SterlingKey™ - Development board
Convert any wired keyboard into multi-device wireless

User Manual

Version 1.0.3

April 4, 2024

Table of Contents

Contents

User Manual ..... **i**

Table of Contents ..... **ii**

List of Figures ..... **ii**

List of Tables ..... **ii**

1. Introduction 3
   1.1 Overview 3
2. Getting Started 5
   2.1 Cautions & Warnings 5
   2.2 Device Compatibility 6
   2.3 LED Indicators 7
   2.4 Touch Sensor 7
3. Troubleshooting & Support 8
4. Forum 9

List of Figures

Figure 1 - Overview of device 3

Figure 2 - Typical application 4

List of Tables

Table 1 - Record of Changes 10

1. Introduction

Are you tired of tangled cables on your desk? Do you wish for a seamless transition between your desktop and mobile devices using the same keyboard? Look no further! SterlingKey™ is here to transform your typing experience. With it you can convert any wired keyboard into multi-device wireless!

Important Note: This is still an actively developed project, it's not a fully complete product. It is a programmable and updatable development board, but the initial firmware is provided. You can program it however you want; it is using an ESP32-S3 with a CH340C USB to Serial Chip, or you can find my firmware through https://sterling-key.com/forum

1.1 Overview

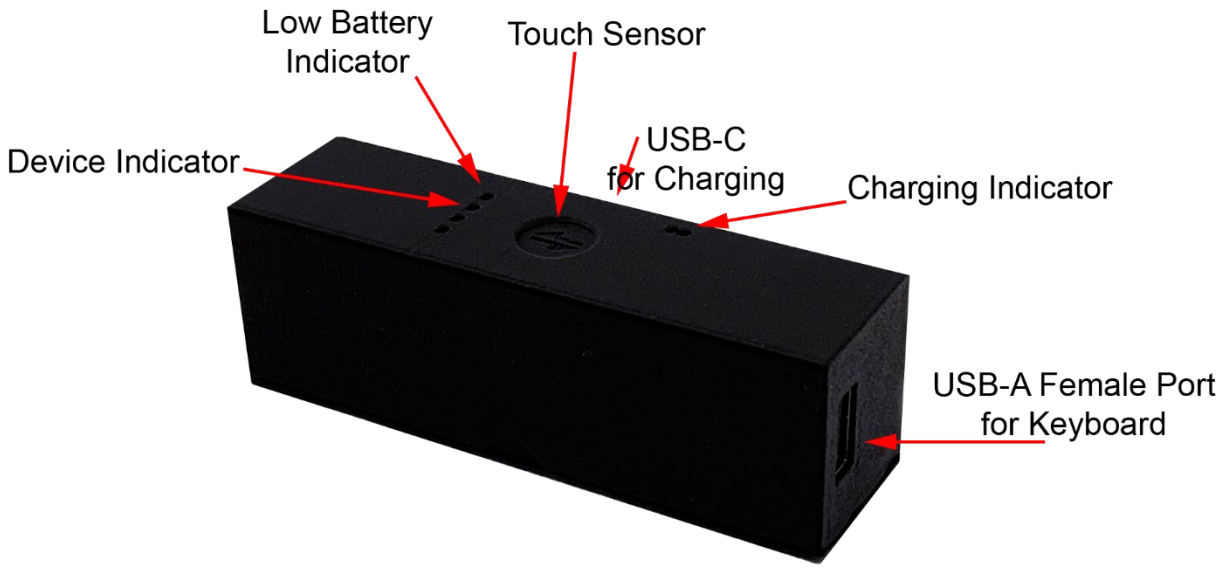

Figure 1 - Overview of device

Figure 2 - Typical application

2. Getting Started

Below you can find how to set up and use the device in less than 1 minute.

1. Remove the plastic battery pull tab
2. The device should automatically power on and the first Device Indicator LED will turn on
3. Plug in your keyboard to the USB-A Female Port
4. Hold the Touch Sensor for 0.5 seconds, you should feel two short vibrations. Then let go. The device has entered the pairing mode and the Device Indicator will start blinking
5. Turn on Bluetooth on your host (i.e. laptop, mobile etc.) and search for Bluetooth devices. The device will have the name “SterlingKey™” plus the name of your keyboard (i.e. SterlingKey™ USB Keyboard).
   Note: The device stays into pairing mode for 60 seconds. After that, the Device Indicator will stop blinking, and if you try to connect to it, the connection will be rejected. You have to first enter pairing mode, and then search for devices
6. You don’t have to enter a PIN, just accept the pairing process on your host if asked
7. After a couple seconds the connection will be established, and you can enjoy your wireless keyboard
   SterlingKey™ will remember all the paired devices, so the next time it is boot up, it will automatically accept the connection from every paired device without needing to re-pair them
8. To switch devices, simply tap on the Touch Sensor. You will see the Device Indicator will now go to the second position. You can do the pairing process again for this slot, and as previously, it will be stored into the memory
9. To power off SterlingKey™, hold the Touch Sensor for 1 second, you will feel 3 short vibrations and then you let go
10. SterlingKey™ powers off automatically after 5 minutes of in activity
11. To wake it up, simply tap the Touch Sensor, and the devices will automatically reconnect to it after a few seconds
12. If you want to change keyboards, make sure to unpair and pair SterlingKey™ again with the new keyboard

2.1 Cautions & Warnings

2.1.1 Battery Safety

SterlingKey™ uses a 21700 sized battery. While any 21700 battery can be used, it is highly advisable to use the given battery, or one with a similar capacity (4900mAh). Overcharge and undercharge protections are implemented into the board, so the battery will safely stop charging once it reaches maximum capacity. Likewise, the system will turn off if the battery goes below a set threshold. It is recommended to charge the device when the Low Battery Indicator red LED turns on, which is around at 10% capacity.

IMPORTANT: Make sure the polarity of the battery is correct. The flat side of the battery must be connected to BAT-, while the side with the white ring must be connected to BAT+.

NEVER install the battery backwards. It will overheat the device and you risk damaging the components.

2.1.2 Charging Safety

When charging SterlingKey™, make sure you use a charger that can provide at least 500mA at 5V, otherwise the device might not work properly.

A charger that can provide 2A at 5V is recommended, for the fastest possible charging speed.

You can use any Type-C cable, but you must NOT provide higher voltage than 5V, because you risk damaging the components and the battery.

2.1.3 Pairing Precautions

SterlingKey™ advertises all the time. This means that you will always be able to find it if you search for Bluetooth devices. However, if you try to connect to it while not in pairing mode, SterlingKey™ will reject the connection. This means that you must first enter pairing mode, and then start searching for Bluetooth devices.

2.1.4 Storage Safety

Do not store the device in direct sunlight or extreme temperatures. The enclosure might deform, and the battery might overheat.

Batteries are sensitive, avoid dropping the device.

2.2 Device Compatibility

SterlingKey™ emulates the USB Descriptors of the connected device as closely as possible on boot. While the main use of SterlingKey™ is to convert keyboards into wireless, it can be used by devices that act as keyboards, mice, multimedia controllers, or a combination of these three. If for example your keyboard has a built-in touchpad, and multimedia controls (i.e. volume up/down) or even email/browser shortcuts, they will all work as expected.

QMK/VIA keyboards store macros internally in the keyboard memory, and SterlingKey™ will properly transmit these signals as well.

If you want you can also convert 2.4GHz keyboards to multi-device Bluetooth, by plugging in the 2.4GHz receiver into SterlingKey™.

You can use SterlingKey™ with any operating system (Windows, MacOS, Linux, Android, iOS) as long as it supports BLE.

2.2.1 Limitations

- If you have software that looks for specific keyboards (via VID/PID), to control for example the RGB of the keyboard, these will not work because SterlingKey™ has its own unique VID/PID
- SterlingKey™ uses BLE, your host must support it otherwise you will not be able to connect to it

2.3 LED Indicators

SterlingKey™ has a few LED Indicators

- 3 white LED Device Indicators which show you which device is currently active
- 1 red LED Low Battery Indicator which turns on when the battery is at 10% or less
- 1 red LED Charging Indicator which turns on when the device is being charged
- 1 white LED Charging Indicator which turns on when the charging has finished

For the Device Indicators, there are two modes

- Static means the device is selected
- Blinking means the current slot is in pairing mode

2.4 Touch Sensor

The Touch Sensor has multiple functions, and each function is accompanied by a short vibration

- As soon as you tap the sensor, you will feel a short vibration. If you let go, SterlingKey™ will change the output device
- If you keep holding the Touch Sensor, after 0.5 seconds you will feel a second vibration. If you let go, SterlingKey™ will enter pairing mode for the selected slot
- At 1 second, you will feel a third vibration. If you let go, the device will go to sleep
- When in sleep, tap the Touch Sensor to wake it up

3. Troubleshooting & Support

If SterlingKey™ does not appear to work, make sure you follow the below troubleshooting steps:

1. Do you see any LED indicators? If not, make sure the device is turned on. Simply tap the Touch Sensor
2. Does the device not turn on at all? Try charging the battery as it may be drained
3. Try replugging the battery
4. Can you see SterlingKey™ in the host but the connection fails? Make sure you start the pairing process first, and then search for Bluetooth devices. Try starting the pairing process and restarting the Bluetooth on your host before attempting to connect
5. Is the keyboard unresponsive? Try turning SterlingKey™ off and then back on, by holding the Touch Sensor for 1 second (you will feel 3 short vibrations) and then tapping the Touch Sensor to wake it up
6. Did you change keyboards but not re-pair? Unpair SterlingKey™ and pair it again. This is required because some computers cache the old keyboard, and some keys might not work properly without re-pairing

Have any other issue? You have the below options:

1. Try looking in the forum if anyone else has the same issue as you, and if there is a solution https://sterling-key.com/forum
2. If no one has asked the same question, you can always create a free account and make your own post. Please be as descriptive as possible, in order for me to be able to reproduce the problem you are encountering
3. You can find me on social media, links are in the forum
4. Feel free to contact me at support@sterling-key.com

4. Firmware Updates & Forum

Want to share your experience, post photos or videos, send some feedback, write a review, talk with the community, or ask any question? The forum is free to access and you can find all the info of the product, and firmware updates there. You can create an account for free, activate it through the link you will receive in your email (make sure to check the spam folder), and come join!

https://sterling-key.com/forum

For instructions on how to update the firmware, please check the forum

Record of Changes

Table 1 - Record of Changes

Version Number	Date	Author/Owner	Description of Change
1.0.3	*4 April, 2024*	*Sterling Hawk*	*Battery polarity warning*
1.0.2	*26 March, 2024*	*Sterling Hawk*	*Added important note about changing keyboards*
1.0.1	*17 March, 2024*	*Sterling Hawk*	*Reformatting and small changes*
1.0	*27 January, 2024*	*Sterling Hawk*	*Initial version*