

BlueCoin starter kit



Features

- Contains FCC ID: S9NBCOIN01
- Contains module IC 8976C-BCOIN01 certified with PMN: [STEVAL-BCNKT01V1](#); HVIN: STEVAL-BCNCS01V1; HMN: STEVAL-BCNCR01V1; FVIN: bluenrg_7_2_c_Mode_2-32MHz-XO32K_4M.img
- The development kit package includes:
 - BlueCoin module (STEVAL-BCNCS01V1) with STM32F446, [LSM6DSM](#), [LSM303AGR](#), [LPS22HB](#), 4x [MP34DT06J](#), [BlueNRG-MS](#), [BALF-NRG-01D3](#), [STBC03JR](#)
 - CoinStation (STEVAL-BCNST01V1) board
 - BlueCoin Cradle (STEVAL-BCNCR01V1)
 - 130 mAh Li-Po battery
 - Plastic box for housing the BlueCoin cradle and the battery
 - SWD programming cable
- Software libraries and tools:
 - [STSW-BCNKT01](#) firmware package with raw sensor data streaming support via USB, data logging on SDCard, audio acquisition and audio streaming, time-of-flight example and BLE protocol to interface to a Smartphone App
 - [FP-AUD-SMARTMIC1](#): smart audio IN-OUT software expansion for STM32Cube
 - [FP-SNS-ALLMEMS1](#): STM32 ODE function pack for BLE and sensors
 - [FP-AUD-BVLINK1](#): BLE and microphones software expansion for STM32Cube
 - [STBLESensor](#): iOS™ and Android™ demo apps
 - [BlueST-SDK](#): iOS and Android software development kit
 - Compatible with STM32 ecosystem through STM32Cube support

Product summary

Product summary	
BlueCoin starter kit	STEVAL-BCNKT01V1
MEMS audio sensor omnidirectional stereo digital microphone	MP34DT06J
Li-Ion linear battery charger with LDO and load switches	STBC03JR
iNEMO 6DoF inertial module	LSM6DSM
e-Compass with 3D digital linear acceleration sensor, 3D digital magnetic sensor	LSM303AGR

Description

The [STEVAL-BCNKT01V1](#) integrated development and prototyping platform for augmented acoustic and motion sensing for IoT applications builds on the listening and balancing capabilities of the human ear.

With the expanded capabilities of its starter kit, BlueCoin lets you explore advanced sensor fusion and signal processing functions for robotics and automation applications with a 4 digital MEMS microphone array, a high-performance 9-axis inertial and environmental sensor unit and time-of-flight ranging sensors.

A high-performance STM32F446 180 MHz MCU enables real-time implementation of the very advanced sensor fusion algorithms like adaptive beamforming and sound source localization, with ready-to-use, royalty-free building blocks.

The BlueCoin can connect via the on-board BLE link to any IoT and smart industry wireless sensor network.

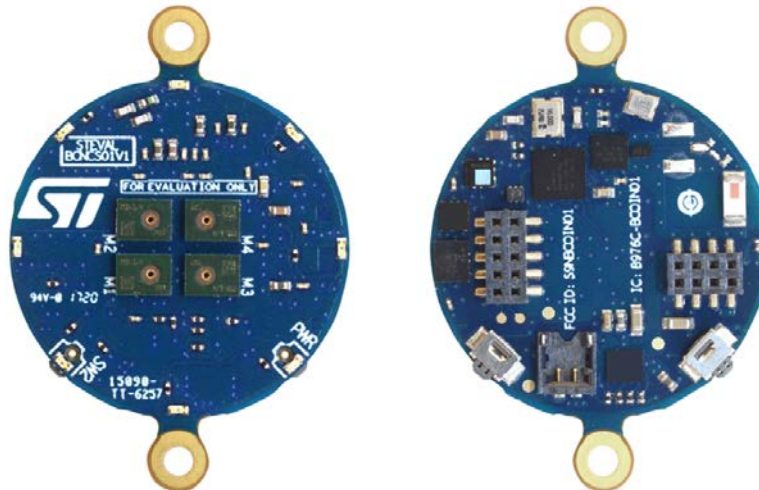
To upload new firmware onto the BlueCoin an external SWD debugger (not included in the starter-kit) is needed. It is recommended to use the ST-LINK V2.1 found on any STM32 Nucleo-64 development board.

1 Content of the starter kit

STEVAL-BCNCS01V1 - BlueCoin Core System board features

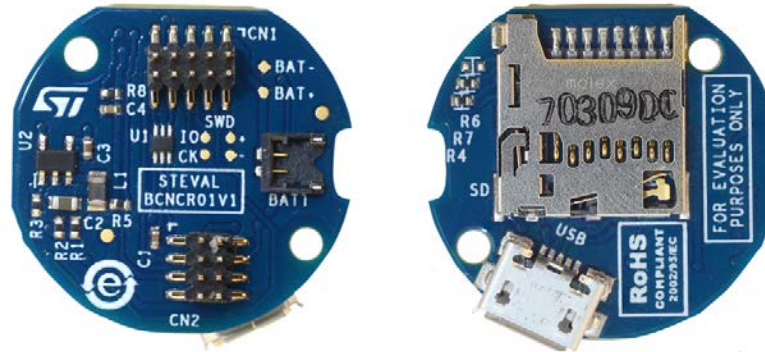
- Very compact module for motion, audio and environmental sensing and Bluetooth low energy connectivity with a complete set of firmware examples
- Main components:
 - STM32F446 – 32-bit high-performance MCU (ARM® Cortex®-M4 with FPU)
 - 4x [MP34DT06JTR](#) – 64dB SNR Digital MEMS microphone
 - [LSM6DSM](#) – iNEMO inertial module: 3D accelerometer and 3D gyroscope
 - [LSM303AGR](#) – ultra-compact high-performance eCompass module: ultra-low power 3D accelerometer and 3D magnetometer
 - [LPS22HB](#) – MEMS nano pressure sensor: 260-1260 hPa absolute digital output barometer
 - [BlueNRG-MS](#) – Bluetooth low energy network processor
 - [BALF-NRG-01D3](#) – 50 Ω balun with integrated harmonic filter
 - [STBC03JR](#) – linear battery charger with 150 mA LDO 3.0 V
- External interfaces: UART, SPI, SAI (Serial Audio Interface), I²C, USB OTG, ADC, GPIOs, SDIO, CAN, I2S
- SWD interface for debugging and programming capability
- The Bluetooth radio power output is set by default to 0 dBm; the FCC and IC certifications refer to this operating value. The power output can be changed up to 8 dBm by reprogramming the device firmware, but this change will require an update of the FCC and IC certifications, with additional radio emission tests to be performed.

Figure 1. STEVAL-BCNCS01V1 - BlueCoin Core System

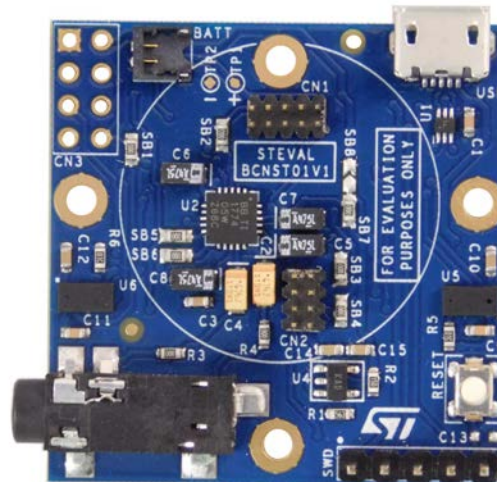


STEVAL-BCNCR01V1 - BlueCoin Cradle board features

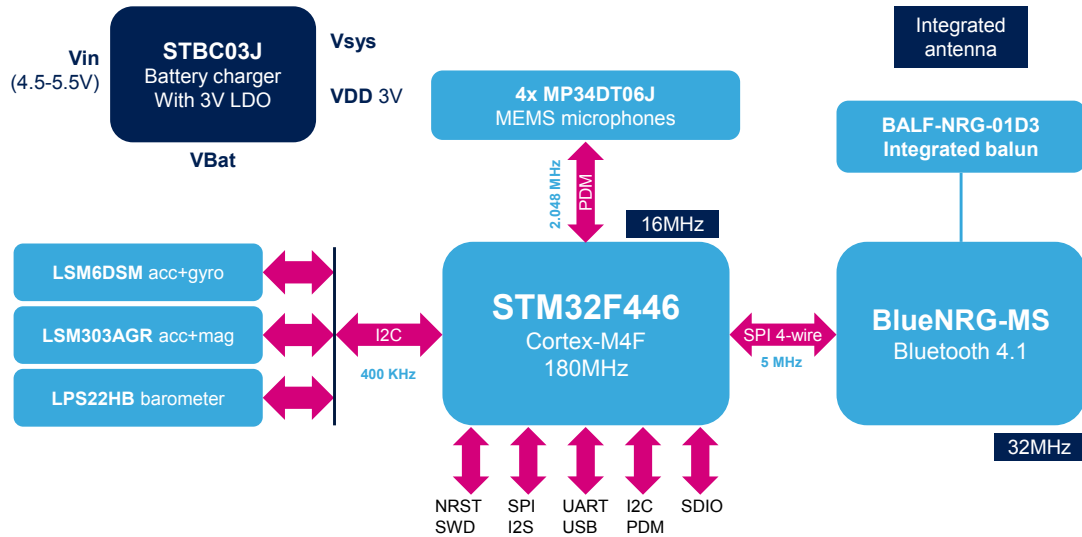
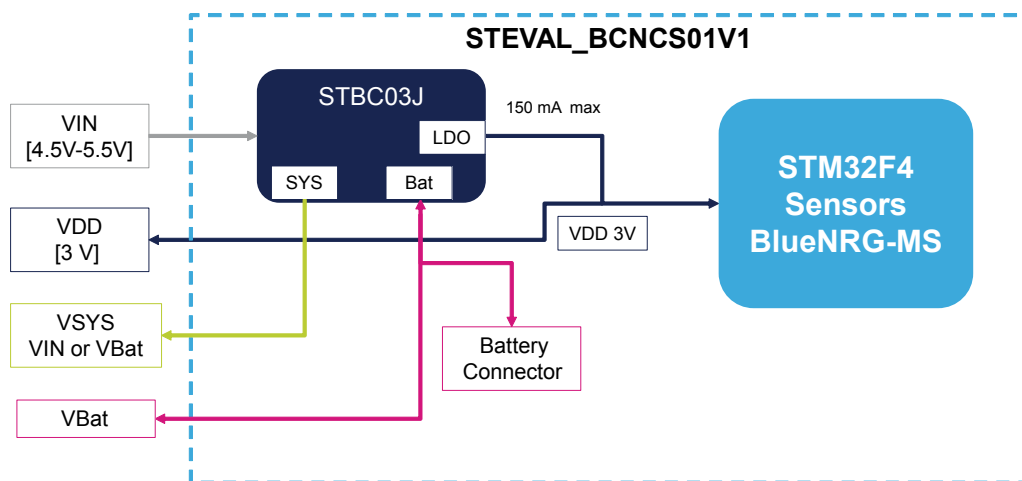
- BlueCoin Cradle board with BlueCoin connectors
- ST1S12XX – 3.3 V step down DC-DC converter
- [USBLC6-2P6](#) – very low capacitance ESD protection
- USB type A to Mini-B USB connector for power supply and communication
- microSD card socket

Figure 2. STEVAL-BCNCR01V1 - BlueCoin Cradle board

STEVAL-BCNST01V1 - CoinStation board features

- CoinStation expansion board with BlueCoin connectors
- [LDK120M-R](#) – 200 mA low quiescent current very low noise LDO
- [USBLC6-2P6](#) – very low capacitance ESD protection for USB
- 2x [VL53L0X](#) Time-of-Flight (ToF) ranging sensor
- 16-Bit, low-power stereo audio DAC and 3.5 mm jack socket
- Micro-USB connector for power supply and communication
- Reset button
- SWD connector for programming and debugging

Figure 3. STEVAL-BCNST01V1 - CoinStation board


2 Schematic diagrams

Figure 4. Functional block diagram

Figure 5. BlueCoin power supply


Revision history

Table 1. Document revision history

Date	Version	Changes
08-Jun-2017	1	Initial release.
28-Jul-2017	2	Updated cover page image, Figure 1: "STEVAL-BCNCS01V1 - BlueCoin Core System", Figure 2: "STEVAL-BCNCR01V1 - BlueCoin Cradle board" and Figure 3: "STEVAL-BCNST01V1 - CoinStation board".
04-Oct-2017	3	Updated features and description on the cover page. Removed product notice section.
11-Oct-2018	4	Added references to MP34DT06J microphone. Updated Figure 4. Functional block diagram.
06-Mar-2019	5	Updated cover page features.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2019 STMicroelectronics – All rights reserved