⚙️ AuroraLamp — Technical Appendix

This section provides essential hardware and configuration information for users, installers, and maintainers.

🧭 Operating Modes

Jumper Position	Mode Name	Description
Left (1)	**Rainbow Fade**	Smooth continuous transition through all colors of the visible spectrum.
Center (2)	**Sunstorm**	Dynamic effect simulating solar flares — deep orange to near-white flashes.
Right (3)	**Christmas Glow**	Gentle fade between festive colors: greens, reds, and golden tones.

> The jumper selects the active color cycle at power-up.
> The lamp automatically loops through its pattern until powered off.

🔌 Power Supply

Parameter	Specification
Input Voltage	5 V DC via USB-C
Typical Current	50 – 200 mA (depending on brightness and color)
Connector	USB-C, reversible plug
Polarity Protection	Built-in

> Use only standard 5 V USB power sources (e.g., phone charger, PC, or power bank).

💡 LED System

Component	Description
LED Type	WS2812B (addressable RGB)
Control Logic Voltage	5 V (TTL compatible)
Color Depth	24-bit (8 bits per channel)
Gamma Correction	Applied in firmware for natural light transitions
PWM Frequency	~800 kHz internal (per WS2812B spec)

🧠 Firmware

- Fully self-contained — no external controller required.
- Gamma-corrected brightness control ensures visual consistency across all color modes.
- Smooth blending between predefined palettes (rainbow, sunstorm, and festive).

> Firmware auto-starts and runs continuously after power-up.

⚠️ Notes & Safety

- Operate in dry indoor environments only.
- Do not short the USB-C pins or modify the LED wiring while powered.
- Avoid direct viewing of full-brightness white light from close distance.
- Disconnect power before opening or modifying the enclosure.

Version

Firmware: **v1.0.0**
Hardware Revision: **A1**
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Crafted with care — engineered for light.