SPORTiiiis Operation Description

FCC ID: ZZNSP100
IC ID: 9896A-SP100
Model #: SP100

Background

SPORTiiiis is a zone-based head's up display system for triathletes. It employs an array of bicolour or tricolour LEDs in the proximity of the eye to display zones. The system also has a speaker to annunciate metrics and other functions.

The user has three methods of providing input to the device. Tapping either side of the main module, touching the button, and communicating via the 4iiii software program.

The system shall support any foot-pod, heart-rate monitor, bike speed/cadence sensor, bike power sensor and any other ANT+ sensor.

The system will be used on the body in indoor and outdoor environments. It will also be subjected to sweat.

Environmental

Operating temperature: -10C to + 50C
Storage temperature: -20C to + 70C

Electrical

Operating Battery life: 8h minimum.
Standby battery life: 1 month minimum. 3 months desired at full battery.
Shipping mode battery life: 1 year
Micro-B USB connector.

Charging: 5V wall adapter or USB port @78.5mA. (4.85V-5.25V) Approximately 1.5h charge time. There will be no charging adapter provided. The user shall use their desktop or laptop computer, or their own 5V USB wall wart/adapter.

RF communication:

2457MHz (ANT+), with support for full 2.4GHz ISM Band (2403MHz-2481MHz) for ANT FS and other functions as this communication shall use dynamic frequency selection when the particular channel is too crowded. 10m expected RF range. SPORTiiiis transmit communication has a primary channel at 2450MHz (like ANT FS) and employs dynamic frequency selection if the current channel used is crowded. It will switch to any of the following frequencies: 2450, 2403, 2407, 2415, 2420, 2425, 2429, 2434, 2440, 2445, 2449, 2454, 2460, 2465, 2470, 2475, 2480.

Gaussian Frequency Shift Keying (GFSK) modulation, 140usec transmission window, 144byte transmission packet, 300usec receive channel open window.
Single antenna configuration for Receive and Transmit. Wire antenna.

The unit can support up to 8 independent communication channels open at a time. This is defined as having several sensors/devices communicating with the SPORTiiiis module at different time periods on the same channel. Only one sensor/device can be communicated (Rx or Tx) at a time.

LED: The LED package shall be bicolour (RG) or tricolour (RGB) with preference to 4 pads (common cathode). The lens shall be diffused type. The brightness depends on the overmould material opacity and thickness. Overall, the LEDs must be visible when looking at the sun through sunglasses. The LEDs must also be visible in sunlight on regular glasses as well. The current estimation for minimum luminous intensity is 30mcd green and 60mcd for red and blue.

Accelerometer function: The accelerometer shall be able to detect single taps, double taps and triple taps from the left or right faces of the module.

Optical sensor function: The optical sensor shall have enough dynamic range to detect variations in ambient light. For example when going in and out of tree-shade. The system takes this feedback and adjusts the LED brightness accordingly.

Flash memory: The flash memory will mostly be used to hold voice clips. A 16Mb Flash memory chip will be employed.

Speaker: 10mm speaker with SPL greater than 90dB across the vocal range (50Hz-5kHz). Speaker max thickness 5mm, and have lead wires exiting the back of the speaker body.

This system is not expected to be audible at race pace on a bicycle. Wind noise on a bicycle is quite high (with or without a helmet), and head winds can render the system inaudible.

Colours: The product colours shall be non-metallic, RoHS compliant process black and Red Pantone 485C for logo and other markings. For small text, process white may be used. The boom shall be semi-transparent, tinted black. The opacity of the boom shall be enough to hide the internal components but not to compromise the LED brightness

Highlights on the device shall be in Red Pantone 485C, which includes: the speaker ring and the button cover. All other parts shall be process black.

Main module construction

One module half houses the battery. The other module half houses the PCB. All dimensions minimized as much as possible. Note: the PCB must be fixed to the mechanics. The two module halves shall be ultrasonically welded together. A glue shall be used to complete the seal around the weld-line, speaker, USB cover and boom base.

Sunglass attachment

The attachment shall use standard 0.1” tie-wraps to clasp onto frame arms, shall not scratch or mark sunglasses, and be solid and not have any play/movement.

Packaging

The contents within the packaging shall include: main unit, HRM soft strap, USB cable (0.5m), manual, tie-wraps (x10), attachment part(s), and potentially a foot pod or bike speed/cadence sensor.