

# Laird BL600 Range Testing

Application Note

v.1.1

## INTRODUCTION

Bluetooth Low Energy is designed for use within Personal Area Networks (PANs). A BLE connection is typically only meant to cover a maximum range of 50 meters and is often meant for much shorter distances.

However, BLE connections are capable of a further range than advertised. In fact, in recent Bluetooth field testing, a Laird engineer was able to sustain communications up to almost 130 meters.

This paper describes the setup, procedure, and results of the successful long-range Bluetooth testing.

## TEST HARDWARE

A mobile BL600 kit was used for this test:

- Laird BL600 development board
  - BL600 attached
  - Powered by battery pack
  - Firmware v.1.2.54.0
  - Development board V02

This mobile kit's connection strength was tested with the following devices:

- Apple iPhone
- Apple iPad
- Texas Instruments Bluetooth dongle mounted to a host device
- Nordic Semiconductor Bluetooth dongle mounted to a host device

## TEST PROCEDURE

The test procedure is as follows:

- Run the Health Thermometer Sensor *smart*BASIC application on the BL600.
- Pair and connect one of the test devices to the BL600.
- While holding the mobile BL600 kit, place a finger on the temperature sensor. This ensures constant temperature data is being fed to the test device.
- Slowly, back the two devices apart until signal is lost.
- Record the location at which signal is lost.
- Use map software, in this case Google Earth, to measure the range of the connection.

## TEST RESULTS

The BL600 sustained connectivity with each device to varying ranges before the connection was lost. The results are summarized in [Table 1](#).

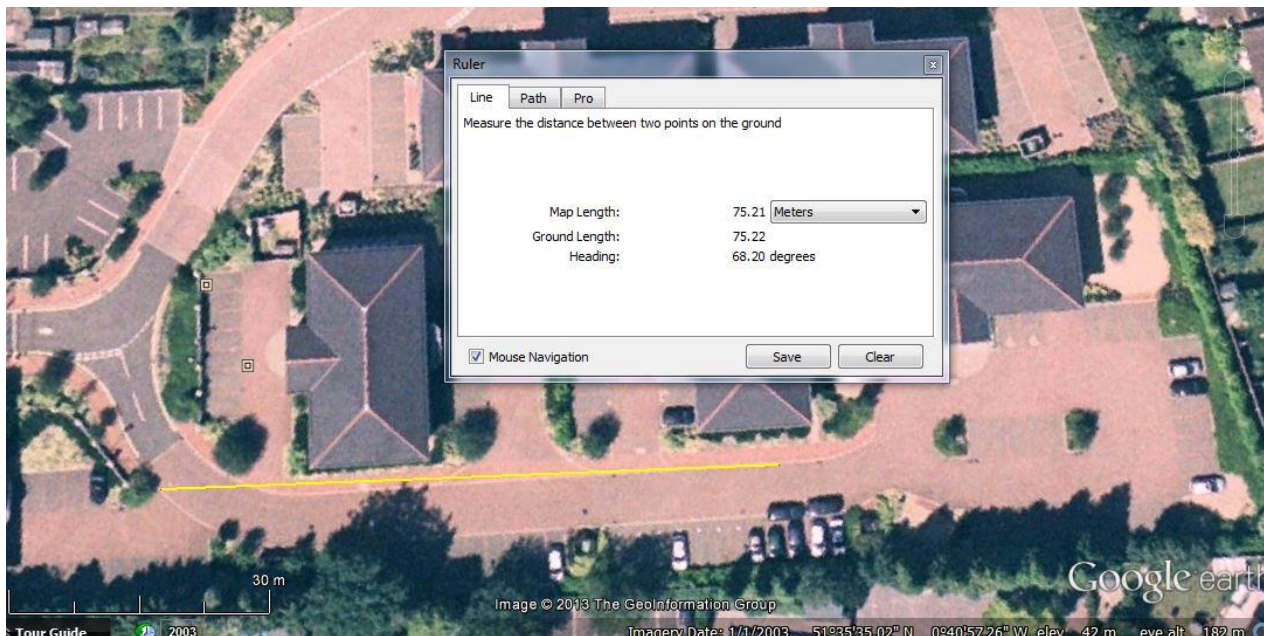
*Table 1: BL600 Range Test results*

iPhone	iPad	Nordic Dongle	Texas Instruments dongle
110 meters	128 meters	128 meters	75 meters

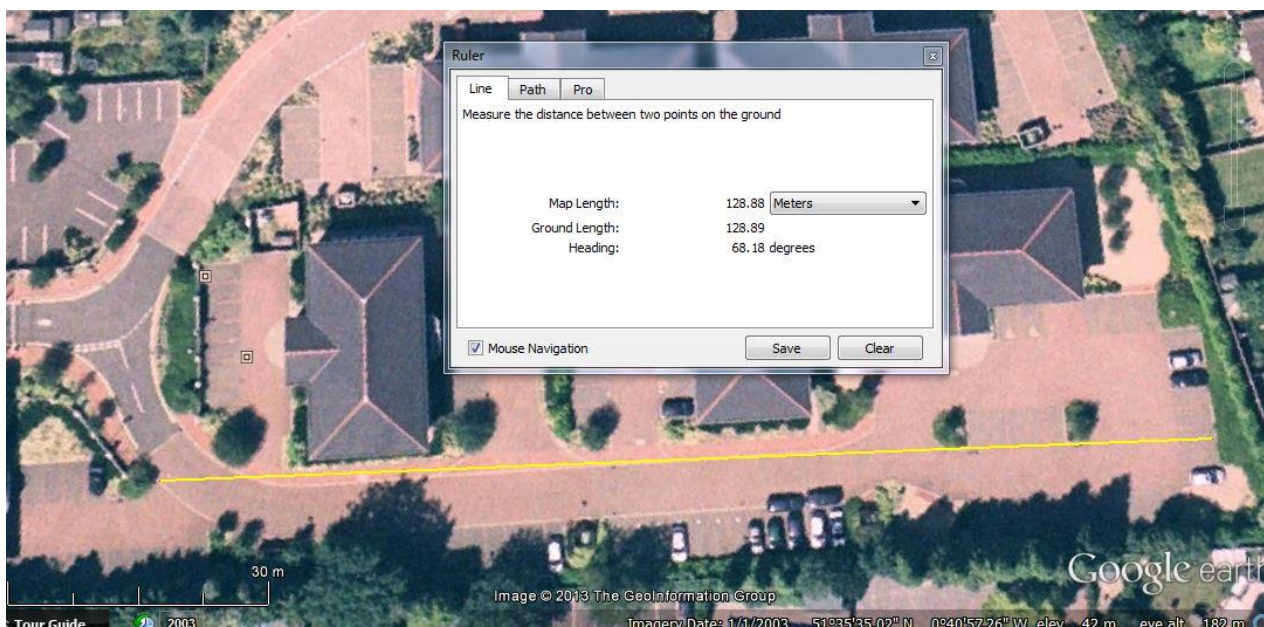
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Maps of the achieved ranges are shown in [Figure 1](#) through [Figure 4](#).



*Figure 1: Range achieved with TI Bluetooth dongle*



*Figure 2: Range achieved with iPad*

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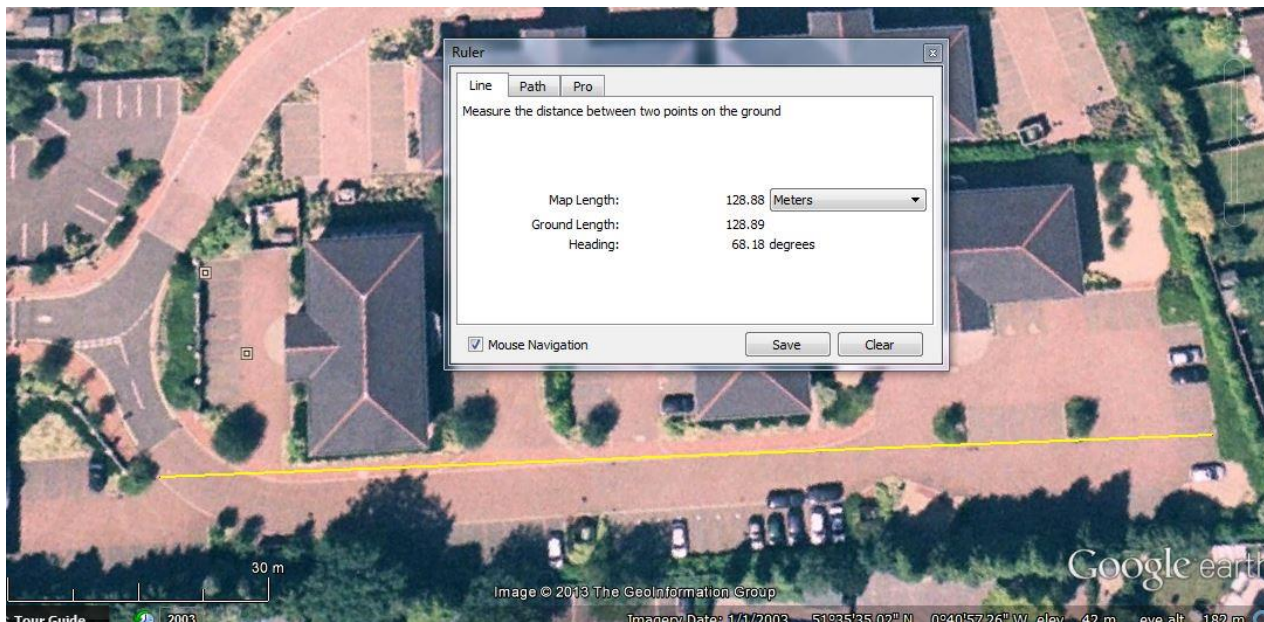


Figure 3: Range achieved with Nordic Bluetooth dongle

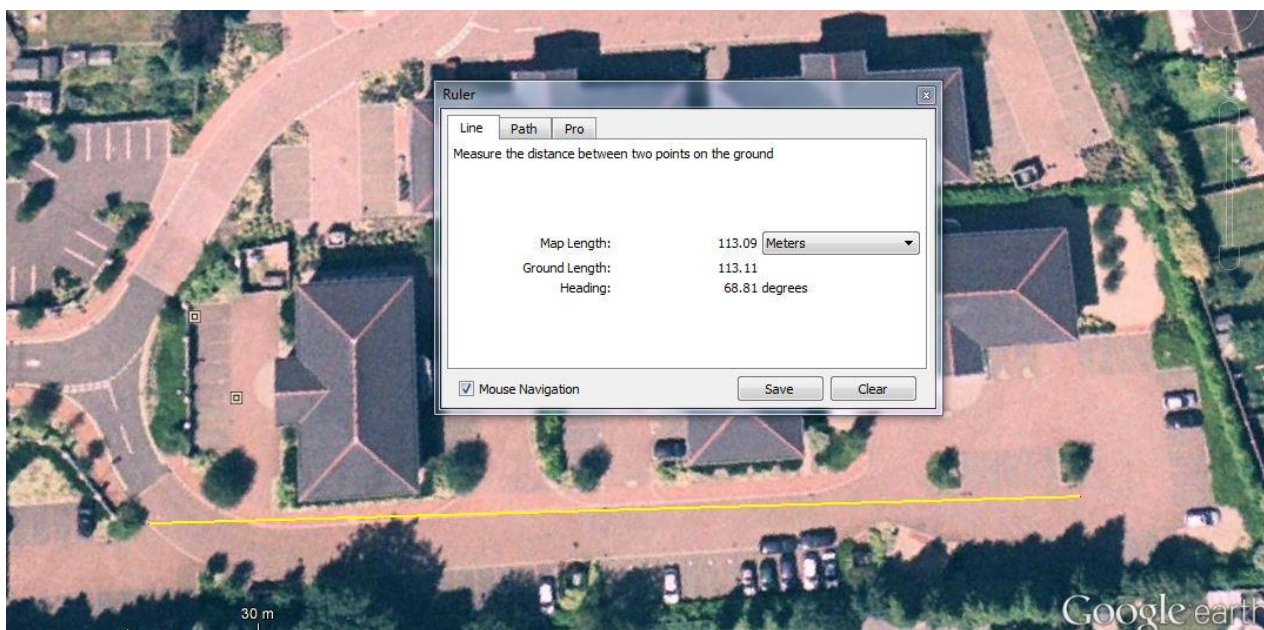


Figure 4: Range achieved with iPhone

## CONCLUSION

The conditions of this test were favourable particularly considering that line of sight was maintained for the range test. The most adverse condition was the likely presence of numerous Wi-Fi networks in the area. Actual results for many applications will vary. However, this demonstrates that it is possible to maintain a range up to 128 meters, far greater than the range of most Bluetooth applications today.

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### ADDITIONAL INFORMATION

Documentation, product information, and software downloads are available from the Embedded Wireless Solutions Support Center: [https://laird-ews-support.desk.com/?b\\_id=1945#docs](https://laird-ews-support.desk.com/?b_id=1945#docs)

Product information can also be accessed from the BL600 product page on the Laird website: <http://www.lairdtech.com/products/bl600-series>

### REVISION HISTORY

Revision	Date	Description	Approved By
1.0	08 Oct 2013	Initial Release	Jonathan Kaye
1.1	12 Jan 2015	Updated <i>Additional Information</i> links	Sue White