

# ZZNV100 Operation Description

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FCC ID: ZZNV100  
IC ID: 9896A-V100  
Model #: V100  
Model Name: Viiiiva

## *Background*

The Viiiiva is a Heart Rate Monitor that connects your full suite of ANT+® sensors to your iOS® device such as an iPhone®. Viiiiva implements Liiiink connectivity between devices to turn your iPhone into a cycling computer or running monitor; delivering all your ANT+ data seamlessly and in real time using the free 4iiii App or many of the popular fitness Apps. Liiiink is an exclusive 4iiii Innovations feature and only available with Viiiiva.

The user has multiple methods of providing input to the device. These methods include tapping the device to wake up your iPhone or changing the settings within the Viiiiva using a phone app.

The system supports ANT+ sensors such as foot-pods, bike speed/cadence, and bike power meters.

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: 200h minimum. 300h-365h desired.  
Standby battery life: 1 year minimum. 1.5 – 2 years desired at full battery.  
Battery type: CR2032 coin cell lithium battery

## *RF communication*

The V100 implements two radios on a PCB with one antenna. The two radios implement ANT wireless and Multi-protocol Bluetooth low energy (BTLE) wireless.

Both radios use 4dBm transmit drive (2.5mW). Frequency deviation is defined as the channel bandwidth about the carrier frequency:  $\pm 170\text{kHz}$ . The modulation used is Gaussian Frequency Shift Keying (GFSK).

The unit can support up to 8 independent ANT communication channels open at a time. Each channel can be configured to a different purpose including ANT+ transmitter (Tx), or ANT+ receiver (Rx), and ANT-FS. Channels are shared with the time division multiple access (TDMA) scheme.

The Tx and Rx frequency used by ANT+ is 2457MHz. ANT-FS uses the frequency 2450MHz for reception at 32bps. For data transfer, the frequency switches to anywhere on the 2.4GHz ISM Band (2403MHz-2481MHz) at rates up to 20kbps.

The BTLE uses a variant of the frequency hopping spread spectrum (FHSS) scheme. Therefore the radio maintains one RF link with a single device at multiple frequencies. During advertising mode the frequencies used are 2402 MHz, 2426MHz, and 2480MHz. The maximum data rate during advertising is 8kbps. During data transfer the frequencies used are the even multiples of 2MHz from 2402MHz to 2480MHz. The maximum data rate during data transfer is 21.280kbps. Dynamic frequency selection is employed if the current channel used is crowded. It will switch to any of the other data transfer frequencies.

### *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. The accelerometer may not require calibration, but requires verification after ultrasonic welding.

### *Flash memory*

The flash memory will mostly be used to hold workout session files (.fit). The memory will consist of 2x256kB of memory.

### *Colours*

The product colours shall be non-metallic, RoHS compliant process black and Red PMS485C for logo and other markings. For small text, process white may be used. Highlight text shall be in Red PMS485C. Text may be laser etched.

### *Main module construction*

The Viiiiva plastics consist of two half modules to encase the PCB. The battery door will be removable with a coin another coin cell battery. All dimensions minimized as much as possible. The two module halves shall be ultrasonically welded together.

### *HRM soft strap*

The Viiiiva is worn by the user by snapping the main module into a soft fabric strap that is worn around the chest. The soft strap shall be comfortable and made out of an elastic fabric to minimize chance of chaffing.

### *Packaging*

The contents stored within the packaging shall include: main unit, HRM soft strap, and manual.