



## WELCOME

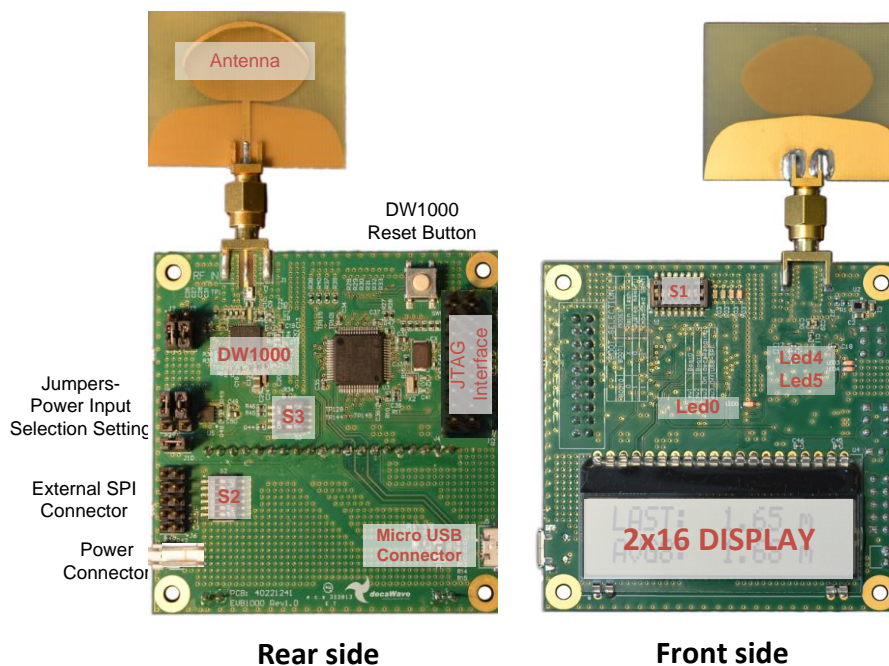
Thank you for purchasing this EVK1000 evaluation kit. This demonstrates the functionality of our DW1000 chip using a two-way ranging distance measurement application and allows you to evaluate our DW1000 technology.

This guide is all you need to start the two-way ranging demonstration. Further information on the EVK1000 and its use in application development can be obtained from DecaWave.

The EVK1000 contains two evaluation boards (EVB1000), two antennae, two DC power leads and two micro USB cables. You should check the contents of the EVK1000 carefully to ensure no components are missing or damaged. Please contact DecaWave if you require assistance.

## EVALUATION BOARDS EXPLAINED

The evaluation boards in your kit are preconfigured and are ready to go; just follow the steps in the next section.

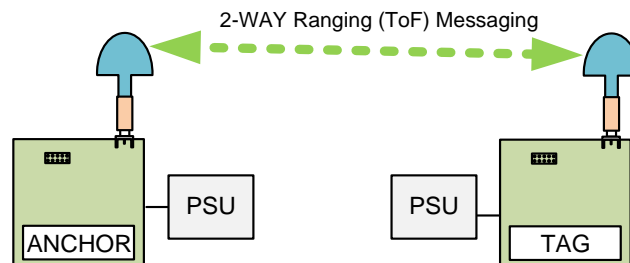




## TWO WAY RANGING

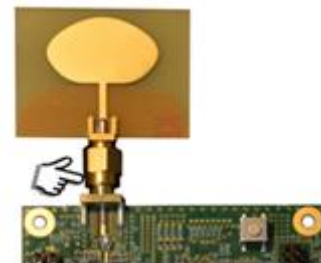
In a two way ranging (Time of Flight) scheme two nodes, denoted TAG and ANCHOR respectively, communicate with each other. By exchanging message transmit and arrival times the nodes can calculate the distance between their two antennae.

In the EVK1000 demonstration the TAG commences the sequence by polling for any ANCHOR in range. The ANCHOR listens for these polling messages, responds when it receives one and a ranging exchange takes place as illustrated below.

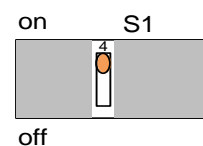


## GETTING STARTED

**STEP 1:** Remove the boards from the box and connect antennae supplied to each of the boards.



**STEP 2:** Determine which of the two boards is the **ANCHOR** and which is the **TAG** is by checking **S1-4** (ON is **ANCHOR**, OFF is **TAG**).



**STEP 3:** Connect the micro USB cable to a power source e.g. a laptop or a fully charged 5V USB battery.





**STEP 4:** Power up the **TAG** evaluation board by connecting the other end of the micro USB cable to the USB socket as shown.

You'll notice that **LED 0** is now on and the TX and RX **LEDs 3** and **4** are flashing. **LED 6** (red) is ON indicating that this board is operating as a **TAG**.

The **TAG** begins sending polling messages and indicates on its display that it is waiting for a response from the **ANCHOR** which is not yet powered up.



**AWAITING  
RESPONSE**

**STEP 6** Now power up the **ANCHOR** board by repeating steps 3 and 4.

**LED 4** is flashing, and the display indicates that the **ANCHOR** is waiting for polling messages from the **TAG**. **LED 5** (yellow) is ON indicating that this board is operating as an **ANCHOR**.

**AWAITING  
POLL**

**STEP 7:** After a couple of moments, communication between **ANCHOR** and **TAG** is established and on the display of each of the boards the distance from the last measurement and the average distance over 8 measurements is displayed.

**LAST: 1.44 m  
AVG8: 1.46 m**

## READY FOR MORE?

For more information including the EVK1000 user manual, binary and source code files for the software on the EVK1000 and the PC-based "DecaRanging" executable & associated user manual please visit [www.decawave.com](http://www.decawave.com) where these materials are available for download free of charge.

## MORE INFORMATION

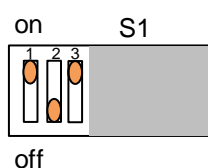
The boards in your EVK1000 are pre-configured as follows: -

- a) To be powered via the micro USB connector.
- b) The channel parameters are set to **Mode 3**.

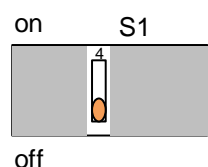
S1-5	S1-6	S1-7	Mode	Channel	Data Rate	PRF	Preamble
OFF	ON	OFF	3	2	110 kb/s	64	1024

- c) One of the two EVBs is configured as an **ANCHOR** while the other is configured as a **TAG**.

DIP switch S1 on the front site is used for setting the control mode (**S1-1, S1-2 & S1-3**), operation mode (**S1-5, S1-6 & S1-7**) and function selection (**S1-4**).

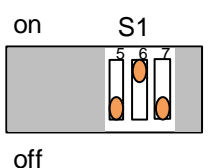


**S1-1 & S1-3 ON, S1-2 OFF:** Board runs DecaWave's two-way ranging "DecaRanging" software from its on-board ARM processor.



**S1-4 ON:** The unit is configured as an **ANCHOR**.

**S1-4 OFF:** The unit is configured as a **TAG**.



**S1-5, S1-6 & S1-7** are used to select configuration settings such as channel, PRF, data rate and preamble code. Configurations setting are described in the *EVK1000 User Manual*, available at request.

## REGULATORY APPROVALS

The EVK1000, as supplied from DecaWave, has not been certified for use in any particular geographic region by any regulatory body governing radio emissions in such regions. The EVK1000 is supplied under the following conditions (i) the distribution and sale of the EVK1000 is intended solely for use in the development of devices which may be subject to regulations or other authority governing radio emissions. (ii) this EVK1000 may not be resold by users for any purpose. (iii) the EVK1000 as supplied by DecaWave may not be incorporated directly into user devices or products unless such products undergo the appropriate certification. (iv) operation of the EVK1000 in the development of future devices is at the discretion of the user and the user bears all responsibility for any compliance with regulations laid down by the authority governing radio emissions in the user's jurisdiction.

**FCC NOTICE:** This kit is designed to allow (i) product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and (ii) software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the conditions that this device not cause harmful interference to licensed radio stations and that this device accept harmful interference. Unless the assembled kit is designed to operate under Part 15, Part 18 or Part 95 of the FCC Rules, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under Part 5 of the FCC Rules.