



A Qualcomm® Technologies Bluetooth Low Energy Case Study

DropMix™ by Hasbro and Harmonix, developed by NFS



Introduction:

DropMix is a dynamic, fast-paced music-mixing game that allows players to blend popular songs from award-winning artists to create amazing mixes. The DropMix Music Gaming System includes the DropMix game board and 60 DropMix song cards. Each card activates a part of a song track, and every track blends seamlessly with others to create unique mixes. The game board is equipped with 5 NFC antennas to read the playing cards in stacks, and a Bluetooth Smart link to communicate with phones or tablets. Players download the free DropMix app (for iOS and Android) on their compatible phones or tablets, which enables the card reading, controls the LED lighting, and generates the music for the mix.

The DropMix game was developed as a collaboration between global play and entertainment company, Hasbro and Harmonix Music Systems, best known for their innovative Rock Band and Dance Central franchises. The game developers teamed with Near Field Solutions Ltd (NFS) to solve the card-to-board-to-app communications requirements to bring the game to life and make it a success.

Developing the DropMix system posed significant hurdles for NFS. Timing was a particularly difficult challenge, as the nature of the game requires that numerous data transfers must be performed within a few microseconds. NFS turned to the Qualcomm Bluetooth Low Energy CSR1011 chip for their solution, writing new, complex 8051-code for the internal IO processor in the CSR1011 to solve the time-critical transfer of data. The firmware NFS wrote for the CSR1011 controls the entire game, including the NFC card-reading on multiplexed antennas. Since the mobile app also controls the LED lighting effects—linked to the music in real-time—it was necessary to implement the exchange of data over a Bluetooth link to provide LED control.

Case Study Highlights

Near Field Solutions Ltd (NFS) is a leader in Near Field Communication (NFC), Bluetooth Smart (also known as Bluetooth Low Energy, or BLE), IoT, antenna modeling, and printed electronics.

Using our CSR1011 chip and the H13137V3 development kit, NFS created the DropMix Music Gaming System, modifying the chip's firmware to support the Bluetooth Smart and NFC communications demands.

Results: NFS went from initial specifications to first prototypes in just 6 weeks. The project was commercial-ready in less than 9 months.



Working with Qualcomm Technologies International, Ltd.

When NFS faced obstacles in development, support from the Qualcomm Bluetooth Low Energy team proved vital to their efforts. The NFS team's familiarity with the CSR1011 chip, along with its attractive price point, were the most important factors in their decision to use the CSR1011 for the DropMix project.

Glenn Needham, director and founder of NFS, discussed his team's process and the vital role support from the Qualcomm Bluetooth team played in its success. "When we started, we thought the Bluetooth side of things would be much simpler than the NFC side of things," said Needham. "In the end, the Bluetooth side ended up being quite complex. We had to effectively re-write and modify the firmware in the in the CSR1011 chip's embedded IO processor to be able to do it. Without proper support, that would have been impossible."

The real-time tasks, allowing the NFC and BLE to work in concert to deliver data back and forth between the board and the phone/tablet, posed the greatest challenge for Needham's team.

"Because we've worked with the CSR1011 chip on previous projects, we knew what we could achieve with it."



Results

Given the project's unique demands, NFS needed to optimize the scope of features, cost, and schedule, all while delivering a commercial-ready product in less than 9 months. With our development kit and support from the Qualcomm Bluetooth Low Energy team, NFS went from initial specifications to the first prototypes in just 6 weeks.

In the end, NFS, Hasbro, and Harmonix, incorporating Qualcomm Bluetooth Low Energy technology and support, delivered a unique music mixing game, giving players an exciting, new gaming and entertainment experience. With the DropMix game board and cards communicating in real time with the DropMix app on the user's phone or tablet, players can create mind-blowing mixes featuring hit songs from award-winning artists.

The Power of CSR1011

- Bluetooth 4.1 low energy radio with direct single-ended 50Ω antenna connection
- Controller, host, and application integrated on one chip, perfect for transfer of simple data sets between compact devices
- Switch-mode power supply and linear regulators with up to 4.4V direct supply connection for Li-poly batteries, and on-chip temperature and battery monitoring
- Software support for easy application development and an SDK that includes example applications to significantly reduce product development time

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Qualcomm Technologies International, Ltd. is an industry leader in delivering high quality connectivity experiences that help differentiate devices in the Internet of Things (IoT). More than singular solutions, we develop flexible, robust product platforms combining silicon, software, and services to provide customers a connectivity platform for success.

For More Information

- Visit Dropmix.com for more information about the DropMix game
- Visit usingnfc.com for more information about NFS
- Visit www.qualcomm.com/products/csr1011 for more information about the CSR1011

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