

# PRODUCT INFORMATION: DWM1001

## Overview

- UWB and *Bluetooth®* module based on Decawave's DW1000 IC and Nordic Semiconductor nRF52832 SoC
- On board motion sensor and integrated antennas
- Embedded firmware enabling:
  - Accurate UWB-based Real-Time Location Systems (RTLS)
  - Data encrypted network connectivity (available: Q1 2018)

## **Benefits**

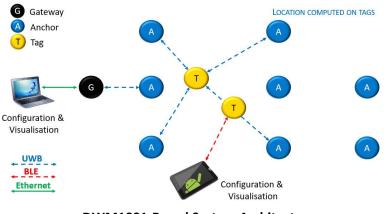
- Build scalable Two-Way-Ranging (TWR) RTLS systems with up to thousands of tags
- Accelerates product designs for faster time-to-market & reduced development costs
- Same module for anchor, tag & gateway designs
- No RF design required
- Embedded DRTLS firmware (DWM1001 TWR RTLS) reduces software development effort
  - Firmware API to customise embedded user application
  - SPI, UART and Bluetooth® APIs to access DWM1001 from an external device
- On-board Bluetooth<sup>®</sup> for connectivity to phones/tablets
- · Low-power hardware and software architecture for longer battery life
- Certification: Q1 2018

## **Example Applications**

- Industrial (asset-tracking, factory automation)
- Healthcare (locate assets, patients & staff)
- Retail (security, navigation, customer analytics)
- Consumer (connected home, sports analytics)

## **Complementary Products**

- DWM1001-Dev: Development board for evaluating and programming the module
- MDEK1001: Development and evaluation kit with 12 units, Android tablet application, Web Client



DWM1001-Based System Architecture



DWM1001 Module



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API (from network)

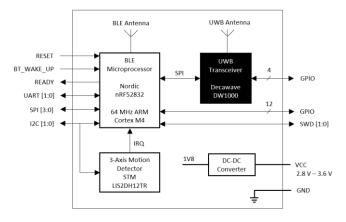
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Application Space

TWR RTLS || Bluetooth

# **Technical Data**

#### **Hardware Features**



- $\geq$ Decawave DW1000 UWB transceiver
  - IEEE802.15.4-2011 compliant
- $\geq$ UWB PCB antenna (6.5 GHz centre frequency)
- 6.8 Mbps frame data encoding
- ~60 m UWB line-of-sight range  $\triangleright$
- Nordic Semiconductor nRF52832 SoC
  - ARM Cortex M4F, 512K Flash •
- $\geq$ Bluetooth<sup>®</sup> chip antenna
- 3-axis accelerometer: STM LIS2DH12TR  $\triangleright$
- $\triangleright$ Low power - Sleep mode: <5µA
- $\geq$ Supply voltage: 2.8 V to 3.6 V
- $\triangleright$ 19.125 mm x 26.125 mm x 2.6 mm
- 34 x 1 mm pitch side castellations  $\geq$
- $\geq$ Serial Wire Debug (SWD)
- **External Interfaces:** 
  - SPI slave, I2C, UART
  - **I2S Audio**
  - NFC Ready
  - **GPIOs**
  - **Bluetooth Wakeup**







IMU

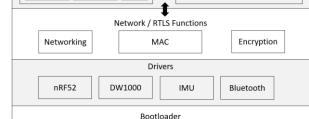
Application Layer

**Software Features** 

API (from hardware I/F)

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User Application Space



- DRTLS firmware:
  - Complete RTLS & network stack configurable into anchor, tag or bridge modes
  - User options for partial or full re-flash
  - Location Engine on tag •
  - Over-the-air firmware updates
- > Application code:
  - Two-Way-Ranging (TWR) RTLS
  - Application memory area for custom code
- Configuration via Bluetooth® or UART commands
- MAC layer:  $\triangleright$ 
  - Resource allocation, frame & slot timing
- Wireless mesh network (available: Q1 2018):
  - Network mgmt. & dynamic data routing •
  - Discovery, joining, leaving, self-healing
- $\geq$ Security (available: Q1 2018):
  - AES encryption & decryption
- API access to firmware:
  - Nordic nRF52832 peripherals (GPIOs, I2C)
  - **DRTLS** Configuration



### Get Started:

- Learn more at: www.decawave.com/products
- Download the RTLS SW at www.decawave.com/support/software

Join the community:

- http://www.decawave.com/decaforum/

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