# BT510 Tilt Sensor (tiltad.py)

# Overview

This page provides some details regarding the advertisement format used by the tiltad.py sample designed to run on Canvas firmware on the Sentrius BT510 sensor.

# Advertising Format

Here is an example of a raw byte array containing a BLE advertisement from a BT510 running tiltad.py:  
02 01 06 0B 09 42 54 35 31 30 2D 43 34 36 41 0F FF 77 00 C9 00 00 02 00 FF 00 40 F6 3C 00 67 DC

The advertisement contains 3 primary "Length-Tag-Value" (LTV) segments, one after another:

**Advertising Flags**  
Len Tag Value  
02 01 06

**Device Name**  
Len Tag Value  
0B 09 42 54 35 31 30 2D 43 34 36 41

**Manufacturer Specific Data**  
Len Tag Value  
0F FF 77 00 C9 00 00 02 00 FF 00 40 F6 3C 00 67 DC

This portion of the advertisement is where the sensor data is stored.

Sensor data is decoded as follows:

77 00 - Company ID for the Manufacturer Specific ad data.

C9 00 - Protocol ID (16 bit) indicating the format of the bytes to follow

02 00 - Raw Accelerometer X axis data (signed 16 bit value)

FF 00 - Raw Accelerometer Y axis data (signed 16 bit value)

40 F6 - Raw Accelerometer Z axis data (signed 16 bit value)

3C - 8 bit packet counter, increments each time ad data is updated

00 - Status Flags. This is an 8-bit value where several bits are defined to indicate the status of various sensors on the BT510.

**Bit 0x01**: If 0, indicates battery OK. If 1, indicates battery LOW  
**Bit 0x02**: If 0, indicates magnet not present. If 1, indicates magnet detected  
**Bit 0x04**: If 0, the button is not being pressed. If 1, the button is being pressed

67 DC - Temperature data (16-bit raw temp sample taken from the internal I2C SiLabs Si7055 temperature sensor). These bytes can be converted to degrees Celsius with the formula found in the Si7055 Datasheet:

