



Improving Worker Safety with IoT Stress Monitors

//This device is useful for monitoring the safety of workers in the field where Wi-Fi access isn't available, but cellular is."

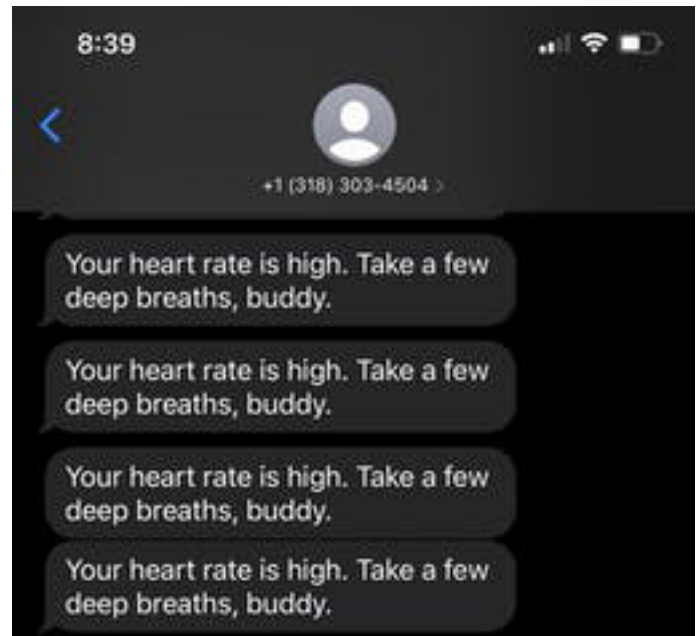


Brandon Satrom
VP of Developer Experience & Engineering
Blues Wireless

Instructions on GitHub: https://github.com/bsatrom/wfh_stress_monitor

People who work alone or in remote areas lack supervision or the ability to call for help when injury and illness occur, resulting in delays in emergency response. This wearable IoT stress monitor tracks individual health and environment data via Bluetooth and cellular, even in remote settings. A cloud-based dashboard is accessible remotely, tracks the data in real time, and sends automated alerts triggered by specific health events and environmental stimuli. To protect the sensitive health data it's transmitting, the Notecard integrates an STSAFE Secure Element for end-to-end data encryption.

When building an IoT device Proof of Concept (PoC) or prototype it's best to use a Blues Wireless Notecard System on a Module (SoM) because it's the quickest and most affordable way to add connectivity. Did you know with Blues Wireless you can go from unboxing the product, to sending arbitrary data over the global cellular network in less than 30 minutes? You can build a fully functional prototype of an IoT stress monitor for less than \$300, using only 5 hardware components.



Biometric and Environmental Monitoring

What if a wearable device could monitor worker safety with an automatic alert and response system based on changes in their vital signs or environment? This device is useful for monitoring workers in the field where Wi-Fi access isn't available, but cellular is. When atypical metrics are recorded on this device, an SMS alert system is triggered and the data is accessible via a cloud dashboard for remote monitored by team members. Using Blues Wireless Notecard, GPS coordinates are captured, allowing emergency responders to pinpoint an approximate location of the person in distress.

This is the best way to build a wearable IoT stress monitor prototype because it's built on one board and transmits data securely:

- Notecarrier-AF is a host board (called a Notecarrier) that has headers enabling use of any Feather-compatible device.
- Notecard is cellular and GPS-enabled device-to-cloud data-pump.
- Notehub.io routes data to your cloud.
- Notecard provides network connectivity available in 130 countries.
- Each Notecard includes 500MB of data accessible over a 10-year period.
- Notecard secures transactions without any provisioning challenges, using encrypted "off the internet" communication.

Behind the IoT Stress Monitor

If you're looking to get a prototype built from the group up in less than a day, this is the best project to follow. You can find the complete source code for the project at the GitHub repository linked below and complete project assembly instructions on Hackster.

GitHub: https://github.com/bsatrom/wfh_stress_monitor

Hackster: <https://www.hackster.io/brandonsatrom/serenity-now-build-your-own-bluetooth-wfh-stress-monitor-cc5fdb>

Price: \$262.90	Languages: JavaScript
Lines Of Code: 84	Python
Project Time: 4 Hours	HTML
	CSS

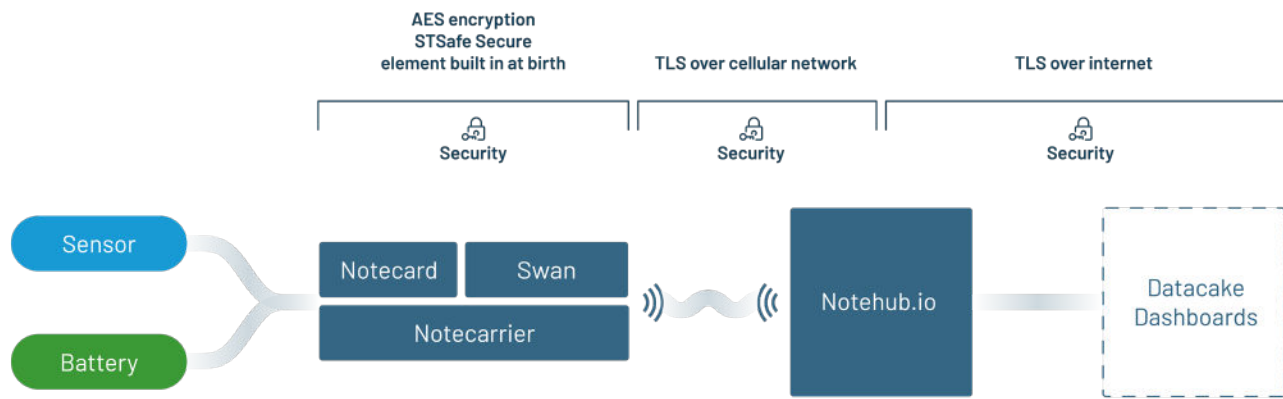


Hardware

- [Blues Wireless Feather Starter Kit:](#)
 - Blues Wireless Notecard SoM
 - Blues Wireless Notecarrier-AF
 - Blues Wireless Swan Development Board
- [Adafruit Feather Bluefruit LE Board](#)
- [Polar Verity Sense Heart Rate Monitor](#)

Software apps and online services

- [Blues Wireless Notehub.io](#)
- [Twilio SMS Messaging API](#)
- [Microsoft Azure](#)

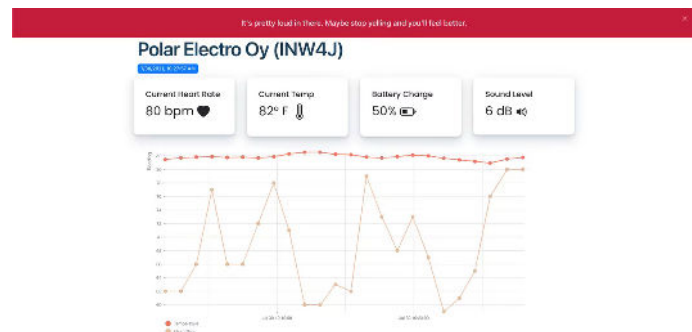


The main parts of the project are:

- Connecting your microcontroller and sensors
- Encrypting data
- Routing encrypted data to the cloud
- Decrypting data for storage in your cloud infrastructure
- Building your dashboard
- Establishing alert thresholds
- Sending alerts

How Blues Wireless Improves Biometric and Environmental Monitoring Device Builds

Working with biometric data and ensuring the device correctly reports metrics and observations requires a certain mastery of mathematical and biological topics. Getting that part right is crucial for the device to provide the intended value. We advise our customers to reduce the overall system complexity by using pre-built System on a Module (SoM) technology with zero-configuration provisioning for connectivity.



Blues Wireless is the simplest way to add connectivity to an IoT device. In 30 minutes, you can unbox the product and send your data over a global cellular network, with no configuration needed. Think of Blues Wireless like a snap-in connectivity layer that just works, letting you focus on the important, custom parts of the device.

In the image below, you'll see a left-to-right depiction of how sensor data moves from an edge device to a cloud application. Blues Wireless provides the infrastructure for bidirectional communication between edge devices and cloud endpoints via a combination of hardware

and software. On the hardware side, in the host device, Blues Wireless Notecard provides an internal endpoint for sensor data. Notecard securely transmits the sensor data to the customer's preferred cloud endpoint via Blues Wireless Notehub, an intermediary cloud application. Notehub provides protocol translation, transport security, data routing, device management, and device firmware update capability.

Get Started

To build your prototype, start with the Polar Verity Sense Heart Rate Monitor, a Bluetooth-enabled device to capture heart rate. Add the [Adafruit Feather nRF52840 Sense](#), a wireless sensor platform with Bluetooth, motion sensor, accelerometer, magnetometer, temperature, pressure, humidity, proximity, light, color, and gesture sensors, as well as a PDM microphone and sound sensor. And it supports CircuitPython, Arduino or C/C++ using the Nordic nRF SDK.

For cloud connectivity, use the [Blues Wireless Notecard](#), a cellular and GPS-enabled device-to-cloud data-pump that comes with 500 MB of prepaid cellular data usable for up to 10 years. For the fastest device build, plug the Notecard into a host board called the Notecarrier AF because it includes headers compatible with any Feather device.

Further, to get data where you want it, use Blues Wireless Notehub. Notehub is the cloud service for securely managing fleets of Notecards and routing Notecard-provided data to third-party cloud applications. Notehub allows for secure communications between edge devices and the cloud without certificate management or manual claiming of devices. With the Notecard/Notehub combination you are free to push data into your cloud application of choice so you can choose the best architecture and tools for your device build.

For technical support with the Blues Wireless Notecard, Notecarrier, or Notehub, please visit dev.blues.io.

Other Wearable Stress Monitor Applications

This device can be used to monitor health conditions of people as well as changes in their environment. Here are some other ideas for this device:

- Police, Emergency First Responders and Construction Workers can use this to detect oncoming vehicles.
- High-risk and solo remote workers like Wind Turbine Technicians or Wilderness Rangers.
- Air traffic control specialists, Warehouse workers, or people working overnight shifts.
- [Remote patient monitoring for outpatient cancer treatment](#)
- Event monitor for the elderly or adults with disabilities