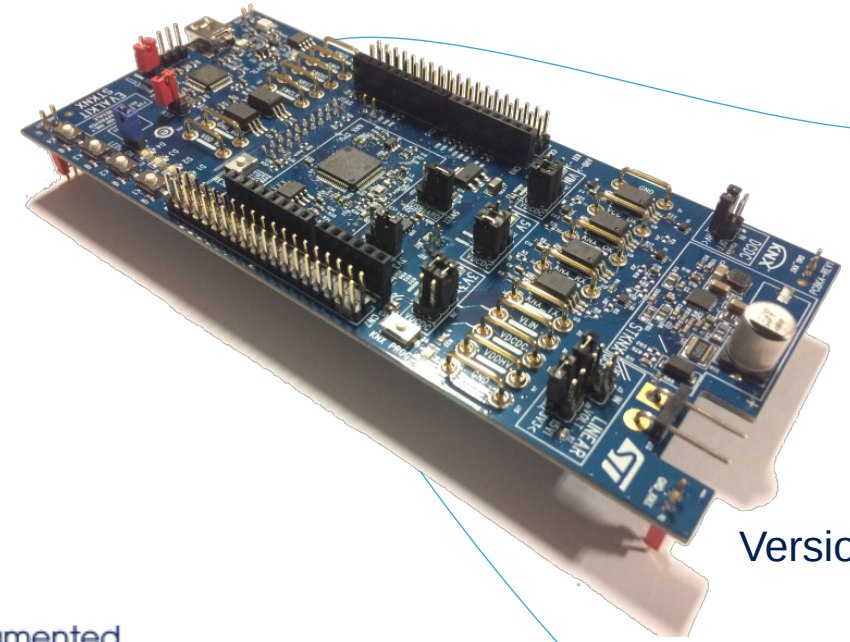
Quick Start Guide

STKNX evaluation board (EVALKITSTKNX)



Version 1.4 (February 9, 2018)

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Overview

1. EVALKITSTKNX Development Platform overview
2. Software overview and setup of the development environment
3. Setup example

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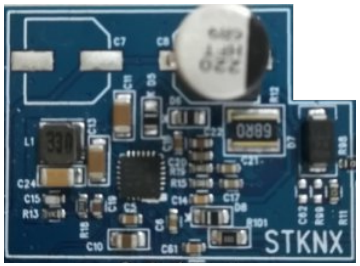
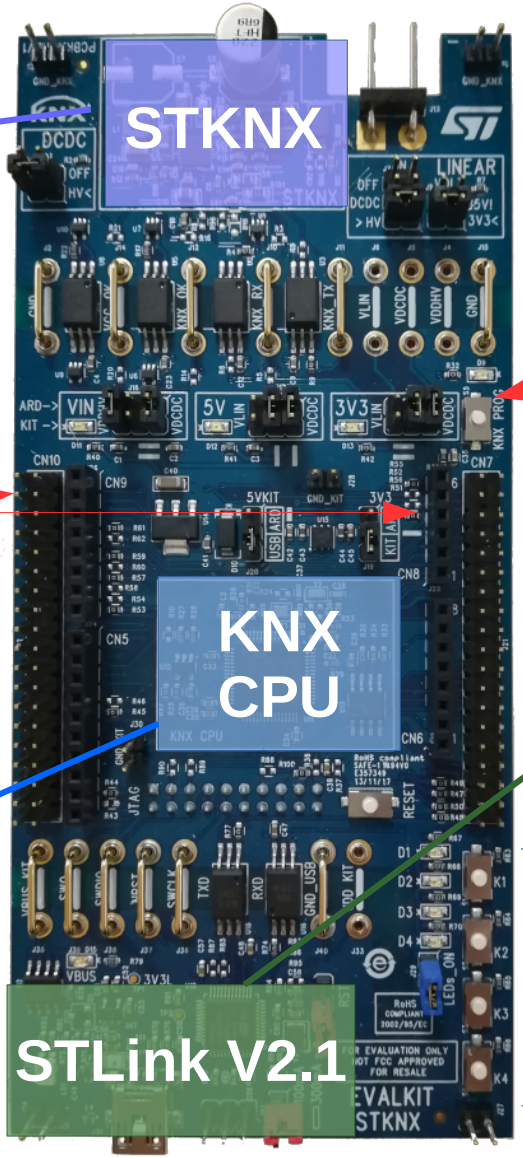
EVALKITSTKNX Development Platform overview

Board description



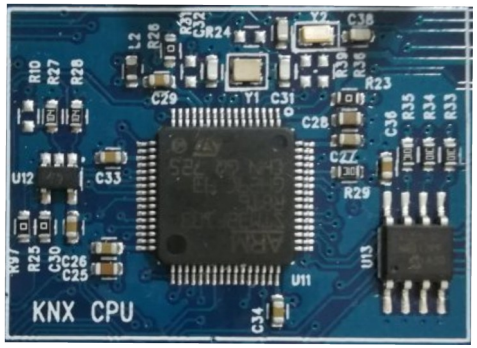
34 mm x 24 mm



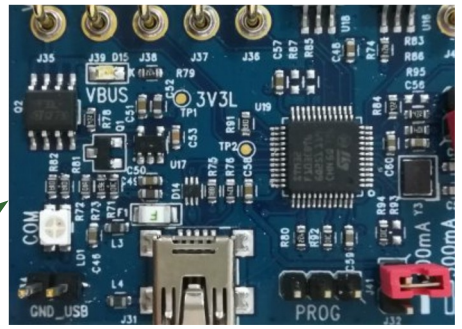
70 mm x 155 mm

KNX Prog key & LED

UNO &
Morpho connectivity



33 mm x 24 mm



4 user LED & buttons

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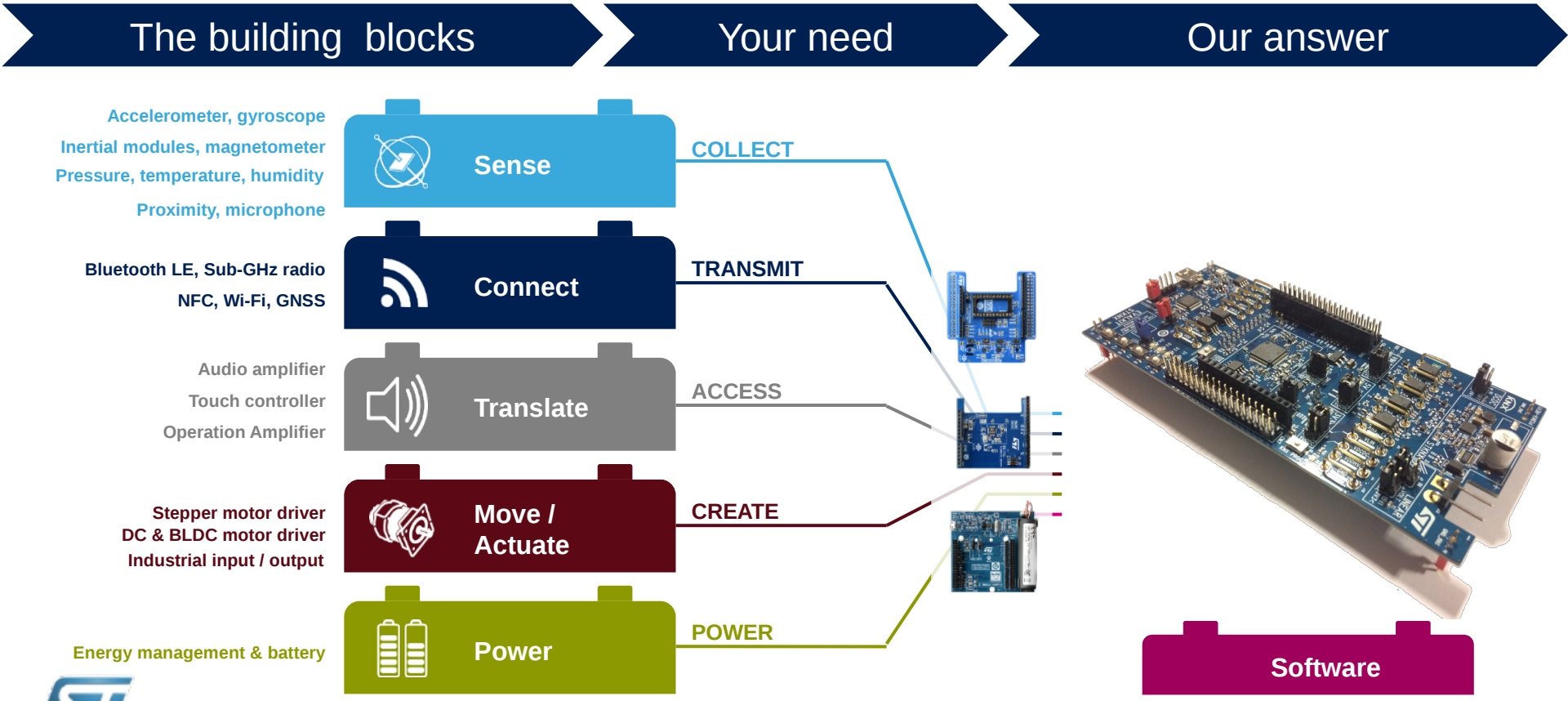
EVALKITSTKNX Development Platform overview

Development platform spirit

- **EVALKITSTKNX** has been developed in the spirit of the STM32 Nucleo boards.
- Expansion boards with additional functionality can be **plugged directly on top of the Eval Kit** development board or stacked on another expansion board.



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Overview

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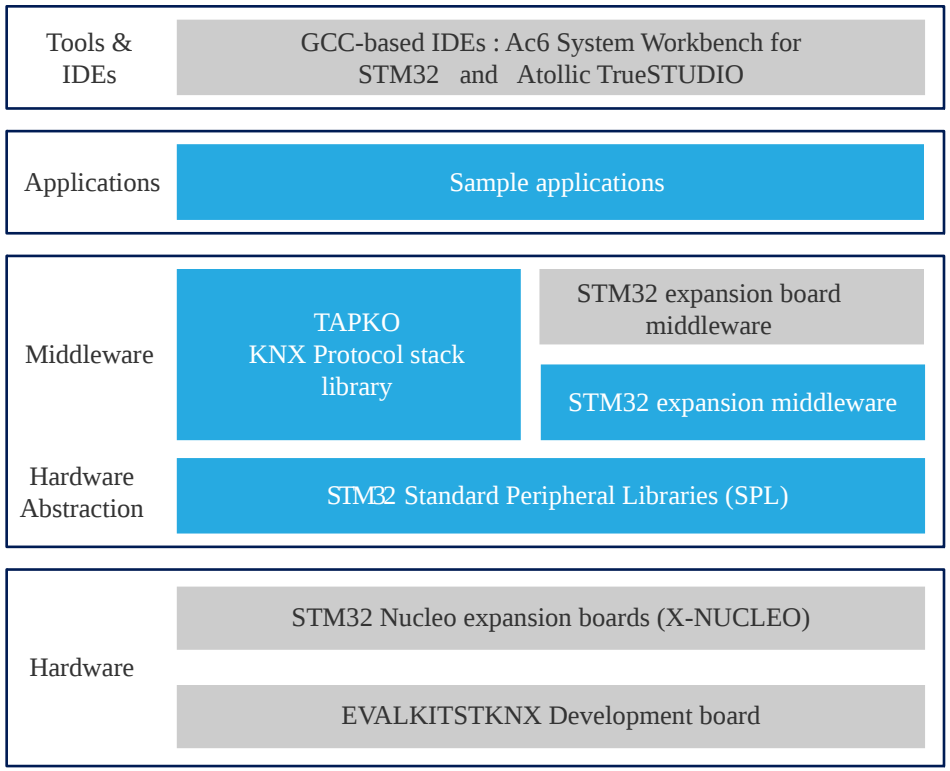
Software Overview and Setup
Software components

- **EVALKITSTKNX** comes with a complete software package. A sample application is provided.
- Access to hardware features is simplified with the utilisation of the **STM32 Standard Peripheral Libraries** (SPL)
- A demonstration version of the **TAPKO's KNX Protocol stack** is provided as a binary file.
- The software package is compatible with two free GCC-based IDEs : **Ac6 System Workbench for STM32 and Atollic TrueSTUDIO**. Versions of thes two IDE exist for Linux and Windows OS.

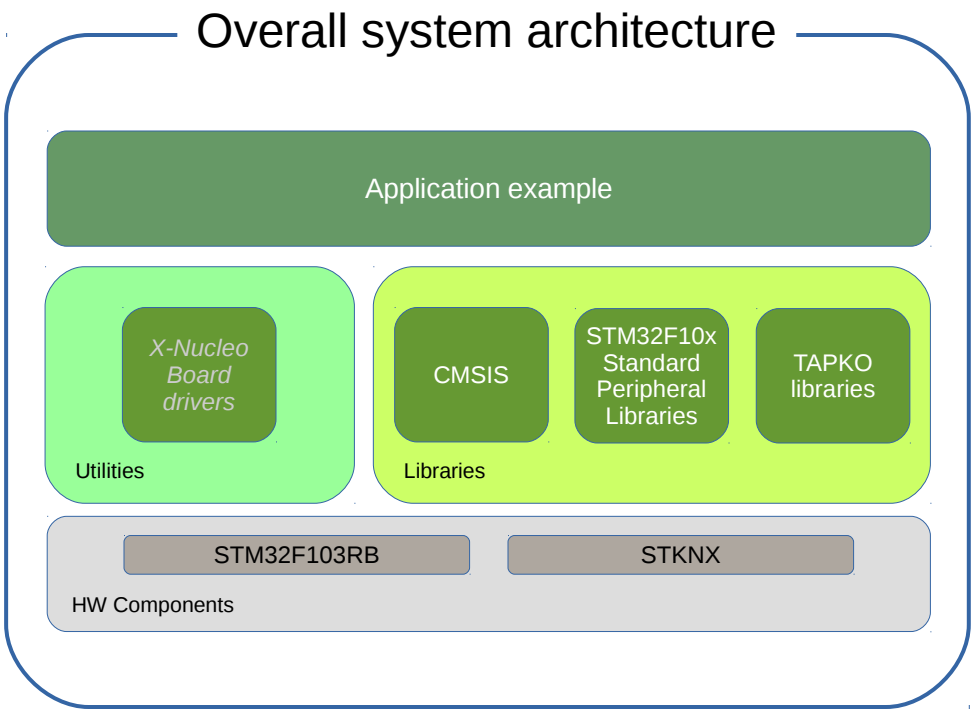


Software Overview and Setup

Software overview

STM32F103RB-STKNX software description

- This software, running on the STM32F103, demonstrate the STKNX capabilities.
- It is built on top of the STM32 Standard Peripheral Libraries (SPL) that eases access to STM32 features.
- It uses a demonstration version of the TAPKO KNX protocol stack.
- Example to demonstrate actuator and sensor.



Software Overview and Setup
Software prerequisites

- A Linux computer or a Windows computer with one of the supported development toolchains:
  - Atollic: TrueSTUDIO (Link)
  - AC6 System Workbench for STM32 : SW4STM32 (Link)

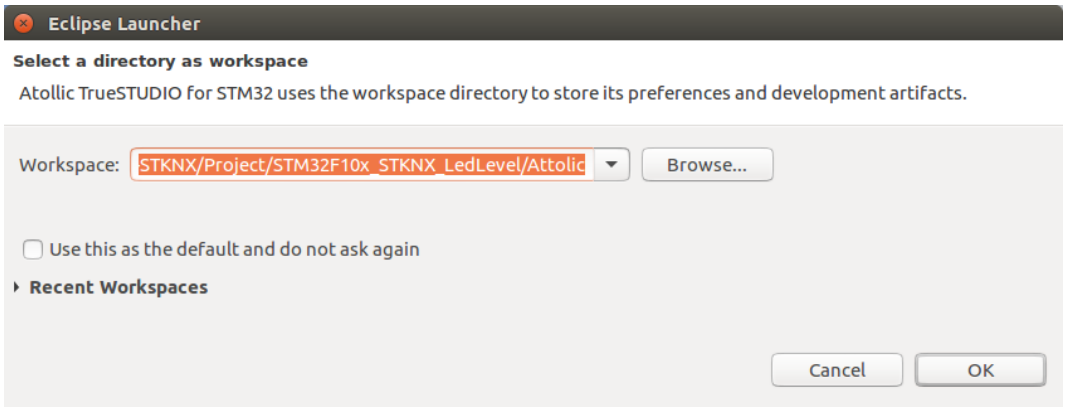
  or a Mac OSX computer with AC6 System Workbench for STM32
- EVALKITSTKNX firmware example
- ST-LINK/V2-1 USB driver (Link)
- ST-LINK/V2-1 firmware upgrade (Link)
- KNX ETS5 (Engineering Tool Software) Application (Link)

Software Overview and Setup

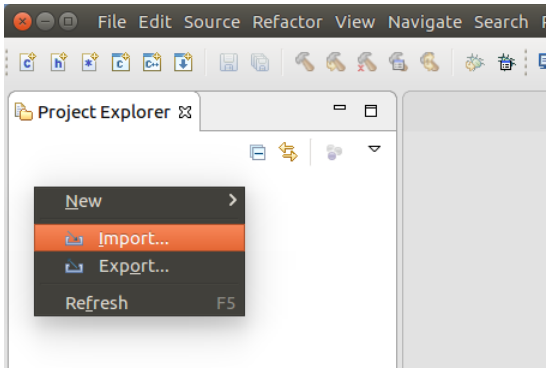
Install and build firmware with Atollic TrueSTUDIO

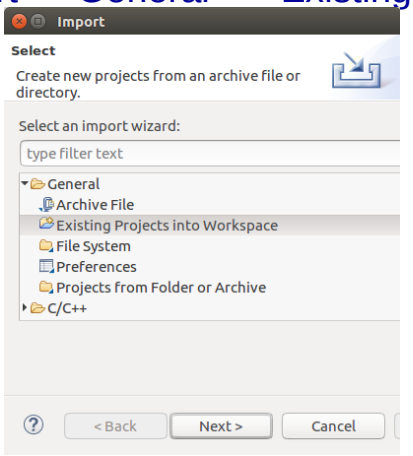
1. Download the STM32F103RB-STKNX package and extract it in your file system.

   Open Atollic TrueSTUDIO and when requested to select a directory as workspace, browse to : `<your path>/STM32F103RB-STKNX/Project/STM32F10x_STKNX_LedLevel/Attolic`



2. In the **ProjectExplorer** panel, right click and select Import → General → “Existing Projects into Workspace”

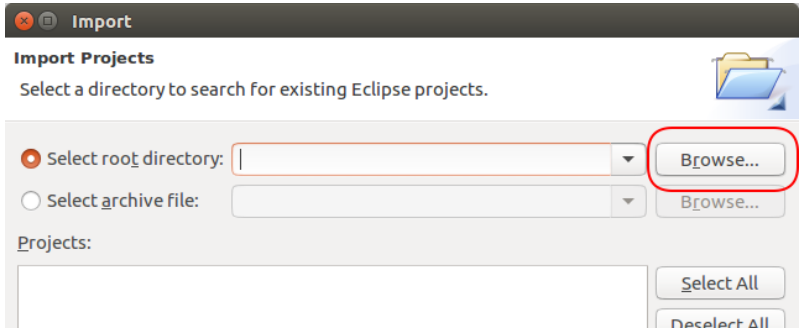


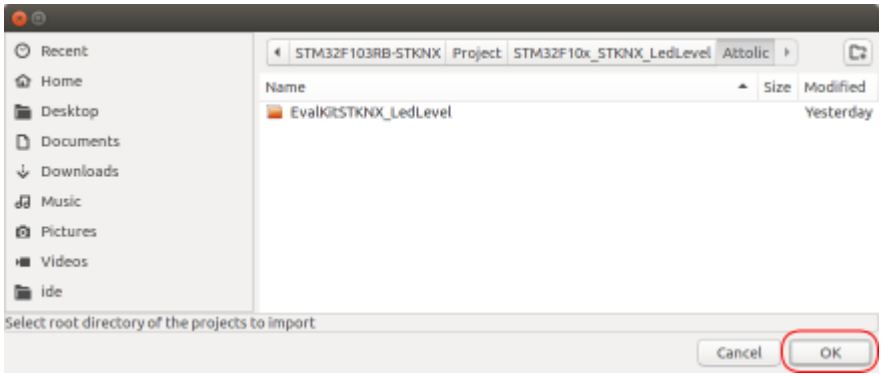


Software Overview and Setup

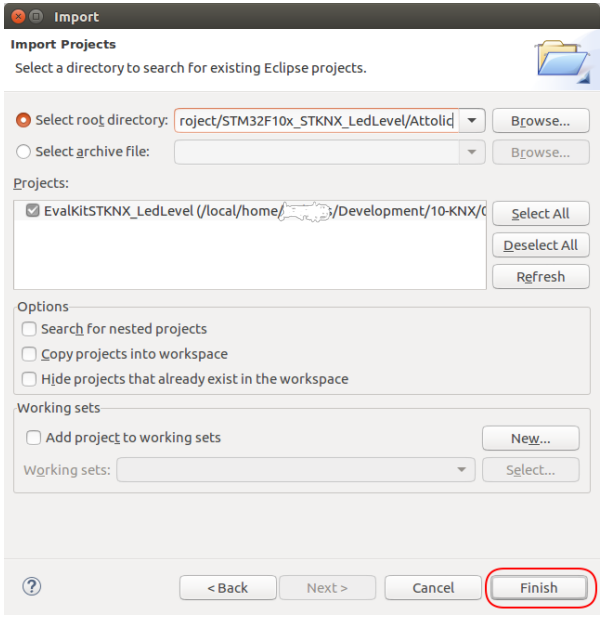
Install and build firmware with Atollic TrueSTUDIO

3 In the **Import** windows, click on Browse and on OK in the next window.





4 The project to import has been automatically selected. You can now click on Finish. The project is imported.



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Software Overview and Setup

Install and build firmware with Atollic TrueSTUDIO

5 Select the project name in the **Project Explorer**, and click on Clean icon  or select Clean Project in the contextual menu.

6 Click on build icon  or select Clean Project in the contextual menu.

Problems Tasks Console Properties

CDT Build Console [EvalKitSTKNX_LedLevel]

```
arm-atollic-eabi-gcc -c ../../../../../Libraries/STM32F10x_StdPeriph_Driver/src/stm32f10x_rtc.c -mthumb -mcpu=cortex
arm-atollic-eabi-gcc -c ../../../../../Libraries/STM32F10x_StdPeriph_Driver/src/stm32f10x_spi.c -mthumb -mcpu=cortex
arm-atollic-eabi-gcc -c ../../../../../Libraries/Tapko/dev_mod/07B0/dat_07B0.c -mthumb -mcpu=cortex-m3 -std=gnu11 -D
arm-atollic-eabi-gcc -c ../../../../../Libraries/STM32F10x_StdPeriph_Driver/src/stm32f10x_pwr.c -mthumb -mcpu=cortex
arm-atollic-eabi-gcc -c ../../../../../Libraries/Tapko/dev_mod/07B0/app_07B0.c -mthumb -mcpu=cortex-m3 -std=gnu11 -D
arm-atollic-eabi-gcc -c ../../../../Src/demo_dimmer.c -mthumb -mcpu=cortex-m3 -std=gnu11 -DSTM32 -DSTM32F1 -DSTM32F103R
arm-atollic-eabi-gcc -c ../../../../../Libraries/STM32F10x_StdPeriph_Driver/src/stm32f10x_flash.c -mthumb -mcpu=cort
arm-atollic-eabi-gcc -c ../../../../../Libraries/Tapko/dev_mod/07B0/knx07B0_if.c -mthumb -mcpu=cortex-m3 -std=gnu11
arm-atollic-eabi-gcc -c ../../../../../Libraries/CMSIS/CM3/CoreSupport/core_cm3.c -mthumb -mcpu=cortex-m3 -std=gnu11
arm-atollic-eabi-gcc -c ../../../../../Libraries/STM32F10x_StdPeriph_Driver/src/stm32f10x_iwdg.c -mthumb -mcpu=corte
arm-atollic-eabi-gcc -c ../../../../../Libraries/STM32F10x_StdPeriph_Driver/src/stm32f10x_rcc.c -mthumb -mcpu=cortex
arm-atollic-eabi-gcc -c ../../../../../Libraries/STM32F10x_StdPeriph_Driver/src/stm32f10x_exti.c -mthumb -mcpu=corte
arm-atollic-eabi-gcc -c ../../../../../Libraries/STM32F10x_StdPeriph_Driver/src/stm32f10x_usart.c -mthumb -mcpu=cort
arm-atollic-eabi-gcc -c -mthumb -mcpu=cortex-m3 -g -Wa,--warn -x assembler-with-cpp -o startup/startup_stm32f10x_md.
arm-atollic-eabi-gcc -o EvalKitSTKNX_LedLevel.elf Examples/Src/app_data.o Examples/Src/demo_dimmer.o Examples/Src/ma
/opt/Atollic_TrueSTUDIO_for_STM32_x86_64_9.0.0/ide/jre/bin/java -jar /opt/Atollic_TrueSTUDIO_for_STM32_x86_64_9.0.0/
Generate build reports...
Print size information
   text    data     bss     dec     hex filename
  65100    1750    2432   69282   10ea2 EvalKitSTKNX_LedLevel.elf
Print size information done
Generate listing file
Output sent to: EvalKitSTKNX_LedLevel.list
Generate listing file done
Generate build reports done
arm-atollic-eabi-objcopy -O binary EvalKitSTKNX_LedLevel.elf EvalKitSTKNX_LedLevel.bin
 arm-atollic-eabi-size EvalKitSTKNX_LedLevel.elf

17:25:31 Build Finished (took 18s.320ms)
```

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Software Overview and Setup

Install and build firmware with Atollic TrueSTUDIO

7 Once build is finished, you can start debugging the project : click on Clean icon  or select Debug As → Embedded C/C++ Application in the contextual menu.

Or you can drag and drop the binary (*EvalKitSTKNX_LedLevel.bin*), available in **Debug,** to the virtual drive that is mounted when you connect the EVALKITSTKNX board to your computer. Name of this virtual drive is STKNX.

Overview

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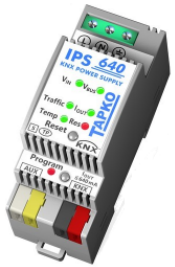
Setup & demo examples
Hardware prerequisites

- One EvalKitSTKNX board
- One KNX sensor : Apricum TAI-KNX 4

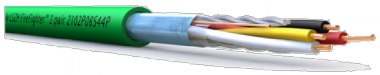
- One KNX Power Supply



- One KNX TP interface (USB-KNX interface)

- A type A to type B USB cable

- KNX cable



(*) Power stage supply voltage from 8 V to 50 V

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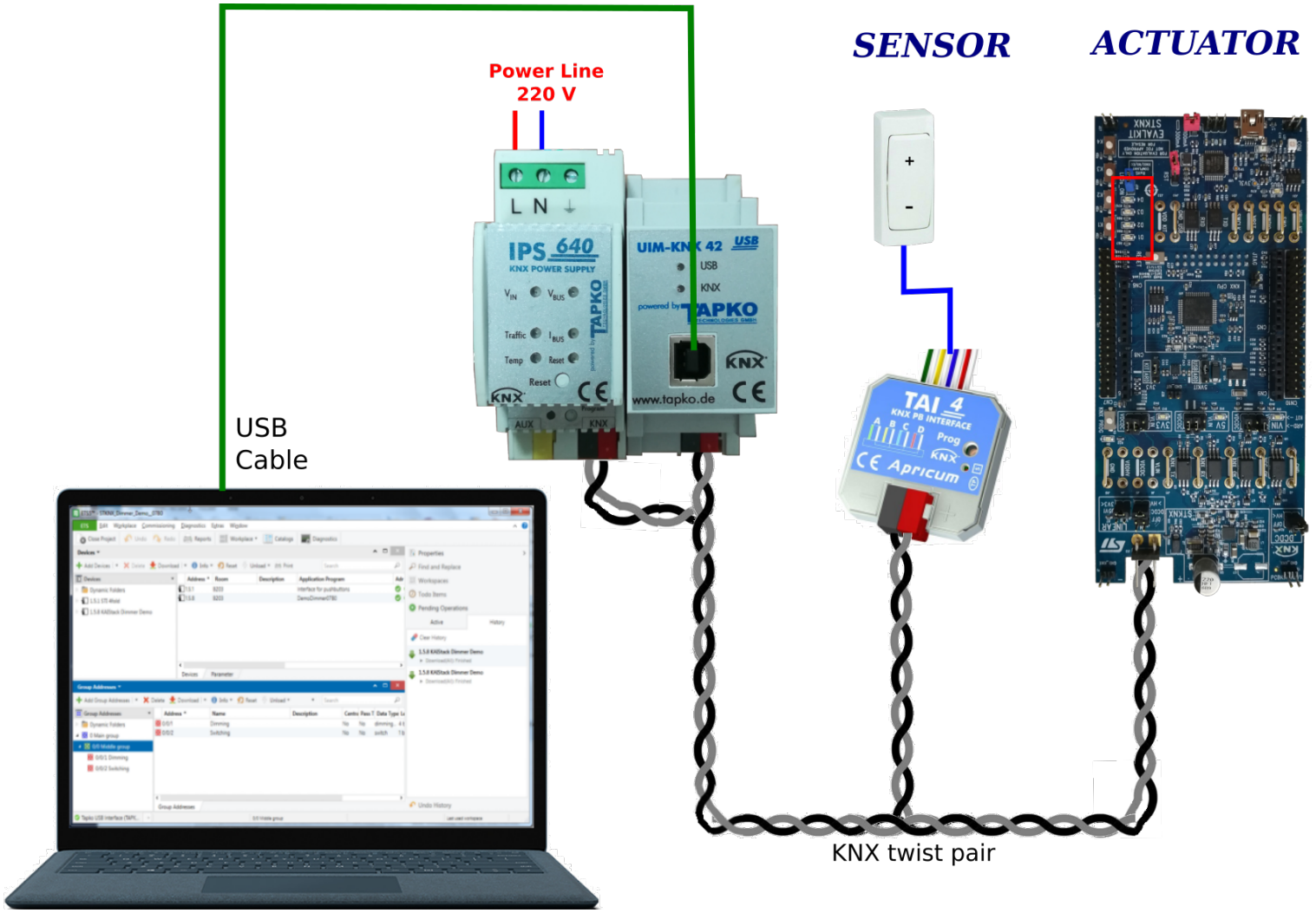
Setup & demo examples

Setup a simple KNX network

1 Setup the KNX network according as described by the picture

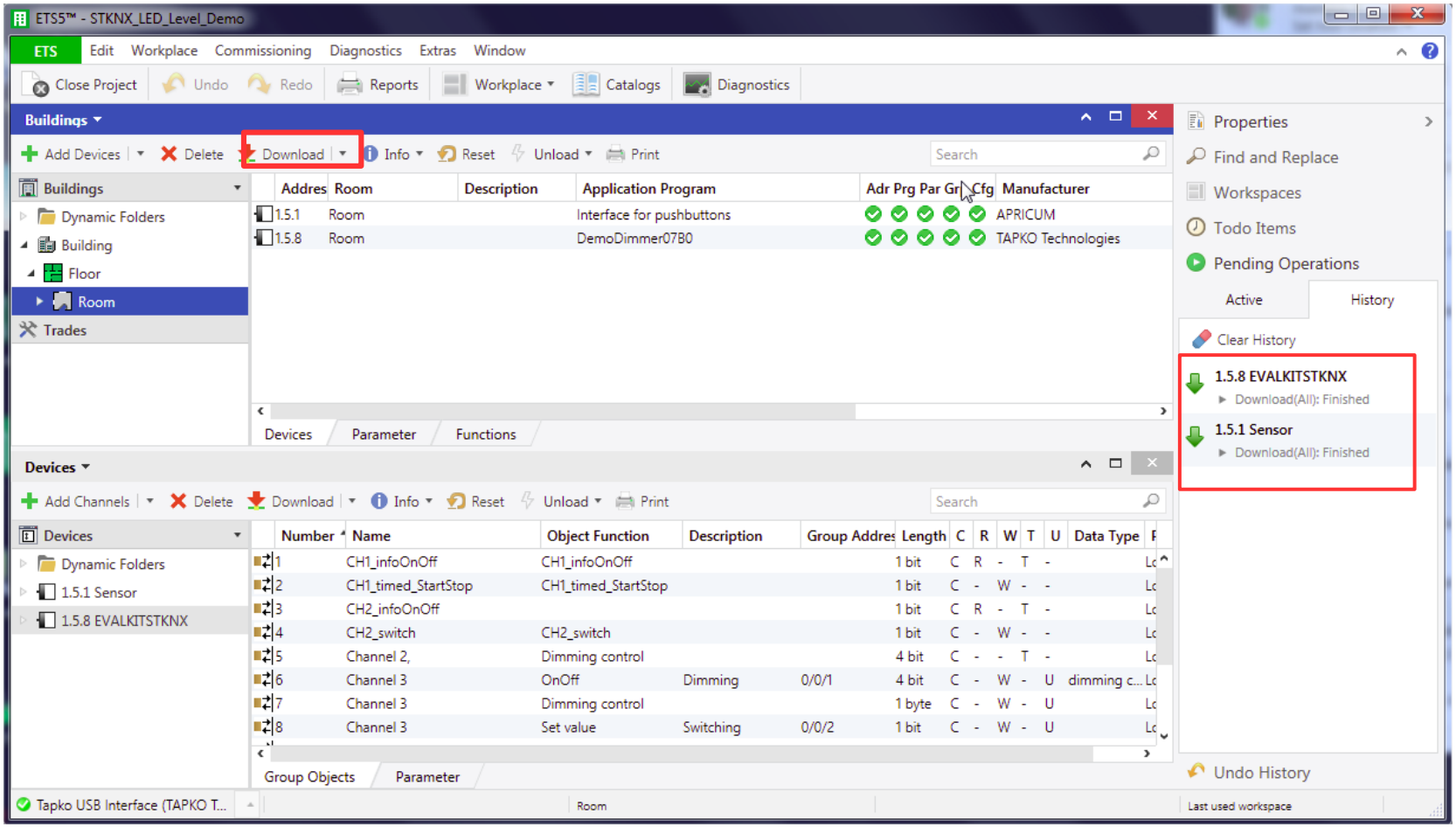


Setup & demo examples

Setup a simple KNX network

2 In the ETS5 application, import the project STKNX_LED_Level_Demo.knxproj available in STM32F103RB-STKNX/Project/STM32F10x_STKNX_LedLevel/ETS5_ProjectFile

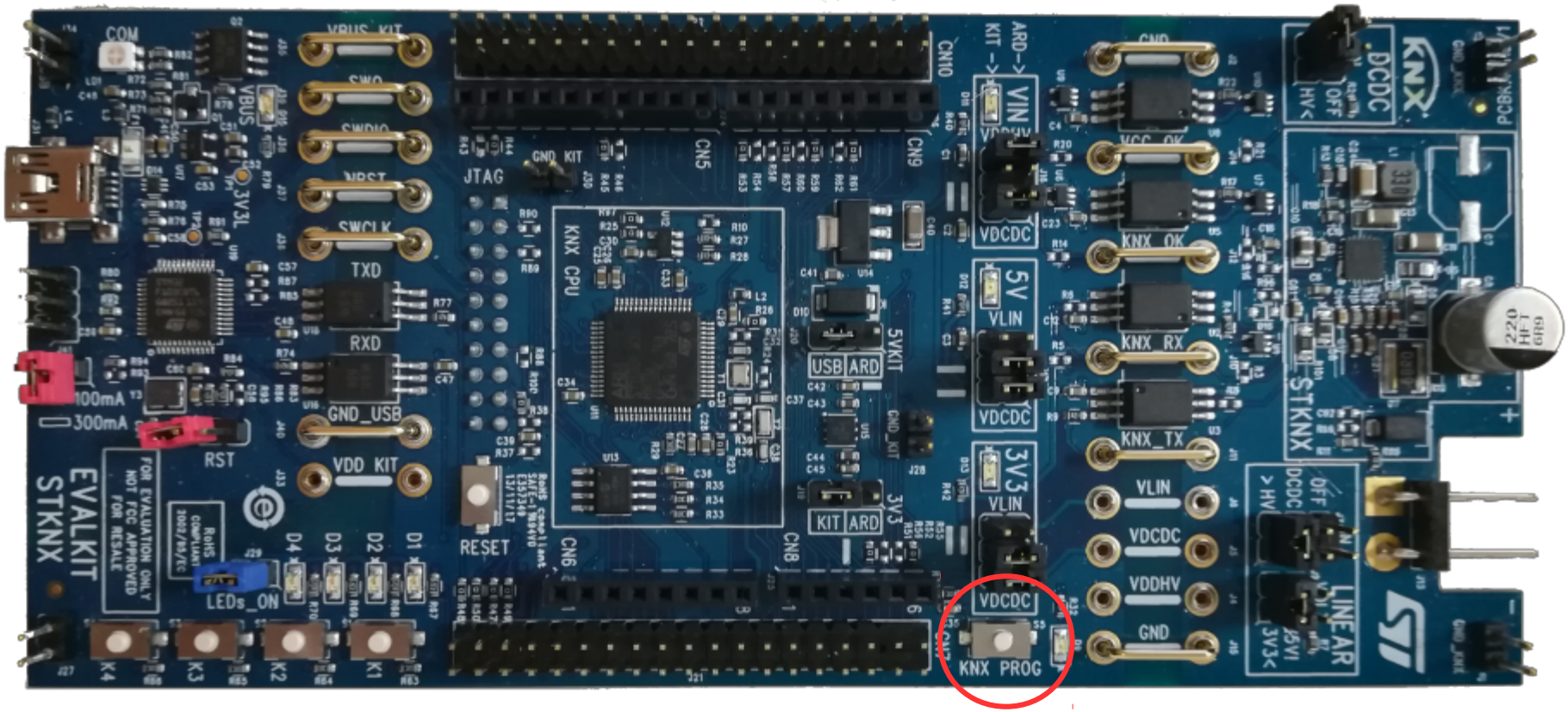
3 Download the full configuration in both STI and EVALKITSTKNX devices



Setup & demo examples

Setup a simple KNX network

4 When asked in the ETS5 application, press the “KNX PROG” button of the EVALKITSTKNX board.

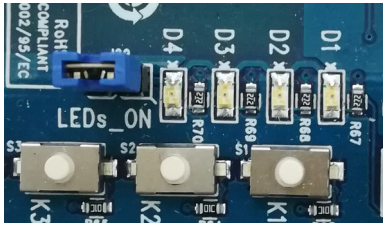


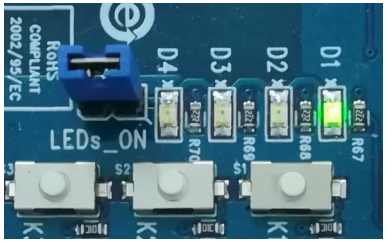
Setup & demo examples

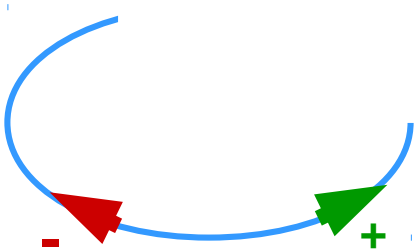
Setup a simple KNX network

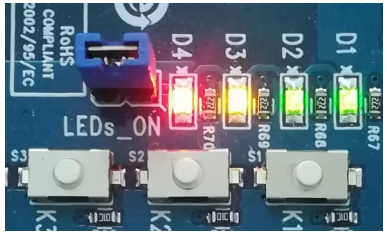
5 Tests :

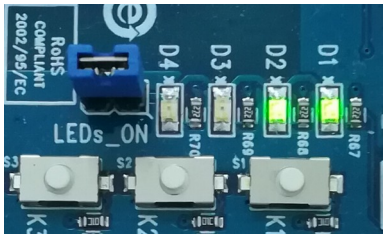
- ON button of the sensor is used to increase the number of led switched on
- OFF button of the sensor is used to decrease the number of led switched on

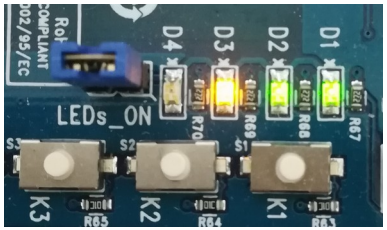












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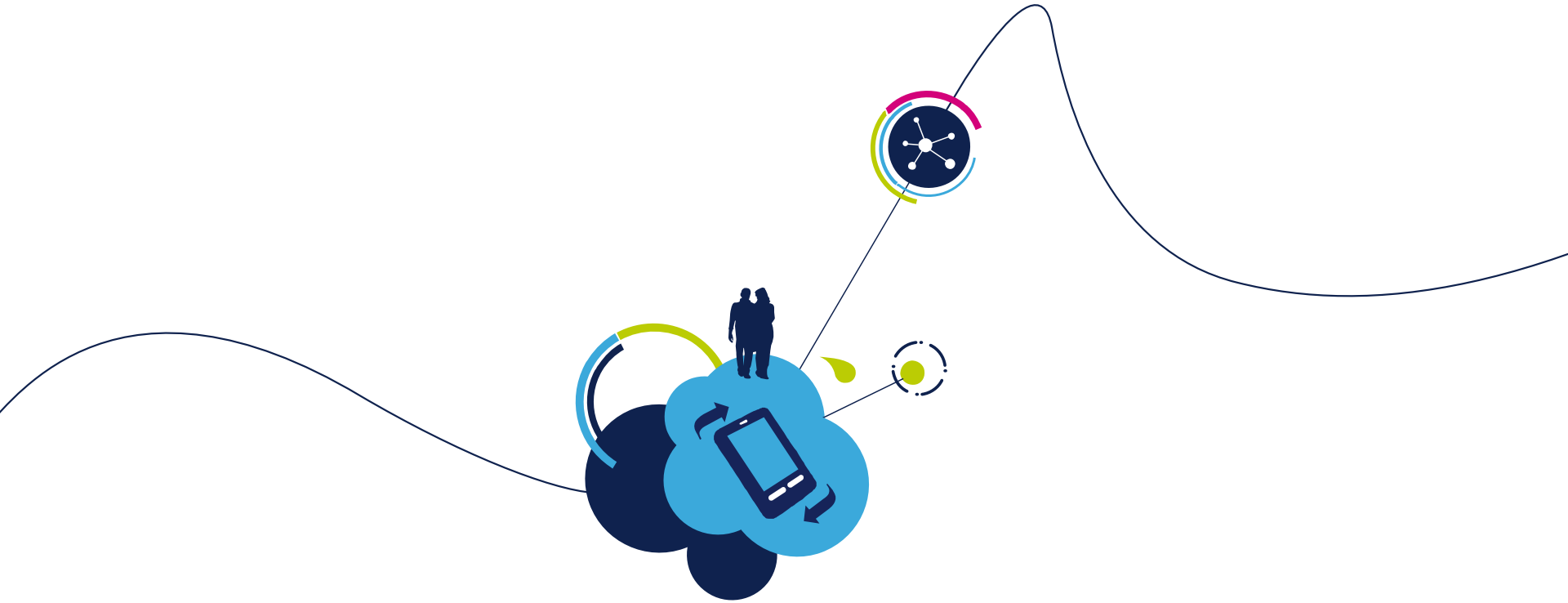

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