

B-UWB-MEK1 antenna offset adjustment

Introduction

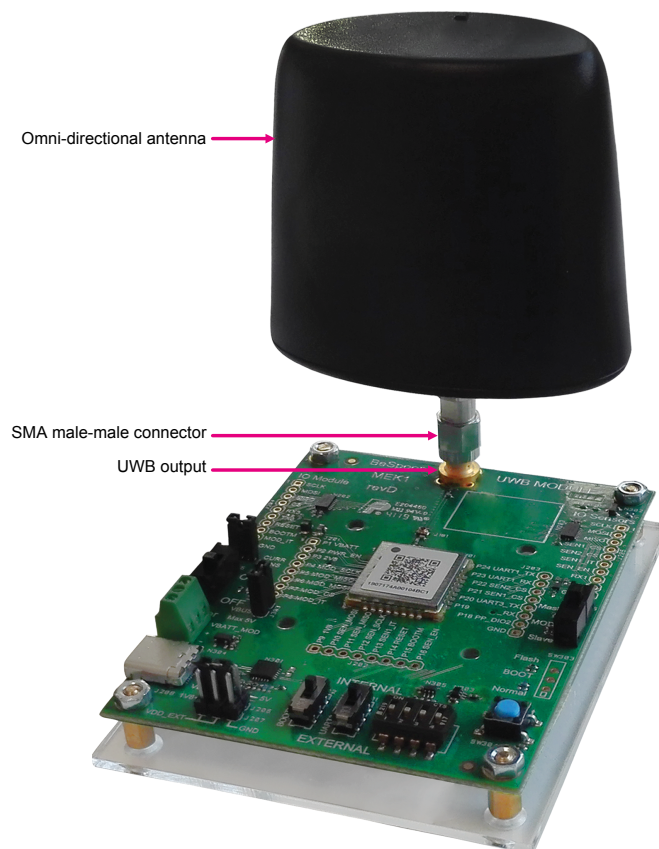
B-UWB-MEK1 boards have an SMA connector as UWB output. The module is calibrated so that the distance measure starts at the SMA output.

When plugging an antenna with a connector, this reference point changes and offsets the distance measurement. Therefore, the system must take into account specific offset values, which depend on the antenna and connector types.

The B-UWB-MEK1 standard and extension kits are delivered with omnidirectional antennas and SMA male-male connectors. The offset for this configuration is 31 cm. This is the default value in MOD1/MEK1 programming tool applied to each board.

This application note complements the information available in the SDK. It is intended for advanced users already familiar with the quick start guide. It is based on system version 3.x.

Figure 1. B-UWB-MEK1 board with an omnidirectional antenna



1 General information

B-UWB-MEK1 embeds the B-UWB-MOD1, which features the STM32L476JE 32-bit microcontroller based on the Arm® 32-bit Cortex®-M4 processor.

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

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Definitions

Table 1 presents the definition of acronyms that are relevant for a better understanding of this document.

Table 1. List of acronyms

Term	Definition
3D_SELF	3D single self-positioning
BLR	Beacon-listening rate
HF	Hyperframe
PHS	Protocol hyperframe size
PSN	Protocol slot number
PSS	Protocol slot size
RTLS	Real-time locating system
RV	Rendez-vous (slot and zone)
SF	Superframe
SFI	Superframe information
TDMA	Time-division multiple access
UWB	Ultra-wideband

References

Refer to the following documents for an introduction to the B-UWB-MEK1 and B-UWB-MOD1 products in indoor location systems:

- Ultra-wideband module for high-precision indoor location (DB4404)
- Evaluation kit for the B-UWB-MOD1 ultra-wideband module (DB4392)
- B-UWB-MEK1 quick start guide (UM2798)
- SDK advanced documentation

Demonstration software

Contact the local STMicroelectronics sales office or distributor (refer to www.st.com) for the latest software and associated documentation.

2 Offset adjustment

2.1 Find the offset

Table 2. Find the offset

Component			Offset (in cm)			
			Ch1	Ch2	Ch3	Ch4
Antenna	Omni-directional with original SMA connector		26	31	27	37
	Directional with original connector		29	37	26	50
Additional connector	SMA male-male		3			
	SMA female-male right angle					
	Attenuator					
Cable	Average factor		Offset of two SMA wire-male connectors included	Real cable length (in cm) × 1.49		
	Measurement on a network vector analyzer			Group delay (in s) × C (in m.s ⁻¹) × 100 (C = 299 792 458 m.s ⁻¹)		

2.2 Apply the offset

- Step 1.** Refer to [Table 2](#):
- If your configuration includes the original connector only, select the antenna value only.
 - If your configuration includes more than one connector, sum the values of all components:
 - Antenna with additional connector,
 - Or antenna with cable.
- Step 2.** Connect the board to the computer.
- Step 3.** Open the MOD1/MEK1 programming tool and turn the board ON.
- Step 4.** In the menu on the right, select the board serial port.
The programming tool displays a progress bar and device information.
- Step 5.** In [**Settings tab > PROTOCOL CONFIGURATION**], select [**Advanced**].
The advanced setting field opens.
- Step 6.** In [**ANTENNA CONFIGURATION**], enter your offset value.
- Step 7.** Click on [**Apply settings**].
- Step 8.** Wait until the progress bar displays OK.
The antenna offset is adjusted.

3 Ask for support

Additional information is available from the documents listed in [References](#). All documents may be updated without notice to individual users beforehand.

For up-to-date support or information about standardized as well as customized solutions, refer to the UWB and product pages on www.st.com, or to the nearest STMicroelectronics office.

Revision history

Table 3. Document revision history

Date	Revision	Changes
20-Apr-2021	1	Initial release.

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