nRF52840 Dongle

Development dongle for Bluetooth 5/Bluetooth mesh/Thread/Zigbee/802.15.4/ANT/2.4GHz

Product Overview
The nRF52840 Dongle is a small, low-cost USB dongle for Bluetooth® Low Energy (LE), Bluetooth mesh, Thread, Zigbee, 802.15.4, ANT and 2.4 GHz proprietary applications using the nRF52840 SoC. The dongle is the perfect target hardware for use with nRF Connect for Desktop as it is low-cost but still support all the short range wireless standards used with Nordic devices. The dongle has been designed to be used as a wireless HW device together with nRF Connect for Desktop.

It can also be used to develop code for the nRF52840 SoC mounted on the dongle. Programming is supported through a USB enabled bootloader. Connectors for external debuggers are available.

The dongle is supported by most of the nRF Connect for Desktop apps and will automatically be programmed if needed. It is the number one target for coming nRF Connect apps. In addition, custom applications can be made and downloaded to the dongle. It has a user programable RGB LED, a green LED, a user programmable button as well as 15 GPIO accessible from castellated solder points along the edge.

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

KEY FEATURES
- Bluetooth 5 ready multiprotocol radio
  - 2 Mbps
  - Long Range
  - Advertising Extensions
  - Channel Selection Algorithm #2 (CSA #2)
- IEEE 802.15.4 radio support
  - Thread
  - Zigbee
- Arm® Cortex™-M4 with floating point support
- DSP instruction set
- Arm CryptoCell CC310 cryptographic accelerator
- 15 GPIO available via edge castellation
- USB interface direct to nRF52840 SoC
- Integrated 2.4 GHz PCB antenna
- 1 user-programmable button
- 1 user-programmable RGB LED
- 1 user-programmable LED
- 1.7-5.5 V operation from USB or external

APPLICATIONS
- Advanced wearables
  - Advanced personal fitness devices
  - Connected health
- IoT
  - Connected home sensors and controllers
  - Industrial IoT sensors and controllers
- Interactive entertainment devices
  - Advanced remote controls
  - Gaming controllers
  - Virtual/Augmented Reality applications

Bluetooth 5 - Longer range, and higher throughput
The nRF52840 SoC is ready to take advantage of the considerable performance improvements for Bluetooth LE 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 2 Mbs from 1 Mbs in Bluetooth 4.x.

High link budget for in-home applications
The nRF52840 SoC is the ideal solution for smart connected home applications. It supports both Bluetooth 5’s long range feature and also 802.15.4 which is already a popular technology for home networking protocols. With a maximum output power of 8 dBm a total link budget of >111 dBm is achievable for achieving robust communications through objects within the home.
Arm CryptoCell 310
The nRF52840 features an on-chip Arm CryptoCell 310 cryptographic hardware accelerator. CryptoCell offers a wide range of ciphers and security features for building solid security into applications from the ground up. Use of CryptoCell also makes associated security operations run faster and uses less processing time and power than equivalent operation carried out in software by the CPU.

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

Nordic SoftDevices
Nordic protocol stacks are known as SoftDevices. SoftDevices are pre-compiled binaries without runtime dependencies. They reside in a separate memory location to your application and offer safer, easier, and more secure application development. The nRF52840 SoC is supported by the S140 SoftDevice.

S140 SoftDevice
The S140 SoftDevice supports 20 Bluetooth LE links in concurrent operation for all 4 roles (Central/ Peripheral/Broadcaster/Observer). The S140 is a Bluetooth 5 qualified stack and as such supports the latest long range and high throughput features introduced in Bluetooth 5.

### Bluetooth 5 data rates

<table>
<thead>
<tr>
<th>Data Rate</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Mbs (New)</td>
<td>High throughput</td>
</tr>
<tr>
<td>1 Mbs</td>
<td>Existing Bluetooth LE data rate</td>
</tr>
<tr>
<td>500 kbs (New)</td>
<td>Longer range</td>
</tr>
<tr>
<td>125 kbs (New)</td>
<td>Longest range</td>
</tr>
</tbody>
</table>

### nRF52840 COMPATIBLE SOFTDEVICES

- **S140**: Feature complete Bluetooth 5 protocol stack for the nRF52840 SoC
- **S340**: Combined Bluetooth 5 and ANT protocol stack for the nRF52840 SoC

### RELATED PRODUCTS

- **nRF52840 DK**: Development kit for the nRF52811 and nRF52840 SoCs
- **nRF52 DK**: Development kit for the nRF52810 and nRF52832 SoCs
- **nRF52840**: SoC for Bluetooth 5/Bluetooth mesh/802.15.4/Thread/Zigbee/ANT/2.4 GHz
- **nRF52832**: SoC for Bluetooth 5/Bluetooth mesh/ANT/2.4 GHz
- **nRF52811**: SoC for Bluetooth 5.1/802.15.4/Thread/Zigbee/ANT/2.4 GHz
- **nRF52810**: SoC for Bluetooth 5/ANT/2.4 GHz
- **nRF5 SDK**: Main software development kit for Bluetooth 5, ANT and 802.15.4
- **nRF5 SDK for Mesh**: Software development kit for Bluetooth mesh
- **nRF5 SDK for Thread and Zigbee**: Software development kit for Thread and Zigbee

### ORDER INFORMATION

- **nRF52840-Dongle**: Development dongle for the nRF52840 SoC

---

**WORLD WIDE OFFICE LOCATIONS**

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

**For more information**
Visit 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.