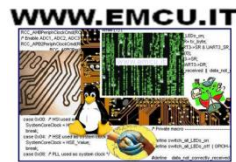


STEVAL-IDZ301V1

Oct. 2012



STEVAL-IDZ301V1

The **STEVAL-IDZ301V1** is a demonstration board of the **SPZB32W1** series of IEEE 802.15.4 ZigBee®RF modules based on the **STM32W108CU6** microcontroller that integrates a **32-bit ARM®Cortex™ - M3** microprocessor and a **2.4 GHz, IEEE 802.15.4 radio**.

The STEVAL-IDZ30xV1 kit allows testing the performance of the RF, the features of the protocol libraries defined for the microcontroller, and prototyping the target application. The kit includes a development board and a software library that can be integrated in the structure of the packages available from the ST website for ZigBee PRO, Zigbee RF4CE and simplified MAC of the STM32W108 microcontroller family.



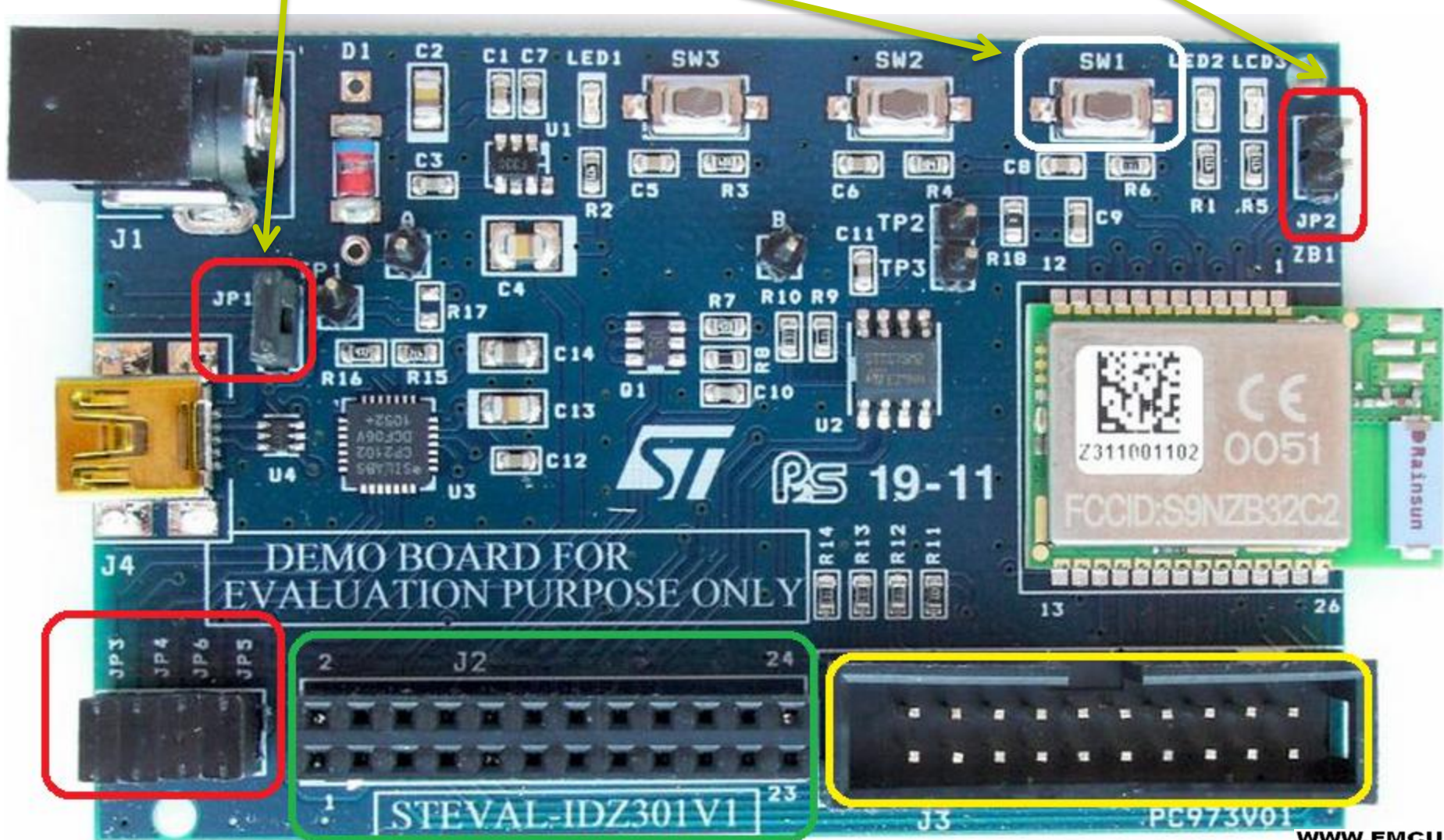
STEVAL-IDZ301V1 Key Features

- **Integrated RF module** belonging to the SPZB32W1 series of IEEE 802.15.4 ZigBee® modules
- 20-pin **JTAG** connector for programming and debugging purposes
- Hardware support for application development:
 - **Temperature sensor**
 - **Circuitry for measuring the battery voltage**
 - **Two configurable push buttons**
 - **Two configurable LEDs**
 - **Mini-USB connector and USB-RS-232 bridge**
 - Jumper (JP1) allows DC power source selection between the external power supply or external USB supply
 - LED power indicator
 - **Jumper for boot activation**
 - **Jumpers for serial communication setup (RS232 or mini-USB)**
 - **24-pin, double-row header for access to the remaining STM32W GPIO signals and interfaces**

JP1 Configurable power jumper.
Present == power is from USB port.

JP2 Configurable boot jumper.
Present == loading the bin files on the STEVAL
via the USB connector.

SW1 == RESET



STEVAL-IDZ301V1 & 802.15.4 Simple MAC Library



Customer application

Network layer
(optional)

802.15.4
MAC interface

Standard library

- The ST **IEEE 802.15.4** Simple MAC Library provides a set of APIs allowing access to the **PHY** and **lower-MAC** functionality of the STM32W SoC:
 - RX/TX functionalities
 - Radio channel selection
 - **Transmit power level** control
 - Boost mode control
 - Radio **sleep** and **wakeup** control
 - LQI and RSSI for received packets
 - Implements Unslotted CSMA transmit support including CCA
 - Ability to enable/disable receiver
 - Automatic acknowledgement management



Customer code

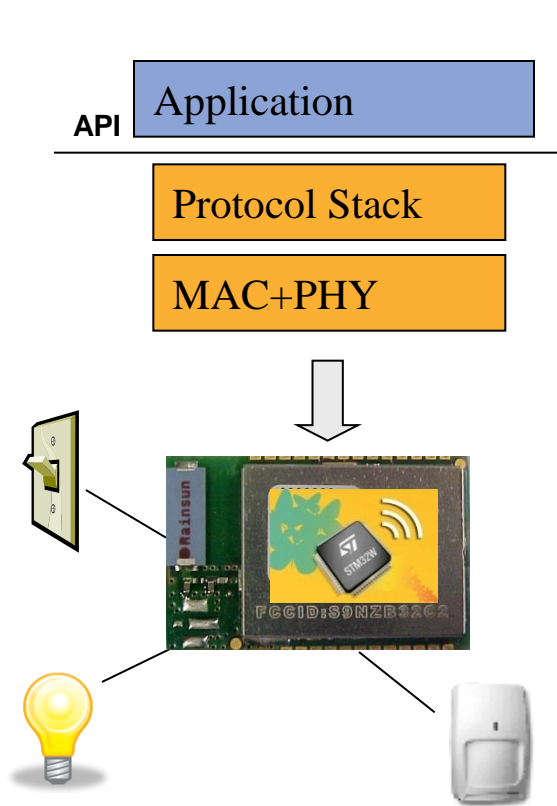


Productized Libraries

STEVAL-IDZ301V1 & 802.15.4

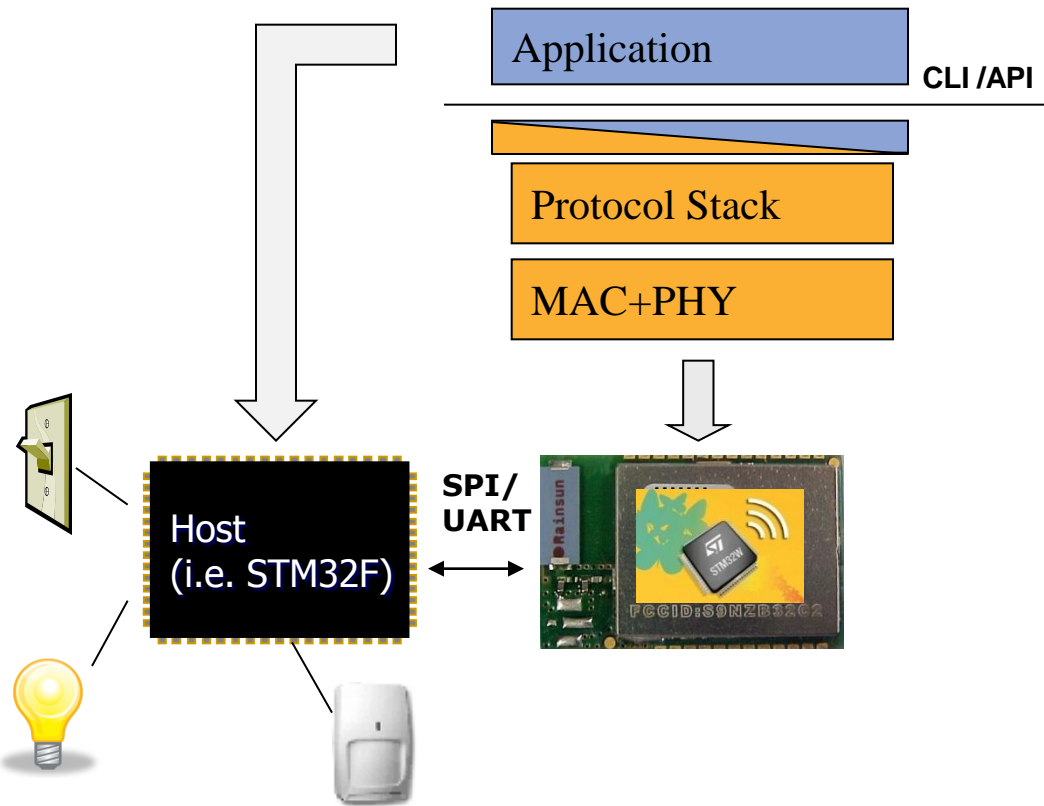
SOC Use Mode:

SPZB32W1xx.4 runs both the protocol and the application both stored in the integrated Flash



Network Coprocessor Use Mode:

SPZB32W1xx.4 runs the protocol while an host processor runs and store the application

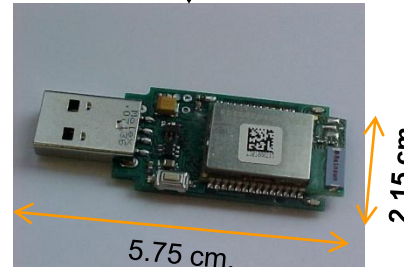
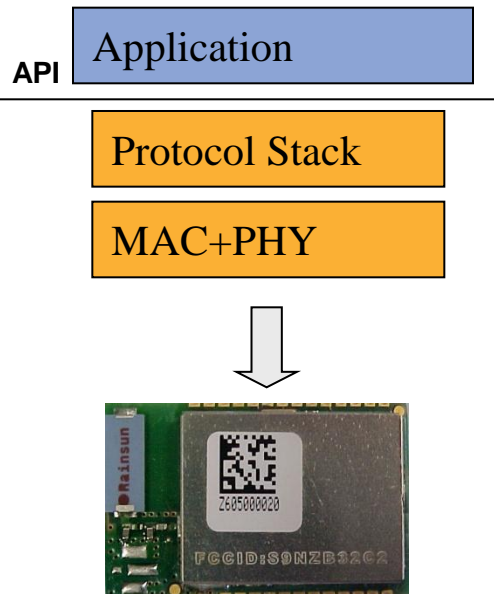


Extra info are [here](#)

STEVAL-IDZ301V1 & 802.15.4 ref.design

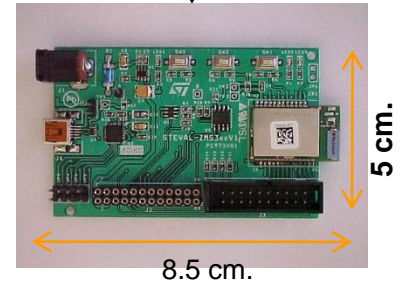
SOC Use Mode:

SPZB32W1xx.4 stores and runs both the protocol and the application



STEVAL-IDZ401V1

- Optimized USB Dongle Design
- Powered and programmable via USB
- STM32F USB Bridge
- Integrated JTAG



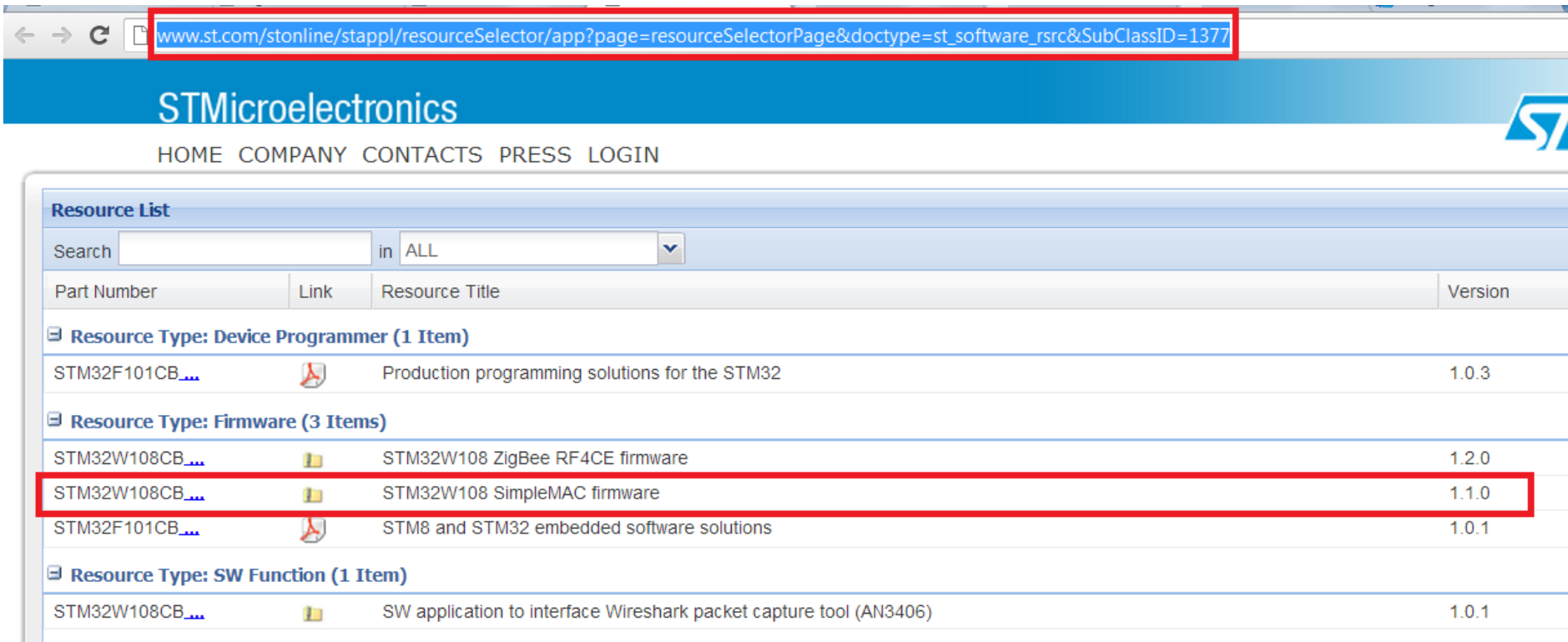
STEVAL-IDZ30xV1

- Flexible and expandable development board
- Multiple Power Supply Options
- SiLab USB Bridge
- Integrated temperature sensor, configurable buttons, configurable leds and voltage battery measurement circuitry





STEVAL-IDZ301V1 & TALK-802.15.4

Aim of this example is to explain how to use the STM example concerning the:
Simple MAC (v.1.1.0) TALK (point to point connection) using two eva-boards.

The SW (STM Simple MAC) that we used is [here](#) (see below):



The screenshot shows the STMMicroelectronics website with the URL www.st.com/stonline/stappl/resourceSelector/app?page=resourceSelectorPage&doctype=st_software_rsrc&SubClassID=1377 highlighted in the address bar. The page features a navigation bar with links: HOME, COMPANY, CONTACTS, PRESS, LOGIN. Below the navigation bar, the 'Resource List' section is displayed. It includes a search bar and a dropdown menu set to 'ALL'. The resources are categorized into three groups: 'Resource Type: Device Programmer (1 Item)', 'Resource Type: Firmware (3 Items)', and 'Resource Type: SW Function (1 Item)'. The 'Firmware' category is expanded, showing three items. The item 'STM32W108 SimpleMAC firmware' is highlighted with a red box, indicating it is the correct resource for the example.

Part Number	Link	Resource Title	Version
Resource Type: Device Programmer (1 Item)			
STM32F101CB...		Production programming solutions for the STM32	1.0.3
Resource Type: Firmware (3 Items)			
STM32W108CB...		STM32W108 ZigBee RF4CE firmware	1.2.0
STM32W108CB...		STM32W108 SimpleMAC firmware	1.1.0
STM32F101CB...		STM8 and STM32 embedded software solutions	1.0.1
Resource Type: SW Function (1 Item)			
STM32W108CB...		SW application to interface Wireshark packet capture tool (AN3406)	1.0.1

STEVAL-IDZ301V1 & TALK-802.15.4

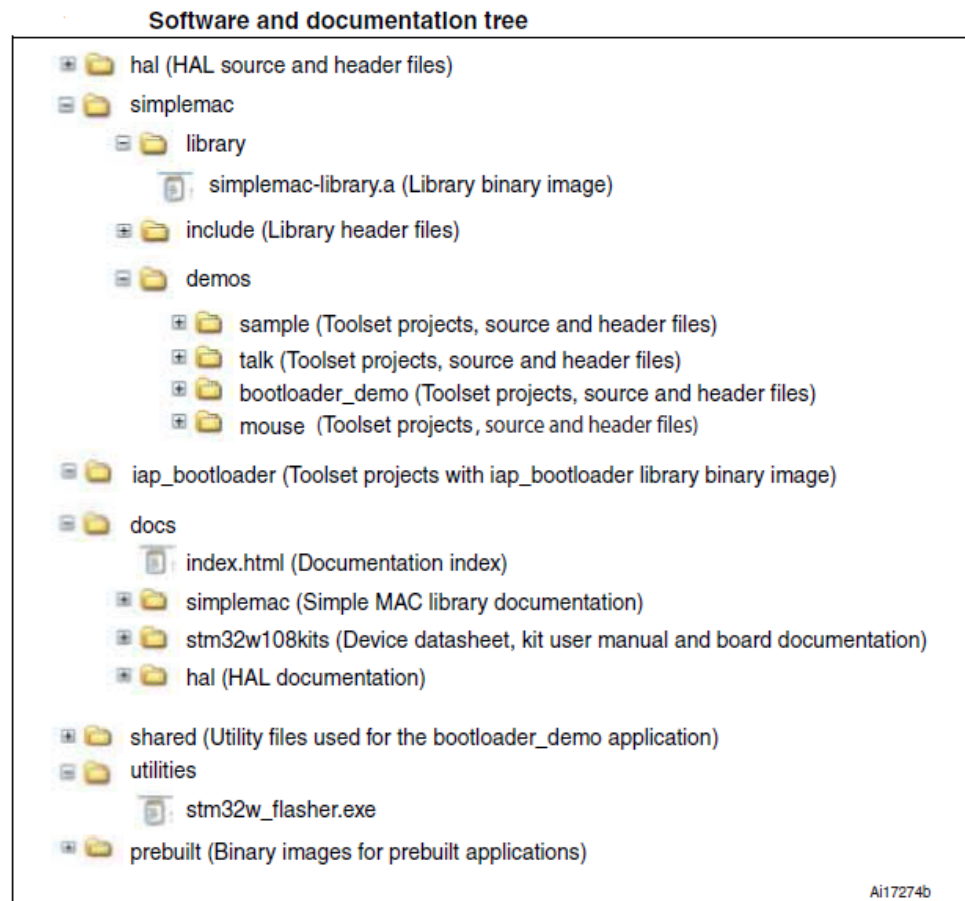
Download and install the: **STM32W108 SimpleMAC firmware.**

After the installation you find the Examples, Documentation, etc in:

C:\Program Files\STMicroelectronics\ST SimpleMAC-1.1.0\STM32W108

or in:

C:\Program Files (x86)\STMicroelectronics\ST SimpleMAC-1.1.0\STM32W108



STEVAL-IDZ301V1 & TALK-802.15.4

ATTENTION:

We assume that you have already installed on your PC the [IAR v.6.40.4.4221](#) (32KFree).

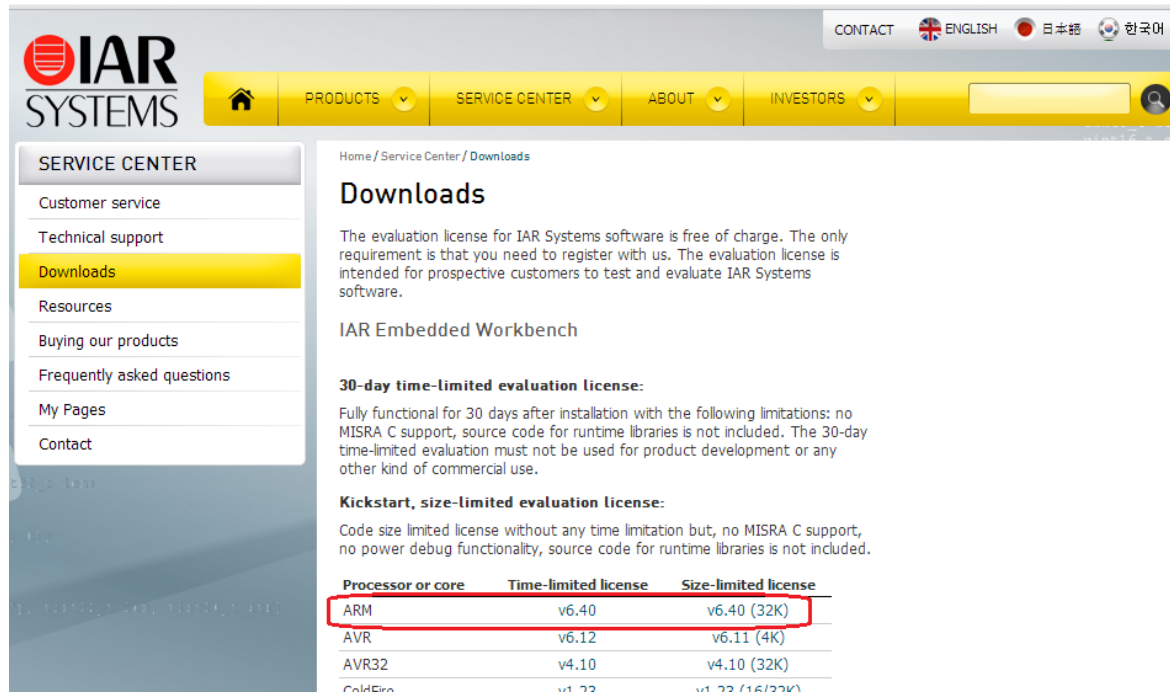
The STM firmware is guaranteed for using in conjunction with:

IAR v.5.41

ATOLLIC TrueStudio Lite 2.1.0

ATOLLIC TrueStudio Professional 2.1.1

I tested the SimpleMAC TALK under IAR v.6.40.4.4221 and it works but is not guaranteed from STM.



IAR SYSTEMS

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- Technical support
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- My Pages
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Downloads

The evaluation license for IAR Systems software is free of charge. The only requirement is that you need to register with us. The evaluation license is intended for prospective customers to test and evaluate IAR Systems software.

IAR Embedded Workbench

30-day time-limited evaluation license:

Fully functional for 30 days after installation with the following limitations: no MISRA C support, source code for runtime libraries is not included. The 30-day time-limited evaluation must not be used for product development or any other kind of commercial use.

Kickstart, size-limited evaluation license:

Code size limited license without any time limitation but, no MISRA C support, no power debug functionality, source code for runtime libraries is not included.

Processor or core	Time-limited license	Size-limited license
ARM	v6.40	v6.40 (32K)
AVR	v6.12	v6.11 (4K)
AVR32	v4.10	v4.10 (32K)
ColdFire	v1.22	v1.22 (16/32K)

STEVAL-IDZ301V1 & TALK-802.15.4

Copy all the contents of:

C:\Program Files (x86)\STMicroelectronics\ST SimpleMAC-1.1.0

Into your working directory, we suppose that is:

C:\SILICA-STday\SILICA-STday2012\HOn2

Because up to now the SW example (**ST SimpleMAC-1.1.0**) do not support the **STEVAL-IDZ301V1** is necessary do some changes in two files that are:

C:\SILICA-STday\SILICA-STday2012\HOn2\STM32W108\hal\micro\cortexm3\board.c

and

C:\SILICA-STday\SILICA-STday2012\HOn2\STM32W108\hal\micro\cortexm3\stm32w108\board.h

Click [here](#) for download the **board.c** and replace with it the original file.

Click [here](#) for download the **board.h** and replace with it the original file.

After this change you are ready to use the [STEVAL-IDZ301V1](#) .

STEVAL-IDZ301V1 & TALK-802.15.4

The TALK example configure two STEVAL-IDZ301V1 boards for:
point to point connection.

Connect the STEVAL-IDZ301V1 to your PC and make sure that the jumper (JP1) is present, see below.



STEVAL-IDZ301V1 & TALK-802.15.4

The first time you connect the STEVAL-IDZ301V1 to PC probably (depend of the board revision code) it request the driver (SILICON LABS CP2102 - [VCP Driver Kit](#)) that you get [here](#).

 CP210x_VCP_Win_XP_S2K3_Vista_7.exe

The USB/RS232 driver is available for:

Windows XP/Server 2003/Vista/7

WinCE

Macintosh OSX

Linux

STEVAL-IDZ301V1 & TALK-802.15.4

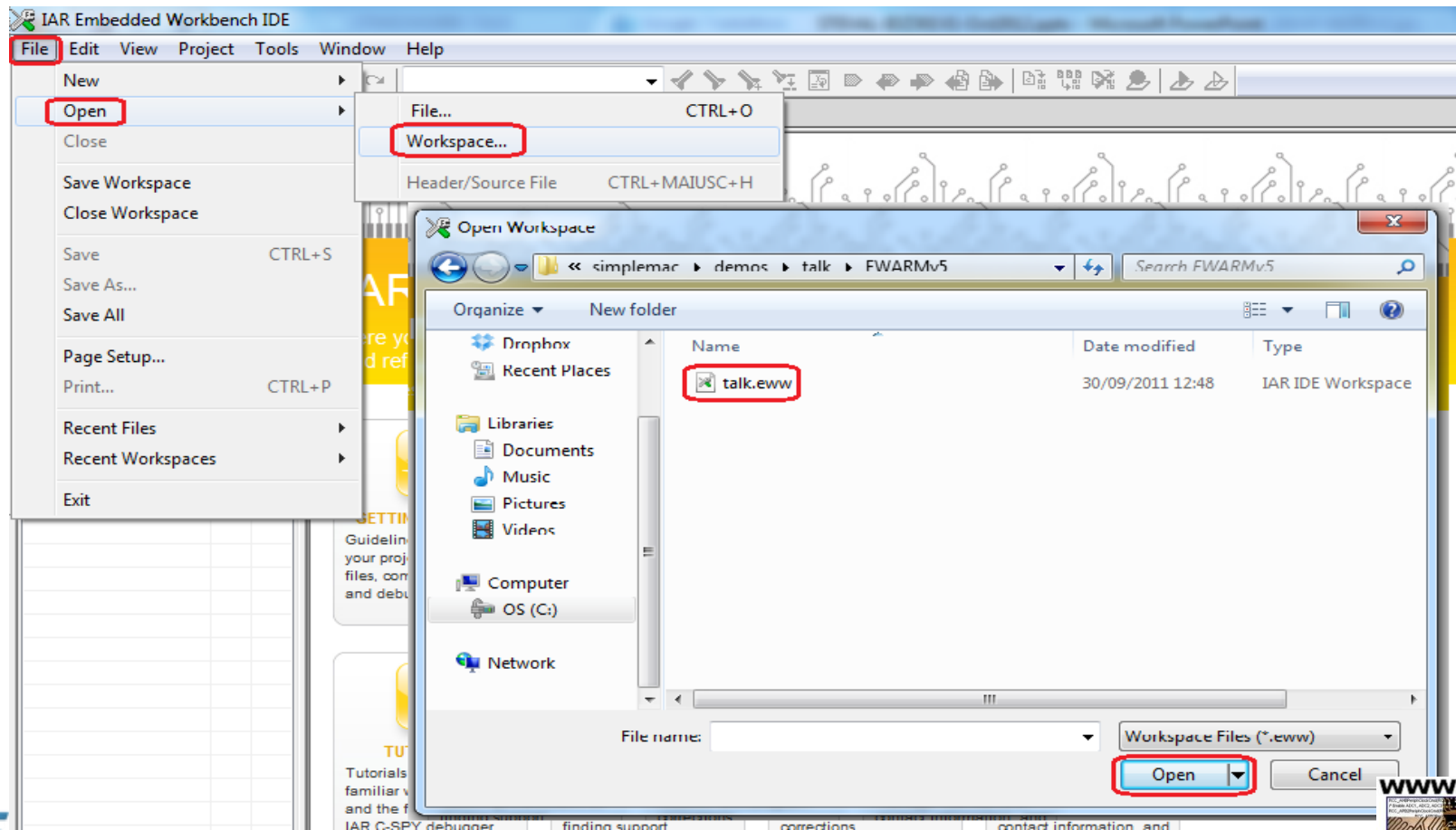
Now we are ready to open the **TALK example** that is here:

C:\SILICA-STday\SILICA-STday2012\HOn2\STM32W108\simplemac\demos\talk\EWARMv5\talk.eww

For do this run **IAR**, next choose:

File -> Open -> Workspace

From the windows that appears select: **talk.eww** and press **OPEN**. See below.



Before compile the example is necessary to configure the IAR IDE, for do this follow the step below.

talk - IAR Embedded Workbench IDE

File Edit View Project Tools Window Help

1 workspace

2 STM32W108x8

3 talk - S

4 Options... ALT+F7

5

6

7

8

9

10

11

Options for node "talk"

Category: 5

General Options

C/C++ Compiler

Assembler

Output Converter

Custom Build

Build Actions

Linker

Debugger

Simulator

Angel

GDB Server

IAR ROM-monitor

J-Link/J-Trace

TI Stellaris

Macraigor

PE micro

RDI

JTAGjet

ST-LINK

Third-Party Driver

TI XDS100

Target

Output

Library Configuration

Library Options

MISRA-C:200

Processor variant

Core

Cortex-M3

Device

ST STM32W108CB

Endian mode

Little

Big

BE32

BE8

FPU

None

OK

Cancel

Options for node "talk"

Category:

General Options

C/C++ Compiler

Assembler

Output Converter

Custom Build

Build Actions

Linker

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Simulator

Angel

GDB Server

IAR ROM-monitor

J-Link/J-Trace

TI Stellaris

Macraigor

PE micro

RDI

JTAGjet

ST-LINK

Third-Party Driver

TI XDS100

Factory Settings

Setup

Download

Images

Extra Options

Plugins

Driver

ST-LINK

Run to

main

Setup macros

Use macro file(s)

Device description file

Override default

\$PROJ_DIR\$\\..\\..\\..\\hal\\micro\\cortexm3\\stm32w108\\regs.d

OK

Cancel

Options for node "talk"

Category:

General Options

C/C++ Compiler

Assembler

Output Converter

Custom Build

Build Actions

Linker

Debugger

Simulator

Angel

GDB Server

IAR ROM-monitor

J-Link/J-Trace

TI Stellaris

Macraigor

PE micro

RDI

JTAGjet

ST-LINK

Third-Party Driver

TI XDS100

Factory Settings

ST-LINK

Reset

Normal

Interface

JTAG

SWD

Clock setup

CPU clock:

72.0

MHz

SWD clock:

Auto

2000

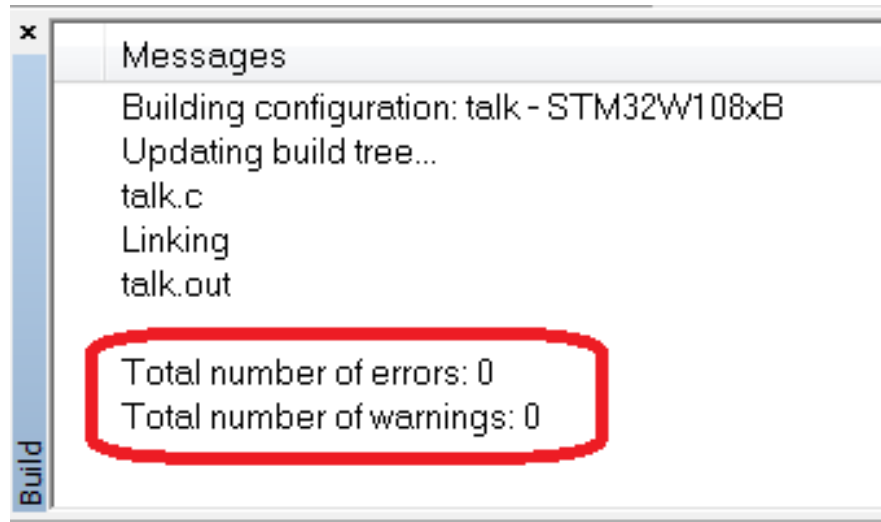
kHz

OK

Cancel

STEVAL-IDZ301V1 & TALK-802.15.4

Now compile the project: **Project -> Make**.
You must see something like below.



Connect the **ST-LINK-v2** to the **STEVAL-IDZ301V1** and select:

1. **Download and Debug**
2. **Now exit from Debug**

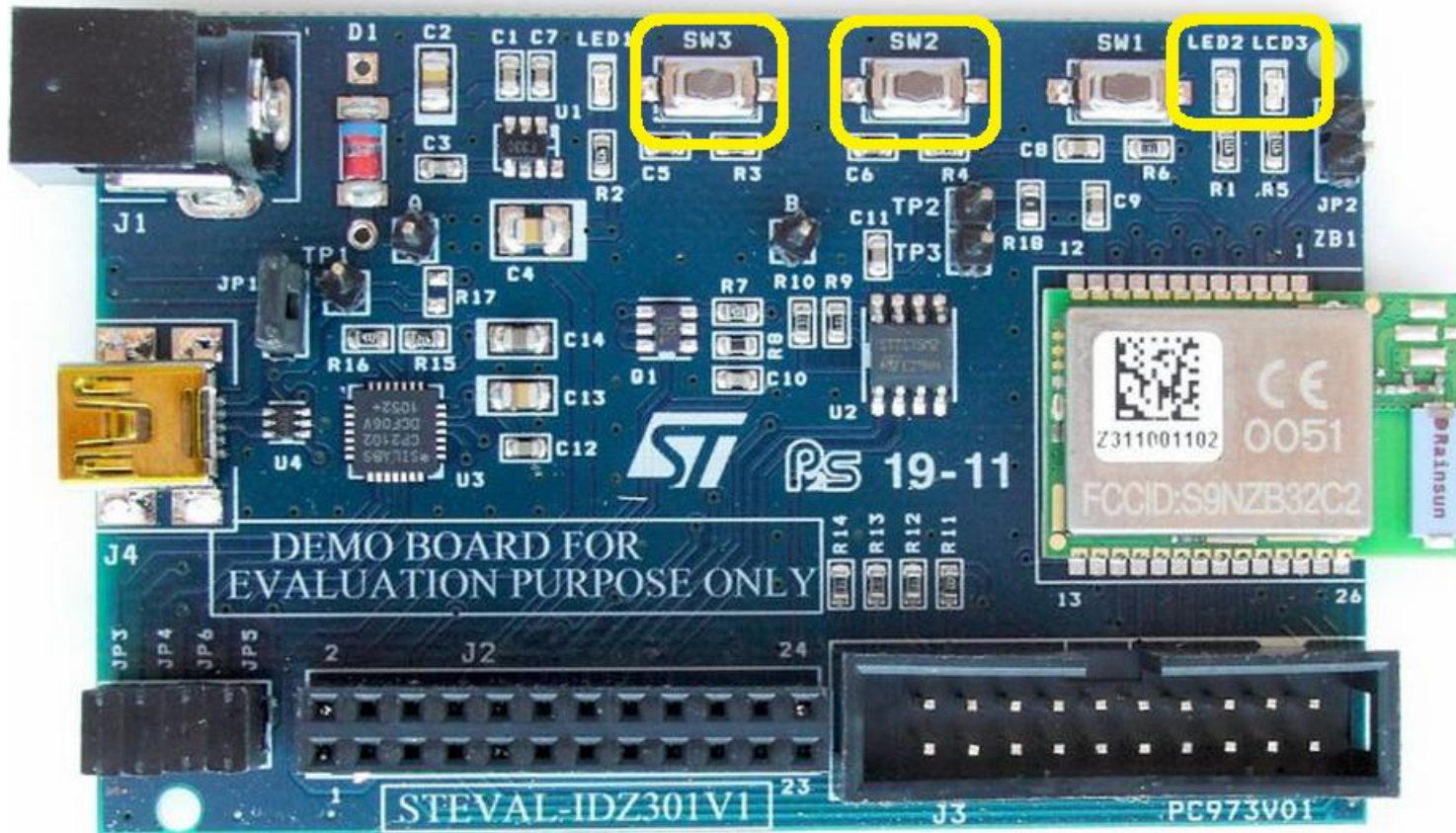
Do this steps (1 and 2) on two **STEVAL-IDZ301V1** board.

Now connect two **STEVAL-IDZ301V1** to PC and you must see the **YELLOW** and **RED** LEDs **ON**.

STEVAL-IDZ301V1 & TALK-802.15.4

Now you are ready for test the SW.

- Press on both **STEVAL-IDZ301V1** the **reset** button.
- If you press the button S2 on a board on the other board you see the LED2 go ON/OFF
- If you press the button S3 the LED3 go ON/OFF.



STEVAL-IDZ301V1 documentation

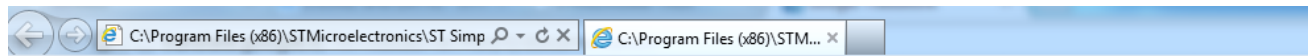
The documentation is in your PC:

C:\Program Files (x86)\STMicroelectronics\ST SimpleMAC-1.1.0\STM32W108\docs

Inside the docs folder there is:

Index.html

Double click on it and you must see the Index Doc Page, see below.



SimpleMAC Kits for STM32W108xBU6x documentation version 1.1.0.0

[Please check on STM32W108 Internet web site for latest documents updates](#)

Release Notes

- [STM32W108 SimpleMAC Library Release Notes](#)

Library APIs

- [STM32W108 SimpleMAC Library APIs Documentation](#)

Library User Manual

- [STM32W108 SimpleMAC Library User Manual](#)

Demo Applications

- [STM32W108 SimpleMAC Library Demo Applications](#)

Hardware Abstraction Layer (HAL) APIs

- [HAL APIs Reference for the STM32W108](#)

Utilities

- [STM32W108 Simple MAC nodetest](#)

STEVAL-IDZ301V1 documentation

The doc concerning this example (**TALK**) is in: **DEMO APPLICATIONS**, see below



SimpleMAC Kits for STM32W108xBU6x documentation version 1.1.0.0

[Please check on STM32W108 Internet web site for latest documents updates](#)

Release Notes

- [STM32W108 SimpleMAC Library Release Notes](#)

Library APIs

- [STM32W108 SimpleMAC Library APIs Documentation](#)

Library User Manual

- [STM32W108 SimpleMAC Library User Manual](#)

Demo Applications

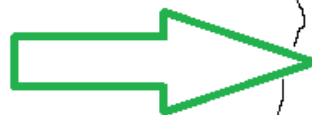
- [STM32W108 SimpleMAC Library Demo Applications](#)

Hardware Abstraction Layer (HAL) APIs

- [HAL APIs Reference for the STM32W108](#)

Utilities

- [STM32W108 Simple MAC nodetest](#)



A screenshot of the STM32W108 SimpleMAC Library documentation website. The page features the STMicroelectronics logo at the top left. A navigation menu on the right lists "Main Page", "Modules", "Classes", and "Files". Below the menu, there are sections for "Bootloader demo", "MEMS mouse demo", and "Point-to-point demo". Each demo section includes a "See also:" link to a specific file (e.g., "bootloader_demo.c", "mouse.c", "talk.c"). The "talk.c" link is highlighted with a red box. At the bottom right, there is a logo for "WWW.EMCU.IT" and a small image of a penguin.

STEVAL-IDZ401V1

Oct. 2012

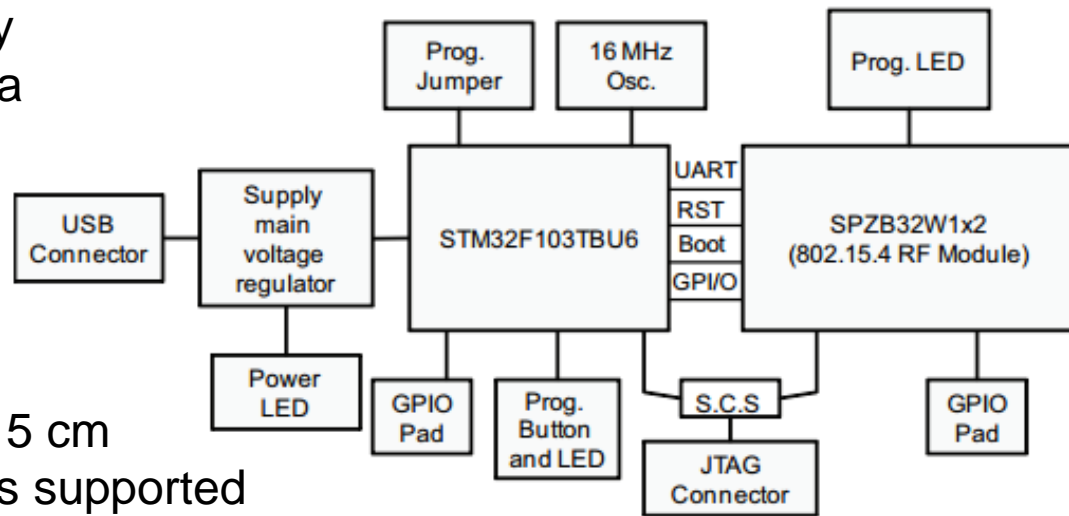


STEVAL-IDZ401V1

The **STEVAL-IDZ401V1** is an IEEE 802.15.4/ZigBee RF module with a USB interface and with a “dongle” style optimized form factor.

The board includes an STM32F103 chipset with USB bridge functional capabilities and an STM32W chipset. Configurable LEDs and a pushbutton are also available onboard.

- Based on a 2.4 GHz IEEE 802.15.4/ZigBee® SPZB32W1A2 RF module
- Integrated STM32F103TBU6 with USB bridge capabilities
- USB interface and power supply
- Supported reprogrammability via the USB interface
- JTAG connector
- Configurable pushbutton
- Configurable LEDs
- Power indicator LED
- Small dimensions 5.75 cm x 2.15 cm
- STM32W protocol stack libraries supported
- Supported application partitioning between STM32F and STM32W

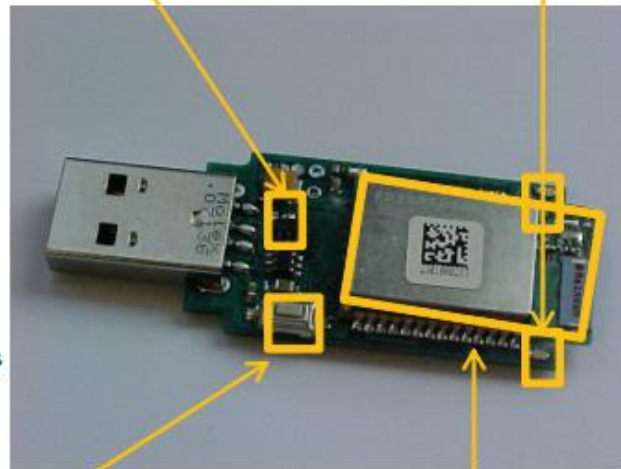


STEVAL-IDZ401V1

JMP Boot
(STM32F)

Configurable LEDs
(STM32F, STM32W)

**Front
Side**



Configurable
Button (STM32F)

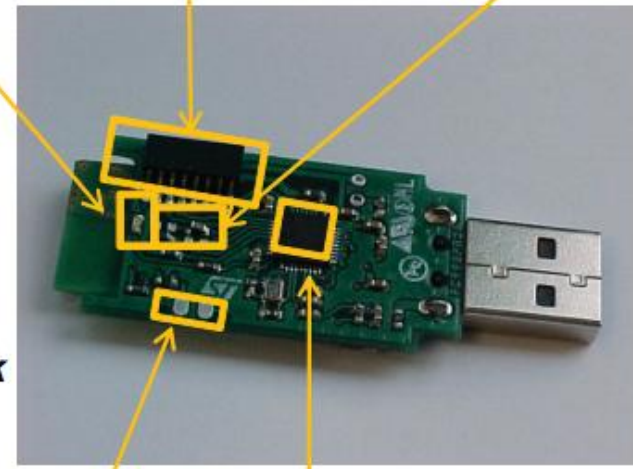
SPZB32W1A2

Power Led

8 pin
JTAG Conn.

Resistors for JTAG
Use Configuration

**Back
Side**



GPIOs PADS
(STM32F, STM32W)

STM32F103TB