

BLE TAG 1600 User Manual

BT1600

Connected Services Driver ID Tag

BLE tag

A BLE tag is standalone battery powered device. A vehicle can have more than one tags linked to it. Proposal is to keep placeholder for up to five tag addresses in IVU memory. Public/Static address (mac) for any BLE device is 12bytes long.

Expectations from BLE tag

- When awake, tag must transmit its address every second.
- It must not change its address.
- It may only start broadcasting for a duration of time if movement detected. (Like lifting key etc.)
- It should not expect any intentional trigger from user to start broadcasting. It may stop broadcasting if not moved for few minutes (say 30mins).
- Must have a reasonable battery life (12Months+).
- Should not accept any incoming connection requests that may prevent it broadcasting.
- Must have reasonable transmitting power to be able to be detected by TN475/TN1600 for various possible installation locations.

Current Tag:

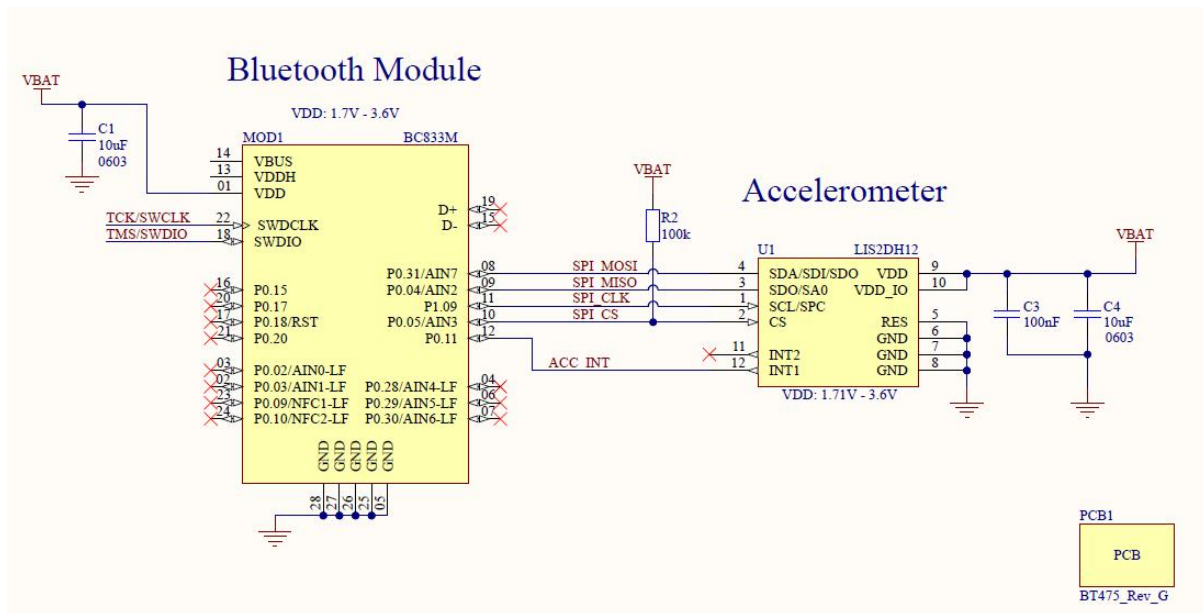
- SOC: Nordic nrf52833
- Motion Sensor: ST LIS2DH12
- Transmit Power -12dB.
- Advertisement frequency: 1000ms
- Power Consumption:
 - up to 70mA (during broadcast)
 - below 6uA (during sleep)
- Battery Type: CR2032

Above expectations are same for next variant.

Electronics Expectations:

NRF52833 soc should be connected to accelerometer vis SPI interface as shown in schematic below. Only one 100K pull up resistor required on CS line. No resistors required on data and clock lines.

There must be test points for SWCLK, SWDIO, GND and VBAT.



On next variant, there should be provision for LED on one of the pins. A protection diode can be added to prevent wrong polarity damage.

Also, electronics can be covered via a tin to prevent EM interference and damage during battery replacement.

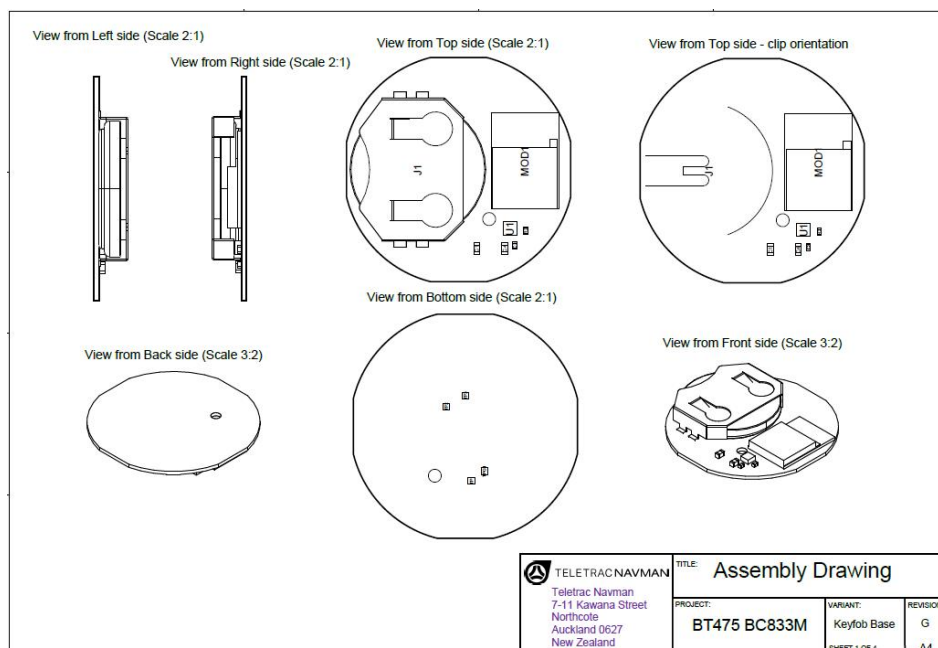
Mechanical Expectations:

PCB thickness: 1mm or more

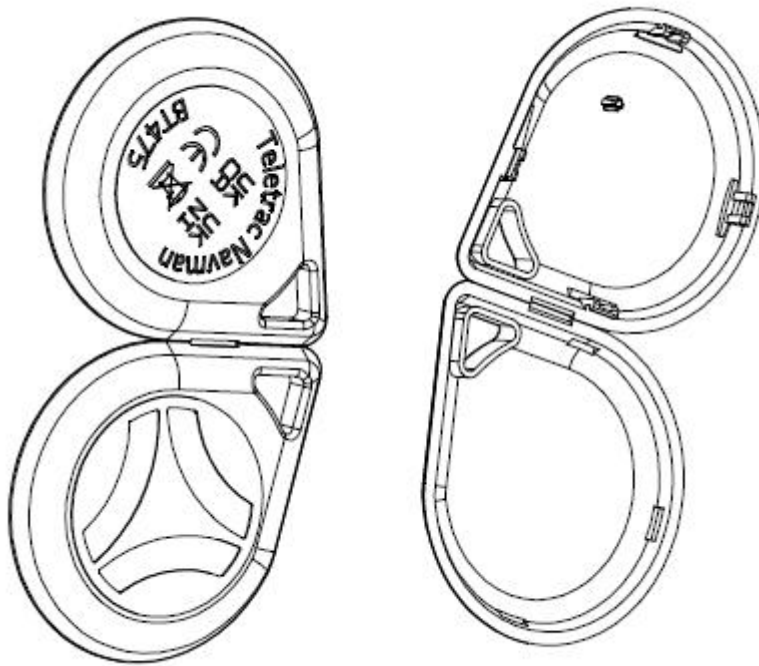
Battery cradle with pressure point/s.

Dust proof and water-resistant housing.

Example PCB:



Housing:



From next variant expectation is to improve upon housing in terms for dust and water resistance. Maybe having some O-ring type solution there two plastics meet.

The plastic should meet an automotive standard and be scratch resistant and available in various colours, should the need require.

The plastics tooling should be made in such a way that we can remove the centre and replace with a manufacturer's logo (as we can currently)

It should snap together better than the current design, feel better quality to the touch and be easier to open when replacing the battery.

The battery cradle and -ve contact should be strong enough so as not to break away from the PCB when a battery is being replaced or if the tag is dropped from a reasonable height.

Regulatory Conformance

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC RF Radiation Exposure Statement Caution:

To maintain compliance with the FCC's RF exposure guidelines, place the product at least 20cm from nearby persons.

EU

The simplified EU Declaration of Conformity referred to in Article 10(9) of Directive 2014/53/EU is hereby provided as follows:

Name of Manufacturer: [Positioning Universal Inc]

Address of Manufacturer: [4660 La Jolla Village Drive, Suite 1100, San Diego, CA92122]

Declares that the radio equipment type: [BT1600]

is in compliance with Directive 2014/53/EU (Radio Equipment Directive).

The full text of the EU Declaration of Conformity can be found at the following internet address:
[Positioning Universal](#).

The description of accessories and components, including software, which allow the radio equipment to operate as intended, can be obtained in the full text of the EU declaration of conformity at the following internet address: [Positioning Universal](#).

Product information

Bluetooth radio specifications:

Operating frequency:2402MHz-2480MHz

RF Power:6.86 dBm (EIRP)

UK

The simplified UK Declaration of Conformity referred to in Regulation 6 of the UK Radio Equipment Regulations 2017 (SI 2017/1206) is hereby provided as follows:

Name of Manufacturer: [Positioning Universal Inc]

Address of Manufacturer: [4660 La Jolla Village Drive, Suite 1100, San Diego, CA92122]

Declares that the radio equipment type: [BT1600]

is in compliance with the UK Radio Equipment Regulations 2017 (SI 2017/1206).

The full text of the UK Declaration of Conformity can be found at the following internet address:
[Positioning Universal](#).

The description of accessories and components, including software, which allow the radio equipment to operate as intended, can be obtained in the full text of the UK Declaration of Conformity at the following internet address: [Positioning Universal](#).

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