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 MP34DT04-C1, BlueNRG-MS, BALF-NRG-01D3, STBC03JR
  - CoinStation (STEVAL-BCNST01V1) board equipped with 2 x VL53L0X time-of-flight, LDK120M LDO, audio DAC, 3.5 mm audio jack, USB connector, battery connector and SWD programming interface
  - BlueCoin Cradle (STEVAL-BCNCR01V1) with SD memory card slot, USB port, ST1S12XX step down DC-DC converter and battery connector
  - 130 mAh Li-Po battery
  - Plastic box for housing the BlueCoin cradle and the battery
  - SWD programming cable
- Software libraries and tools:

- STSW-BCNKT01 BlueCoin 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. It includes low level drivers for all the on-board devices
- 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
- ST BlueMS: iOS™ and Android™ demo apps
- BlueST-SDK: iOS and Android software development kit
- Compatible with STM32 ecosystem through STM32Cube support

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.

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1   Content of the starter kit

Figure 1: STEVAL-BCNCS01V1 - BlueCoin Core System
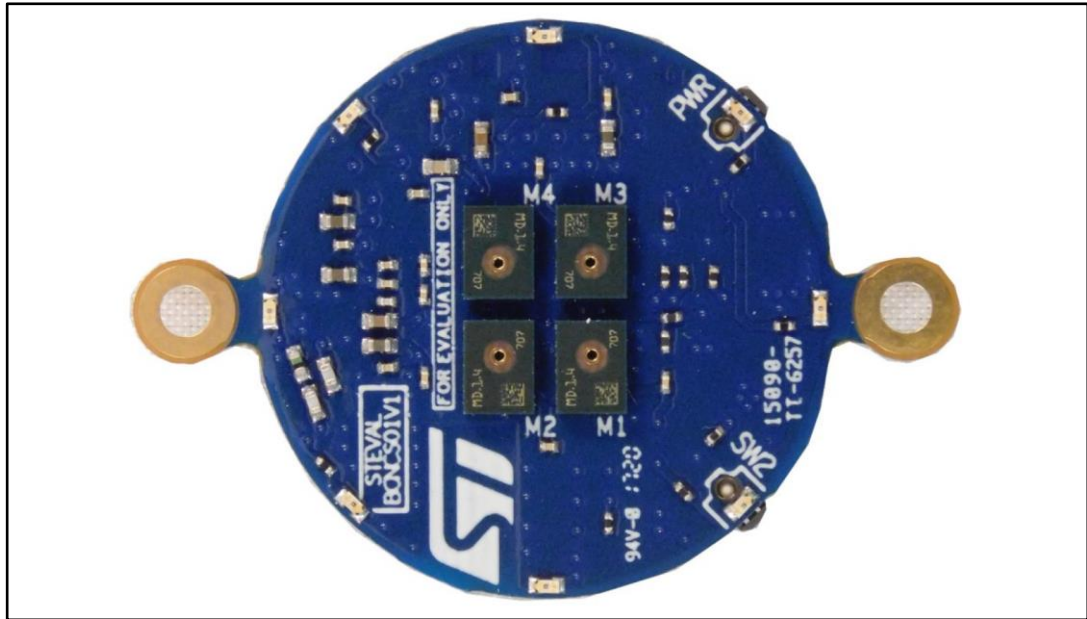
STEVAL-BCNCS01V1 - BlueCoin Core System board features

- 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 MP34DT04-C1 – 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 2: STEVAL-BCNCR01V1 - BlueCoin Cradle board
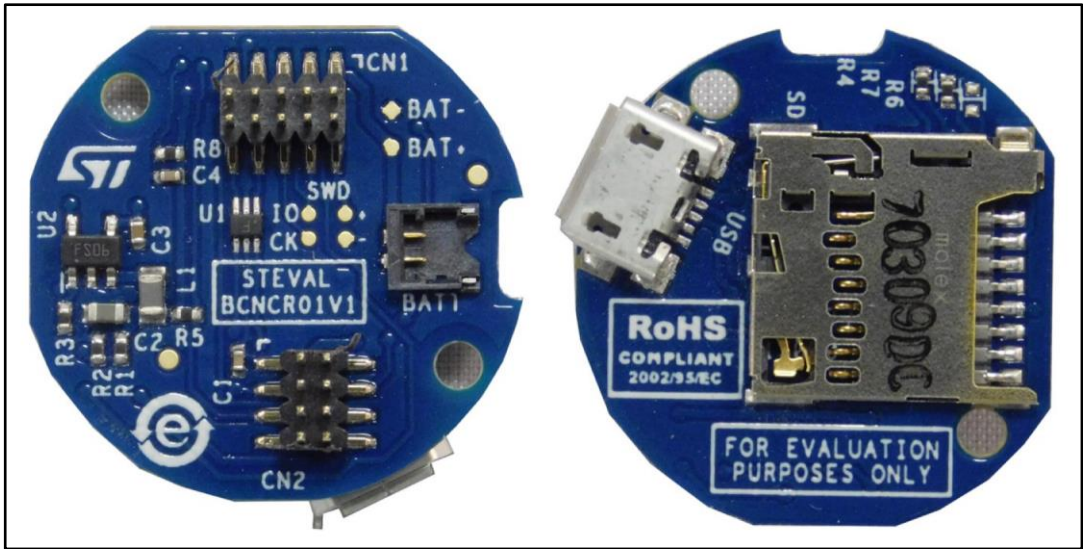
STEVAL-BCNCR01V1 - BlueCoin Cradle board features

- 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 3: STEVAL-BCNST01V1 - CoinStation board
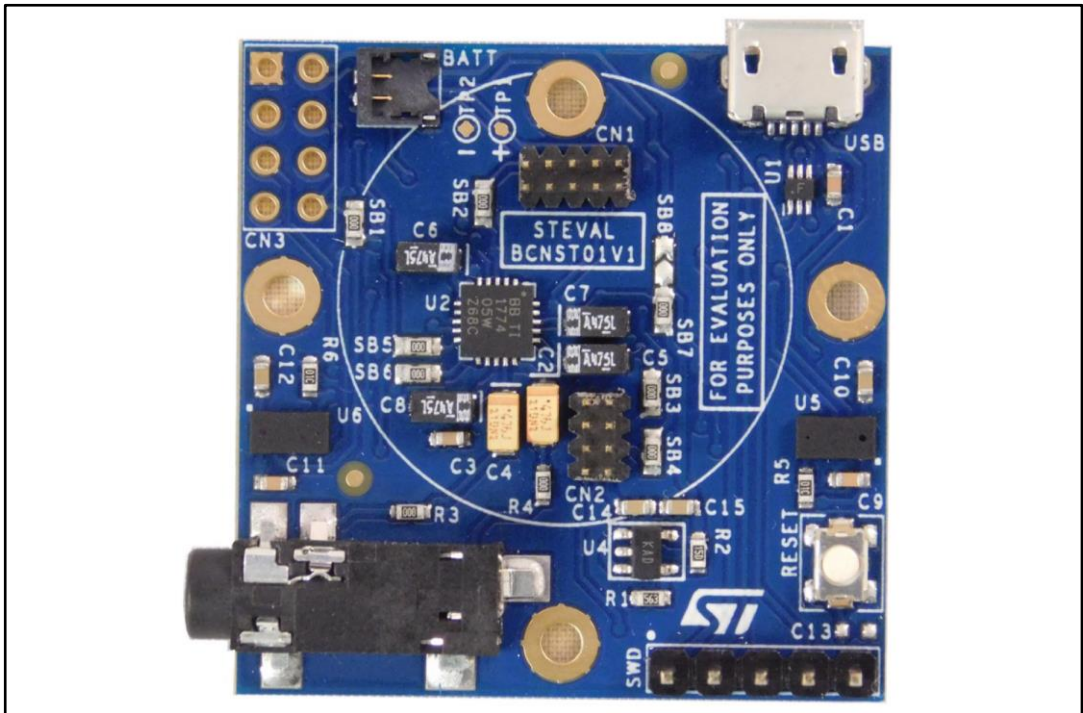
STEVAL-BCNST01V1 - CoinStation board features

- 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

2 Product notice

FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Innovation, Science and Economic Development Canada Compliance

This device complies with Innovation, Science and Economic Development RSS standards. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Conformité à Innovation, Sciences et Développement Économique Canada

Cet appareil est conforme aux normes RSS d'Innovation, Science et Développement économique. L'utilisation est soumise aux deux conditions suivantes: (1) cet appareil ne doit pas causer d'interférences nuisibles, et (2) cet appareil doit accepter de recevoir tous les types d'interférence, y comprises les interférences susceptibles d'entraîner un fonctionnement indésirable.

Les changements ou les modifications non expressément approuvés par le fabricant pourraient annuler le permis d'utiliser l'équipement.

3 Schematic diagrams
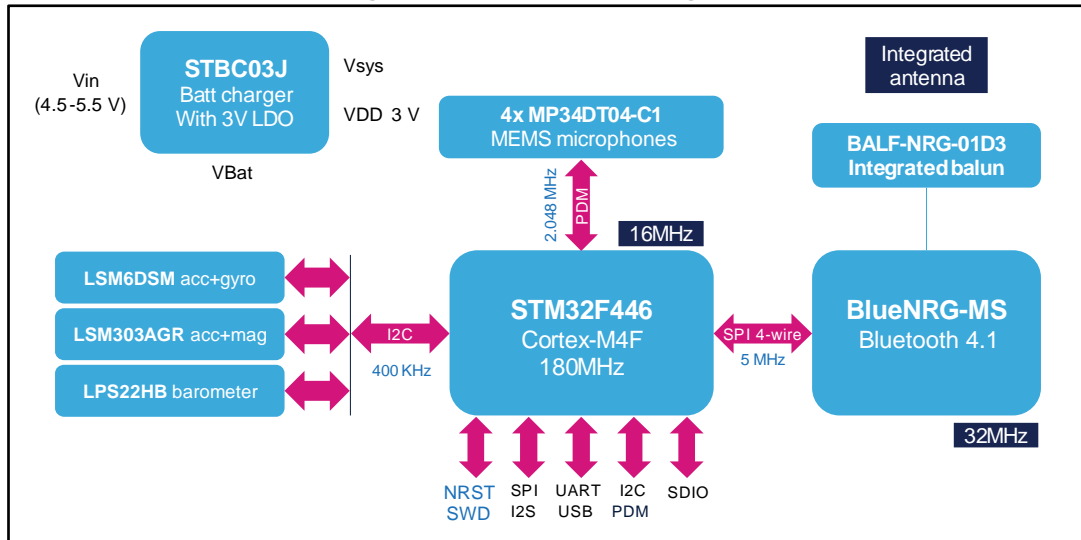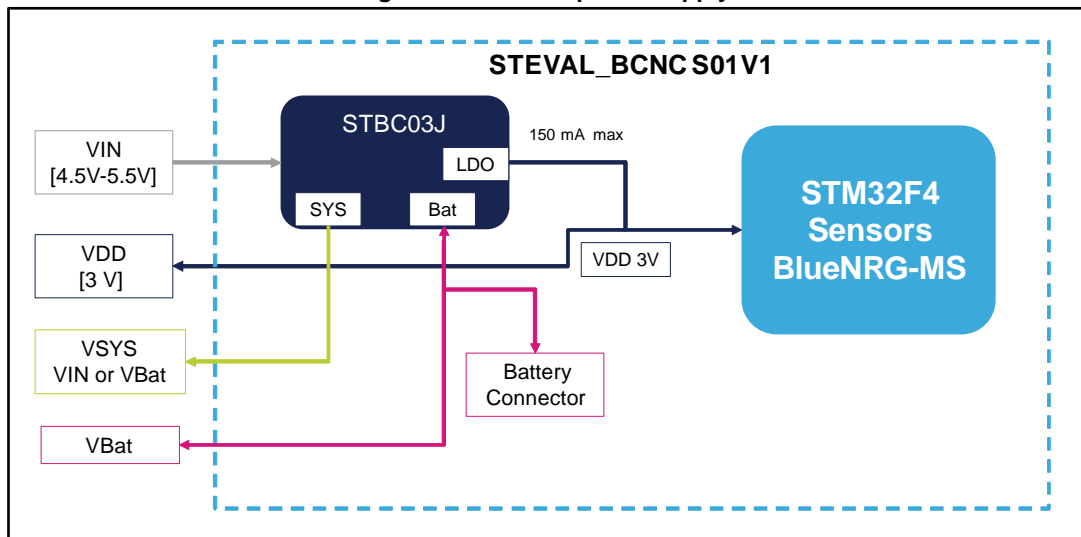
Figure 4: Functional block diagram

Figure 5: BlueCoin power supply

4 Revision history

Table 1: Document revision history

Date	Version	Changes
08-Jun-2017	1	Initial release.

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