

PADAWAN OUTPOST

COMBAT LIGHTSABER

MODEL QUINLAN VOS

NEOPIXEL BLADE · PROFFIE V2.2 CORE

PRODUCT MANUAL

Read this manual online:

GLOSSARY

Alt font	A second set of sounds inside a font folder, in alt000, alt001 and so on. Blade code can switch to it live.
Blade style	ProffieOS code that sets how the blade looks: color, ignition, flicker and the flash on a clash.
Bootloader	A program built into the processor that takes new firmware over USB. Nothing can erase it.
Config file	The C++ file that describes this saber: blade, button, presets and features.
Core	Board, battery and speaker in one removable unit that slides into the hilt.
Neopixel	A blade lined with LED strips in which each LED shows its own color.
Pogo pins	Spring-loaded contacts that connect the blade and the core to the hilt without plugs.
Preset	One saved setup: a sound font, a blade style and a music track.
Prop file	The part of ProffieOS that turns presses and gestures into actions. This saber uses the Fett263 prop.
Proffieboard	The sound board in this core. This one is V2.2, and it runs the open-source ProffieOS.
Serial monitor	A text window for typing commands to the saber over USB.
SmoothSwing	A sound engine that blends two looping swing sounds live, following how fast the blade moves.
Sound board	The circuit board that runs a saber's software, such as a Proffieboard or a Xenopixel. It sits in the core.
Sound font	A folder of sound files for one character, such as hum, ignition, swing and clash.
Style argument	A color or time left open in a blade style, so Edit Mode can change it without new firmware.
Workbench	ProffieOS Workbench, a web page that controls and edits the saber over USB.

RESOURCES

ProffieOS docs
pod.hubbe.net

The Crucible
Support forum

Fett263
Prop, styles, config helper

Style Editor
Live blade preview

Workbench
Edit the saber in Chrome

ProffieOS
Source code on GitHub

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PROFFIE VS OTHERS

Other sabers use the same kind of LEDs, battery and speaker, but their makers keep the code closed.

	Most sabers	Proffie
Software	Closed	Open source, GPLv3
Board design	Closed	Open hardware, design files published
Blade effects	A fixed list	Any effect you can code
Buttons and gestures	Fixed	A prop file you can rewrite
Sounds	Played on cue	Switched and triggered by blade code
Updates	From the maker	Free, from the community

WHAT FITS WHAT

A Xenopixel core fits this hilt

Padawan Outpost sells this model with a Xenopixel V3 or a Proffie V2.2 core. Both are the same pogo core size and drive the same blade.

Xenopixel and Proffie share blades

Any 1 in Neopixel blade with a three-ring contact disc works with either board.

A baselit core needs another emitter

A baselit core shines its own LED up a hollow blade, and this emitter holds the pin connector for a Neopixel blade.

A baselit blade stays dark

It fits, but a hollow blade has no LEDs, and this hilt has no LED to shine into it.

Other pogo cores need the same format

The core must be 1 in wide, with the same length and pin layout. LGT, Nexus and DamienSaber hilts share it. Check with the seller for other brands.

You can swap the board alone

It takes soldering. The board comes out of the core, and the battery and speaker stay.

Your settings stay with the old core

Fonts and presets live on its SD card and board. Copy the card first (page 40).

> A store that lists a core for Baselit, Xenopixel V3 and Proffie V2.2 hilts sells three versions, one per board. For this saber, choose the Proffie V2.2 version. Padawan Outpost lists this hilt as PO x KR core compatible.

1

GET STARTED

SABER TYPES

A baselit saber lights a hollow blade with an LED in the hilt, so the whole blade shows one color at a time. A Neopixel blade has its own LED strips inside.

Blades

	Baselit	Neopixel
Light source	One LED in the hilt	LED strips inside the blade
Ignition	Fades on	Grows from the hilt up
Clash	The whole blade flashes	A flash where it hits
Dueling	Toughest	Needs a heavy-grade blade

Sound boards

Board	Code	Set up with
Xenopixel	Closed	Phone app
SN-Pixel	Closed	Phone app
Golden Harvest	Closed	Menu, phone app
CFX	Closed	Menu, text files
Verso	Closed	Menu
Proffie	Open	Menu, browser, code

> This saber has a Neopixel blade, 1 in wide with a heavy 3 mm wall, and a Proffieboard V2.2.

MODDING IDEAS

Upgrade to ProffieOS 8
New menus, SD card protection and independent dual blades.

Rewrite a button
Copy the prop file and change one EVENTID line.

Write a style
A class with run() and getColor(). Test it on your computer with make test in styles.

Light and dark fonts
An alt font replaces the whole sound set when the style changes, as Quinlan Vos falls to the dark side in Dark Disciple.

Mini games
Fett263's training remote game runs inside a blade style.

Debug the board
An ST-LINK on the SWDIO and SWCLK pads gives breakpoints on the real hardware.

Add Bluetooth
An FSC-BT630 module lets Workbench connect without a cable.

Read the hardware
KiCad files and the schematic are at fredrik.hubbe.net/lightsaber/v5.

SAFETY NOTICE

Charge the saber to full before you first use it. Charge it only with the included cable and a 5V 1A USB charger. A stronger charger can damage the battery and electronics.

Don't leave the saber charging unattended, and unplug it when it's full.

Warning

Keep it away from young children. Older children use it with an adult present.

Duel with control and respect. Don't aim at faces, and stop if the blade cracks.

ANATOMY

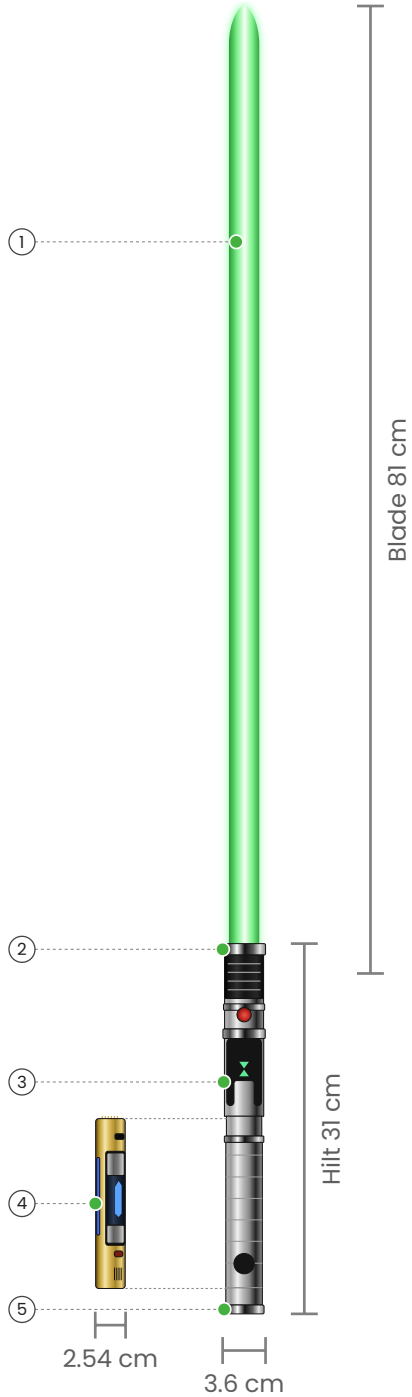
1. **Blade**
   A polycarbonate tube with Neopixel LED strips. It's 81 cm long.

2. **Emitter**
   The top of the hilt. Two screws hold the blade in it.

3. **Hilt**
   The metal handle. It's 31 cm long and unscrews at the joint and at the pommel.

4. **Core**
   The removable electronics: board, battery and speaker. It sits in the lower half of the hilt (page 27).

5. **Pommel**
   The bottom cap. Sound comes out through its holes, and it unscrews to take the core out.



UNDER THE HOOD

SmoothSwing

Two looping swing sounds play at zero volume under the hum. Swing speed sets their volume, and the board fades from one to the other as the blade turns. The hum dips as you swing.

Clash detection

A clash is a jolt that doesn't match how the saber is moving. Sound from the speaker shakes the sensor too, so ProffieOS raises the threshold as you turn the volume up.

```
|accel − down|/2 + |delta gyro|/2 > threshold
```

> STM32L433 at 80 MHz, 256 KB flash, 64 KB RAM. ProffieOS has no operating system kernel. Its tasks take turns in one loop.

BLADE STYLES

A blade style is code that sets the color of each LED, many times a second. Styles stack in layers. Even Green is a style, so you can swap any color for an effect.

```
StylePtr<Layers<
  AudioFlicker<Green, Rgb<0,128,0>>,   // base
  ResponsiveClashL<White>,             // clash flash
  InOutTrL<TrWipe<300>, TrWipeIn<500>> // on, off
>>()
```

Style Editor

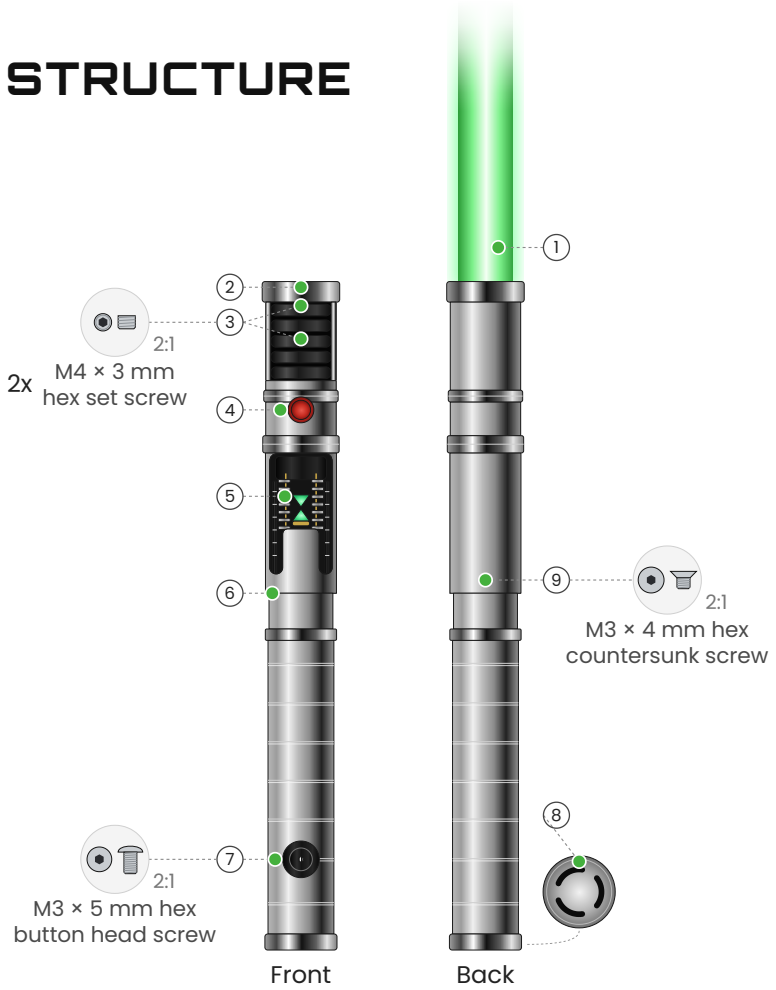
Paste a style and watch the blade animate, then trigger clashes and lockups. fredrik.hubbe.net/ProffieOS-StyleEditor

Fett263 Style Library

Build styles from menus, with Edit Mode options built in. fett263.com

> Copies of one style with different colors take no extra memory when the colors are style arguments, such as `RgbArg<BASE_COLOR_ARG, Green>`.

STRUCTURE



1. Blade
2. Emitter
3. Blade retention screws
4. Power button
5. Crystal chamber
6. Joint (also unscrews)
7. Covertec wheel (belt clip mount)
8. Pommel, sound holes
9. Sleeve screw

> The Covertec wheel slides into a Covertec belt clip, which you buy on its own, so the hilt hangs from a belt. Remove the blade first.

IN THE BOX

Hilt with Proffie core	Blade 32 in (81 cm)
USB-C cable	Hex key and spare screws The 3 mm screws hold the blade

DEMOS



Product video 0:30

The core lighting up, then the blade going in and the saber lit



Assembly video 2:36

A full disassembly and rebuild demo



DamienSaber

The maker's page for this saber, with its own photos and videos

THE CONFIG FILE

A config is one C++ file that describes this saber. ProffieOS reads it once for each section.

Section	Holds
`CONFIG_TOP`	Board, button count, volume, clash threshold and features
`CONFIG_PROP`	The button logic: saber_fett263_buttons.h
`CONFIG_PRESETS`	Each preset's font, track, style and name, and the blade's pixels and pins
`CONFIG_BUTTONS`	The Power button

```
{ "Vos;common", "tracks/vos.wav",   // font, track
  StylePtr<...>(), "green" },        // style, name

WS281XBladePtr<144, bladePin,       // pixels, data pin
  Color8::GRB,
  PowerPINS<bladePowerPin2, bladePowerPin3> >()
```

Without a new upload

Fonts, colors, timings and preset order change in Edit Mode or Workbench.

With a new upload

New blade styles, new features and button changes.

YOUR FIRST CHANGE

Start from a build that matches the factory one, then change one thing at a time.

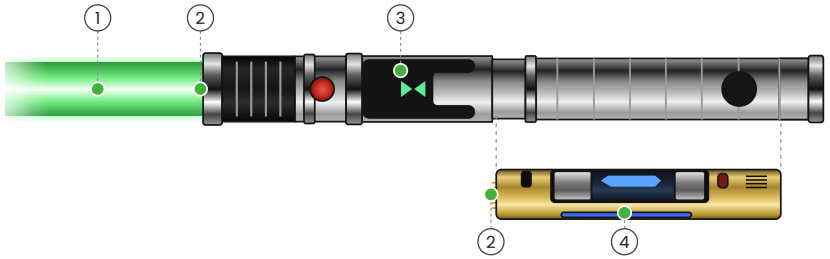
1. Build and upload the factory config unchanged. The saber should behave as before.
2. Make one small edit, such as a color in the first preset or an ignition time from 300 to 600 ms.
3. Upload and test it with the blade on.
4. Commit the config to git, so you keep each working version.

> Uploading clears Edit Mode changes unless the config has `#define KEEP_SAVEFILES_WHEN_PROGRAMMING`.

> Stuck? Ask on The Crucible, crucible.hubbe.net. Fredrik and Fett263 answer questions there.

HOW IT FITS TOGETHER

A saber is a blade, a hilt and a core. The core slides out of the hilt, and the board inside it controls the light and the sound.

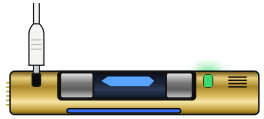


1. **Blade**
   A polycarbonate tube with two LED strips inside, back to back. Each LED holds its own red, green and blue light and a tiny chip, so it can show any color on its own. The board sends a stream of colors up the strips and changes them to make the blade grow from the hilt or flicker like fire.
2. **Pogo pins**
   Spring-loaded contacts at both joints, so the blade and the core connect without plugs or wires.
3. **Hilt**
   The metal shell. It holds the button and the wires between the two joints. The rest of the electronics sit in the core.
4. **Core**
   One removable unit: board, battery, speaker, charging port and accent LEDs (page 27).

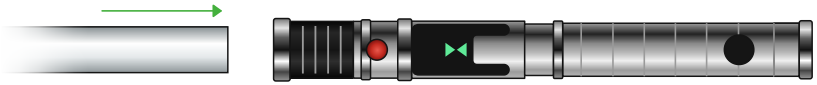
> The board is the circuit board inside the core, also called the sound board. It runs the software, so it sets the sounds, blade effects and controls. Lightsabers are typically named after the board type they use; a Proffie saber is a lightsaber with a Proffieboard core.

QUICK START

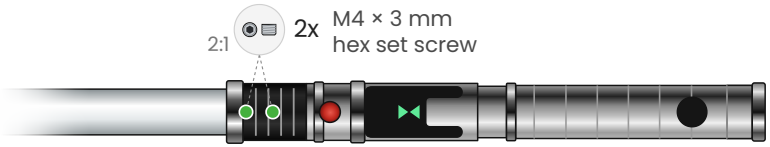
1. Charge to full (page 13). The first charge takes a few hours.



2. Push the blade all the way into the emitter.



3. Tighten the two 3 mm screws with the hex key until snug.



4. Click Power to ignite. Hold Power to turn off. Long Click to try the other presets.



SET UP THE CODE

1. Clone the code: `git clone github.com/profezzorn/ProffieOS`, or download release 8.10 or later.

2. Install the Arduino IDE or arduino-cli. Add the board URL below, then install the Proffieboard plugin.

3. Choose Proffieboard V2. Set USB Type to Serial + Mass Storage + WebUSB and DOSFS to SDCARD (SPI).

4. Put the config in ProffieOS/config and set `CONFIG_FILE` in ProffieOS.ino to its name.

```
https://profezzorn.github.io/arduino-proffieboard/
  package_proffieboard_index.json
```

```
arduino-cli compile --fqbn proffieboard:stm32l4:\
  ProffieboardV2-L433CC ProffieOS.ino
```

> ProffieConfig (Mac, Windows) and JMT Studio (Mac, Windows, Linux) edit, build and upload in one app, without Arduino.

BACK UP FIRST

Save three things before changing anything. Each one lets you undo a mistake.

1. Copy the whole SD card to your computer, including the .ini and .tmp files. They hold your Edit Mode changes.

2. Find the config file: a .h file on the card, or inside a ProffieOS zip. If it's missing, ask DamienSaber for it. The board can't give it back.

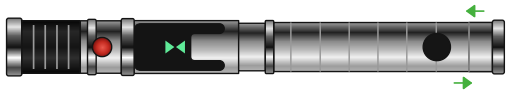
3. Save the firmware. In Chrome, open profezzorn.github.io/webdfu/dfu-util, send `RebootDFU` over serial, click Connect, then Read.

> To undo Edit Mode changes, delete presets.ini and presets.tmp from the card, then restart the saber.

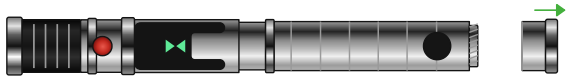
> You can recover from a bad upload. Hold BOOT, press RESET, then let go of BOOT, and the processor's built-in bootloader takes new firmware.

CHARGING

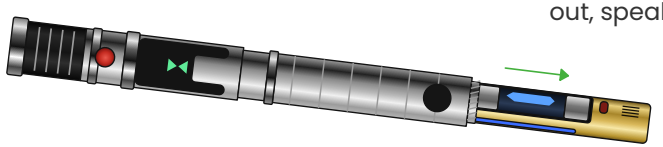
1. Hold the grip and turn the pommel at the bottom counterclockwise to unscrew it.



2. Pull the pommel off.



3. Tilt the hilt so its open bottom points down. The gold core slides out, speaker end first.



4. Plug a USB-C cable into the port next to the gold pins. Use a 5V 1A charger only. The light by the speaker shows red while charging and green when full.



Charging

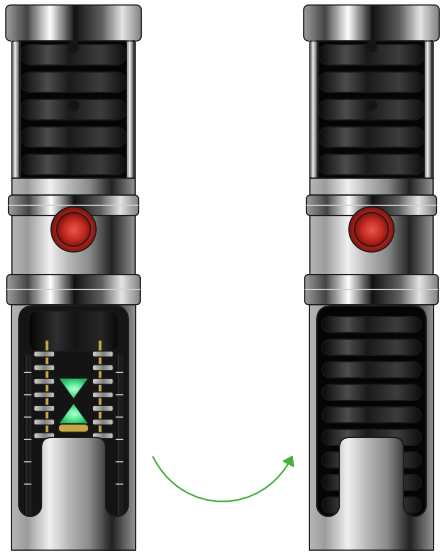


Full

5. Slide the core back in, gold pins first, then screw the pommel back on.

> The hilt also unscrews at the joint below the crystal chamber, which frees the core from the top instead.

CRYSTAL COVER



Open Closed

The silver sleeve around the crystal chamber turns, so the window shows either the crystals or the black back of the chamber. Quinlan Vos's hilt in The Clone Wars has no window, so the closed look matches the show.

1. Find the sleeve screw on the back of the hilt, behind the crystal window (page 9, part 9).
2. Loosen it about half a turn with the hex key. Don't take it out.
3. Turn the silver sleeve until the window closes, or opens again. Don't force it.
4. Tighten the screw.

CONNECT A COMPUTER

Open the gold core and plug into the micro-USB port on the Proffieboard. The USB-C port on the core only charges. For a computer with small oval ports, get a USB-C to Micro-USB cable; for wide rectangular ports, USB-A to Micro-USB.

> The cable must carry data. Stores list it as a data or sync cable. Charge-only cables look the same and won't work. Cables from phones and game controllers tend to carry data, and ones from lamps and fans often don't. If nothing appears on the computer, try another cable.

What shows up

Device	Use
Serial port	A command line into the saber
WebUSB	For ProffieOS Workbench in Chrome or Edge
Drive	The SD card, for copying fonts

Serial commands

Type	Result
`version`	ProffieOS version
`list_presets`	All presets
`battery_voltage`	Battery level
`sdtest`	SD card speed
`on, off, clash`	Test effects
`RebootDFU`	Bootloader mode

> The devices you see depend on the board's firmware settings. Workbench: profezzorn.github.io/lightsaber-web-bluetooth/app.html

SOUND FONTS

Each preset pairs a sound font with a blade style. Fonts, music tracks and quotes live on the microSD card under the Proffieboard, inside the gold core.

Inside a font folder

hum	The idle hum
swingl, swingh	SmoothSwing loops
clsh, blst, lock	Clash, blaster, lockup
out, in	Ignition, retraction
font	The font's spoken name
config.ini, smoothsw.ini	Timings, swing feel

Changing fonts

Copy a font folder onto the card, then choose it for a preset in Edit Mode (page 36). Rename fonts made for other boards first, with the free SoundFontNamingConverter.

> Fonts: Kyberphonic, Greyscale Fonts (some free), KSith, JayDalorian. A purchase covers your own sabers. Sounds are 44.1 kHz, 16-bit mono WAV.

THE BUTTON

The red button is the Power button. You give each command as a pattern of presses on it.

Click
One short press

Double Click
Two fast presses

Triple Click
Three fast presses

Long Click
Press for 1 second, then let go



Hold
Press and keep holding

Click + Long Click
One short press, then a long click



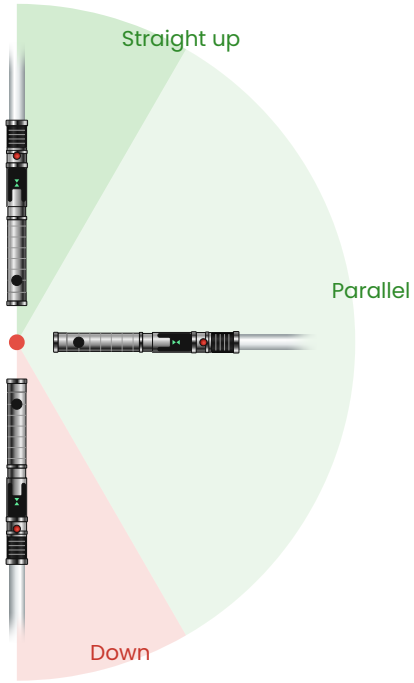
Double Click and Hold
Two presses, hold on the second

Triple Click + Long Click
Three short presses, then a long click



BLADE ANGLE

Some presses do different things depending on where the blade points. Down means steeper than 60° below level. Straight up means steeper than 60° above.



Press	Parallel or up	Down
Long Click	Next preset	Previous preset
Triple Click + Long Click	Next font	Previous font
Double Click, blade off	Music player (straight up: play / stop)	Music player

REHEARSAL

Record a fight sequence, then replay it as choreography.

1. Blade off: Triple Click and Hold. The saber ignites in Rehearsal mode. If you saved a rehearsal before, it asks Replace? Turn right and Click to start a new one.
2. Fight your sequence. The saber records each Clash and Hold + Clash (lockup), with its sound.
3. Hold Power to save. Triple Click and Hold cancels.
4. Blade off: Hold Power + Swing to play it back. Clashes and lockups replay in order.
5. Hold Power to end.

EDIT MODE

Edit Mode is a spoken menu for changing fonts, colors, blade length, timings and volume on the saber. It needs the menu voice files on the SD card.

Blade off: Double Click and Hold to enter

Control	Effect
Turn right	Next item, increase, Yes
Turn left	Previous item, decrease, No
Hold + Turn right / left	Jump by 5 (fonts, tracks, blade length) 500 for timings, 5000 for options
Click	Select, save, enter
Long Click	Cancel, revert, go back
Hold	Back to the main menu in the main menu: exit Edit Mode
Double Click and Hold, turn	Color zoom release to save

Turn means roll the whole saber on its long axis, blade level (page 20).

CONTROL

Blade off

Click	Ignite
Click + Long Click	Ignite muted
Long Click ↑	Next preset
Long Click ↓	Previous preset
Hold	Scroll presets
Triple + Long Click ↑	Next font
Triple + Long Click ↓	Previous font
Hold + Clash ↑	Volume
Hold + Clash ↓	Gestures on / off
Dbl Click + Long Click	Battery level
Double Click	Music player
Double Click ↑↑	Play / stop music
Triple Click	Force / quote
Dbl Click and Hold	Edit Mode

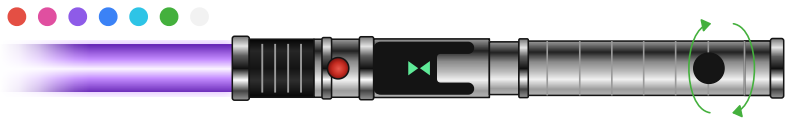
Blade on

Hold	Turn off
Hit the blade	Clash
Hold + Clash	Lockup
Thrust	Stab
Hold + Stab ↓	Drag
Hold + Stab ↑	Melt
Click	Blaster block
Dbl Click and Hold	Lightning block
Hold + Swing	Multi-blast
4 Clicks	Color change
Long Click	Force / quote
Double Click	Stop music

↑ parallel or up · ↓ down · ↑↑ straight up

Turn means roll the whole saber on its long axis (page 20). Scroll presets: turn, Click to select. Volume: turn, Click to exit. Multi-blast: Click or Clash to exit.

COLOR



1. With the blade on, point it parallel or down and press 4 Clicks. Color change starts.

2. Hold the blade level and roll the whole saber on its long axis. The blade steps through the colors.



3. Click to save the color. Long Click to cancel and keep the old one.

> Color zoom: during step 2, Double Click and Hold, then turn a little at a time for fine steps. Let go to save.

Blade style (blade on)

Control	Effect
Triple Click + Long Click parallel or up	Next blade style
Triple Click + Long Click down	Previous blade style

WHAT YOU CAN CHANGE

Start at the top. Each step needs more tools and can change more.

1. **On the saber**
   Pick a preset, then change its color, sound font, blade length, ignition speed or volume in Edit Mode (page 36). Record a fight to replay with Rehearsal (page 37).

2. **On the SD card**
   Add sound fonts, music to play along with, or quotes. Replace one sound, such as the hum, with any WAV file of your own (page 38).

3. **In the code**
   Write new blade effects, such as fire, an unstable blade or a rainbow. Change what each press does, turn gestures on or off, or give Quinlan Vos a light and a dark font that swap as he turns (pages 39 to 44).

4. **In the hardware**
   Add Bluetooth so Workbench connects without a cable, or more accent LEDs. These need a soldering iron (page 46).

Ideas for this saber

Idea	Step
A red blade and a darker hum for Vos's dark side	1 and 2
Your own voice as the boot sound	2
Ignite with a swing instead of the button	1
The crystal in a different color from the blade	3
A blade that crackles during a lockup	3

> Back up the SD card and the config before changing anything in the code (page 40).

WHAT IS PROFFIE

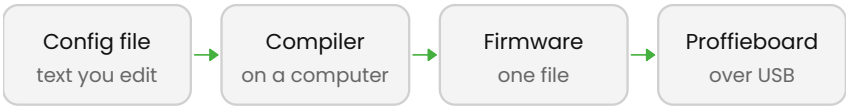
Proffie is this saber's board and the software it runs: the Proffieboard and ProffieOS. Fredrik Hübinette designed both, and the name comes from his nickname, Profezzorn.

Anyone can read, change and share ProffieOS under the GPLv3 license, and Fredrik publishes the board's design files. You can reprogram this saber yourself.

Where things live

Where	What	Change it
Firmware, in the processor	Your config file: blade styles, button logic, features	Upload from a computer
SD card	Sound fonts, music, quotes, menu voice	Copy files
Saved settings, on the SD card	Edit Mode changes: font, color, timings	On the saber

From config to saber



You edit the config as plain text. A compiler on your computer turns it into firmware, and the upload replaces the program on the processor. Fonts and settings on the SD card stay as they are.

> ProffieOS 8 came out in 2026 and runs on this 2019 board. Updates stay free.

MUSIC

With the blade off, Double Click pointing straight up to play or stop the font's music. Double Click parallel or down to open the music player.

In the music player

Control	Effect
Turn right	Next track
Turn left	Previous track
Click	Play this track once
Hold	Play, then shuffle
Hold + Turn right	Play, then the next tracks in order
Hold + Turn left	Repeat this track

> With the blade on, Double Click stops the music. To pick a track, turn the blade off first.

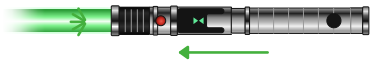
Force sounds and quotes

Triple Click (blade off) or Long Click (blade on) plays a Force sound or a character quote. Point straight down when you press to switch between Force and quote mode. Quotes play in order.

MOTION



Clash
Hit the blade against something. Hold Power as you hit for lockup.



Stab
Thrust forward so the tip hits. Hold Power as you stab for drag (pointing down) or melt.



Swing
A firm swing. Hold Power and swing for multi-blast mode.



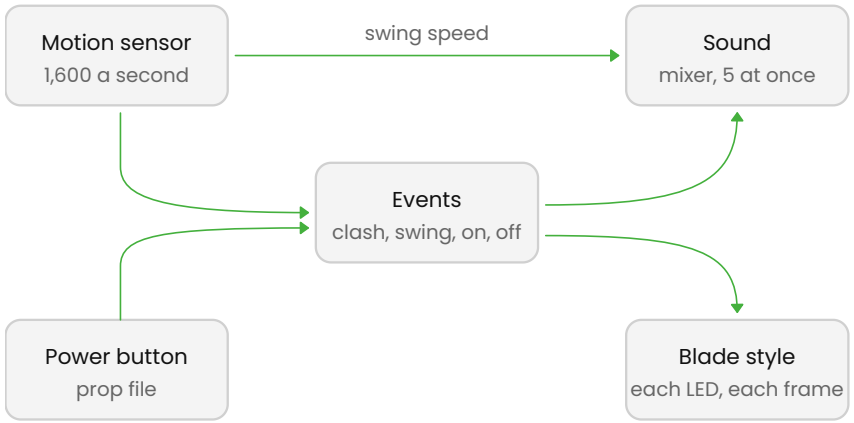
Turn right / left
Roll the whole saber on its long axis with the blade level. Each step is about 30°. Nothing unscrews. The menus for presets, volume, color and music use it.



Like a dial
Point the blade away from you and look at the pommel. Turn right is clockwise. Each tick is one step.

HOW THE CORE WORKS

The board is a small computer. Many times a second it reads the motion sensor and the button, works out what happened, then updates the blade and the sound.



Light
A blade style gives each LED a color, and the board works the colors out again for each frame. An ignition is a style that lights the LEDs from the hilt up.

Sound
Sounds are WAV files on the SD card. The board mixes up to five at once, such as the hum, a swing and a clash, and plays them through the speaker.

Effects
A hit, a stab or a press gives the board an event. The board passes it to the blade style, which flashes the blade, and to the sound font, which plays the clash, in the same frame.

Presets
A preset pairs one sound font with one blade style. Switching presets changes the whole saber at once.

You can change each of these in software (page 35).

COMMON ERRORS

A robot voice names each problem the board finds. The voice is built into the board, so it works even when the SD card can't be read. It sounds muffled and clipped.

It says	Meaning	Fix
“Font directory not found”	The board can't find a preset's sound folder on the SD card, or can't read the card right now. A loose blade causes it too. It says this once for each missing folder	Push the blade all the way in and tighten both blade screws. Then charge, restart the core and check the folder names match the presets
“SD card not found”	The board can't see the card at all	Restart the core. The card must be FAT32
“Error in font directory”	A font has missing or misnumbered files, or the menu voice files are gone	Copy the font and the common folder back
“Voice pack not found”	The common folder with the menu voice is missing	Copy common back onto the card
“Error in voice pack version”	The common folder is too old for ProffieOS 8	Install the newer voice pack
“Error in blade array”	The board doesn't detect the blade it expects	Push the blade all the way in, then restart
“Low battery”	The battery is running down	Charge it

To restart the core, slide it out and back in, or click its power switch off and on (page 27).

A saber set up without the voice plays a short tune instead, one note per syllable of the same messages. Hear each one at pod.hubbe.net/troubleshooting/beep_codes.html.

TROUBLESHOOTING

1. **Saber won't turn on**
   Charge it. Check the core went back in speaker end first, and screw the pommel on tight so the gold pins touch.

2. **Saber says “Font directory not found”**
   Push the blade all the way in and tighten both blade screws (page 9). A loose blade loses contact with the pogo pins, so the board can't identify it.

3. **The saber speaks an error**
   Look it up under Common errors (page 21).

4. **No sound**
   Turn the volume up (Hold Power + Clash, blade off).

5. **Presses do the wrong thing**
   Check the blade angle (page 16). Long Click does different things pointing up and down.

6. **Saber turns on when you move it**
   Gestures are on. Hold Power + Clash pointing down to turn them off.

7. **Blade flickers or only half lights**
   Push the blade all the way into the emitter and tighten the two retention screws.

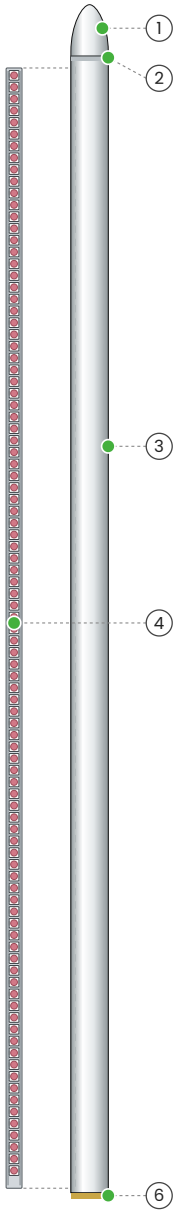
3

CUSTOMIZATION

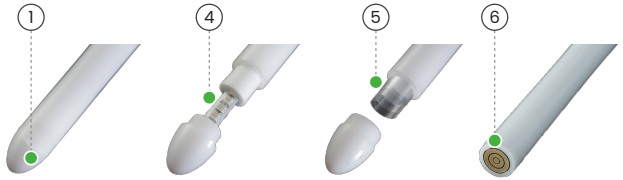
BLADE

NexusSabers A207-1
Neopixel
heavy-dueling blade

NexusSabers LGT
A207-1



ProffieOS sends a data signal up the strips, and each LED sets its own color.



1. **Bullet tip**
   Pointed, threaded polycarbonate tip. It unscrews for repairs only.

2. **Mirror**
   Reflects light back down so the tip glows.

3. **Tube**
   Polycarbonate, 1 in (25.4 mm) outer diameter, 3 mm wall, 32 in (81 cm).

4. **LED strips**
   Addressable RGB LEDs (Neopixel), two strips back to back.

5. **Diffusion**
   White foam sleeve and clear film spread the light into an even glow.

6. **Contact disc**
   Gold rings at the base meet the spring pogo pins in the emitter. The rings connect at any rotation.

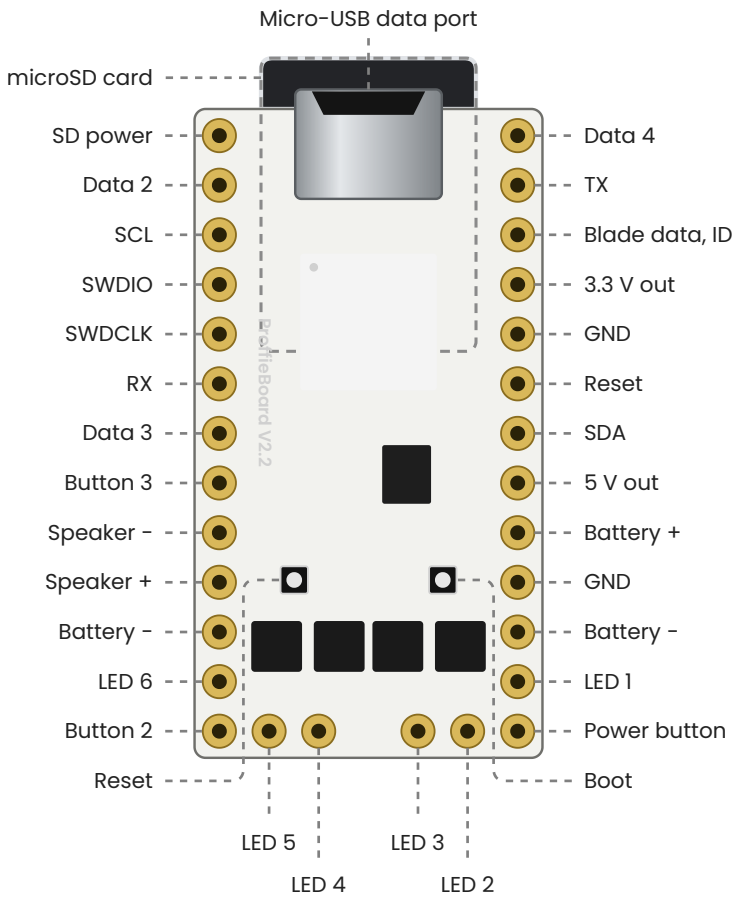
2

TECHNICAL SPECS

BOARD PADS

Battery +	Battery input, 2.6 to 4.5 V.
Battery -	LED return, joined to GND. Solder the battery's - wire here, not to GND.
GND	Ground for the electronics. Both GND pads connect.
Speaker + / -	The bass speaker. The + wire has a red dot.
Buttons 1–3	Power button and two extra buttons, or touch buttons.
Blade data, ID	Data 1. Sends the color signal to the blade and reads the blade ID resistor.
Data 2, 3	Extra LED data lines, or free.
Data 4	LED data line, free, or audio DAC output.
LED 1–6	Negative side of hilt or accent LEDs, up to 30 V.
SDA, SCL	OLED display, and the motion sensor chip.
RX, TX	Bluetooth module.
SWDIO, SWDCLK	ST-LINK debugger.
SD power	Switched 3.3 V that turns off Bluetooth and OLED to save power.
5 V out	Runs only while sound plays.
3.3 V out	About 250 mA for an OLED, Bluetooth or accent LEDs.
Boot, Reset	Put the board in bootloader mode when uploads fail.
Micro-USB	Firmware and SD uploads only. It doesn't charge the battery.

BOARD Proffieboard V2.2



Hold Boot, press Reset, then let go of Boot to load firmware when uploads fail (page 40). Mods solder to free pads, such as RX and TX for Bluetooth.

SPECIFICATIONS

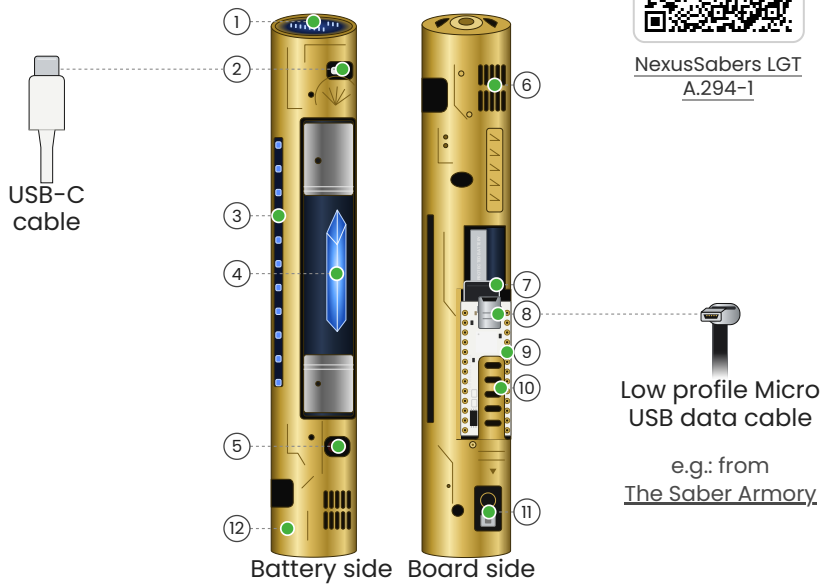
Item	Detail
Model	Combat Lightsaber, Quinlan Vos
Board	Proffieboard V2.2, removable pogo core
Hilt length	31 cm
Blade	32 in (81 cm), 1 inch Neopixel
Crystal chamber	Exposed crystal, lights in the blade color
Charging	USB-C on the core, 5V 1A max
Sound	Fonts, music and quotes on a microSD card
Product code	184-PF
Factory code	DamienSaber NO184-PF
Warranty	12 months

ELECTRONICS

Part	Model
Core	NexusSabers LGT A.294-1 Proffie V2.2 pogo core, polycarbonate chassis, 25.4 × 185 mm
Sound board	Proffieboard V2.2 Open hardware by Fredrik Hübinette. V3.9 is the current model
Processor	STMicroelectronics STM32L433CC Arm Cortex-M4F, 80 MHz, 256 KB flash, 64 KB RAM
Motion sensor	STMicroelectronics LSM6DS3H 6-axis: 3-axis accelerometer and 3-axis gyroscope, read 1,600 times a second
Audio	I²S digital audio, class-D amplifier 5 V boost rail, 44 kHz 16-bit, up to 5 sounds at once
Speaker	Bass speaker, 2–3 W, 4 or 8 Ω At the pommel end of the core. Sound leaves through the pommel holes
LED drivers	6 MOSFET channels Low-side switching, rated to 30 V
Accent LEDs	LED strip along the core Lights the crystal chamber in the blade color
Battery	18650 Li-ion, 3.7 V, 3600 mAh Protected cell: reverse-polarity and overload protection
Board input	2.6–4.5 V
Storage	microSD card Sound fonts, music, quotes and settings
Ports	USB-C on the core for charging Micro-USB on the board for configuration
Power switch	Push button by the pogo pins Cuts the battery for storage or to reset the core
Software	ProffieOS, open source (GPLv3) Fett263 one-button controls

CORE NexusSabers LGT A.294-1

NexusSabers LGT A.294-1



1. Pogo pins (top end)
2. USB-C charging port
3. Accent LED strip
4. 18650 battery, 3600 mAh
5. Charging light
6. Bass speaker
7. microSD card
8. Micro-USB data port
9. Board (Proffieboard V2.2)
10. Board clamp
11. Power switch
12. Chassis (gold metal exterior)

> The microSD card (7) slides into a slot under the board (9), below the Micro-USB data port (8).

> The Micro-USB data port (8) takes a data cable, not a charging cable. The port sits close to the chassis (12) and doesn't fit most plugs. Use a low-profile plug like the one shown.

> The power switch (11) is a push button that cuts the battery (4) off from the board. Click it off to store the saber. If the saber stops responding, click it off, then on.