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Indoor Solar Development Kit with Nordic BLE (DEV-IN-BLE-NS)

System Overview

- The Indoor Solar Development Kit with Nordic BLE (DEV-IN-BLE-NS) is perfect for developers looking to design or add PowerFilm's high-performance indoor solar to BLE products.
- Works out of the box and can operate at extremely low light levels down to 200 lux and below.
- Features onboard energy harvester/power management IC, BLE circuitry, Indoor Solar Panels and all required components to be plug and play.
- Includes a custom onboard capacitor charger ("Cap-Charger"), enabling operation without a storage element.
- Fully compatible with Nordic's development tools and connects to the simulated Heart Rate Sensor Demo in the nRF Toolbox mobile app.

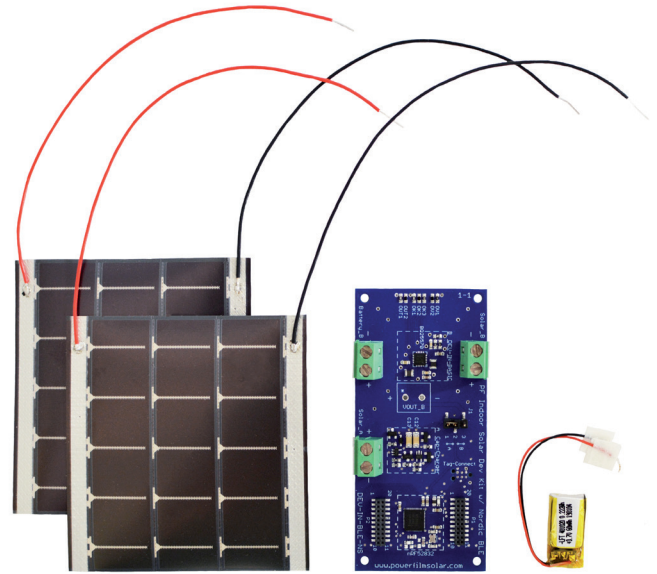


Figure 1: Kit Contents

What's In The Kit?

- DEV-IN-BLE-NS circuit board assembly
- (2) LL200-3.6-75 high performance Indoor Solar Panels with leads
- 40mAh rechargeable Li-Polymer battery
- Instructions, hardware and software files, and product documentation

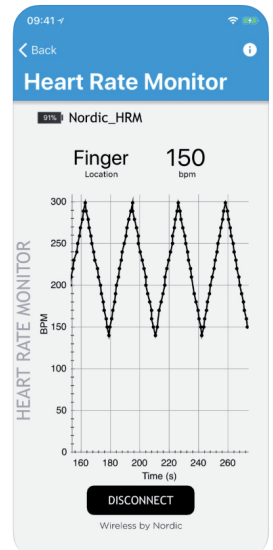
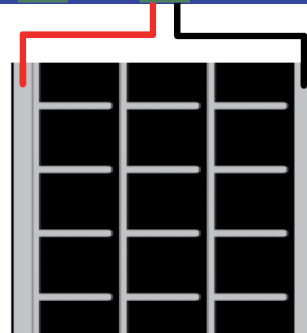
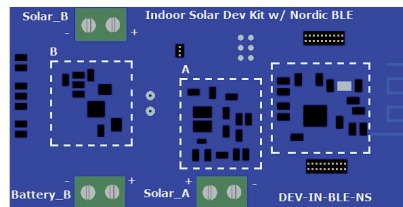


Figure 2: System Diagram

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Indoor Solar Panel: LL200-3.6-73

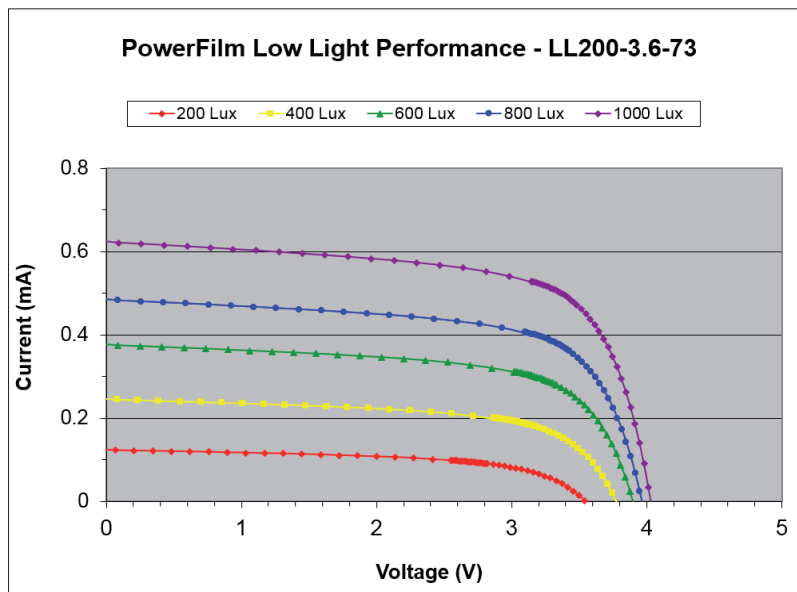
Number of Cells	Cell Width (cm)	Module Length (mm)	Type
3	2	73	Tandem Junction

Panel Size: 2.9 in x 3 in / 73 mm x 74 mm

Module width: 74

Minimum		
Lux	Operating Voltage	Power (mW)
200	2.4	0.22
400	2.7	0.50
600	2.9	0.81
800	3.0	1.09
1000	3.2	1.43

Absolute maximum open circuit voltage: 5.6V



nRF52832 Nordic BLE Module

Fully functional BLE module configured for ultra-low power operation. Connects to iOS and Android devices through Nordic's Heart Rate Sensor example in the nRF Toolbox mobile App.

- iOS and Android connectivity
- IO Break-out connectors for additional sensors or components
- Segger Embedded Studio project solution files
- Small footprint with compact meandering antenna design

Energy Harvesting Modules

Includes the two charging circuits detailed below. The first is a custom battery-free capacitor charger ("Cap-Charger") and the second implements TI's BQ25570 energy harvesting/power management IC and is identical to the Indoor Solar Development Kit. The desired charging circuit can be chosen with jumper J1.

Cap-Charger

- Up to 2x performance vs standard energy harvesting IC solutions
- Rapid charging during initial off state (0-2V)
- Low voltage load disconnect with hysteresis and high voltage charge termination
- Low cost and small footprint

BQ25570 IC

- MPPT Input with low voltage boost converter
- Regulated power output (default 3V)
- Integrated battery charger (default 4.2V Li-ion) with low voltage load disconnect and high voltage charge termination