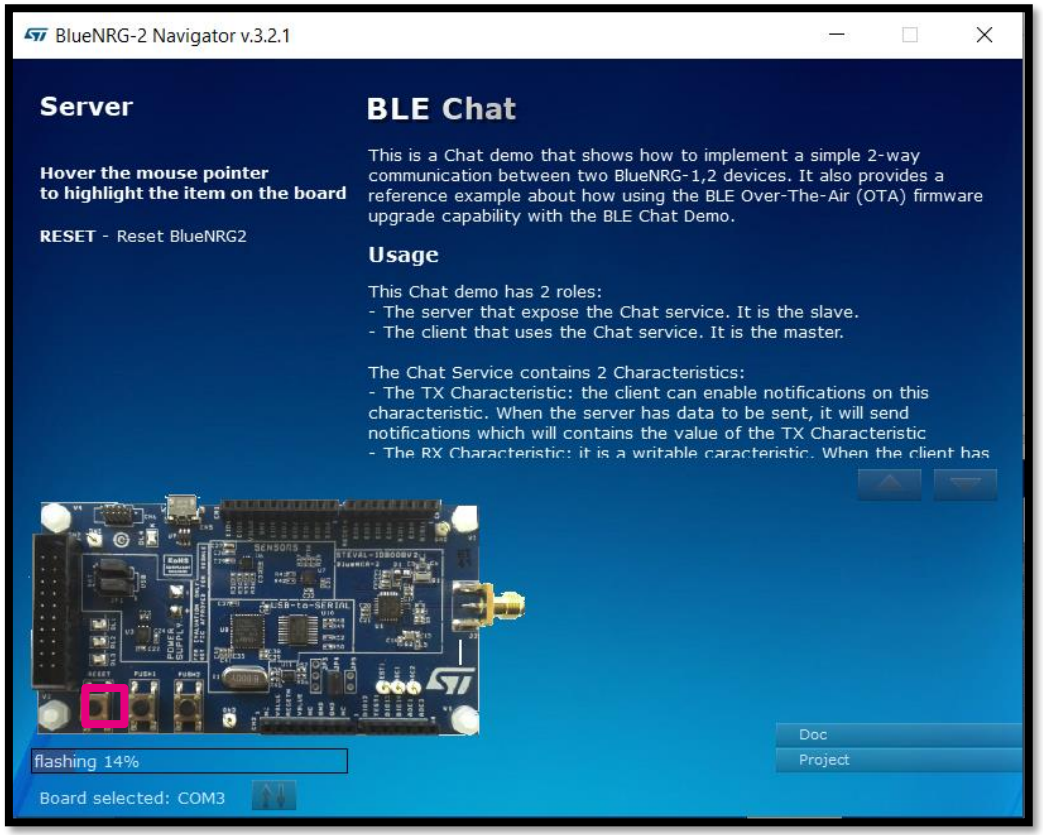
Run BLE_Chat using Navigator

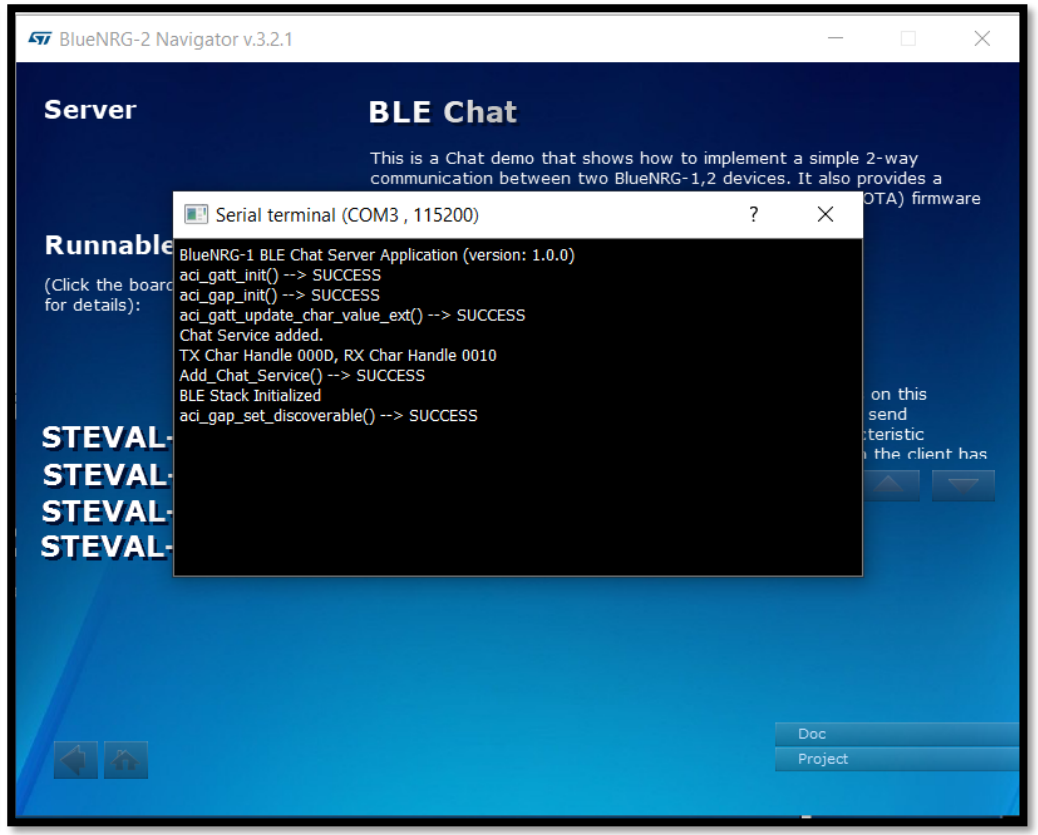
- Open BlueNRG-2 Navigator
- Navigate to BLE_Chat
  - BLE demo and test apps
    - BLE_Chat
      - Server
- If drivers installed and board connected The Eval board pic will appear
- Click on Flash and Run button



STSW-BlueNRG1-DK (4/7)

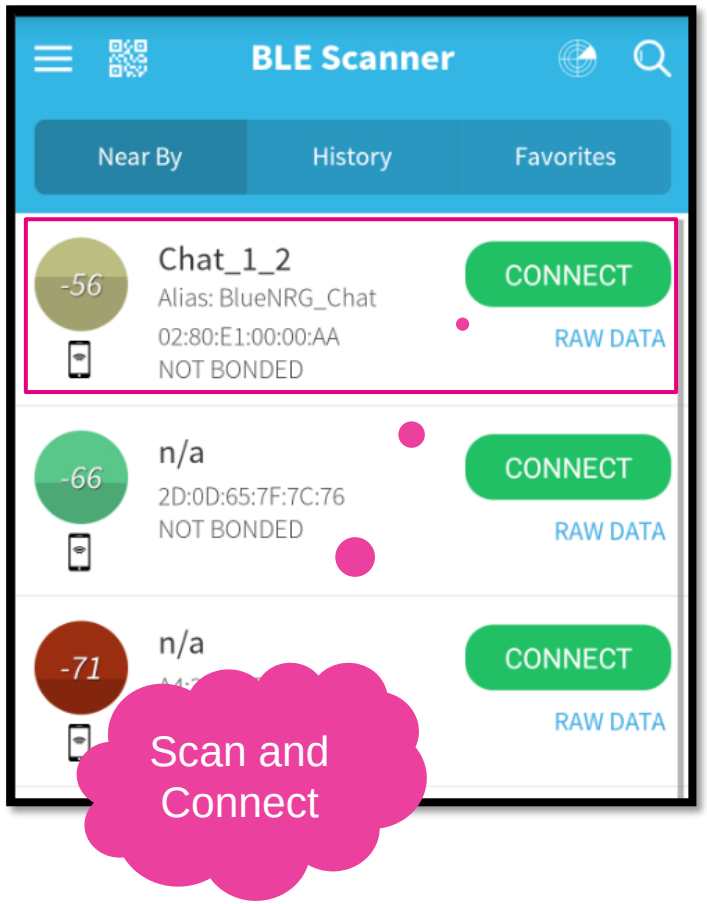
- The board will be flashed with the BLE_Chat Server configuration compiled code
- After flashing, serial terminal would automatically appear.
- Push the reset button and messages from board should display





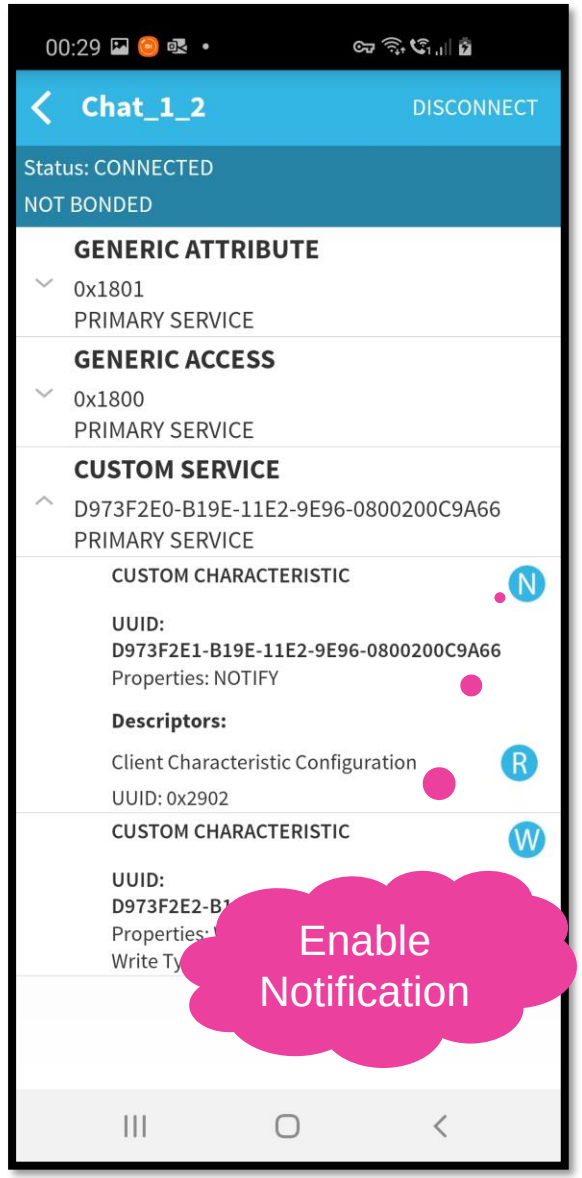
Connect BLE_Chat with Phone

- Install a generic BLE service discovery tool like B-BLE or BLE Scanner on you phone
- Enable Bluetooth and location on your phone and start the application
- Click on “Scan” button
- The devices available should appear
- Click on CONNECT button against “Chat_1_2”



Connect BLE_Chat with Phone

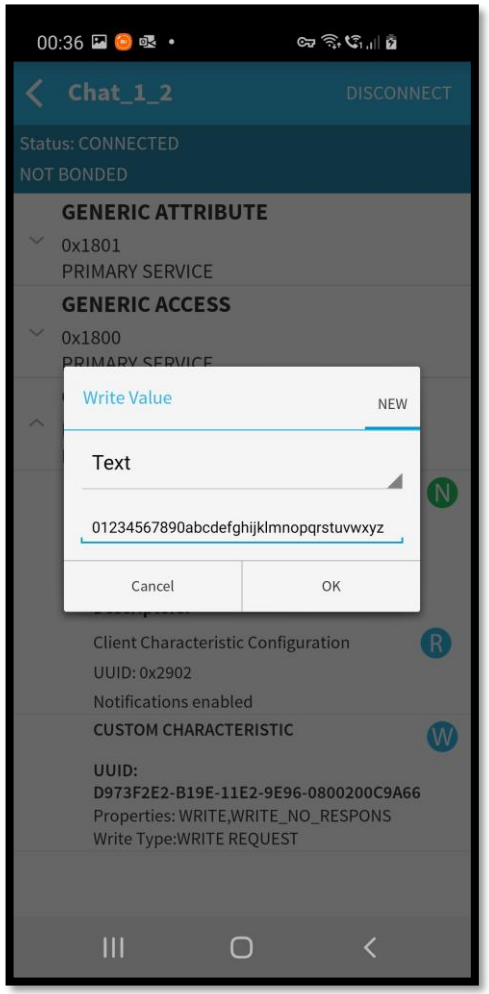
- After you connect, the service discovery will start
- You would see three services
  - Generic Attribute (GATT 0x1800)
  - Generic Access (GAP 0x1801)
  - Custom Service (ST Chat Service)
- Click on custom service
- Then enable notifications by clicking on “N” Button. It would turn green

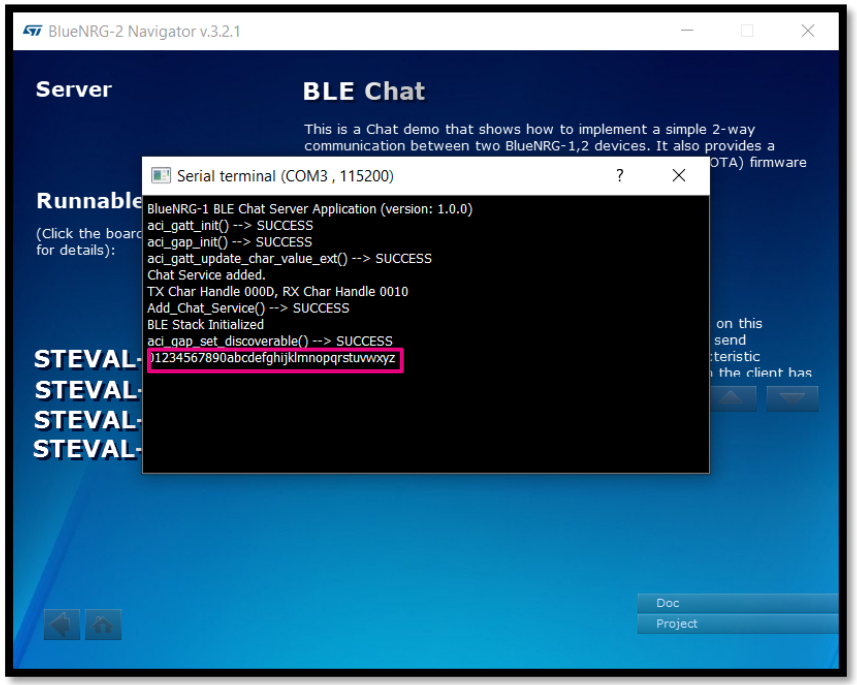


Exchange data from phone to UART

- Click on “W” button
- A window will appear
- Type in text (ASCII) any data to be send to the UART
- The click on “OK”

Note: If size exceeds 20 bytes, BLE scanner automatically breaks data in 20 bytes and send across multiple packets
This limit can be increased to 240 bytes per packet but depends on support of phone for “Data Length Extension (DLE)” feature





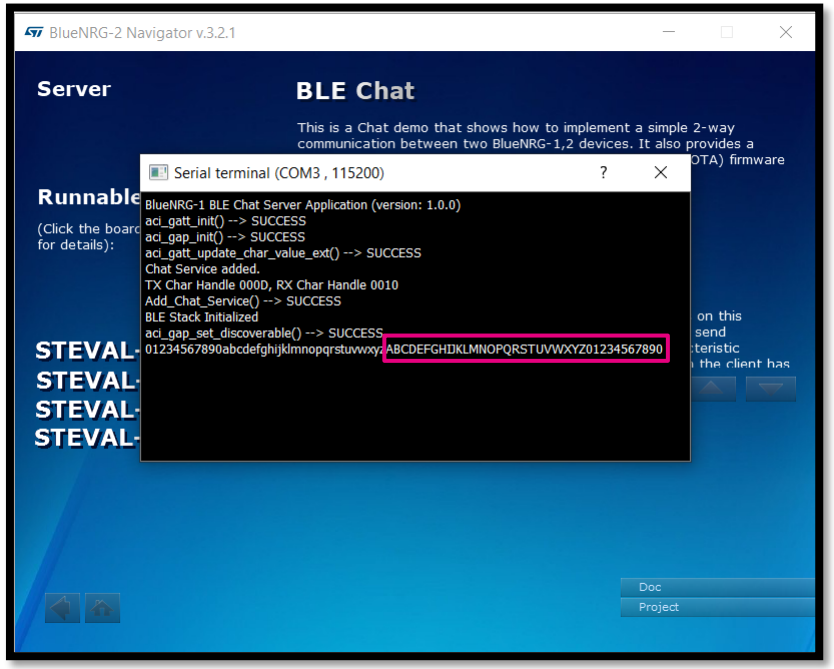
Exchange data from UART to Phone

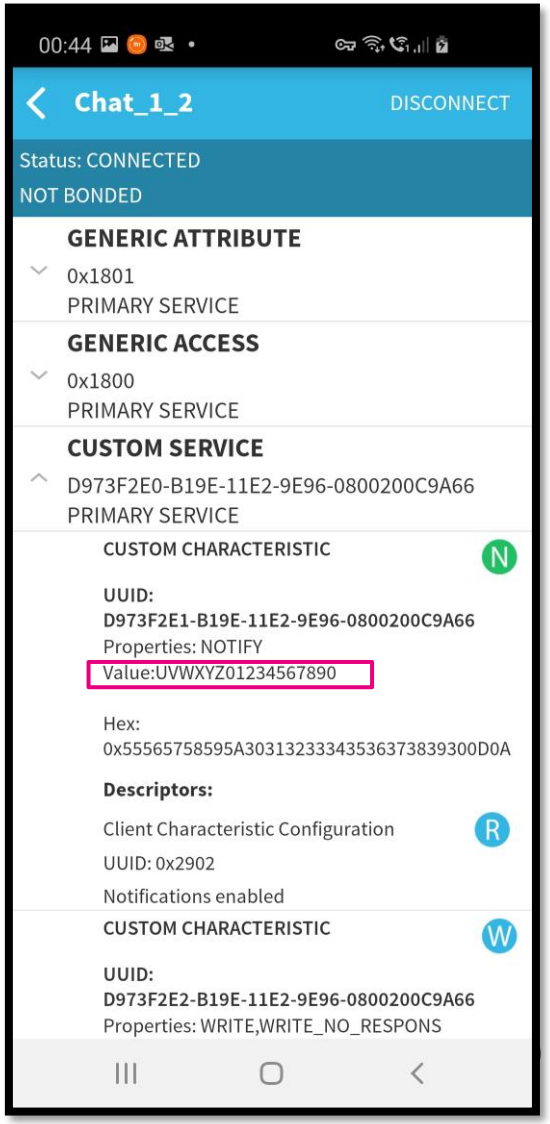
- Type data on the Serial terminal
- Hit enter key or send “\n” new line character
- The data will be sent to phone and will be visible if “N” notification button is green

Note: if size exceeds 20 bytes, BlueNRG-2 will automatically break the data in packets in 20 bytes and send to phone

On the phone, only last packet will display as previous packets were received and overwritten

If phone supports DLE, the code can request to increase packet size





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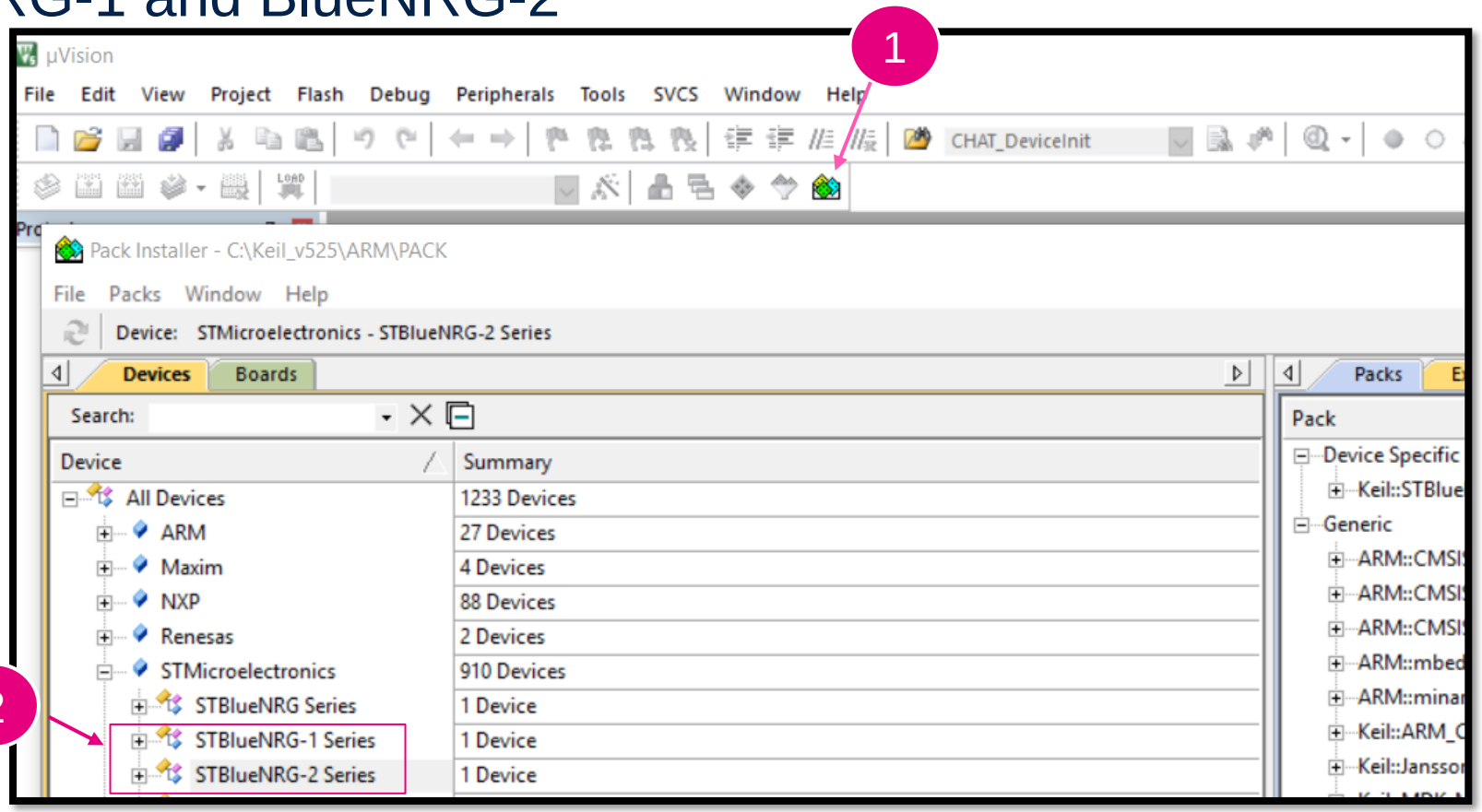
Setup Keil IDE

Install Keil

- Kindly refer below link for all details on ST version of Keil
  - https://www2.keil.com/stmicroelectronics-stm32/mdk
- Download Keil MDK-ARM v5 from https://www.keil.com/demo/eval/arm.htm
- Run the downloaded MDK5xx.exe installer.
- Install to any path you like. If you have existing MDK-ARM installations that you want to keep, select a new folder for MDK v5.

Install Keil Device Function Packs

1. Open Keil window, Click on the Pack Installer button and open it
2. Select device and Click Install to download and install the Device Function packs for BlueNRG-1 and BlueNRG-2

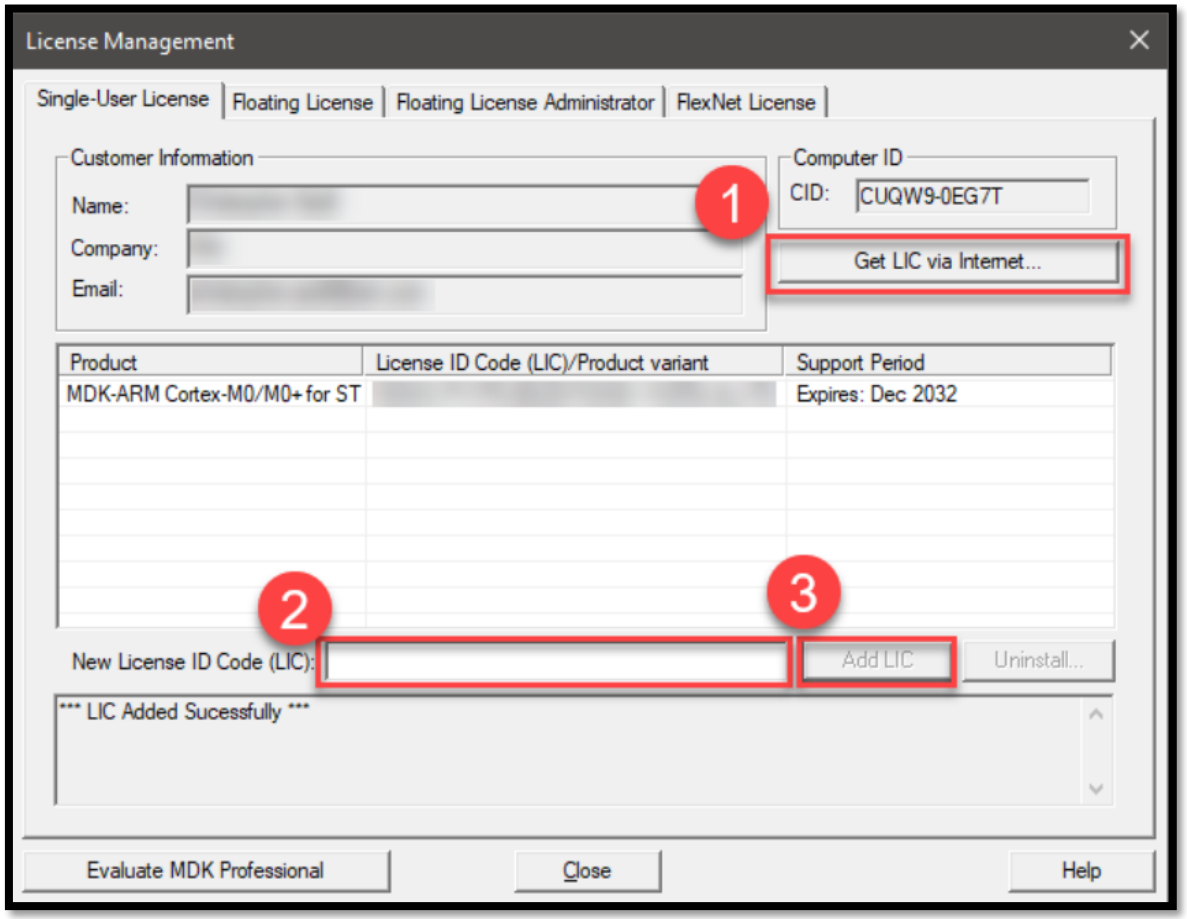


Get Keil ST License

- Follow instructions on the page link below to install the license after you install Keil
  - https://www2.keil.com/stmicroelectronics-stm32/mdk
- Login with an account that has administration rights.
- Right-click the µVision icon and select Run as Administrator... from the context menu.
- Open the dialog File — License Management... and select the Single-User License tab.
- Click the button Get LIC via Internet..., then click the button OK to register the product. This action opens the License Management page on the Keil web site.
- Enter the Product Serial Number 4RMW3-A8FIW-TUBLG along with your contact information and click the button Submit.
- An e-mail is sent back with the License ID Code (LIC) within a few minutes.

Activate Keil ST License

- To activate the Software Product
  - enter the LIC in the field New License ID Code (LIC) of the dialog License Management (2)
  - click Add LIC (3)
  - Verify the license as visible in screenshot with expiry date



Settings in Keil

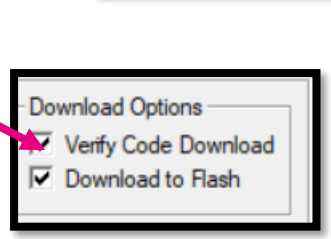
- After DFP and License are installed, open BLE Chat example project in Keil

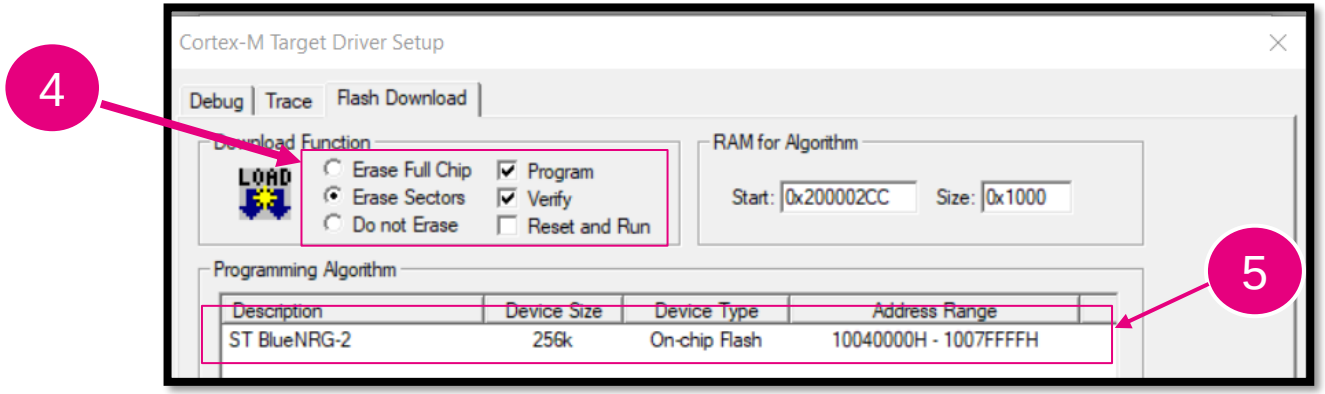
  \\STSW-BLUETILE-DK 1.3.0\Project\BLE_Examples\BLE_Chat\MDK-ARM\BlueNRG-2

- Select ST-Link as debugger

  Select ST-Link as debugger (1)

- Settings for ST-Link
  - Click on settings (2)
  - Check both the download options (3)
  - Verify download functions (4) and programming algorithm (5)





Important Documents

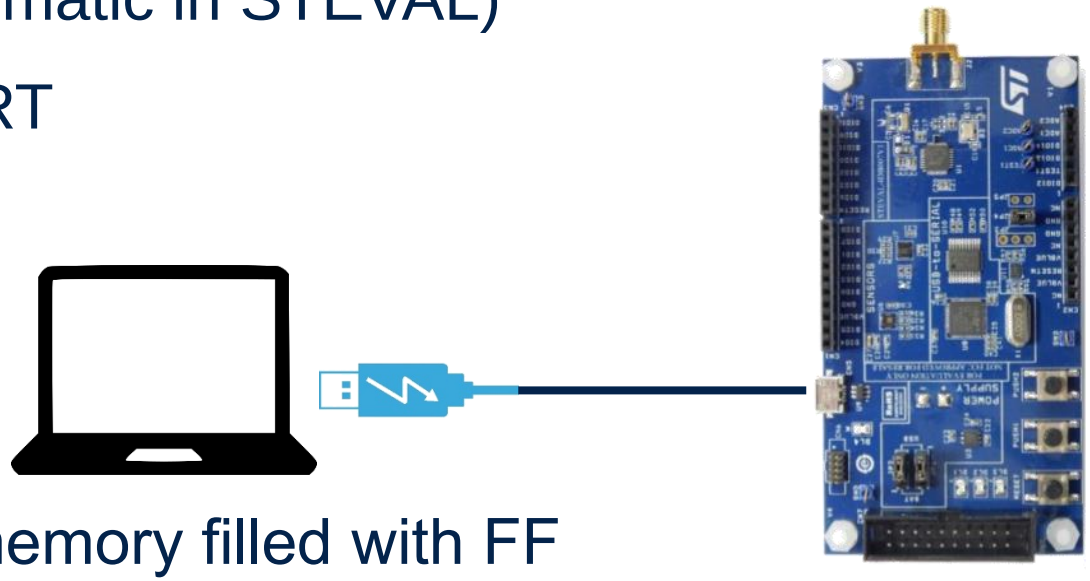
Important Documents for Reference

- BlueNRG-2 Datasheet PDF
- PM0257 BLE stack v2.x programming guidelines PDF
- UM2406 The BlueNRG-X Flasher SW package PDF
- DT0120 How to program and debug BlueNRG-1 and BlueNRG-2 devices PDF
- UM2058 BlueNRG GUI SW package PDF
- UM2109 BlueNRG-1 ST-LINK Utility software description PDF
- AN5187 BlueNRG-1, BlueNRG-2 improving robustness PDF

Test Debugger Connection

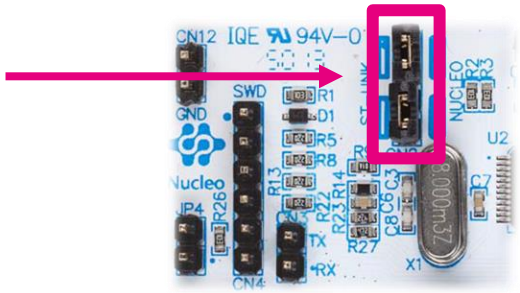
Erase the BlueNRG-2

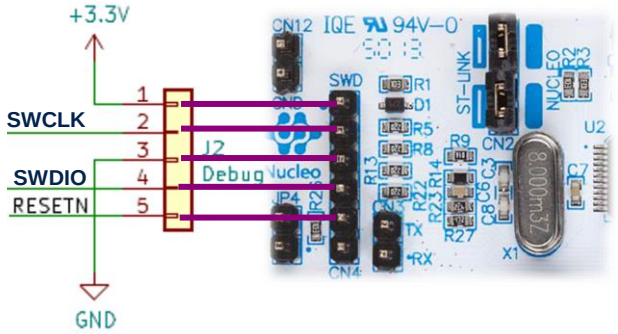
- Pull DIO7 High on BlueNRG-2 Target (Automatic in STEVAL)
- Connect the target to PC using VCOM/UART
- Open BlueNRG-X Flasher
- Select the relevant com port (ST DK)
- Press Ctrl + E and execute mass erase
- Click on “Read” button to verify the blank memory filled with FF
- Remove the micro USB cable now.

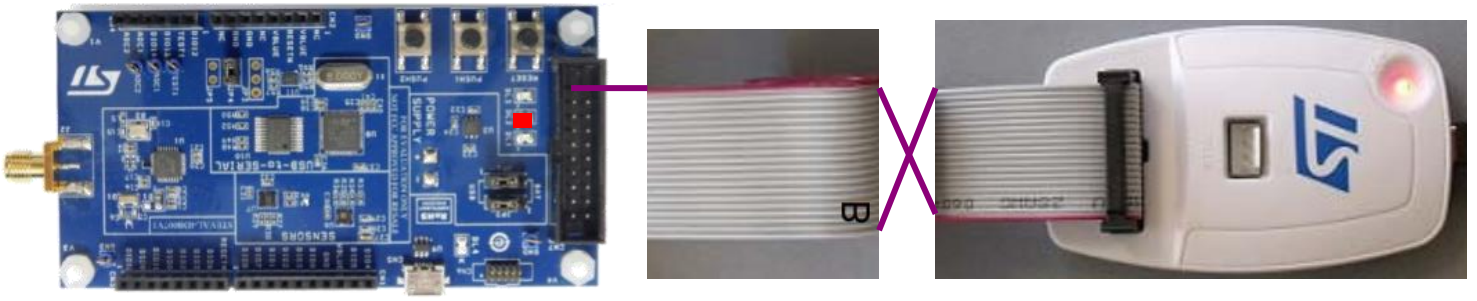


Setup Hardware for Debug

- If using Nucleo board, remove ST-LINK (CN2) jumpers
- Connect the Target board with ST-Link V2
  - Refer the picture for connector alignment
- Now, power up the target and then connect ST-Link V2
- If red led is blinking: your STEVAL is in DFU mode, remove ST-LINK and then connect power. Afterwards connect ST-LINK







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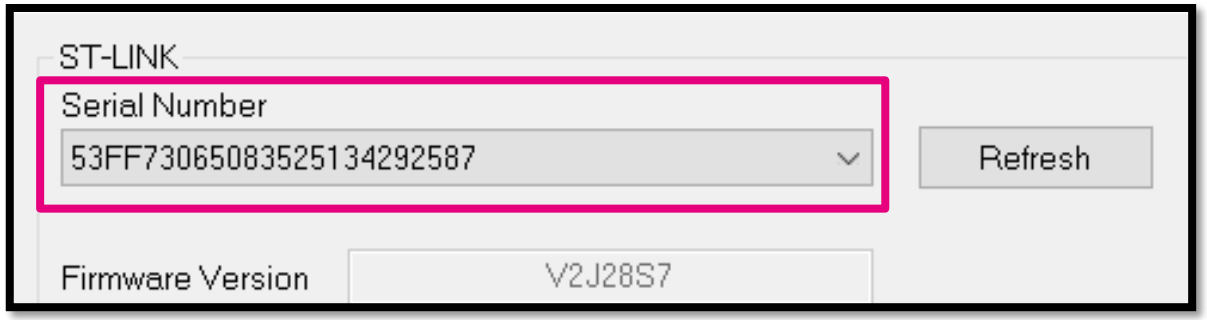
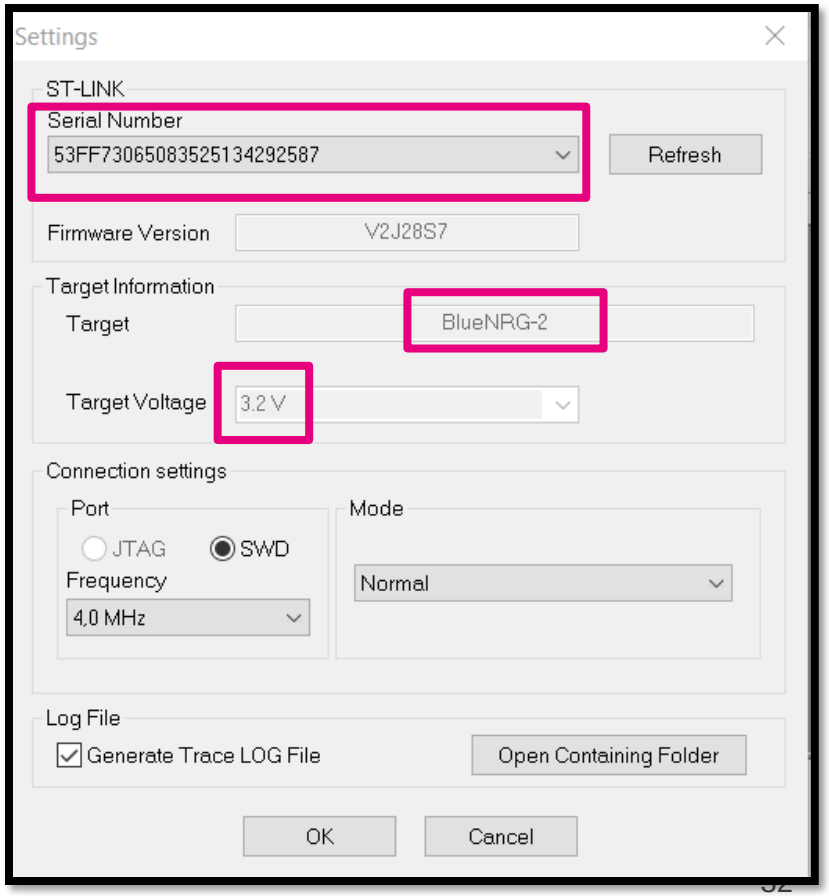
Verify SWD Connection

- Open BlueNRG-1 ST-Link Utility and Click on settings icon
- Check if the ST-Link Serial number is visible
- If you don’t see the ST-Link serial number, then
  - Try clicking on the Refresh button
  - Then, try re-plugging setup again with ST-Link only
  - If persists, update the driver of ST-LINK and firmware of ST-LINK V2
  - Please check you are using BlueNRG-1 ST-Link utility and Not STM32 ST-LINK utility



Verify SWD Target

- If your setup is fine, you should see similar in Target Information
- If BlueNRG-2 is not visible, then you should match the settings as per snapshot
- Once you see the Target voltage and Target, you should click on “OK” button
- The device will now be read by debugger
- If device is not detected, try to reduce the frequency and change the mode



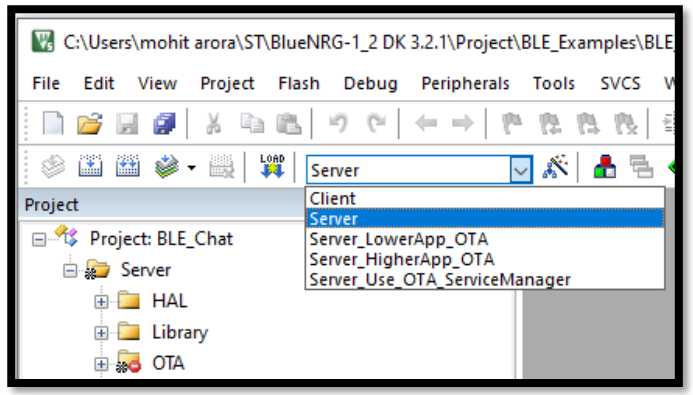
Test Compile and debug run of BLE_Chat project on Keil

Compile BLE_Chat Project

- Open BLE_Chat project in Keil

  Path: C:\Users\{USER NAME}\ST\BlueNRG-1_2 DK 3.2.1\Project\BLE_Examples\BLE_Chat\MDK-ARM\BlueNRG-2
  The project file name is “BLE_Chat” with extension “.uvprojx”

- Select the “Server” from drop down
- Go to “Project” menu dropdown and click “Build Target”
- The Build Output window should show as below



Build Output

```
compiling BlueNRG1_it.c...
compiling chat.c...
compiling gatt_db.c...
linking...
Program Size: Code=65876 RO-data=792 RW-data=692 ZI-data=16200
FromELF: creating hex file...
After Build - User command #1: fromelf.exe --bin Server\Objects\BLE_Chat_Server.axf --output Server\Objects\BLE_Chat_Server.bin
".\Server\Objects\BLE_Chat_Server.axf" - 0 Error(s), 0 Warning(s).
Build Time Elapsed:  00:00:14
```

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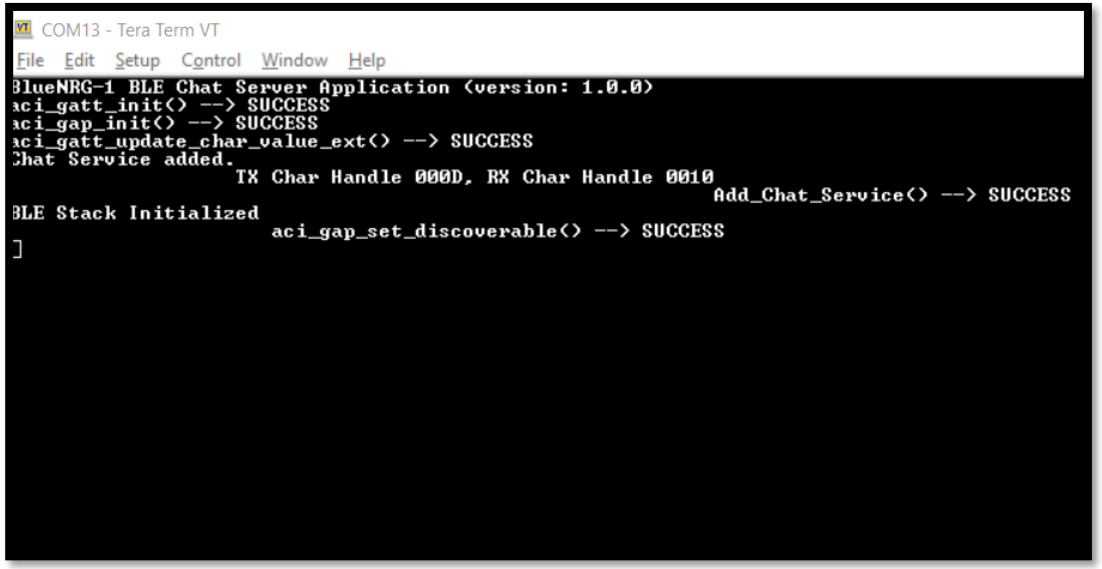
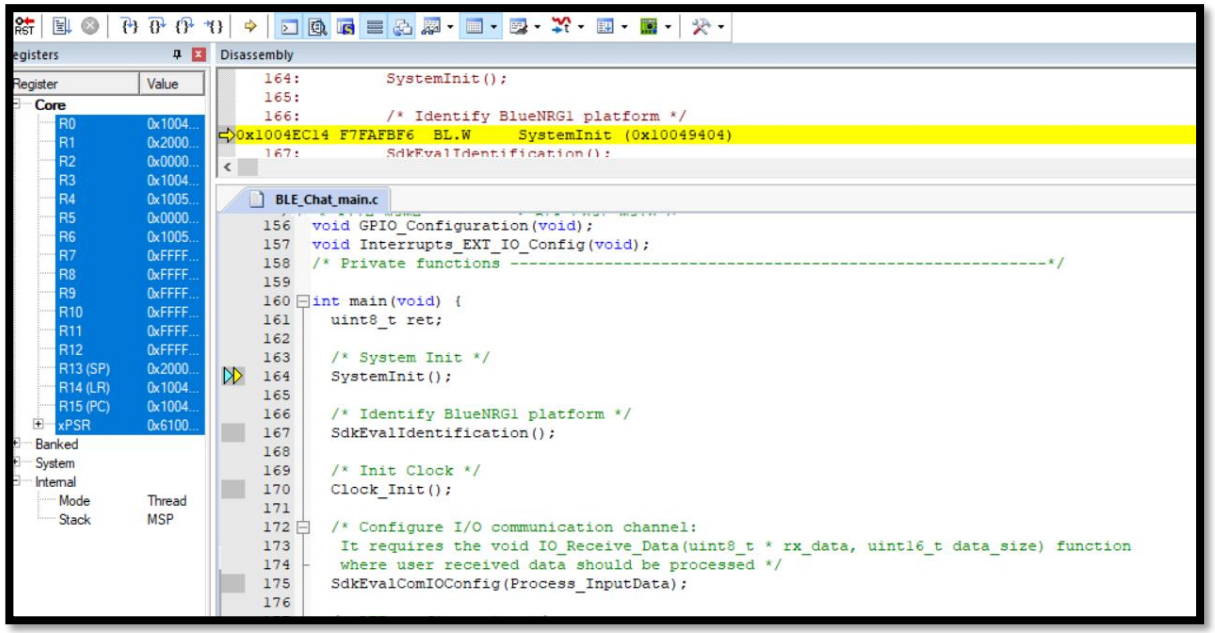
Establish Debug Session

- After build, go further only if you have tested the debugger connection
- Ensure that the BlueNRG-1 ST-Link utility is not connected to target
- Press F8 to program the device
- Press Ctrl+F5 to start the debug session
- Now Open any serial monitor (tera term etc) and open the serial port
- Select setting as 115200 8 N 1
- Enable “\n” new line character for Enter key
- Now press F5

Verify Successful Debug Session Start

- You will see a screen like one here if all works well
- Now click on F5 to run the code
- You can connect via phone following procedure explained with Navigator Usage

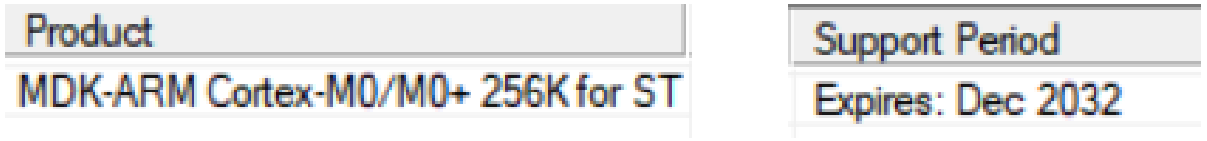




Help: In case of Build Error

If you face issues with Building the Project then

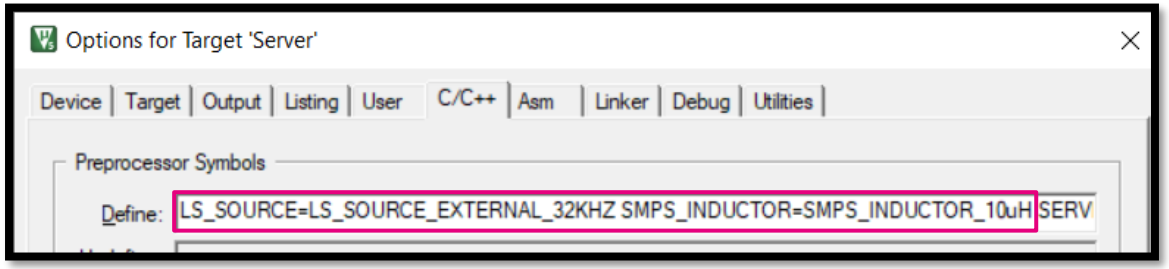
- Goto “File” → “License Management”
- The installed license should be visible as

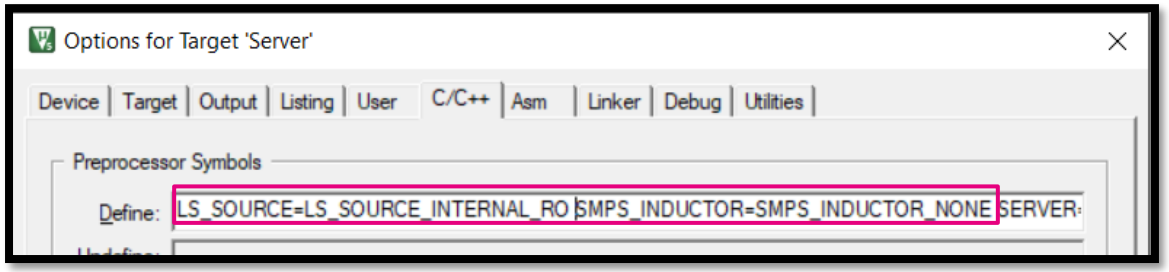


- If you don’t see above license, then refer License Installation section
- If License is installed and you still face issue, check below
  - Keil has write permission in the drive where project is located
  - Try running Keil as administrator
  - Verify if the DFP has been installed.

Help: Verify Preprocessor Settings

- There are different hardware available for BlueNRG-2 with combinations of
  - SMPS On/SMPS Off
  - External LF crystal/Internal RO
- After opening project in Keil Go to Project → Options for Target → C/C++ (tab)
- For STEVAL and BlueNRG-M2SA
  - LS_SOURCE=LS_SOURCE_EXTERNAL_32KHZ
  - SMPS_INDUCTOR=SMPS_INDUCTOR_10uH
- For BlueNRG-M2SP or low-cost modules
  - LS_SOURCE=LS_SOURCE_INTERNAL_RO
  - SMPS_INDUCTOR=SMPS_INDUCTOR_NONE





Help: Unable to establish debug

Please check below

- The DFP is installed
- You have configured debugger settings in Keil as per instructions
- Try reading the device vis BlueNRG-1 ST-LINK utility. If you see all FF starting at address 0x10040000 then you have either
  - You have not flashed the right code or used an OTA configuration
  - your flash erase setting is set for Erase chip, change to Erase sectors

Install Mobile Apps

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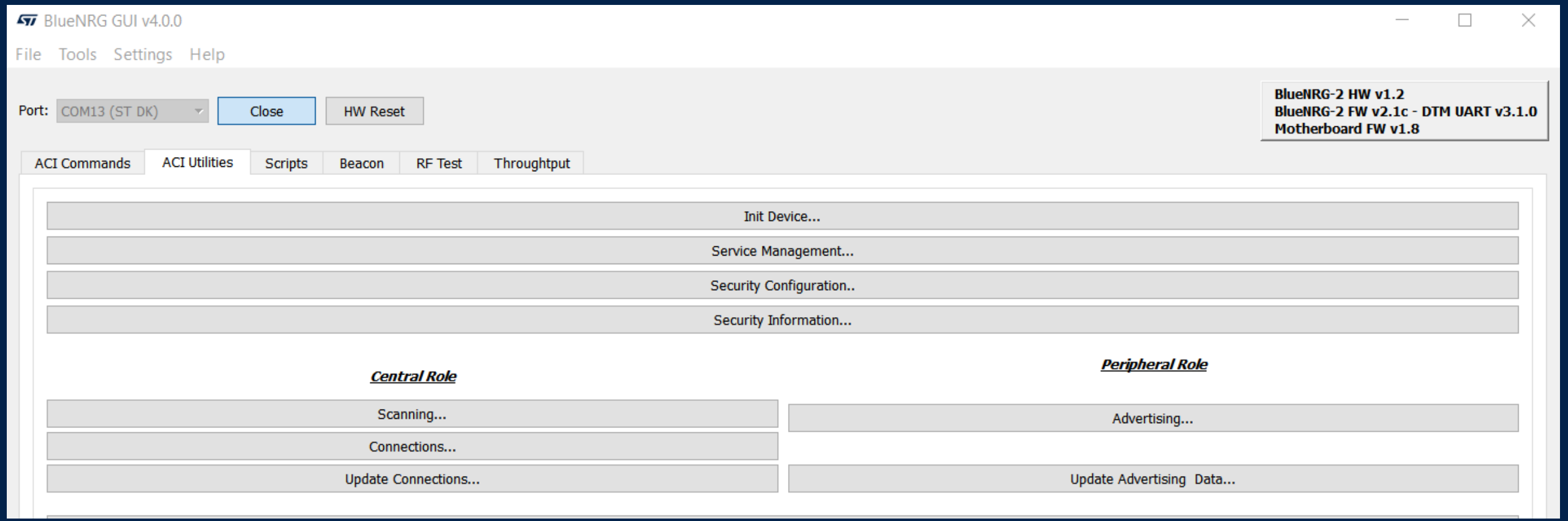
Install Mobile apps

- Install ST BLE sensor mobile app (available for android and iOS)

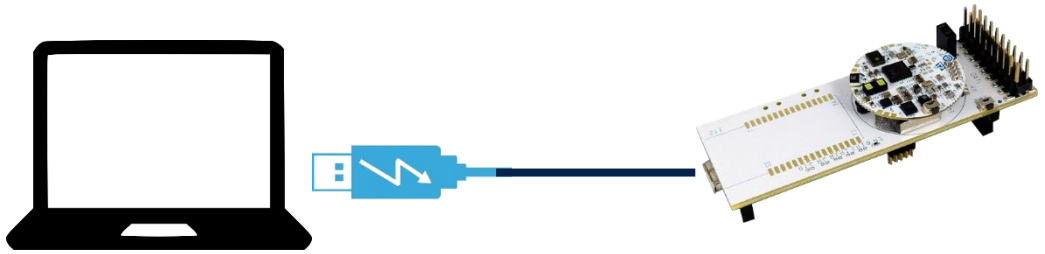
- Install BLE Scanner app (available for android and iOS)

Test Board Connection with BlueNRG-GUI



Erase the BlueTile Board

- Mount the Bluetile on the base board
- Connect the Bluetile base board to PC via Micro USB cable
- Check switches SW2 and SW3 on bluetile host board are on USB connector side
- Open BlueNRG-X Flasher
- Select the relevant com port (ST DK)
- Press Ctrl + E and execute mass erase
- You should see the green light on the BlueTile LED
- Click on “Read” button to verify the blank memory filled with FF

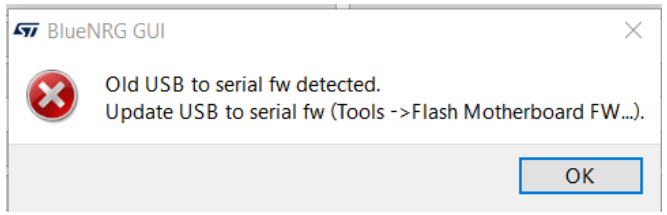


Flash DTM Code

- Click on “Select Image file” button and navigate to
  \\STSW-BLUETILE-DK 1.3.0\Firmware\BLE_Examples\DTM
- Select file DTM_UART.hex and click on “Open”
- Switch to “Image File” tab
- Verify that the file starts from address 0x10040000
- Now click on the “Flash” button upper section of Flasher
- Once successful, you should see a popup like one below. Else, try to erase chip and change USB port and cable

Connect GUI and Verify Versions

- Close Flasher and Start BlueNRG-GUI
- Go to “Settings”→ “Set Baud Rate” and select “115200”. Then click “OK”
- Select the relevant com port and click on open port button and see if the device and firmware versions are visible
- If you see a message like on below, you can click “OK” and continue.



Reference Material

Application Notes and User Manuals

Doc	Title	HW
AN4378	Using the BlueNRG family transceivers under FCC title 47 part 15 in the 2400 – 2483.5 MHz band	BlueNRG-MS, BlueNRG-1, BlueNRG-2
AN4387	Using the BlueNRG family transceivers under ETSI EN 300 328 in 2400 –2483.5 MHz band	BlueNRG-MS, BlueNRG-1, BlueNRG-2
AN4392	Using the BlueNRG family transceivers under ARIB STD-T66 in the 2400 – 2483.5 MHz band	BlueNRG-MS, BlueNRG-1, BlueNRG-2
AN4486	BlueNRG, BlueNRG-MS over-the-air bootloader	BlueNRG-MS
AN4491	BlueNRG, BlueNRG-MS updater	BlueNRG-MS
AN4494	Bringing up the BlueNRG and BlueNRG-MS devices	BlueNRG-MS
AN4630	PCB design guidelines for the BlueNRG and BlueNRG-MS devices	BlueNRG-MS
AN4818	Bringing up the BlueNRG-1, BlueNRG-2 devices	BlueNRG-1, BlueNRG-2
AN4819	PCB design guidelines for the BlueNRG-1 device	BlueNRG-1
AN4820	BlueNRG-1 and BlueNRG-2 low power modes	BlueNRG-1, BlueNRG-2
AN4869	BlueNRG-1, BlueNRG-2 BLE OTA (over-the-air) firmware upgrade	BlueNRG-1, BlueNRG-2
AN4872	BlueNRG-1 and BlueNRG-2 UART bootloader protocol	BlueNRG-1, BlueNRG-2
AN5187	The BlueNRG-1, BlueNRG-2 improving robustness	BlueNRG-1, BlueNRG-2
UM1770	BlueNRG, BlueNRG-MS profiles application interface	BlueNRG-MS
UM1865	BlueNRG-MS Bluetooth® LE stack application command interface (ACI)	BlueNRG-MS
UM1868	BlueNRG and BlueNRG-MS information register (IFR)	BlueNRG-MS
UM2058	BlueNRG GUI SW package	BlueNRG-MS, BlueNRG-1
UM2109	BlueNRG-1 ST-LINK Utility software description	BlueNRG-1
UM2211	BLE-Sub1GHz development kit	S2-LP, BlueNRG-1, BlueNRG-2
UM2379	The BlueNRG-1, BlueNRG-2 radio driver	BlueNRG-1, BlueNRG-2
UM2406	The BlueNRG-1, BlueNRG-2 Flasher SW package	BlueNRG-1, BlueNRG-2

Design Tips

Doc	Title	HW
DT0049	IFR configuration of BlueNRG/BlueNRG-MS using STM32ODE	BlueNRG-MS
DT0051	Quick guide on BLE RF technology: products, evaluation kits and software packages	BlueNRG-MS
DT0052	Quick guide on Sub-1GHz RF technology: products, evaluation kits and software packages	Spirit1, SPSGRF
DT0063	Bluetooth Low-Energy network: time-stamping and sample-rate-conversion	BlueNRG-MS, BlueNRG-1
DT0068	How to replace a low-speed wired connection using a BLE link	BlueNRG-MS, BlueNRG-1
DT0069	Enabling the Bluetooth Low Energy Direct Test Mode (DTM) with BlueNRG-MS	BlueNRG-MS
DT0070	How to set the Bluetooth device address on BlueNRG-MS	BlueNRG-MS
DT0074	BlueNRG-MS radio stack images versions	BlueNRG-MS
DT0093	How to mount the new balun BALF-NRG-02D3 without the top side marking	BlueNRG-1, BlueNRG-2
DT0107	Slot allocation and multiple connection timing strategy for BlueNRG, BlueNRG-MS, BlueNRG-1 and BlueNRG-2	BlueNRG-MS, BlueNRG-1, BlueNRG-2
DT0108	How to program and debug BlueNRG-1 and BlueNRG-2 devices	BlueNRG-1, BlueNRG-2
DT0109	How to configure the BlueNRG-1 and BlueNRG-2 devices in network coprocessor mode	BlueNRG-1, BlueNRG-2
DT0120	How to program and debug BlueNRG-1 and BlueNRG-2 devices	BlueNRG-1, BlueNRG-2
DT0129	BLE Module integration design guidelines	SPBTLE-RF0, SPBTLE-RF, SPBTLE-1S

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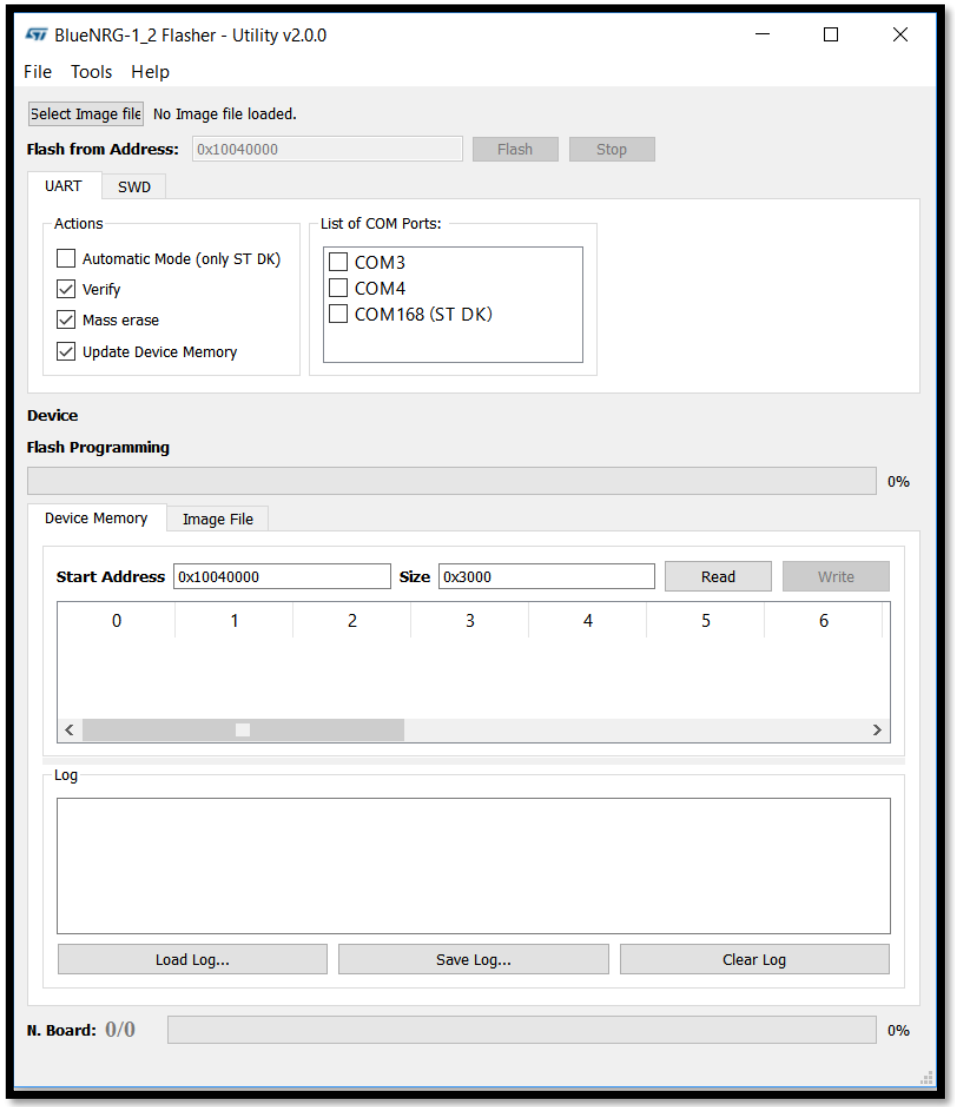
Software and Programming Manuals

Doc	Title	HW
ES0280	BlueNRG/BlueNRG-MS device limitations	BlueNRG-MS
PM0237	BlueNRG, BlueNRG-MS stacks programming guidelines	BlueNRG-MS
PM0257	BlueNRG-1, BlueNRG-2 BLE stack programming guidelines	BlueNRG-1, BlueNRG-2
STSW-BLEPROFILES	BlueNRG-1 BLE Profiles SW package	BlueNRG-1, BlueNRG-2
STSW-BLUENRG-DK	Setup for BlueNRG Kits	BlueNRG-MS
STSW-BLUENRG1-DK	BlueNRG-1, BlueNRG-2 DK SW package	BlueNRG-1, BlueNRG-2
STSW-BNRG001	BlueNRG current consumption estimation tool	BlueNRG-MS, BlueNRG-1, BlueNRG-2
STSW-BNRG1STLINK	BlueNRG-1 ST-LINK utility for BlueNRG-1, BlueNRG-2 MCU	BlueNRG-1, BlueNRG-2
STSW-BNRGUI	BLUENRG family GUI	BlueNRG-MS, BlueNRG-1, BlueNRG-2
STSW-BNRG_V1-DK	BlueNRG-1 DK SW package for BLE stack family v1.x	BlueNRG-1
STSW-BNRG-Mesh	Mesh over Bluetooth Low Energy	BlueNRG-MS, BlueNRG-1, BlueNRG-2
STSW-BNRG-S2LP	STSW-BNRG-S2LP evaluation software package based on BlueNRG-1 and S2-LP	S2-LP, BlueNRG-1, BlueNRG-2
STSW-BNRG-V71A	BLE Stack Image Package Release v7.1a	BlueNRG-MS
STSW-BNRG-V71C	BLE Stack Image Package Release v7.1c	BlueNRG-MS
STSW-BNRG-V71E	BLE Stack Image Package Release v7.1e	BlueNRG-MS
STSW-BNRG-V72C	BlueNRG-MS BLE Stack Image Package Release v7.2c	BlueNRG-MS
STSW-BNRG-V73	BlueNRG-MS BLE Stack Image Package Release v7.3	BlueNRG-MS

STSW-BNRGFLASHER

- BlueNRG-1,2 Flasher utility
- Supports programming via SWD and UART interface
- Supports flash to be read, mass erased, written and programmed
- Can connect to multiple hardware simultaneously
- Autobaud and forced baud rate supported
- Supports .bin and .hex formats

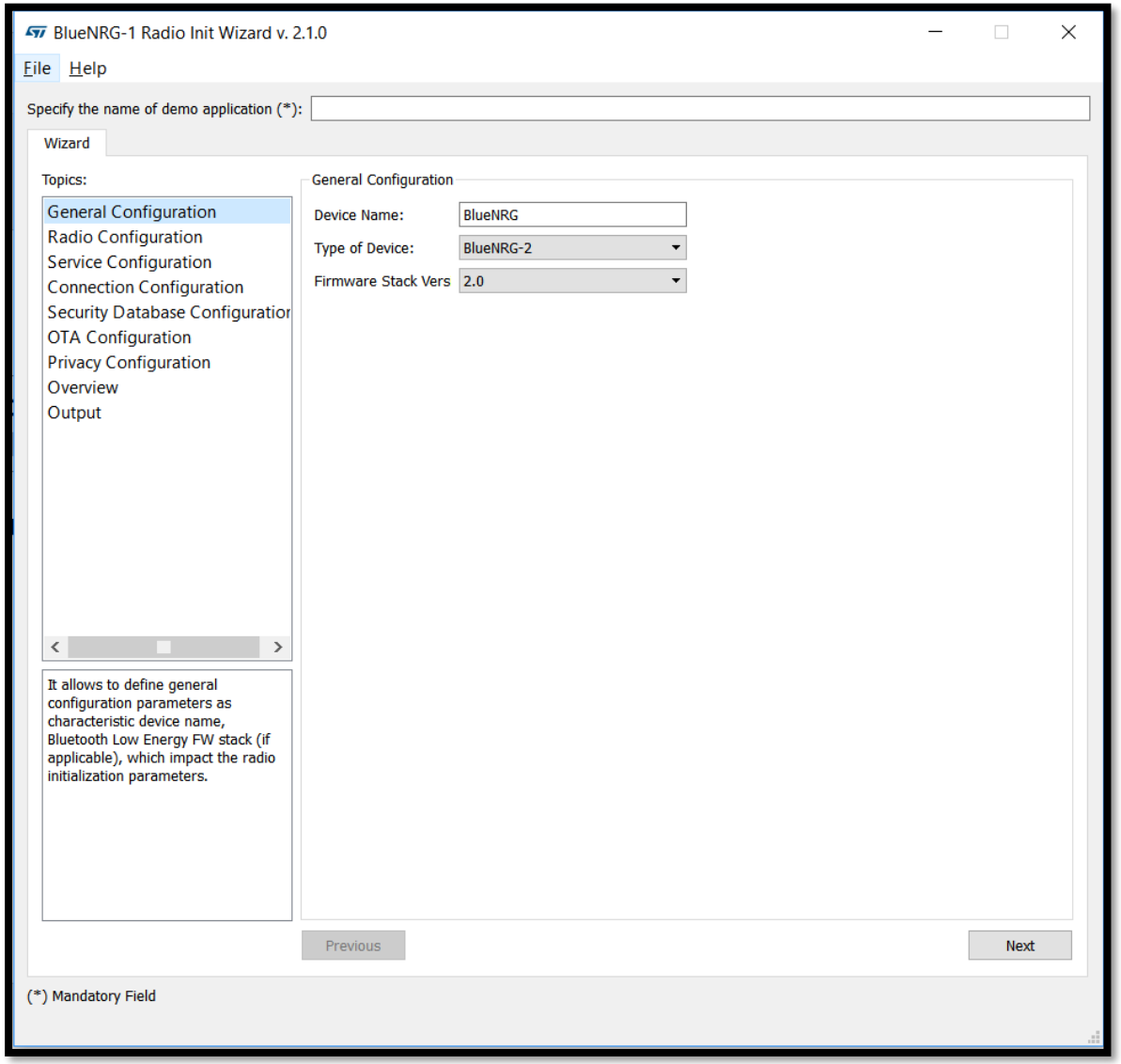


BlueNRG-1, 2 flasher for production programming

- BlueNRG-1,2 Flasher Launcher Utility can be launched through PC command window for integration under test environment
- Supports programming of multiple targets at a time (up to 10)
- Allows a MAC address to be stored on a specific Flash location selected by the user
- UART ‘Automatic Mode’ programming option allows user to enter a programming loop by selecting the connected devices on 'List of COM Ports' and press the Flash button
- Supports data logging into log files with time stamp

BlueNRG-1 Radio Init Wizard

- This tool allows to setup the BlueNRG-1/BlueNRG-2 initialization parameters and generate a configuration header file.
- Part of STSW-BLUENRG1-DK
- Allows to configure various parameters for
  - Stack
  - Security
  - Services
  - Radio
  - OTA



BlueNRG-1 Radio Init Wizard

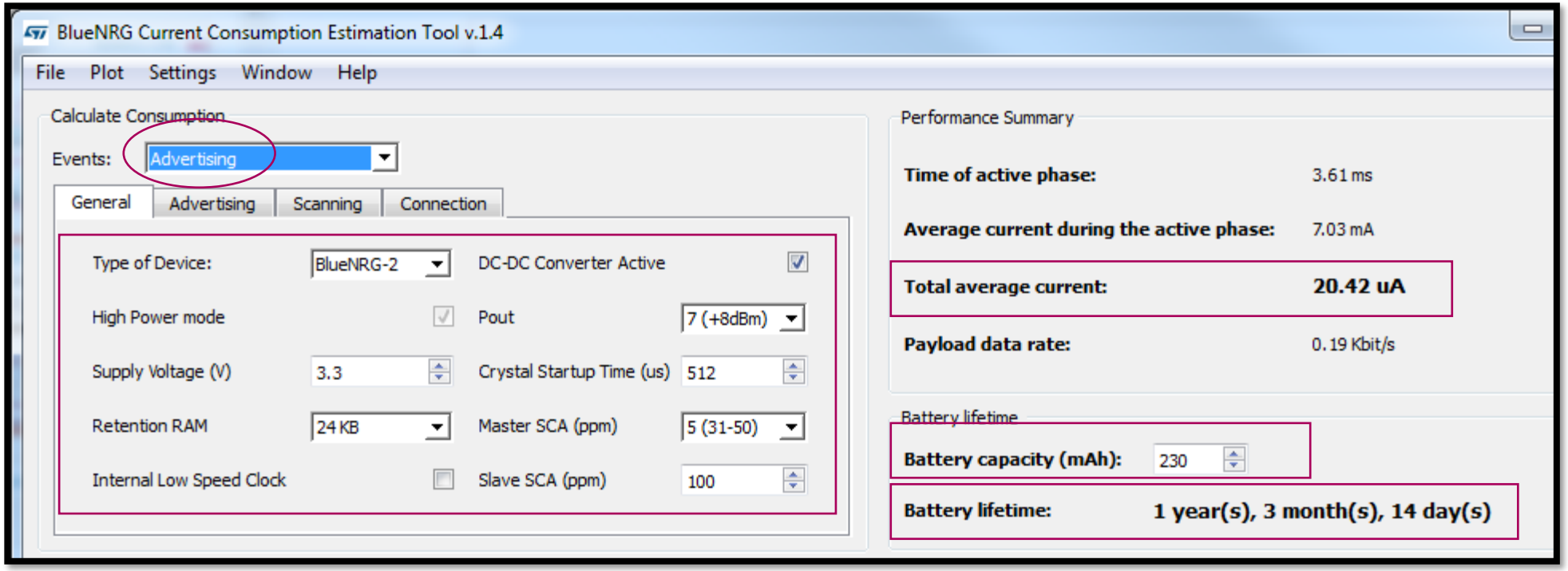
- You can configure below parameters using the wizard
  - BLE Device Name and Stack version
  - Radio Packet configuration
  - Add service declaration for stack with number of services, respective characteristics and configure their properties
  - Define connection parameters and crystal tolerances
  - Enable OTA support
  - Configure privacy at Host or Controller
  - Estimate the RAM required by the BLE configuration and stack.

The generated header file can be directly replaced in the target folder.

BlueNRG Power Consumption Tool

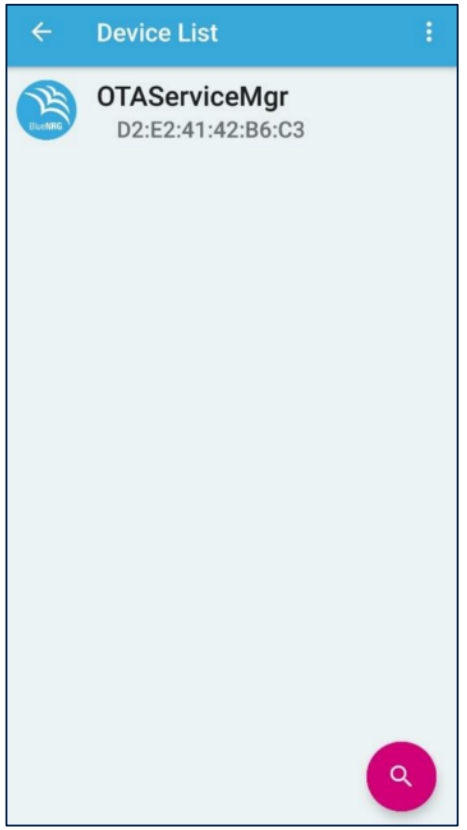
- Quick and accurate estimate of average current consumption and battery lifetime

- Eddystone URL beacon as example, Adv Int 1000 ms (within Google recommended value), 31-byte Adv packet payload, 3 Adv channels



http://www.st.com/content/st_com/en/products/embedded-software/wireless-connectivity-software/stsw-bnrg001.html

ST BLE Sensor App supporting FOTA1/2

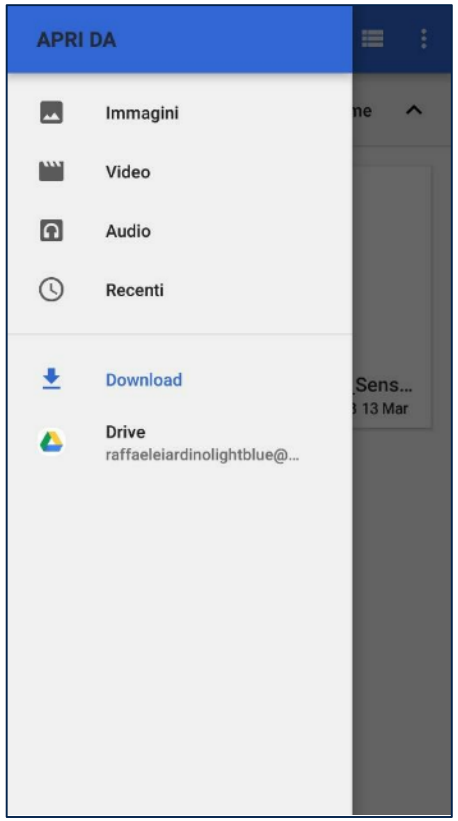


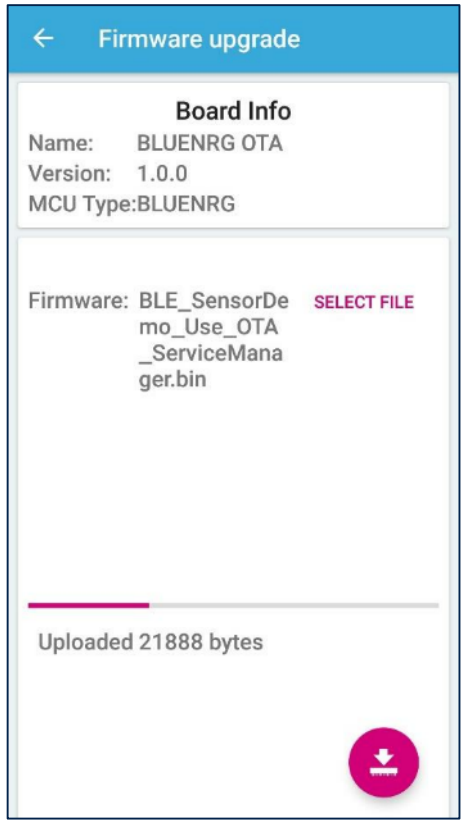
1 **Flash the OTA Service Manager on the STEVAL-IDB008**

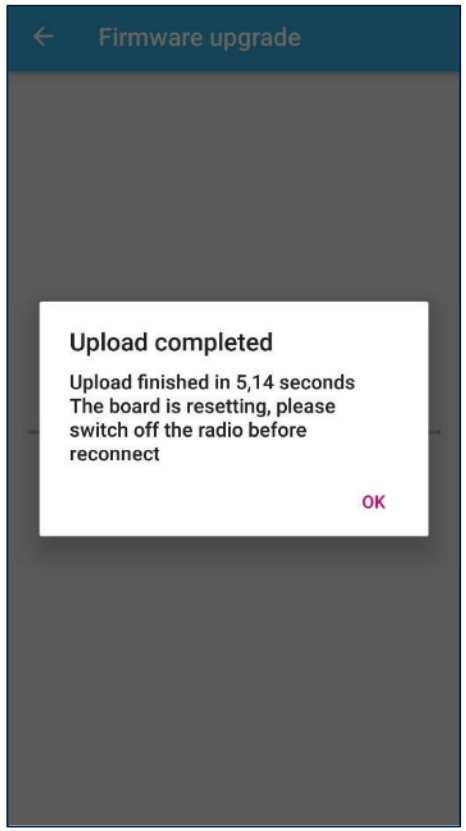
2 **Install the right version of the ST BLE Sensor**
The BlueNRG App should be already installed otherwise install it on your smartpone.

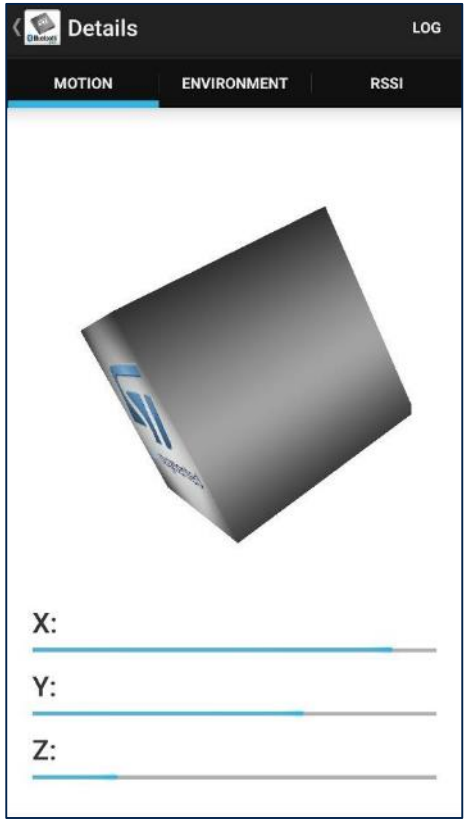
3 **Push CONNECT TO A DEVICE and then OTAServiceMgr**

ST BLE Sensor App supporting FOTA 2/2









4 **Select the file directly from the Cloud (Google Drive) or the one previously loaded in your mobile for instance the BLE_SensorDemo_OTA_ServiceManager.bin**

5 **The file will be flashed OTA and you can see the STEVAL-IDB008 Blue LED blinking**
but only for 5 seconds !
You have just experienced the powerful of the Data Length Extension feature embedded in the BlueNRG-232!

6 **Now the Yellow LED on the STEVAL-IDB008 is active and finally you can play with the BlueNRG APP.**
Also it is possible to re-enable the OTAServiceMgr pushing the button #1 (the middle one) to flash another image.

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Thank you

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