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## Quick guide on SubGHz RF technology: products, evaluation kits and software packages

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Main components	
SPIRIT1	Low data rate, low power sub-1GHz transceiver
SPSGRF-868 SPSGRF-915	Sub-GHz (868 or 915 MHz) low power programmable RF transceiver modules
SP1ML	SPIRIT1 868 and 915 MHz low power RF modules with integrated microcontroller

### Purpose and benefits

The SPIRIT1 is a very low-power RF transceiver, intended for RF wireless applications in the sub-1 GHz band. It is designed to operate both in the license-free ISM and SRD frequency bands at 169, 315, 433, 868, and 915 MHz, but can also be programmed to operate at other additional frequencies in the 300-348 MHz, 387-470 MHz, and 779-956 MHz bands.

The purpose of the design tip is to provide a quick summary guide for the evaluation of ST SubGHz RF technology.

The following sections will describe the available products, based on the Spirit1 SubGHz transceiver, along with the related evaluation kits and software packages that enable customers to rapidly implement a design.

### Description

#### CHIPSET SOLUTION:

- 1) Product: SPIRIT1 - single chipset, low data rate, low power sub-1GHz transceiver:
  - a. Frequency bands: 150-174 MHz, 300-348 MHz, 387-470 MHz, 779-956 MHz
  - b. Modulation schemes: 2-FSK, GFSK, MSK, GMSK, OOK, and ASK
  - c. Air data rate from 1 to 500 kbps SPIRIT1 low data rate, low power sub-GHz transceiver
- 2) FW packages (with SMT32L151):
  - a. STSW-CONNECT009

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- 3) Evaluation kits, with SMT32L151:
    - a. STEVAL- IKR002V: mother +daughter cards (D extension means Daughter Card only)
      - i. STEVAL- IKR002V1 = 169 MHz
      - ii. STEVAL- IKR002V1D = 169 MHz
      - iii. STEVAL-IKR002V7D (daughter card with external PA range extender) - 169 MHz
      - iv. STEVAL- IKR001V2 = 315 MHz
      - v. STEVAL- IKR002V2D = 315 MHz
      - vi. STEVAL- IKR002V3 = 433 MHz
      - vii. STEVAL- IKR002V3D = 433 MHz
      - viii. STEVAL- IKR002V4 = 868 MHz
      - ix. STEVAL- IKR002V4D = 868 MHz
      - x. STEVAL- IKR002V4B = 868 MHz (integrated Balun)
      - xi. STEVAL-IKR001V8D (daughter card with external PA range extender) - 868 MHz
      - xii. STEVAL- IKR002V5 = 915 MHz
      - xiii. STEVAL- IKR002V5D = 915 MHz
    - b. STEVAL- IDS001V: USB dongle
      - i. STEVAL- IDS001V2 = 315 MHz
      - ii. STEVAL- IDS001V3 = 433 MHz
      - iii. STEVAL- IDS001V4 = 868 MHz
      - iv. STEVAL- IDS001V5 = 915 MHz

#### **MODULE SOLUTION – WITHOUT INTERNAL MICROCONTROLLER**

- 1) Product: SPSGRF-868 and SPSGRF-915 modules
  - a. SPSGRF-868 and SPSGRF-915 are easy-to-use, low power sub-GHz modules based on the SPIRIT1 RF transceiver
- 2) FW package: X-CUBE-SUBG1 Sub-1 GHz RF communication software expansion for STM32Cube
- 3) Evaluation kits:
  - a. NUCLEO expansion boards
    - i. X-NUCLEO-IDS01A4 based on the SPSGRF-868 module
    - ii. X-NUCLEO-IDS01A5 based on the SPSGRF-915 module

#### **MODULE SOLUTION – WITH INTERNAL MICROCONTROLLER**

- 1) SP1ML: SUB 1GHz module
  - a. The SP1ML-868 and SP1ML-915 are ultra-low power & fully integrated RF modules operating respectively in the 868 MHz SRD and 915 MHz ISM bands. These modules are based on the SPIRIT1 RF sub-GHz transceiver (with integrated SMPS), STM32L1 microcontroller, integrated filter/balun and chip antenna.
- 2) FW package:
  - a. STSW-SP1ML915AT STEVAL-SP1ML915 firmware

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- b. STSW-SP1ML868AT STEVAL-SP1ML868 firmware

**3) Evaluation kits:**

- a. STEVAL-SP1ML915 USB dongle for SPIRIT1 low power RF modules SP1ML-915
- b. STEVAL-SP1ML868 USB dongle for SPIRIT1 low power RF modules SP1ML-868

## Support material

Documentation
Datasheets: SPIRIT1 SPSGRF SP1ML
User manuals: UM1657: SPIRIT1 development kit

## Revision history

Date	Version	Changes
04-Dec-2015	1	Initial release

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