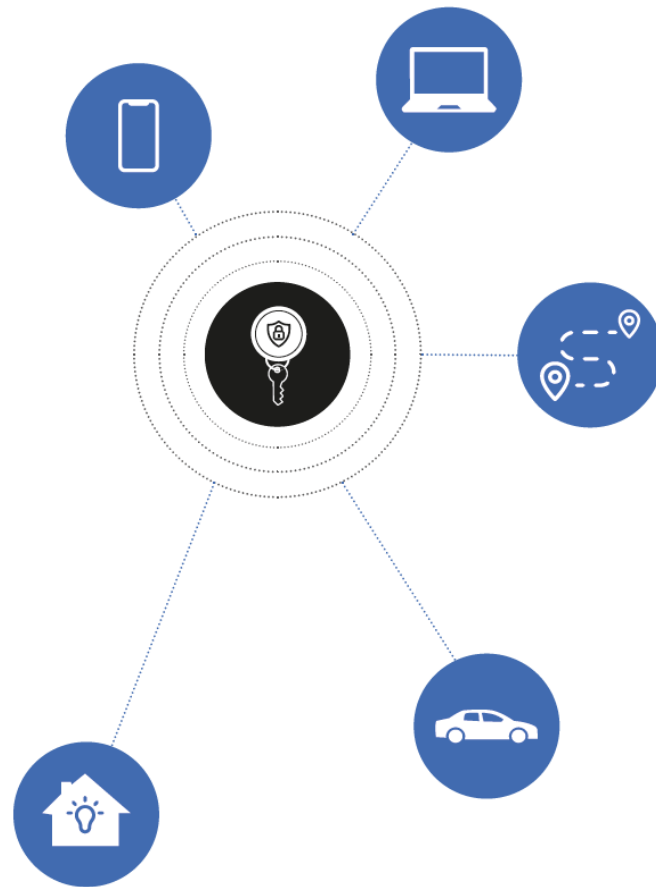




# MK UWB Kit

Featuring **NXP Trimention™**  
**SR150 / SR040**

Secure UWB  
for your IoT solution



# MK UWB Kit SR150/040

What it offers



The **MK UWB Kit SR150/SR040** is the most comprehensive **reference design** and **development platform** for UWB-based IoT solutions.

Leverage on UWB technology advanced functionalities and benefit from **NXP Trimention™ SR150 and Trimention™ SR040 UWB IC** capabilities.

Take your UWB development experience to the next level with the **most complete and powerful UWB development kit in the market!**

# MK UWB Kit SR150/040

What it offers



The image shows the product box for the MK UWB Kit SR150/040. The box is white with blue and orange accents. It features the text "MK UWB Kit" in large black letters, "Featuring NXP Trimemstar SR150 / SR040" in orange, and "Secure UWB for your IoT solution" in small black text. There are also icons for a smartphone, a UWB tag, and a target symbol.

**UWB**

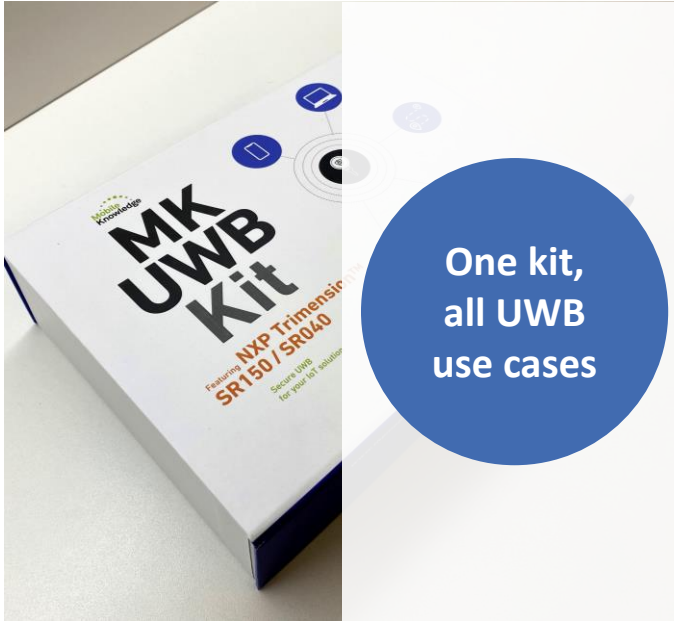
- One kit, all UWB use cases
- Support for multiple host platforms
- Best-in-class distance & AoA accuracy
- Off-the-shelf iOS & Android interoperability
- Powered by Murata's UWB modules
- Now including our brand-new MK UWB Tag!



# MK UWB Kit SR150/040

Contents & features

*Leverage on the MK UWB Kit SR150/SR040 content & features and accelerate your time to market by focusing on your own application development*



## • Device to Device

- Unicast & Multicast DS-TWR
- Secure ranging
- Data transfer
- Tracker and distance alert

## • Mobile to device

- Android support (including background operation)
- iOS support (including background operation)
- Ranging, Tracker, distance alert, Point & Trigger

## • Indoor positioning

- Uplink TDoA
- Downlink TDoA

# MK UWB Kit SR150/040

Contents & features

*Leverage on the MK UWB Kit SR150/SR040 content & features and accelerate your time to market by focusing on your own application development*

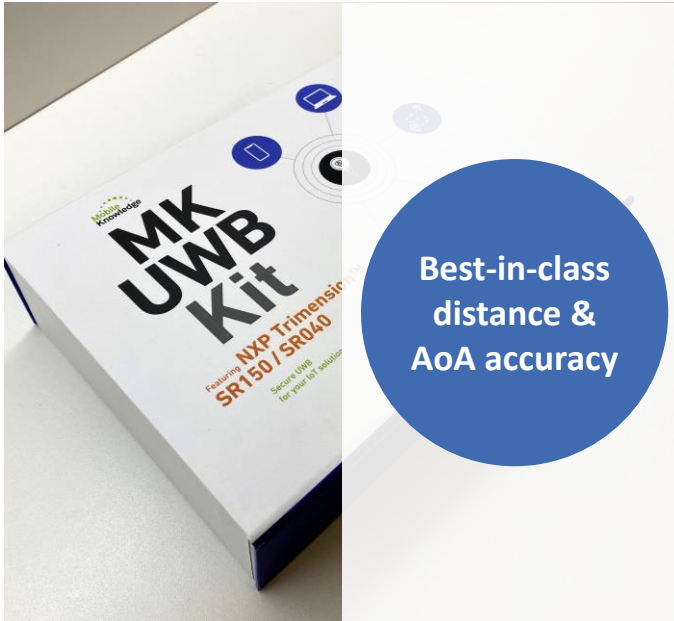


- Development board integrating NXP QN9090 MCU
- Arduino header to connect development board to any host platform, including:
  - Nordic nRF52840 DK
  - Raspberry Pi
- Software drivers for NXP QN9090, Nordic nRF52840 and Linux-based hosts

# MK UWB Kit SR150/040

Contents & features

*Leverage on the MK UWB Kit SR150/SR040 content & features and accelerate your time to market by focusing on your own application development*



- Avg. ranging distance error:  $\pm 7$  cm
- Avg. AoA error:  $\pm 4^\circ$
- Calibrations for MK UWB 3D Antenna board applied to all SW components to get highly accurate distance and AoA data:
  - XTAL calibration
  - AoA calibration
  - Antenna delay calibration

# MK UWB Kit SR150/040

Contents & features

*Leverage on the MK UWB Kit SR150/SR040 content & features and accelerate your time to market by focusing on your own application development*

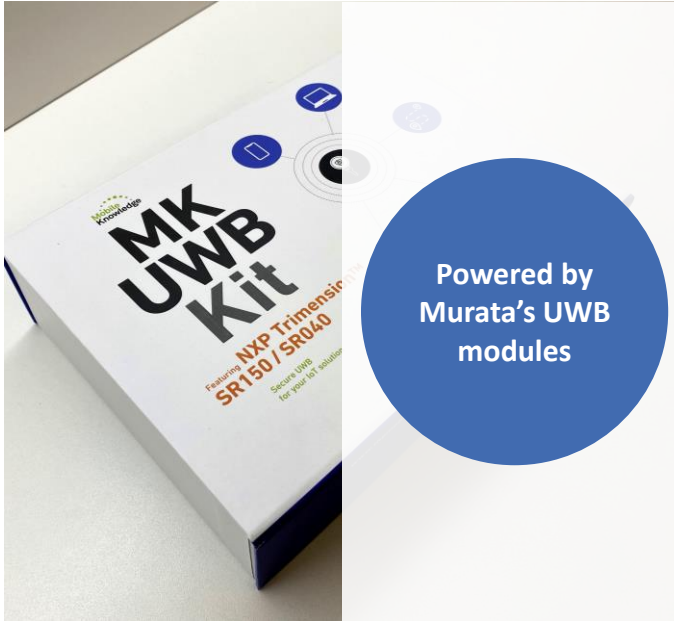


- **Includes all MK UWB Kit Mobile Edition 2.0 software material** supporting UWB-enabled Android and iOS devices
- **MK UWB Connect application** available in Appstore and Play Store, delivered as source code as part of the kit
- **Anchor-to-Mobile and Tag-to-Mobile software** to enable ranging against multiple Apple or Android UWB enabled devices simultaneously


# MK UWB Kit SR150/040

Contents & features

Leverage on the MK UWB Kit SR150/SR040 content & features and accelerate your time to market by focusing on your own application development



**muRata**

- Thanks to the powerful partnership between MobileKnowledge and Murata, **MK UWB 3D Antenna board now includes Murata Type 2BP**, the world's smallest UWB module :
  - Includes NXP Trimension SR150 UWB chipset
  - Includes clock, filters and peripheral components
  - 3 Antenna support (3D AoA or 2D AoA support)
  - Power calibration, XTAL calibration applied
  - FCC/IC/MIC Certified
- The MK UWB Kit SR150/040 now includes our brand-new **MK UWB Tag**, which integrates **Murata Type 2DK** UWB Module: 
  - All-in-one UWB + Bluetooth® LE combo module
  - Integrates NXP Trimension™ SR040 UWB Chipset, NXP QN9090 Bluetooth® LE MCU, on board antennas and peripheral components.
  - UWB ranging support (distance only, no AoA)
  - Power calibration, XTAL calibration applied
  - FCC/IC/MIC Certified



# MK UWB Kit SR150/040

Contents & features

*Leverage on the MK UWB Kit SR150/SR040 content & features and accelerate your time to market by focusing on your own application development*



# MK UWB Tag

Featuring **NXP Trimention™ SR040**

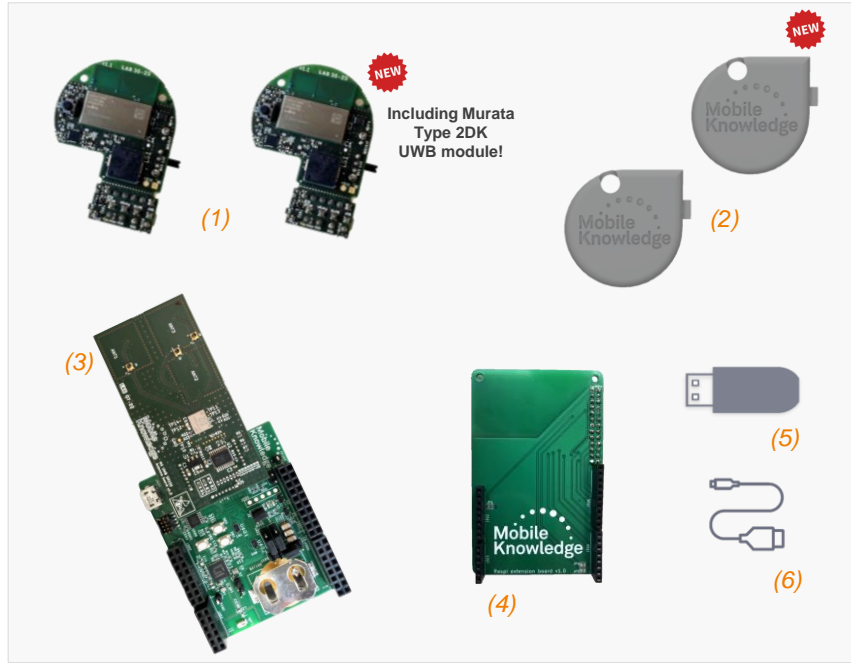
Small and compact, the ideal UWB Tag for accurate UWB positioning

NEW

- The **MK UWB Tag** provides accurate positioning capabilities in **an extra small form factor**:
  - Integrating Murata Type 2DK UWB Module and based on Trimention SR040™ supporting low power operation
  - Extra small form factor
  - Accelerometer, secure element, buzzer, LED, button.
  - Coin-cell battery operation
  - Compatible with all SR040 software
  - Reference hardware design files available
  - Compact casing design available

# MK UWB Kit SR150/040

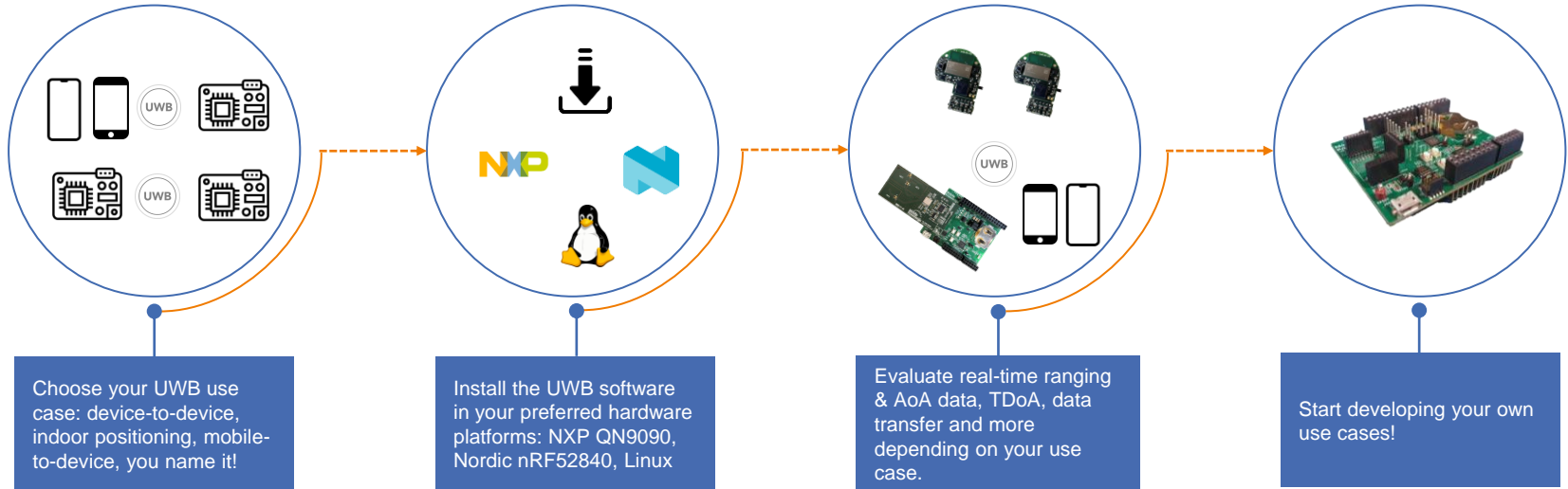
Box content



- 2x MK UWB Tags (1) <sup>NEW</sup>
- 2x Custom-designed casings for MK UWB Tags (2) <sup>NEW</sup>
- 1x MK UWB SR150 Anchor 3D (3), consisting of:
  - MK UWB Shield 2 Arduino-compatible development board
  - MK UWB 3D Antenna board, with a soldered Murata Type 2BP UWB module featuring NXP Trimension™ SR150 UWB IC and supporting 3D position information
- MK UWB Shield 2 to Raspberry Pi connector board (4)
- USB flash drive (5) with software and documentation:  
*Full set of documents to help you get started with the UWB technology using the MK UWB Kit SR150/SR040 hardware and software content. Documentation provides step-by-step instructions to run off-the-shelf demo applications and use the development platform and software libraries to create your own UWB applications*
- Cables and connectors (6): USB to micro-USB OTG adapter, micro-USB to USB-C adapter, and USB cable

# MK UWB Kit SR150/040

Out-of-the-box experience



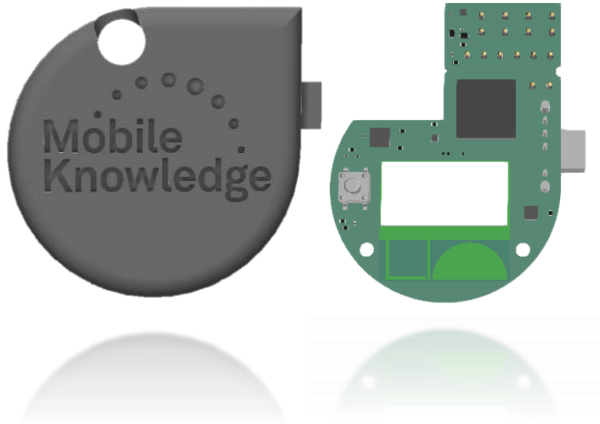
# MK UWB Kit SR150/040

MK UWB Tag: In detail

## MK UWB Tag

The **MK UWB Tag** provides accurate positioning capabilities in **an extra small form factor**. It is ideally suited for low-power applications thanks to **Murata's Type 2DK, an all-in-one UWB + Bluetooth® LE combo module which integrates NXP Trimention™ SR040 UWB Chipset.**

**NEW**



- **Integrating Murata Type 2DK UWB Module**
- Fully integrated solution based on **Trimention SR040™** supporting **low power operation**
- **Extra small form factor \***, ideally suited for portable UWB devices:
  - 3.5 cm x 4.6 cm x 1.1 cm (with debug connector)
  - 3.5 cm x 3.5 cm x 1.1 cm (without debug connector)
- **Peripherals to customize your use case:** accelerometer, secure element, buzzer, LED, button.
- **Coin-cell battery operation**, providing **more than 9 months battery lifetime\*\***
- **Compatible with all SR040 software** (MK UWB Kit software and NXP UWB IoT middleware)
- **Reference hardware design files** available for the acceleration of your design and development activities
- **Compact casing design available**
  - Casing dimensions: 4,2 x 4,2 x 1,68 mm

Check out [MK UWB Tag product brief](#) for more detailed information

# MK UWB Kit SR150/040

UWB Module: In detail

## UWB Module: Murata Type 2DK

Murata Type 2DK is an all-in-one UWB + Bluetooth® LE combo module which integrates [NXP Trimention™ SR040 UWB Chipset](#), NXP QN9090 Bluetooth® LE MCU, on board antenna and peripheral components. Ideally suited for UWB Tag/Tracker which operates by coin-cell battery, and general IoT devices.

**NEW**

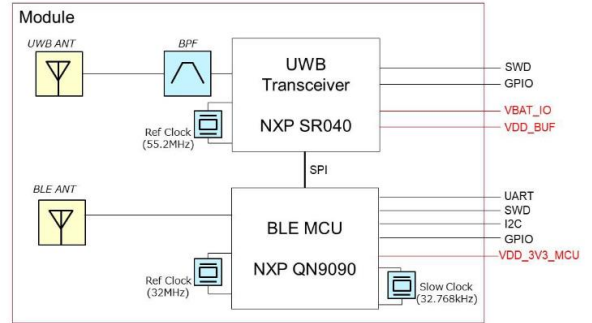


### Murata Type 2DK Module:

This UWB Module regroups all the functionalities needed to implement a power-optimized UWB tag (Bluetooth LE, UWB, antennas).

Simplify your UWB tag design with this all-in-one module from Murata!

Powered by **murata**



Murata Type 2DK Module architecture

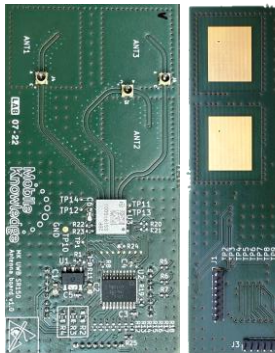
- **P/N: LBUA2ZZ2DK-007**
- UWB + BLE + MCU + antennas functionality in a small form factor (19.6 mm x 18.2 mm x 2.3 mm)
- Worldwide RF bands capability with support of CH5 and CH9
- UWB ranging support (distance only, no AoA)
- Tx Power & XTAL calibration support
- Embedded PHY & MAC FW compatible with FiRa
- **FCC/IC/MIC Certified**

# MK UWB Kit SR150/040

MK UWB 3D Antenna board: In detail

## MK UWB 3D Antenna board

UWB Module-compatible PCB that can be easily connected to the MK UWB Shield 2 supporting **3D Angle of Arrival** measurements.



### MK UWB 3D Antenna board + UWB SR150

**Module:** Ready-to-use solution that features three PCB antennas, enabling ranging, 2D, and 3D Angle of Arrival measurements as well as TDoA.

It can be easily connected to MK UWB Shield 2 using the board pin headers. Specific software and documentation is provided.

**Integrating Murata Type 2BP UWB Module!**

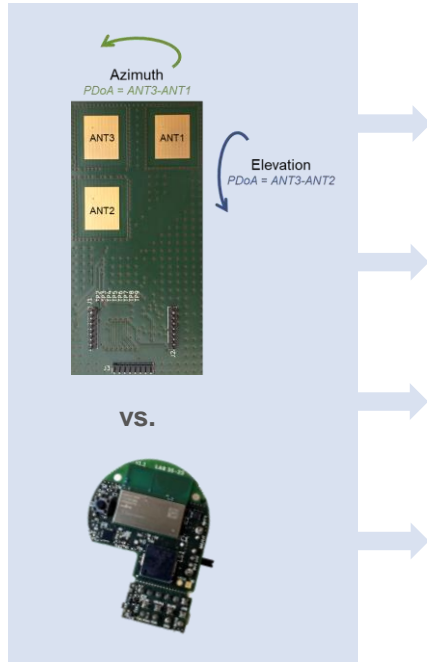


MK UWB SR150 Anchor 3D

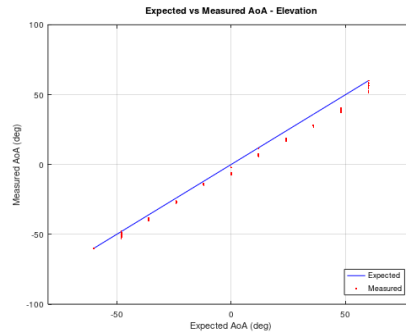
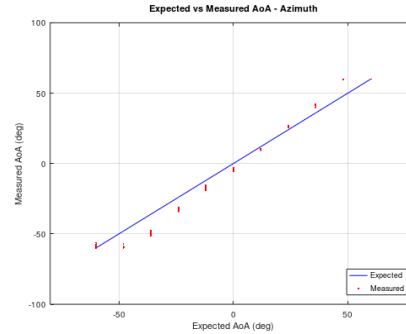
- 70x34,5mm dimensions
- Supporting 3.3 and 1.8v power supply and signal interface
- Accessible RF connectors for calibration/testing purposes

# MK UWB 3D Antenna board

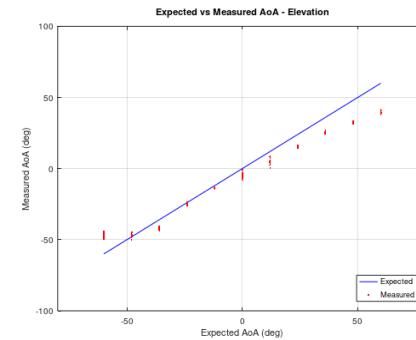
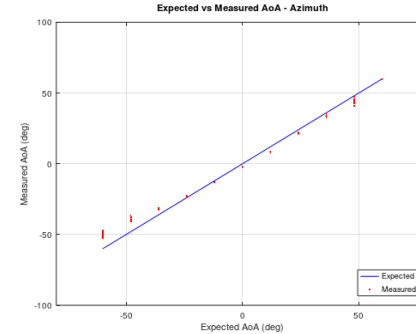
Reference AoA data



## CHANNEL 5 - RESULTS



## CHANNEL 9 - RESULTS



### Short summary of results available:

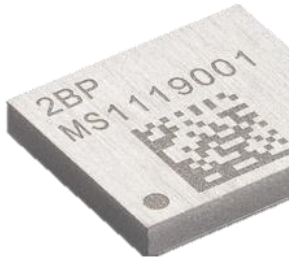
- Improved measurement accuracy and stability
- Angle of Arrival calibration applied
- Effective both in Channel 5 and 9

# MK UWB Kit SR150/040

UWB Module: In detail

## UWB Module: Murata Type 2BP

Murata Type2BP is the world's smallest UWB module and includes [NXP's SR150 UWB chipset](#). It is **FiRa certified** and is ideally suited for deployment in both larger infrastructures (indoor positioning anchors) and in consumer products and general IoT devices with battery operation.

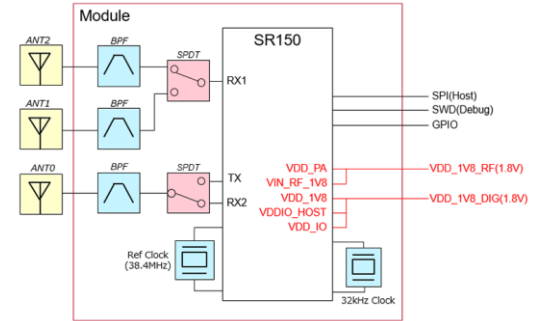


### Murata Type 2BP UWB SR150 Module:

This UWB Module regroups the core functionality of the UWB solution (clocks, filters, switches and passive components).

Compatible with secure UWB ranging, 2D & 3D Angle of Arrival, and TDoA. Suitable for Anchor devices.

Powered by **murata**



Murata Type 2BP Module architecture

- **P/N: LBUA0VG2BP-006**
- UWB functionality in a small form factor (6.6mm x 5.8mm x 1.2mm)
- Worldwide RF bands capability with support of CH5 and CH9
- Interface: SPI
- 3 Antenna support (3D AoA or 2D AoA support)
- Tx Power & XTAL calibration support
- Embedded PHY & MAC FW compatible with FiRa
- **FCC/IC/MIC Certified**



# MK UWB Kit SR150/040

MK UWB Shield 2: In detail

## MK UWB Shield 2

Flexible platform to develop customized UWB systems. As the central part of the MK UWB Kit SR150/SR040, it is used as the **interface between the UWB module and external devices.**

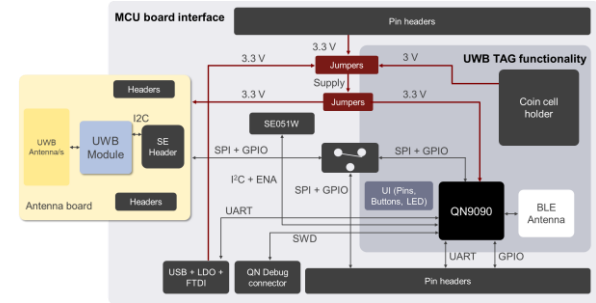


MK UWB Shield 2 supports Trimension SR150 UWB module thanks to **MK UWB 3D Antenna board.**

It is equipped with an embedded wireless microcontroller, QN9090, Arm® Cortex® M4, supporting Bluetooth Low Energy 5.0, open for customer applications (>100KB of memory available). It **includes SE051W for secure ranging use case compliant with FiRa specifications.**

A simple switch allows you to control the UWB module with an external MCU thanks to an **Arduino compatible** interface.

**EASY CONNECTION TO ANY EXTERNAL HOST THROUGH ARDUINO HEADER**



MK UWB Shield 2 architecture

- Easy connection to UWB Module through MK UWB 3D antenna board
- **Easy connection to other host platforms, such as Nordic nRF52840 DK (through Arduino header) and Raspberry Pi (through Shield to Pi board connector board)**
- Can be used as a standalone development platform by using its integrated MCU.
- Controllable by other MCUs through Arduino-compatible expansion headers.
- Support for secure ranging through SE051W.
- Support for multiple interfaces (BLE, USB, UART).
- Power supply available through USB, external board and standard 3V coin cell.

# Demo and use cases

In detail

1



## Device to Device

*Use cases*

Enable **all UWB device-to-device use cases in all your preferred platforms!**

- **DS-TWR (Unicast and Multicast), Data Transfer, Secure Ranging** through NXP UWB IoT Middleware for **NXP QN9090, Nordic nRF52840 and Linux**
- **Tracker and distance alert use cases** thanks to MK UWB SDK & MK UWB Library

2



## Mobile to Device

*Use cases*

Enable **UWB interoperability against Apple® and Android mobile devices** thanks to **MK UWB Kit Mobile 2.0 Software!**

- **MK UWB Connect application** available in Appstore and Play Store enables:
  - **UWB ranging**
  - **Distance alert**
  - **Tracker** (with iOS ARKit integration!)
  - **Point & trigger** (with iOS ARKit integration!)
- **Anchor-to-Mobile and Tag-to-Mobile software** to enable ranging against multiple Apple or Android UWB enabled devices simultaneously.

3



## Indoor Positioning

*Use cases*

Use UWB for **accurate, real-time indoor positioning!**

- **Uplink TDoA:** use an infrastructure of UWB anchors to track in real-time the position of all your devices in a RTLS server.
- **Downlink TDoA:** use an infrastructure of UWB anchors so that your devices can compute their own position in real-time without disclosing any information to third parties.

# Software and documentation

In detail

## Software (device to device)

- NXP UWB IoT middleware for SR150 (QN9090, nRF52840, Linux)
- NXP UWB IoT middleware for SR040 (QN9090)
- NXP SR150 UCI Specification
- MK UWB SDK
- MK UWB Library Lite
- Tracker and distance alert firmware images for MK UWB Tag and Anchor
- MK UWB PC Shell
- MK UWB Toolbox for Android

## Software (mobile to device)

- MK UWB Connect for Android and iOS
- Mobile-to-anchor firmware for MK UWB Anchor
- Tag-to-anchor firmware for MK UWB Tag

## Hardware documentation

- MK UWB Shield 2 User Guide
- MK UWB Tag User Guide
- MK UWB 3D Antenna board HW design files
- MK UWB Tag HW design files
- MK UWB Tag 3D casing files
- Shield To Raspberry Pi Connector Board HW files

## UWB module documentation

- Type2BP/Type2DK Datasheet
- Type2BP Hardware design guide
- Type2BP/Type2DK Footprint
- Type2BP 3D CAD File
- FCC/IC & CE test reports

## Multiplatform support documentation

- MK UWB Kit SR150/SR040 Quick Start Guide
- MK UWB SDK porting guidelines
- MK UWB Kit SR150/SR040 Quick Start Guide for Nordic nRF52840
- Run UWB IoT Middleware examples in QN9090, Nordic nRF52840 and Linux

## Use cases documentation

- MK UWB Tracker and distance alert User Manual
- TDoA Architecture Configurations
- MK UWB Kit Mobile Edition 2.0 Quick Start guide
- MK UWB Connect for iOS User manual
- MK UWB Connect for Android User manual
- Accessory firmware overview User Manual
- AoA evaluation with MK UWB 3D antenna board
- UWB IoT MW documentation for SR150 UWB IoT MW documentation for SR040

## Want to do more?

Long-standing expertise in UWB technology to help you reduce your time to market and focus on your own UWB solution development

- **Development of customized UWB use cases:** Embedded software development, mobile application software development, back-end integration, system integration,...
- **UWB technology consulting and support services:** Guidance on use case definition and system integration, system architecture, software requirements, Q&A resolution, FIRA related process and use cases,...
- **Design and development of customized antenna board** based on customer requirements and constraints in order to optimize ranging and AoA measurements
- **Porting of MK UWB SDK** into a customer platform, enabling MK UWB SDK software tools and functionalities on any customer platform that meets the SDK requirements
- **Licensing of MK UWB Library**, for an easy integration of UWB technology while accelerating the time to market



Contact us at:

[contact@themobileknowledge.com](mailto:contact@themobileknowledge.com)

# MK UWB Kit SR150/040

Ordering details



Visit <https://www.themobileknowledge.com/product/mk-uw-Kit-sr150-sr040/>

## Your entry point to the UWB technology

Evaluate the solution and identify the key technologies involved

**1.800 €**

*Shipping costs not included*

## Additional Components

- Additional MK UWB Tag
- Additional MK UWB SR150 Anchor 3D
- Additional UWB Module Type 2BP
- Additional UWB Module Type 2DK

## MK Services

Contact us for further information  
[contact@themobileknowledge.com](mailto:contact@themobileknowledge.com)

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SECRETARÍA DE ESTADO  
DE DIGITALIZACIÓN  
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