Project Onyx Developer Guide

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Introduction

1.1 Project Source Code

1.1.1 Project Onyx Server Edition

The best way to operate your Volcano at home!

 `click here` to view the repository

1.1.2 Project Onyx Web App (SPA)

The most convenient and feature rich option to use the Volcano on the web. For a list of supported browser see the Supported Web Browsers section.

 `click here` to view the repository

1.1.3 Project Onyx Apple Watch Edition

A fun little experiment that is no longer supported. This has great potential to turn into an app for a portable vape.

 `click here` to view the repository

1.2 Volcano Version

All information in this document is under the context of Volcano firmware version V01.03.0 and Volcano BLE firmware version V01.00.00.00

Bluetooth Low Energy

2.1 Characteristics

Friendly name	Description	UUID
Turn Heat Off	Write a value of 0 to turn the heating element off	10110010-5354-4f52-5a26-4249434b454c
Turn Heat On	Write a value of 0 to turn the heating element on	1011000f-5354-4f52-5a26-4249434b454c
Turn Fan Off	Write a value of 0 to turn the fan off	10110014-5354-4f52-5a26-4249434b454c
Turn fan On	Write a value of 0 to turn the fan on	10110013-5354-4f52-5a26-4249434b454c
Heat/Fan Register	Stores the **state for heat** and **fan**. **Subscribe** to this characteristic to receive events when the state of the heating element or the fan changes	1010000c-5354-4f52-5a26-4249434b454c
Settings Register	Configure the Volcano's **Display While Cooling** and set the Volcano's display temperature to $^{\circ}F$ **or** $^{\circ}C$**. Subscribe** to this characteristic to receive events when the device changes between $^{\circ}F$ and $^{\circ}C$	1010000d-5354-4f52-5a26-4249434b454c

More Settings	Configure the Volcano to vibrate (pulse the fan) when it reaches it's target temperature. Write the mask $0x400$ converted to a 32bit byte array to turn this setting on. Write the mask $0x10000 + 0x400$ to turn this setting off. A bitwise 'and' resulting in a answer equal to 0 means this setting is on	1010000e-5354-4f52-5a26-4249434b454c
BLE Firmware	Read and decode the value to "utf-8" to get the Volcano's current Bluetooth firmware version	10100004-5354-4f52-5a26-4249434b454c
FirmwareVersion	Read and decode the value to "utf-8" to get the Volcano's current firmware version	10100003-5354-4f52-5a26-4249434b454c
Serial Number	Read, decode the value to "utf-8", and substring the first 8 characters to get the Volcano's serial number	10100008-5354-4f52-5a26-4249434b454c
Hours Of Operation	Read and convert the value to a UInt16. This is usually used with minutes of operation to get the full usage time	10110015-5354-4f52-5a26-4249434b454c
Minutes Of Operation	Read and convert the value to a UInt16. This is usually used with hours of operation to get the full usage time	10110016-5354-4f52-5a26-4249434b454c
Current Temperature	To Do	10110001-5354-4f52-5a26-4249434b454c

Set Temperature	Sets the temperature that the Volcano will heat up to when the heat is on. When the value is read convert it to a UInt16, divide by 10, and round to the nearest int. To set the temperature multiply the desired temperature in $^{\circ}C$ by 10 and convert it to a 32bit byte array and write that to the characteristic. This characteristic emits events when the temperature is changed on the Volcano. You can change the ones place after multiplying by ten to write with increased precision. You cannot read with increased precision at the time of writing this document	10110003-5354-4f52-5a26-4249434b454c
Set off timer	This setting is the starting value for "Auto Off Time" when the heating element is turned on. The value can be read the same was as "Auto Off Time" and this value can be updated by writing a 16bit byte array with the new value in seconds. The min value of this is 0 and the max value is assumed to be the max value of the data type. Note this functionality is limited to 15-360 minutes to mirror the officially supported functionality. Yes setting it to 0 is the biggest troll and results in the Volcano immediately turning off after you turn it on.	1011000d-5354-4f52-5a26-4249434b454c

Auto Off Time	Lets the caller know how long until the Volcano automatically turns itself off. The value is stored on the Volcano in seconds. To get the value in minutes read from the characteristic, convert the value to **UInt16**, and divide by 60. This characteristic **does not** emit events. Updated values must be polled or calculated.	1011000c-5354-4f52-5a26-4249434b454c
Screen Brightness	Stores and Sets the display brightness. Accepted values are 0-100. Set the display to 0 to turn it off. When the value is read convert it to a UInt16. When writing the brightness convert the value to a 16 bit byte array	10110005-5354-4f52-5a26-4249434b454c

2.2 Known Issues

- The characteristics for reading temperatures and receiving temperature updates all round to the nearest $^{\circ}C$

  This means we cannot fully support all temperatures in $^{\circ}F$ because we cannot reliably read the values. However we are able to write with full precision.

- A successful write update to the Volcano's screen brightness sometimes results in the Volcano not updating its brightness

- The Volcano sometimes doesn't free up its Bluetooth connection. This can be fixed by power cycling the Volcano's Bluetooth by holding down the "-" button and the "AIR" button at the same time.

Web Application

3.1 Technologies

- React
- Redux
- Styled Components
- React Snowfall
- React Range
- Lodash
- Bootstrap
- React DND
- React Router
- Create React App as a base
- Node LTS (20.11.0)

3.2 Supported Web Browsers

- iOs
  - Web BLE *my personal recommendation. I have no affiliation with this app
  - Bluefy
  - Path Browser (Unofficially supported)
- Windows/Mac OS/Android
  - Google Chrome

Other web browsers that support web BLE may also work

3.3 Running the App Locally

1. Clone the repository
2. Navigate to the root directory of the repository
3. Run the command "**npm install**"
4. Run the command "**npm start**"

3.4 CI/CD Pipeline

3.5 Design Guide

Code Examples

4.1 Turning the Fan Off

4.1.1 Python

Listing 4.1: Example of Python code

```
#assume we are already connected with the BLE client
await bt_client.write_gatt_char("10110013-5354-4f52-5a26-4249434b454c", bytes([0]))
```