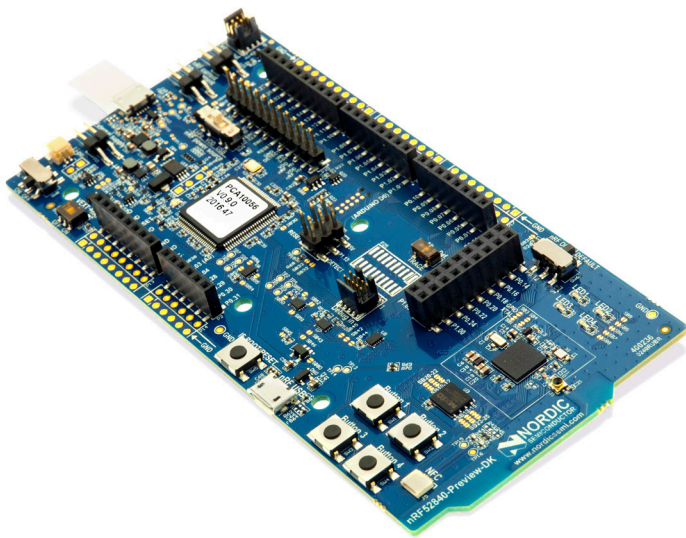# nRF 52 SERIES

nRF52840 Preview DK

Development Kit for Bluetooth low energy (Bluetooth 5), ANT/ANT+, 802.15.4 and 2.4GHz applications on the nRF25840 SoC

Product Overview

The nRF52840 Preview DK is an affordable single board development kit for *Bluetooth®* low energy (Bluetooth 5), ANT, 802.15.4 and 2.4GHz proprietary applications using the nRF52840 multi-protocol SoC.

The kit is compatible with the Arduino Uno Rev. 3 standard making it possible to use a wide range of 3rd-party shields during development.

The kit has access to all I/O (48) and interfaces via connectors and there is an integrated PCB trace antenna and an RF connector for direct RF test measurements. There is also a connector for interfacing to an external NFC antenna (included in kit).

Free software development tools, including protocol stacks (SoftDevices) and the nRF5 SDK, are available to download from www.nordicsemi.com

Bluetooth 5 - Longer range, and higher throughput

The nRF52840 is ready to take advantage of the considerable performance improvements for Bluetooth low energy with the arrival of the Bluetooth 5 specification. Of greatest importance is the support for longer range (up to x4 compared to Bluetooth 4.x) and doubling of on-air data rate, up to 2Mbs from 1Mbs in Bluetooth 4.x

Bluetooth 5 data rates	2Mbs (New)	High throughput
	1Mbs	Existing BLE data rate
	500kbs (New)	Longer range
	125kbs (New)	Longest range

KEY FEATURES

- Affordable, rapid prototyping and development solution for nRF52840 SoC
- Supports development of Bluetooth 5 based applications
- Multi-protocol support for Bluetooth low energy (Bluetooth 5), ANT, 802.15.4 and 2.4GHz
- ARM® Cortex™-M4F
- DSP instruction set
- ARM Cryptocell cryptographic accelerator
- Arduino Rev. 3 compatible connector for use with 3rd party shields
- All I/O (48) and interfaces available via connectors
- Segger J-Link OB Program/Debug supported
- Support for Program/Debug of external target boards
- USB interface direct to nRF52840 SoC
- USB interface to power and Program/Debug MCU
- External memory on-board
- Integrated PCB antenna
- SWF RF connector for direct RF measurements
- Connector for external NFC antenna
- Pins for power consumption measurements
- Compatible with Nordic Power Profiler Kit
- 4 x user-programmable buttons
- 4 x user-programmable LEDs
- Coin-cell battery holde
- +5.5v – +1.7v operation from battery, external or USB

APPLICATIONS

- **Advanced wearables**
  - Connected watches
  - Advanced personal fitness devices
  - Wearables with wireless payment
  - Connected Health
  - Virtual/Augmented Reality applications
- **IoT**
  - Connected Home sensors and controllers
  - Industrial IoT sensors and controllers
- **Interactive entertainment devices**
  - Advanced remote controls
  - Gaming controllers

Wide protocol support with addition of 802.15.4

The nRF52840 has radio support for 802.15.4. This allows nRF52840 to be used in a wide range of home and industrial sensor network applications as it supports two of the most popular wireless sensor standards in use today, Bluetooth low energy and 802.15.4 derivatives. This adds to the already existing radio support for Bluetooth low energy, ANT/ANT+ and 2.4GHz for proprietary.

ARM Cryptocell

The nRF52840 has on-chip ARM Cryptocell cryptographic accelerator. Cryptocell brings best-in-class security features for Cortex-M systems. Cryptocell offers a broad range of cryptographic ciphers and runs independent of the CPU bringing added security and efficiency during security operations.

Easy, fast and safe code development

The nRF52840 offers developers a clean separation between application code development and protocol stacks. This means compile, link and run-time dependencies and associated debugging challenges when using the protocol stack are removed. SoftDevices (Nordic's protocol stacks) are delivered as downloadable binaries. The Application Programming Interface (API) is event-driven and asynchronous allowing very clean and predictable behavior between application and protocol and means application development and re-compiles have no effect on the protocol stack code.

OTA DFU

The nRF52840 is supported by Over-the-Air Device Firmware Upgrade (OTA-DFU). This allows for in the field updates of application and/or protocol stack.

Maximum re-use and easy migration

The nRF52840 has binary compatible peripherals with other devices in the nRF52 and nRF51 Series for most functions. The common hardware and software architectures mean use and porting of existing code is straightforward allowing developers to re-use firmware libraries they have developed previously with ease.

Nordic SoftDevices

SoftDevices (Nordic's protocol stacks) are pre-compiled link-free binaries and can be downloaded from www.nordicsemi.com. SoftDevices reside in separate memory space to the application and are interfaced by their API making the building of applications simpler and more predictable.

The S140 SoftDevice is compatible with nRF52840 and supports concurrent Bluetooth low energy operation for all 4 roles (Central/Peripheral/Broadcaster/Observer). The S140 SoftDevice is a Bluetooth 5 qualified stack and as such supports the latest long range and high throughput features introduced in Bluetooth 5.

nRF528340 compatible SoftDevices

S140	Multi-role, concurrent Bluetooth 5 protocol stack

RELATED PRODUCTS

nRF52840	Multiprotocol SoC supporting Bluetooth 5, ANT, 802.15.4 and 2.4GHz applications
S140 SoftDevice	SoftDevice protocol stack supporting Bluetooth 5
nRF5 SDK	Software Development Kit for nRF52 series soCs

ORDER INFORMATION

nRF52840-PDK	Development Kit for nRF52840 SoC

The nRF52840 Preview DK is available from the following online partners:

WORLD WIDE OFFICE LOCATIONS

Headquarters:
Trondheim, Norway
Tel: +47 72 89 89 00

For more information
Visit **www.nordicsemi.com** for the complete product specification about this and any other wireless ULP products.

About Nordic Semiconductor
Nordic Semiconductor is a fabless semiconductor company specializing in ULP short-range wireless communication. Nordic is a public company listed on the Norwegian stock exchange.

TRONDHEIM, NORWAY HEAD OFFICE
OULU, FINLAND
OSLO, NORWAY
TURKU, FINLAND
SAN JOSE, USA
KRAKOW, POLAND
SEOUL, KOREA
TOKYO, JAPAN
SHANGHAI, CHINA
SHENZHEN, CHINA
HONG KONG, CHINA
TAIPEI, TAIWAN
LAGUNA, PHILIPPINES