Quick Start Guide

Dynamic NFC tag expansion board based on M24SR for STM32 NUCLEO (X-NUCLEO-NFC01A1)

life.augmented

Version 1.1 (May 19, 2015)

Overview

1. Introduction to the STM32 Open Development Environment
2. STM32 Nucleo Dynamic NFC tag expansion board
   - Hardware overview
   - Software overview
3. Documents & Related Resources
4. Setup & Demo Examples

Overview

1. Introduction to the STM32 Open Development Environment
2. STM32 Nucleo Dynamic NFC tag expansion board
   - Hardware overview
   - Software overview
3. Documents & Related Resources
4. Setup & Demo Examples

STM32 Open Development Environment

Lowering the Barriers for “Developers”

Easy access to technology

Idea

Device Prototype

Application SW Development

Form factor Device

Field Testing

Final Device

Commercial SW

Market

Fast, flexible, affordable and based on commercial components

Scalable SW for faster time to Market

life.augmented

STM32 Open Development Environment

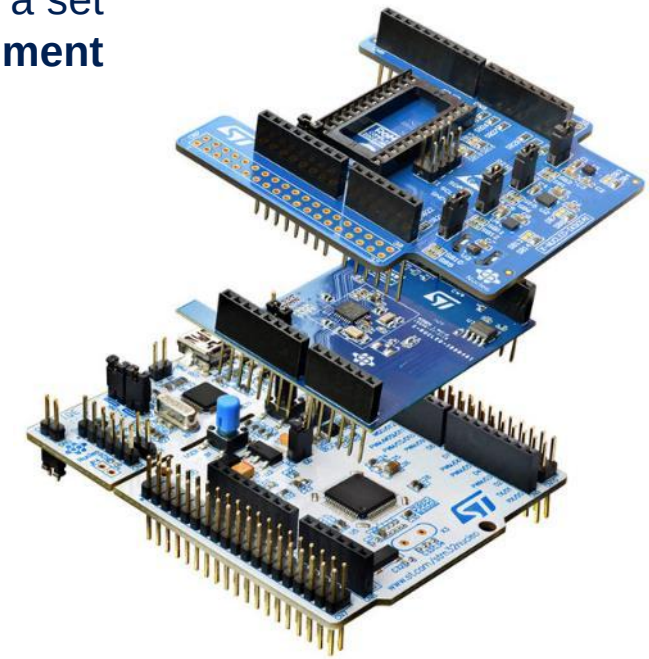
The STM32 Open Development Environment consists of a set of **modular developer boards** and a **SW environment** designed around the **STM32 microcontroller** family

STM32 Nucleo development boards

STM32Cube development software

STM32 Nucleo expansion boards

STM32Cube expansion software



Compatibility with multiple Development Environments

STM32 Open Development Environment

Building block approach

The building blocks | Your need | Our answer

Accelerometer, gyroscope
Inertial modules, magnetometer
Pressure, temperature, humidity, UV
Proximity, microphone

Sense — COLLECT

Bluetooth LE, Sub-GHz radio
NFC, Wi-Fi, GNSS

Connect — TRANSMIT

Audio amplifier
Touch controller
Operation Amplifier

Translate — ACCESS

Stepper motor driver
DC & BLDC motor driver

Move / Actuate — CREATE

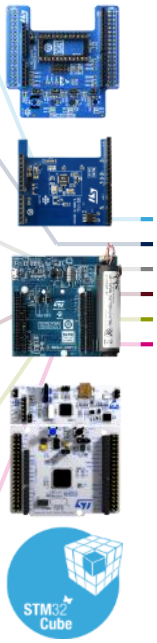
Energy management & battery

Power — POWER

General purpose microcontrollers
Secure microcontrollers

Process — PROCESS

Software



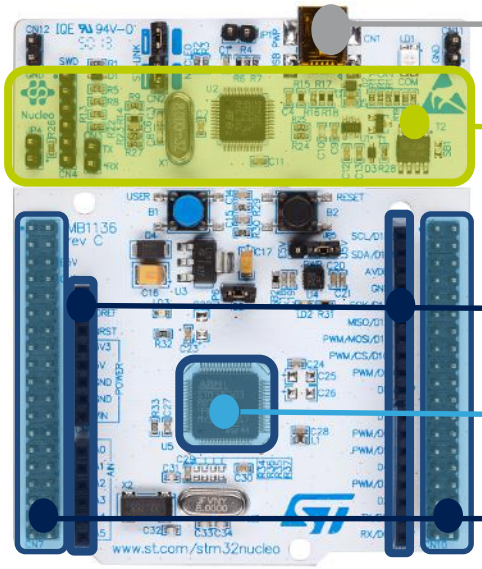
STM32 Open
Development Environment

www.st.com/stm32ode

life.augmented

STM32 Nucleo Development Board

- Based on ST's 32-bit ARM Cortex-M based STM32 microprocessors
  - A Boards with 1 MCU and hardware to program/debug
- Two connectors to connect to companion chips boards
- For all STM32 families



STM32 L0 STM32 L1 STM32 F0 STM32 F1 STM32 F2 STM32 F3 STM32 F4 STM32 F7

complete product range
from ultra-low power to high-performance

(*) thanks to the electrical compatibility it can be used as a shield for Arduino UNO R3 or similar

Overview

1 Introduction to the STM32 Open Development Environment

2 STM32 Nucleo Dynamic NFC tag expansion board
- Hardware overview
- Software overview

3 Documents & Related Resources

4 Setup & Demo Examples

Dynamic NFC Tag Expansion Board

Hardware

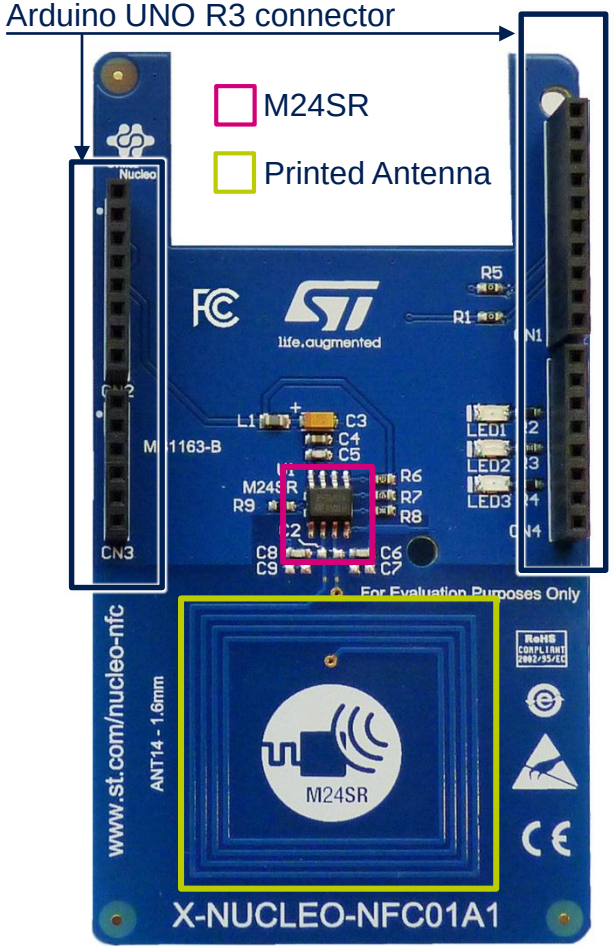
Hardware Description

- The X-NUCLEO-NFC01A1 is a Dynamic NFC tag evaluation board designed around the M24SR64-Y that allows expansion of the STM32 Nucleo boards.
- The M24SR64-Y communicates with STM32 Nucleo developer board though an I^2C link available on the Arduino UNO R3 connector.

Key Products on board

M24SR

The M24SR device is a dynamic NFC/RFID tag IC with a dual interface that embeds a 64-kbit EEPROM.
Memory can either be accessed with the I^2C interface or by a 13.56 MHz RFID reader or an NFC phone.
The RF protocol is compatible with ISO/IEC 14443 Type A and NFC Forum Type 4 Tag.



Latest info available at
X-NUCLEO-NFC01A1

Order Code: **X-NUCLEO-NFC01A1**
Unit Price (US$)*: 9.9
(*) Suggested Resale Price per unit (USD) for BUDGETARY USE ONLY

life.augmented

Dynamic NFC Tag Expansion Board

STM32Cube Expansion Software

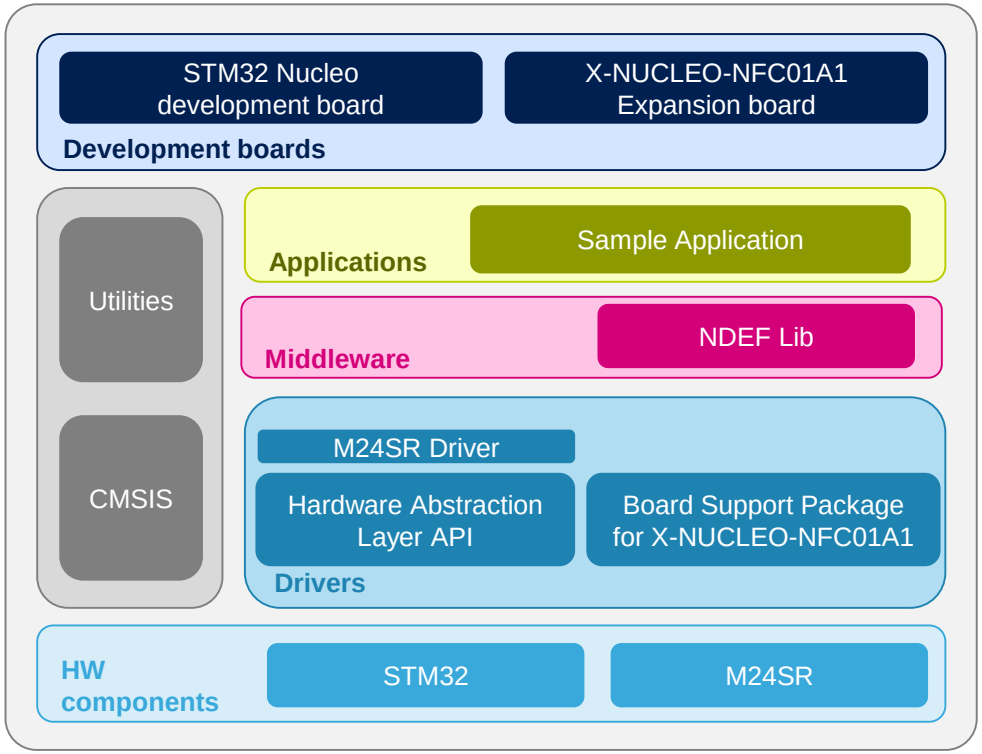
X-CUBE-NFC1 Software

- The X-CUBE-NFC1 is a SW package which provides drivers running on STM32 for M24SR devices (NFC tag type 4 / ISO IEC 14443 Type A). It is expansion for STM32Cube tool that eases portability across different STM32 MCUs
- Implementation examples are available for the M24SR Nucleo NFC expansion board (X-NUCLEO-NFC01A1) plugged on top of an STM32 Nucleo development board (NUCLEO-L053R8, NUCLEO-L152RE, NUCLEO-F030R8, NUCLEOF302R8, NUCLEO-F401RE)

Key features

- M24SR Drivers and X-NUCLEO-NFC01A1BSP to develop applications using our dynamic NFC tag
- Easy portability across different MCU families thanks to the STM32Cube
- Interaction with all NFC capable smartphone
- Free user-friendly license terms

Overall system architecture



Latest SW available at
X-CUBE-NFC1

life.augmented

Overview

1 Introduction to the STM32 Open Development Environment

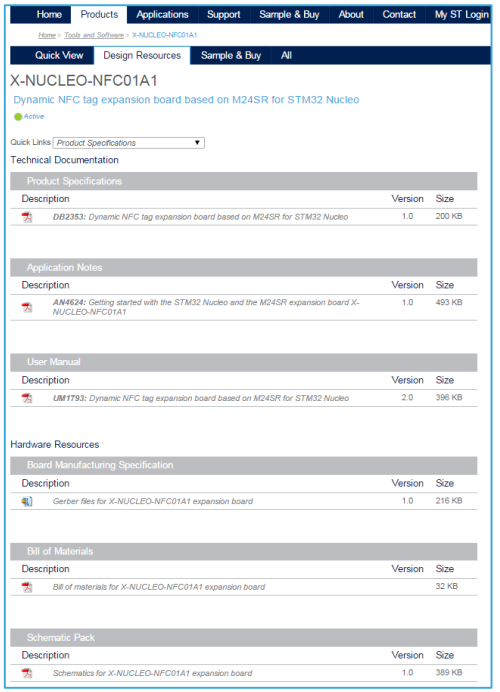
2 STM32 Nucleo Dynamic NFC tag expansion board
- Hardware overview
- Software overview

3 Documents & Related Resources

4 Setup & Demo Examples

Documents & Related Resources

All documents are available in the Design Resources sheet of the STM32 Dynamic NFC tag expansion board based on M24SR Product Folder



X-NUCLEO-NFC01A1: Product Folder (Link)

- Gerber files, BOM, Schematic
- DB2353 : Dynamic NFC tag expansion board based on M24SR for STM32 Nucleo
- AN4624: Getting started with the STM32 Nucleo and the M24SR expansion board X-NUCLEO-NFC01A1
- UM1793: Dynamic NFC tag expansion board based on M24SR for STM32 Nucleo

X-CUBE-NFC1: Product Folder (Link)

- DB2458: Dynamic NFC Tag M24SR software for STM32, expansion for STM32Cube
- AN4624: Getting started with the STM32 Nucleo and the M24SR expansion board X-NUCLEO-NFC01A1
- Related Tools and Software files

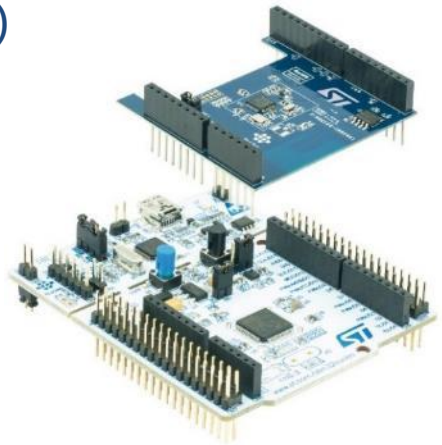
Overview

1. Introduction to the STM32 Open Development Environment
2. STM32 Nucleo Dynamic NFC tag expansion board
   - Hardware overview
   - Software overview
3. Documents & Related Resources
4. Setup & Demo Examples

Setup & Demo Examples

HW prerequisites

- Dynamic NFC tag Expansion Board (X-NUCLEO-NFC01A1)
- STM32 Nucleo development board (NUCLEO-L053R8 NUCLEO-L152RE, NUCLEO-F030R8, NUCLEO-F302R8, NUCLEO-F401RE)
- NFC-enabled Android™ smartphone and ST M24SR Demo application



Smartphone requirement

Android OS phone

Application for Demo

https://play.google.com/store/apps/details?id=com.nfc.m24srdemo
Or
http://www.st.com/web/catalog/tools/FM147/SC1871/PF260168

Setup & Demo Examples
SW prerequisites

- ST-LINK/V2-1 USB driver (Link)

- X-CUBE-NFC1 (Link)
  - Copy the .zip file content into: “c:\Program Files (x86)\STMicroelectronics\” folder on your PC
  - The package contains source code example projects (Keil, IAR, True Studio) based on board NUCLEO-L053R8, NUCLEO-L152RE, NUCLEO-F030R8, NUCLEO-F302R8, NUCLEO-F401RE and M24SR drivers.

Dynamic NFC tag Expansion Board

Start coding in just a few minutes with X-CUBE-NFC1

1 Go to www.st.com/x-nucleo

life.augmented

2 Select X-NUCLEO-NFC01A1

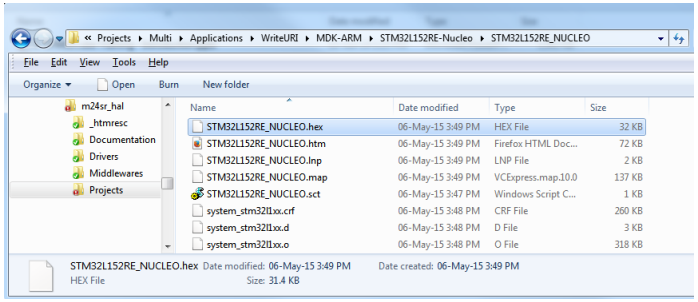
3 Download & unpack X-CUBE-NFC1

X-CUBE-NFC1 package

- _htmresc
- Documentation ← Generic Nucleo docs porting
- Drivers ← BSP, HAL and M24SR driver
- Middlewares ← NDEF lib
- Projects ← Application examples
- package.xml
- Release_Notes.html

4 Download & install STM32 Nucleo ST-LINK/V2-1 USB driver

5 Open project example WriteURI



6 Modify, build application

KEIL™ Tools by ARM

IAR SYSTEMS

atollic

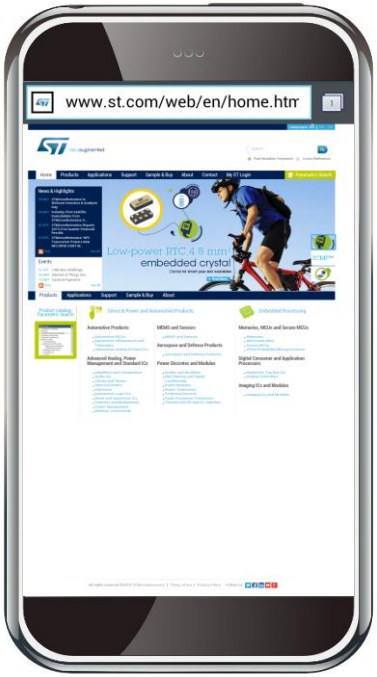
Dynamic NFC tag Expansion Board

Evaluate using X-CUBE-NFC1

7. Program STM32 on NUCLEO with STM32xxxx.hex binary file

8. Enable NFC on your phone and make sure it is also connected to the internet

9. Bring the phone close to the X-NUCLEO-NFC01A1 Antenna.
   You are directly redirected to **st.com** web page



www.st.com/stm32ode

life.augmented