



SB100

StatIQ Band

User Manual



DISCLAIMER

Please read the following disclaimer carefully before using the StatIQ Band (the "Product"), produced by IONA Tech (the "Company"). By using the Product, you (the "Customer") acknowledge and agree to the terms and conditions outlined below:

The Product is designed to help prevent electrostatic discharge damage in industrial environments. However, it is important to note that the industrial environment is complex and can involve numerous variables beyond our control. Therefore, the Company cannot guarantee complete prevention of electrostatic discharge or damage to equipment or systems.

The Product is provided "as is" and without any warranties, express or implied. The Company makes no representations or warranties regarding the effectiveness or suitability of the Product for any specific application or environment. It is the Customer's responsibility to assess and determine the appropriateness of the Product for their particular needs.

While the Product is designed to function under normal operating conditions, there may be situations where it may fail to operate as intended without warning. This could result in equipment damage, malfunction, or other adverse effects. The Company shall not be held liable for any such damages or malfunctions.

It is crucial to follow all installation, operation, and maintenance instructions provided with the Product. Failure to do so may result in improper functioning and potential damage to equipment or systems. The Company shall not be responsible for any damage caused by improper use, installation, or maintenance of the Product.

The Product is not intended to replace or substitute for any safety measures, protocols, or regulations mandated by applicable laws or industry standards. The customer is responsible for ensuring compliance with all relevant safety guidelines and regulations in your industry.

To the maximum extent permitted by law, the Company disclaims all liability for any direct, indirect, incidental, consequential, special, or punitive damages arising out of or in connection with the use or inability to use the Product, even if the Company has been advised of the possibility of such damages.

The customer agrees to indemnify and hold the Company harmless from any claims, damages, liabilities, costs, or expenses (including attorneys' fees) arising out of or in connection with the use or misuse of the Product.

This disclaimer shall be governed by and construed in accordance with the laws of the state of Colorado in the USA. Any legal action or proceeding arising out of or relating to this disclaimer shall be brought exclusively in the courts of the state of Colorado in the USA.

By using the Product, the Customer acknowledges that they have read, understood, and agreed to the terms and conditions of this disclaimer. If the Customer does not agree with any part of this disclaimer, they should refrain from using the Product.

SB100 StatIQ Band: A Wearable Body Voltage Monitor

Table of Contents

1. Getting Started	3
2. Operation	4
3. IONA Tech App	7
4. Usage Details.....	10
5. Troubleshooting	15
6. Applications.....	18
7. Technical Specifications	19
8. Warranty Information	20
9. Regulatory and Safety Notices.....	21
10. Get in Touch	24

1. Getting Started

In the StatIQ Band box you will find

- The StatIQ Band, with hook-and-loop arm strap
- A Zero Disc for rapid, one-handed zeroing of the StatIQ Band
- A USB-C charging cable
- A Quickstart Guide
- A Calibration Certificate for your StatIQ Band

Charging

Before you begin using the StatIQ Band, make sure the battery is fully charged. To charge the battery:

1. Locate the USB-C charging port on the bottom edge of the device.
2. Plug the provided charging cable into any USB power source.
3. While charging, the Charging LED will be amber.
4. When the Band is fully charged, the charging LED will turn green.
5. The Band may take as long as an hour to charge, if completely flat.
6. The battery life of the Band in use is 12-16 hours.

Sensor Protection

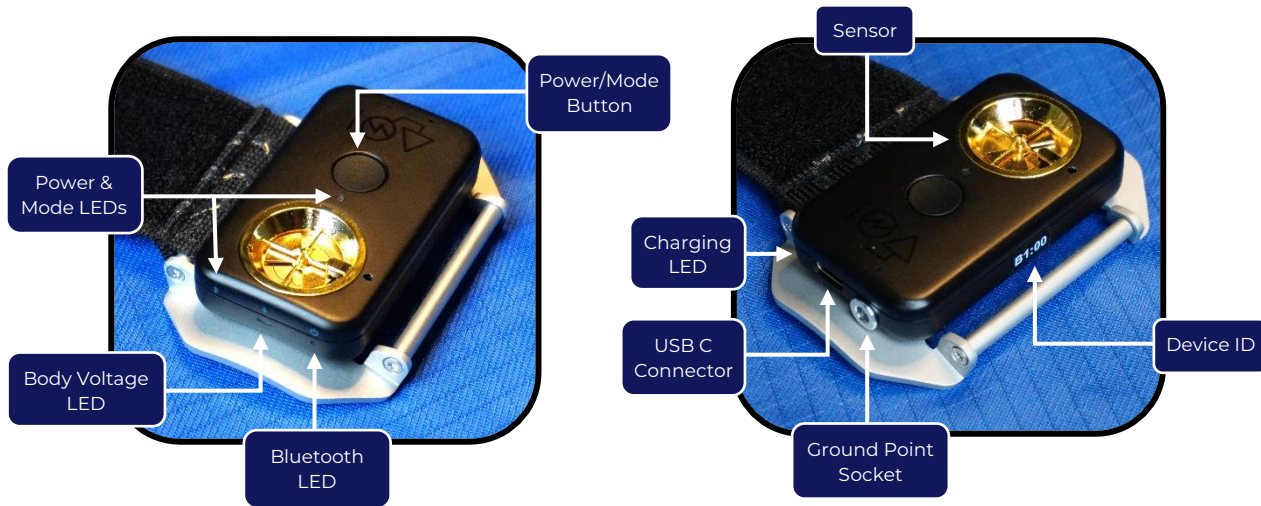


On delivery, the sensor will be covered by a removable sticker. Take this sticker off before using the device. Do not stick your fingers or other objects into the sensor port, ever. Doing so may lead to damage or contamination of the sensor, which is not covered under the warranty.



2. Operation

These pictures show the arrangement of the Band's indicators and button.



Wearing the StatIQ Band

Secure the StatIQ Band around your upper arm in the orientation shown, ensuring that the sensor is unobscured and **pointed away from your body**. The band should be as high up your arm as possible.

Make sure to wear conductive or static dissipative clothing such as an ESD rated smock. Synthetic clothing will hold localized charge that results in an offset in the voltage measurement and undetected ESD events.

Ensure that you can see the three LEDs on the upper edge of the device (the Mode, Body Voltage and Bluetooth LEDs), and that the gold sensor is situated above the Power/ Mode button and the IONA logo.

Fasten the hook-and-loop strap just tightly enough that the Band does not slip down your arm, but not so tight as to be uncomfortable.

You may need to stretch your sleeve towards your hand before tightening the strap, to ensure there are no folds of clothing covering the sensor.



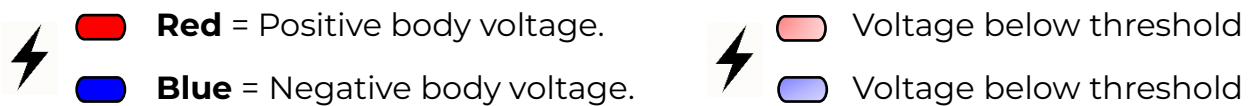
Turning the StatIQ Band ON

Hold the Power/Mode button until the StatIQ Band turns ON. A similar press will turn the StatIQ Band OFF.

The field mill sensor will begin spinning and the device is now measuring the local electric field. If secured to your arm, this measurement represents an accurate measure of your body voltage.

The Body Voltage LED indicates whether you are charged positive (red) or negative (blue) and its brightness indicates the measured voltage relative to the alarm threshold (discussed later).

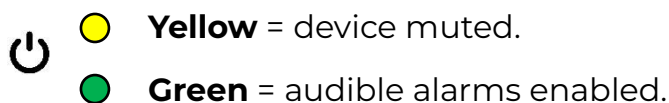
Body voltage LED:



Changing Alarm Modes

A short press of the Power/Mode Button will switch the band between the Muted and Audible modes.

Power/Mode LED:



The Power/Mode LED is visible both on the top edge of the StatIQ Band as well as on the lid next to the Power/Mode Button.

Audible Alarms

Constant alarm = body voltage past threshold (only if audible alarms enabled)

Three quick beeps = ESD event detected (only if audible alarms and ESD Event Detection enabled).

Single beep with Orange Power/Mode LED flash = low battery.

Four beeps with Red Power/Mode LED flash = empty battery, device powers off.

Continuous quick beeps with Red Power/Mode LED flash = shutter malfunction (see Troubleshooting section).

Default Settings

The StatIQ Band is intended to be usable out of the box, with no configuration necessary. It is calibrated and zeroed in production. The default settings are:

Audible Alarms – muted (to be changed by pushing the Power/Mode button)

Alarm Threshold – $\pm 1000V$

Alarm Volume – 50%

ESD Event Detection – Enabled

3. IONA Tech App





Download the **IONA Tech App** from the App Store or Google Play Store to visualize the measured voltage data, change device parameters, and more.

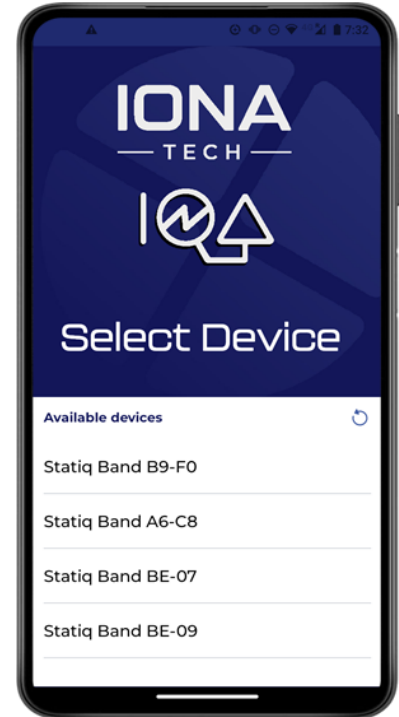
Pairing a Device

When you start the app, the following screen appears. Select the Device that matches the address printed on the label on the side of your StatIQ Band.

Note that when a device is paired with one app, it cannot at the same time pair with another app on another phone or PC.

The Bluetooth LED on the top edge of the StatIQ Band will illuminate blue when the device is connected to an app.

  StatIQ Band paired with app



StatIQ Band Data

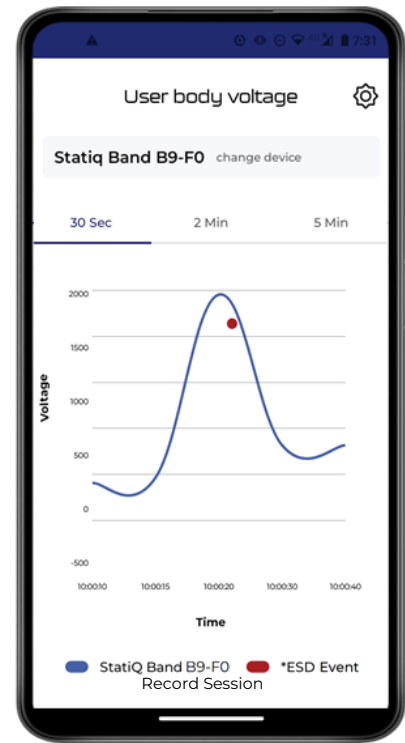
Once you have paired with a device, the app will display a real time graph of the voltage and events from that device.

ESD Events will display on the graph as red dots, where the position on the y-axis represents the voltage change of the discharge.

Change the time scale above the graph to assess various lengths of voltage data.

Select 'Record Session' to generate a CSV file of the voltage and ESD data from the session. The file will be generated in the Documents folder of your phone:

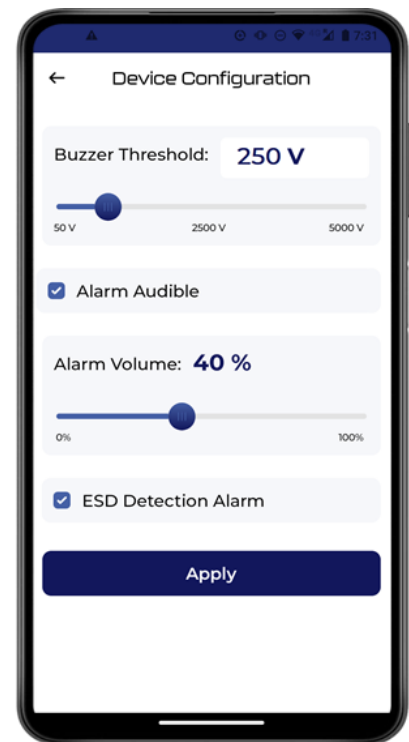
1. When you press 'Save Recording'
2. If you close the connection by returning to the Device List screen
3. If the connection is lost because the StatIQ Band is turned off or if it goes out of range.



Device Configuration

Select the Gear icon on the previous page to adjust the following options:

1. **Voltage Threshold** – the body voltage at which the alarm will sound (the level is the same for positive and negative voltage deviations).
2. **Alarms Audible** – checking this box changes the device mode from Muted to Audible. The mode can still also be changed by the Power/Mode button on the device.
3. **Alarm Volume** – adjusts the alarm volume.
4. **ESD Event Detection** – checking this box ensures that the StatIQ Band detects ESD discharge events. Note that an audible alarm will sound for ESD events only if Alarms are set to Audible.



Unpairing a Device

Note that the Band will remain paired with the app, even if that app is not open on the home screen of the phone. The Band can be unpaired by clicking “change device” or pressing the back arrow from the voltage screen. A confirmation dialog will appear before the connection is closed.

IONA Tech Browser App

All the functionality of the mobile apps can be achieved on a Chrome browser from any computer equipped with a Bluetooth radio. Simply direct your Chrome browser to:

<https://app.iona.tech/>

4. Usage Details

Clothing Requirements

The StatIQ Band measures the local charge density on the surface where it is placed. If that surface is an electrical conductor, it is possible to determine the voltage of the conductor. Therefore, it is important to wear conductive clothing under the StatIQ Band, such as an ESD rated shirt or smock. If synthetic fabrics such as nylon or polyester are used, the local charge on the fabric near the Band will register as a significant voltage offset even when the user is grounded. Moreover, ESD events may be missed by the StatIQ Band. If wearing ESD clothing is not an option, garments made of pure cotton can provide reasonable results.

Do Not Obscure the Sensor

It is important for the StatIQ Band's operation that the sensor is pointing outward from the body and has a clear "view". If you place a hand or other appendage over the sensor, then the sensor's "view" is blocked and it will not record the correct voltage. This is why the upper arm is an ideal place for the Band. Placing it on the chest or wrist, for example, may lead to the sensor being shielded when the forearm is moved in front of the chest. If you wear a short-sleeved shirt, make certain that the sleeve cannot flap over the IONA Band by tucking the sleeve partly under the backplate of the Band.



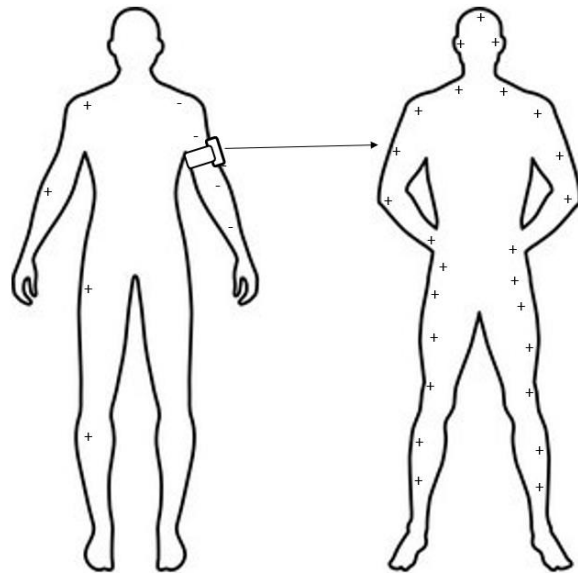
Ground Reference Point

The StatIQ Band contains a standard banana plug ground reference point. This ferrule can be used to ensure that the enclosure of the StatIQ Band is electrically connected to the object on which it is measuring charge. For example, a standard wrist strap may be plugged into the Band's banana socket to reduce (but not eliminate) errors caused by electrically insulating clothing.



Induced Charge and Fields

The StatIQ Band measures the electric charge on the wearer's body. In an isolated environment, this charge only depends on the body voltage. However, if there is another highly charged object near the user, this will induce a charge onto the wearer. Even if the user is grounded, the adjacent charge will induce a field on the wearer and the StatIQ Band will detect this. Just remember that a non-zero voltage measurement from the StatIQ Band always indicates the presence of charge on the user, which should be considered an ESD concern.

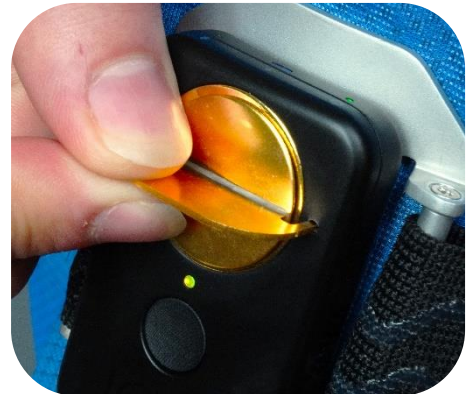


Zeroing the Sensor

The StatIQ Band is calibrated and zeroed at the factory, but the Band may drift from zero after a long period of use, or due to large temperature changes. For the most accurate performance, it should be zeroed periodically.



1. Place the included zero disc on top of the StatIQ Band's sensor so that it fits into the sensor ring and its point fits into the zero disc opening next to the sensor.
2. Press gently on the disc until you hear two beeps and the Power/Mode LED flashes cyan twice.
3. Lift the zero disc gently away from the sensor.



The unit is now zeroed. If the StatIQ Band continues to produce non-zero readings, it is likely an indication that there is errant charge present in the environment.

Using the Band as An Electrostatic Field Meter

The StatIQ Band is calibrated to sense the voltage of a typical human body while strapped to the user's upper arm. It is possible to use the StatIQ Band as a conventional electrostatic field meter. Dividing the voltage reading [in V] by the body factor coefficient 0.295 yields the local electric field [in V/m].

Over-The-Air Updates

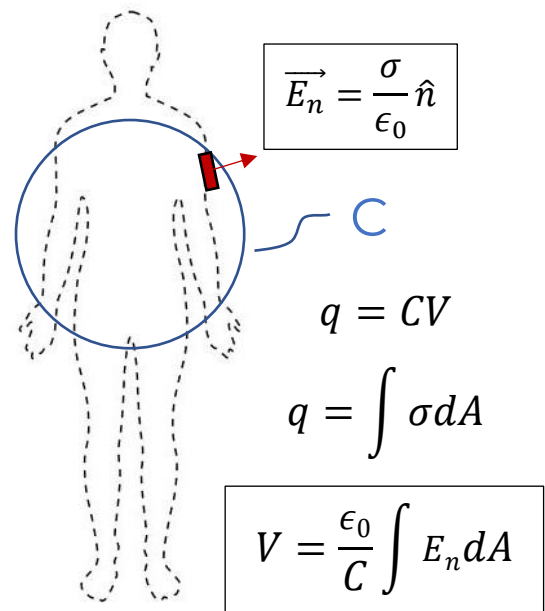
You may experience periodic Over the Air updates to the firmware of your StatIQ Band. This will occur automatically via the mobile app, where you will be alerted of the update. If you do not wish to receive OTA Updates on your devices, please reach out to support@iona.tech.

Calibration

It is recommended that your StatIQ Band is calibrated by the manufacturer or participating distributors after 1 year or 1,000 hours of continuous operation, whichever comes first. During calibration, the device will be characterized for sensor noise and drift to ensure they are within acceptable bounds, and the gain and offset of the device will be set to agree with a known applied electric field. Please reach out to support@iona.tech to schedule a calibration of StatIQ Band.

How it works:

1. The human body has some intrinsic self-capacitance C , which is typically around 200pF. If a body is not grounded, it may accumulate some electric charge Q . The resulting body voltage will be $V = Q/C$.
2. The charge Q distributes itself on the surface area A of the body, with an average charge density σ . According to Gauss' Law, this charge will generate an electric field E which is perpendicular to the body surface and proportional to the charge density σ .
3. The StatIQ Band measures this electric field E using a patented miniature DC electric field sensor. Using estimated values of A and C , the body voltage V can be calculated from the field measurement E .
4. The SB100 StatIQ Band operates continuously, sampling the E field at 1200 times per second. This allows the band to identify electrostatic discharges as low as 100V. It is these low voltage ESD



events that are most concerning in a manufacturing environment, as they go unnoticed and can cause latent damage to electronics.

5. The StatIQ Band transfers voltage data over Bluetooth Low Energy to mobile apps and other back-end services at 80Hz.

5. Troubleshooting

The Band Does Not Start Up

1. Check that the Band is charged – plug the Band into any USB charging point using the supplied USB-C cable. If the StatIQ Band is charging, the Charging LED will be amber. When the Band is fully charged, the charging LED will turn green. Charging time from flat to fully charged is 1 hour. The battery life of the Band in use is 12-16 hours.
2. If the Band is fully charged and holding the Mode & Power Button down will not turn it on, perform a Factory Reset (see below).

The Band Gives Erratic Readings

Erratic readings may be caused by several issues:

1. The Band is not being properly worn.
 - a. The Band is not facing outward, or not high up on the arm.
 - b. The sensor is obscured by a body part or an article of clothing.
 - c. The user is wearing the Band over a shirt or garment with a high susceptibility to static charging, e.g. a nylon, polyester or other synthetic fabric.
 - d. The user is sitting or standing in a position where the sensor is facing another person, object or surface which has a high level of static charge.
2. The sensor or shutter are contaminated.
 - a. Turn the band off and check carefully for hairs or fibers which may have gotten caught in the sensor shutter, or on the sensor surface. These hairs may be removed carefully using a pair of tweezers.

- b. Check for dust or loose dirt on the shutter or sensor surface. It may be possible to clear this with a blast of clean air from a compressed air source.
- c. The shutter or sensor surface has a fingerprint or smudge of dirt on it. It may be possible to clean this with a lint free Q-tip and alcohol. You should try to keep dirt and grease from spreading under the sensor shutter.

If none of the above remedies improve the readings, your StatIQ Band may need to be returned to IONA Tech or to a certified reseller for calibration and/or repair. Contact support@iona.tech for details.

The Band Beeps Continuously with Power/Mode LED Flashing Red

If the sensor's shutter is malfunctioning, the Band will give a continuous series of single beeps, and the Mode LED will flash red. The two likely causes are that the shutter is jammed and unable to rotate, or the shutter has become detached.

1. Check for a foreign object that is blocking the shutter rotation. This could be a hair or fiber that has become caught in the shutter motor shaft and has jammed it. If you can do so, remove the blockage. Be careful not to scratch either the shutter or the sensor surface. These can both be cleaned with a Q-tip and alcohol if they are dirty, or compressed air if they are dusty.
2. If there is no obvious reason why the shutter is jammed or malfunctioning, return the device to IONA Tech for repair.

The Band will not Pair with an App

Check that the Band is not already paired with another app. If it is paired, the Bluetooth LED on the end face of the Band will be illuminated. Note that the Band will remain paired with an app, even if that app is not open on the home screen of the phone. The Band can be unpaired by clicking “change device” on the smartphone app, or “disconnect” on the browser app. Check that the Bluetooth LED goes off when you unpair the device. If it is not clear which app is connected to the StatIQ Band, you may close the connection by turning the Band off and on again.

Permissions are locked

The following permission locks are built into the firmware

1. Mode button lock – pressing the button will not change the alarm mode on the device.
2. Mobile settings lock – the settings can not be changed from the mobile app.

Navigating to the settings page of the mobile app will identify these locks to the user if enabled. Please reach out to support@iona.tech if you would like to enable or change these permission locks.

Factory Reset

If the StatIQ Band appears to be charged but is not functioning, it may be fixed by a Factory Reset. Insert the end of a bent open paperclip or other sharp item into the small hole below the IONA Tech logo on the face of the device. You will feel a button internally be depressed. **Wait at least 10 seconds** after resetting the device before attempting to start it again.

6. Applications

Below are a few intended use cases of the StatIQ Band. We expect the technology to be useful in many more applications, please let us know how you use your StatIQ Bands!

Validation of existing ESD mitigation products

1. Grounded flooring and footwear can be tested to much higher fidelity with the StatIQ Band compared to compliance validations with grounded walking test equipment. The auditor is free to move about the entire ESD Protected Area (EPA) and collect data for analysis via the mobile app. This aids in the identification of ESD hot spot locations.
2. The StatIQ Band can be used as a continuous monitor for heel strap solutions to ensure that mobile personnel are properly grounded at all times. They can also replace continuous wrist strap monitors.
3. The presence of charged insulated materials that exist in the EPA will be identified by the StatIQ Band because the charged objects or surfaces will induce a charge on the person wearing the StatIQ Band even if they are grounded.

Protection against ignition events in hazardous environments.

Warehouses and factories that contain flammable or explosive substances often cover a large area and it is therefore difficult to protect the whole environment against ESD. Wearing the StatIQ Band with appropriate voltage thresholds below expected ignition energies will ensure that employees are alerted when they are in danger of igniting substances through electrostatic shocks.

IONA Tech is actively pursuing IEC 60079 certifications for the StatIQ Band.

Tether free ESD protection in R&D environments

In lower consequence electronics development environments, it is possible to rely on the StatIQ Band for ESD mitigation while moving around between workstations. If there is an exposed ground point available such as a grounded wrist strap situated on the desk, the user can ground themselves when the voltage threshold alarm sounds, prior to handling sensitive electronics, and ensure ESD compliance. If there is a 10M Ω or greater resistance in series with the ground point (such as in a wrist strap), the ESD Event detection on the StatIQ Band will not be triggered.

7. Technical Specifications

Description	Min.	Typ.	Max.	Units
Mass (with backplate & strap)	-	92	-	g
Mass (sensor unit)	-	44	-	g
Size (with backplate) LxWxH	-	88x62x25	-	mm
Size (sensor unit) LxWxH	-	75x43x18	-	mm
Measurement Range	-	±20	-	kV
Noise ¹	5	8	10	V _{rms}
Drift ¹	0	5	20	V/hr
Sampling Rate	-	1200	-	Hz
Output Bandwidth	DC	-	25	Hz
Voltage Alarm Resolution	-	1	-	V
ESD Event Resolution	-	10	-	V
ESD Event Magnitude (ΔV)	100	-	-	V
ESD Discharge Threshold (dV/dt)	2	5	-	kV/s
Battery Life ²	14	16	18	hours
BLE Range ³	10	25	50	m

¹ Sensor voltage is scaled using estimates of human body self-capacitance and area. Individual human bodies can vary by up to 10% from the average values, according to mass and BMI of the individual, but will remain constant for a given person over timescales of days.

² Battery life may be affected by the frequency and volume of audible alarms.

³ BLE range in use is dependent on locality, as e.g., steel building walls and structures can reduce range significantly.

8. Warranty Information

IONA Tech Standard Limited Warranty

IONA Tech warrants products manufactured and sold by IONA Tech to be free from defects in materials and workmanship for the periods listed in the tables on the following pages. This warranty is expressly limited to the original owner who purchases the equipment directly from IONA Tech or from an authorized IONA Tech Distributor.

To maintain this limited warranty, the product must be operated, calibrated, and maintained in accordance with the Operation and Maintenance Manual supplied with the product. Abuse, mechanical damage, alteration, or repairs not made in accordance with the Operation and Maintenance Manual void the IONA Tech Standard Limited Warranty.

The obligation of IONA Tech under this limited warranty is limited to the repair or replacement of components deemed by the IONA Tech Technical Support Center to have been defective under the scope of this Standard Limited Warranty. To receive consideration for warranty repair or replacement, the product must be returned to an IONA Tech Authorized Service Partner or to IONA Tech in Telluride, Colorado, USA, with transportation and shipping charges prepaid. If the product is being returned to IONA Tech, it is necessary to obtain a return authorization number (RMA) from IONA Tech prior to shipment.

This limited warranty is expressly in lieu of any and all representations, express or implied, including but not limited to the warranty of fitness for a particular purpose. IONA Tech will not be liable for loss or damage of any kind connected to the use of its products or failure of its products to function or operate properly.

IONA Tech Standard Limited Warranty covers the instrument and its critical components as follows:

Instruments	Warranty Period
StatIQ Band	One year from date of original purchase

9. Regulatory and Safety Notices

FCC compliance statement and warning



Model: SB100
FCC ID: XPYNINAB30
Unique Identifier: 2XPYNINAB30

Responsible Party – U.S. Contact Information:
IONA Tech LLC
164 Society Dr. Unit O
Telluride, CO 81435
United States
<https://www.iona.tech/>

FCC Compliance Statement

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
2. This device must accept any interference, including interference that may cause undesired operation of the device.

FCC Warning

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.

This device meets the FCC and IC requirements for RF exposure in public or uncontrolled environments.

EU Declaration of Conformity



The SB100 StatIQ Band is in conformity with the relevant Union harmonization Legislation

Application of Council Directives

EMC	2014/30/EU
RoHS 3	2015/863/EU
Low Voltage Directive	2014/35/EU

Standards

EMC	BS EN IEC 61326-1:2021 – Basic environment
	BS EN 55011:2016+A2:2021 – Emissions
RoHS 3 Technical Documentation	BS EN IEC 63000:2018

Disposal Information

The StatIQ Band includes a rechargeable lithium-ion battery. Your municipality may have specific instructions on how to dispose of these, and other electronic components. We recommend contacting your local department of public works for more information on proper recycling of electronic components.

As a convenience, IONA Tech will recycle a used StatIQ Band on your behalf. Contact the Customer Success team at support@iona.tech to request a free shipping label to return your used StatIQ Band.

ROHS and REACH Document of Conformity

ROHS-3 (2015/863/EU) – Restriction of Hazardous Substances, bans the use of the following substances in electrical and electronic equipment:

Substances Restricted	Control Levels
Lead	0.1%/1000 ppm
Mercury	0.1%/1000ppm
Cadmium	75 ppm
Hexavalent Chromium	0.1%/1000ppm
Polybrominated biphenyls (flame retardant)	0.1%/1000ppm
Polybrominated diphenyl ether (flame retardant)	0.1%/1000ppm
Bis (2-ethyl hexyl) phthalate	0.1%/1000ppm
Butyl benzylphthalate	0.1%/1000ppm
Dibutyl Phthalates	0.1%/1000ppm
Diisobutyl Phthalates	0.1%/1000ppm

Based on information obtained from its suppliers IONA Tech certifies that all finished goods that are produced by IONA Tech are fully ROHS-3 compliant to the European Union (E.U.) RoHS Directive and that no IONA Tech products contain Substances of Very High Concern (SVHC) as listed by the European Chemicals Agency (ECHA) under the provisions of (EC) No. 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

10. Get in Touch

Getting help

Answers to commonly asked questions are available from our support center.

You can contact our technical support team Monday - Friday, 9 AM - 5 PM MT with questions or for help with your StatIQ Band.

Call or Text:

(844) 844-4662

(844) 844-IONA

General questions, product support and customer service:

support@iona.tech