# CRMX Flashlight User Manual

*Five Twelve Engineering*

## 1. Overview

The Five Twelve Engineering CRMX Flashlight is a wireless DMX practical flashlight designed for film and television use. It combines a tunable-white LED source, integrated LumenRadio CRMX reception, an actor-operated tail switch, and USB-C service/configuration through the Flashlight Programmer app for macOS.

The fixture uses a simple two-channel DMX personality. Configuration is stored inside the flashlight, so the Mac does not need to remain connected during normal use.

| DMX Channel | Function |
|---|---|
| Start Address | Intensity |
| Start Address + 1 | Color Temperature (CCT) |

### 1.1 Normal Operating Concept

The lighting console controls intensity and CCT over CRMX.
The actor tail switch gates the lamp on or off without changing the received DMX look.
If CRMX/DMX is lost, the flashlight holds the last valid DMX look while power remains on.
The Mac app is used for addressing, status, wireless service, testing, battery calibration, and device information.

### 1.2 DMX Address Range

Valid starting addresses are 1-511. Because the fixture uses two consecutive DMX slots, address 511 uses slots 511 and 512.

> **Saved Settings**
> The DMX address and other persistent settings remain stored in the flashlight after the USB cable is disconnected or the unit is powered off.

# 2. Flashlight Operation

## 2.1 Actor Tail Switch

The tail switch is the local actor control. In the default momentary-toggle mode, each press changes the lamp between enabled and disabled.

- Press once: lamp enabled.
- Press again: lamp disabled.
- The switch does not create a new intensity or CCT value. It only gates the current DMX or held look.
- The flashlight starts with the lamp disabled after power-up.

A maintained-switch mode is also supported for installations that use a maintained tail switch. The selected mode is stored in the flashlight.

## 2.2 Intensity and CCT

DMX Channel 1 controls the overall LED output. DMX Channel 2 controls the blend between the warm and cool LED channels. The exact warm/cool endpoint calibration is determined by the flashlight hardware/firmware configuration.

| DMX Value | Intensity | CCT |
|---|---|---|
| 0 | Off | Warm/cool endpoint depends on fixture mapping |
| 1-254 | Proportional output | Crossfade through the configured range |
| 255 | Full output | Opposite endpoint of the configured range |

## 2.3 Signal Loss / Hold Last Look

If the CRMX radio link or DMX data disappears, the fixture keeps the most recently received valid intensity and CCT look in memory while the flashlight remains powered.

- The actor switch continues to gate the held look.
- When valid DMX returns, console control resumes automatically.
- A power cycle clears the held look.
- Changing the DMX address or deliberately unlinking CRMX clears the old look until fresh DMX is received.

## 2.4 Power and USB Service

Use the flashlight only with the intended battery/power system. For USB service, use a verified USB-C data cable and follow the power arrangement validated for the production hardware. Do not assume simultaneous USB and battery power is safe on an unverified hardware revision.

# 3. CRMX Wireless Operation

The flashlight uses a LumenRadio TimoTwo receiver for CRMX. Pairing is started from the CRMX transmitter. The flashlight stores its pairing information until it is deliberately unlinked.

## 3.1 Pairing

**1.** Power the flashlight and CRMX transmitter.
**2.** Place the CRMX transmitter into its normal Link mode.
**3.** Wait for the flashlight to join the transmitter.
**4.** Confirm Paired, active link/quality, and DMX Receiving in the Settings App or by console response.

## 3.2 Unlinking

**1.** Connect one flashlight to the Mac with USB-C.
**2.** Open the Flashlight Programmer and connect to the device.
**3.** Open the Wireless tab.
**4.** Select Unlink and confirm the command.
**5.** Use the CRMX transmitter Link command to pair the flashlight to a new transmitter.

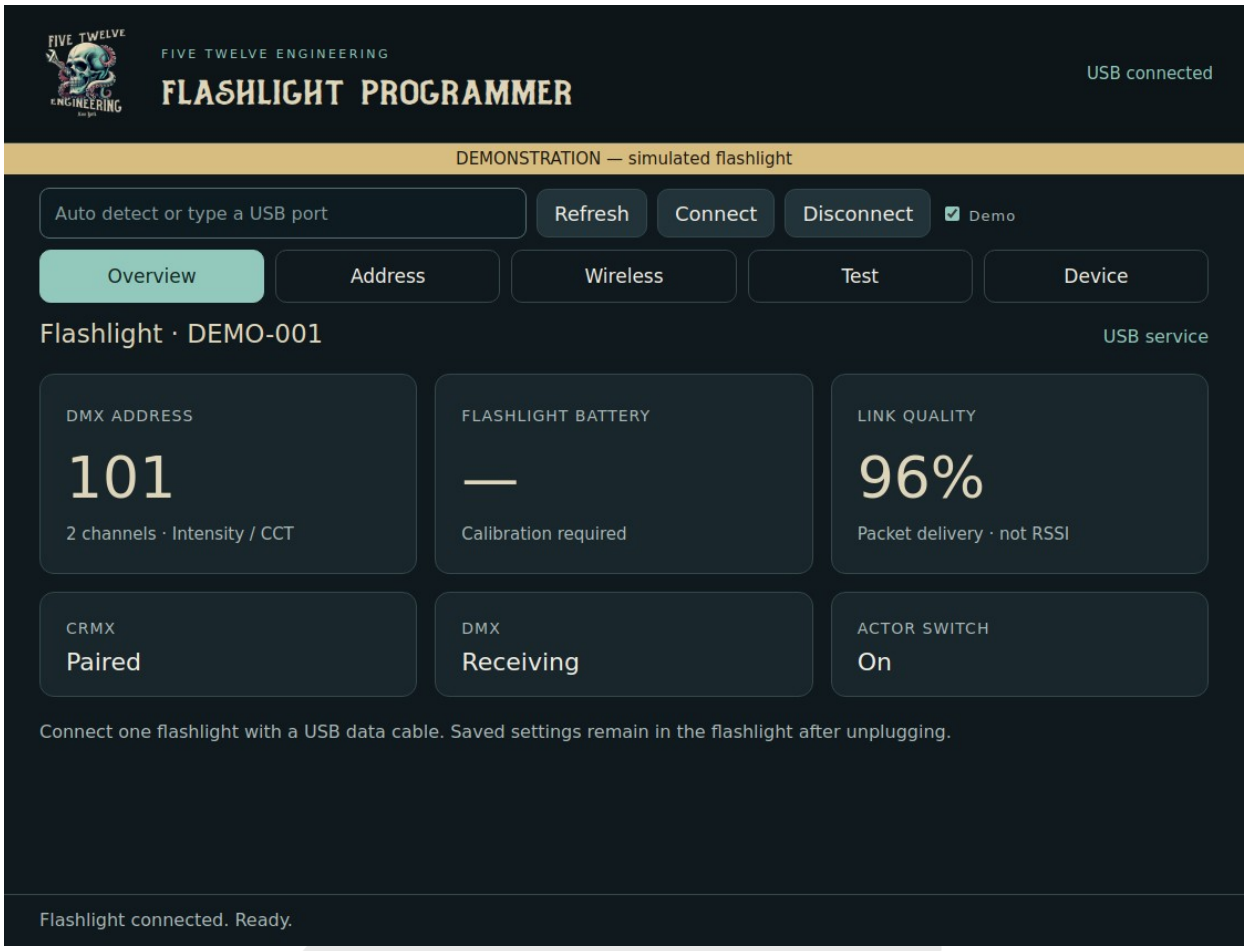
## 3.3 Wireless Status

| Status | Meaning |
|---|---|
| CRMX Paired | The receiver contains pairing information for a transmitter. |
| Link Quality | Packet-delivery quality reported by the radio; this is not RSSI/dBm. |
| DMX Receiving | Valid DMX data is currently being delivered to the flashlight. |
| Actor Switch | Current local tail-switch state. |

**Paired does not always mean Receiving**
A flashlight can remain paired even when the transmitter is off, out of range, or not currently sending valid DMX. Use the separate status indicators to tell these conditions apart.

# 4. Flashlight Programmer for macOS

The Flashlight Programmer is the USB settings and diagnostic application for the CRMX Flashlight. It is designed to work with one flashlight at a time.




*Flashlight Programmer v1.2 - Overview shown in Demo mode*

## 4.1 Connecting a Flashlight

**1.** Connect exactly one flashlight using a USB-C data cable.
**2.** Open Flashlight Programmer.
**3.** Leave the port field on auto-detect, or type/paste the USB port manually if required.
**4.** Select Refresh if needed, then Connect.
**5.** Confirm that the device ID and live status populate on the Overview page.

## 4.2 Main Tabs

| Tab | Purpose |
|---|---|
| Overview | DMX address, flashlight battery, link quality, CRMX/DMX status, and actor switch state. |
| Address | Set and save the DMX starting address. |
| Wireless | View wireless state and unlink the CRMX receiver. |
| Test | Temporarily command intensity and CCT from the Mac. |
| Device | View device identity, firmware, and supported controls. |

# 5. Address and Wireless Settings

## 5.1 Changing the DMX Address

The Address field accepts direct keyboard entry or pasted text. The on-screen keypad remains available as an optional convenience.

**1.** Open Address.

**2.** Click the address field and type a value from 1-511.

**3.** Select Save, or press Enter when the field supports direct-save input.

**4.** Confirm the saved address is read back from the flashlight.

Typing is not replaced by live status refreshes while you are editing the field.

## 5.2 Wireless Tab

The Wireless page separates stored pairing from the current radio/DMX condition. This makes it possible to tell the difference between an unpaired receiver, a paired receiver with no active link, and a receiver that is actively receiving DMX.

## 5.3 Unlink

Unlink is intentionally a deliberate action and requires confirmation. Unlinking clears the receiver pairing and clears the existing held look. Pairing to a new transmitter is then started from the transmitter itself.

## 5.4 Overview Status Fields

| Field | What to Expect |
|---|---|
| DMX Address | The stored two-channel start address. |
| Flashlight Battery | Measured pack voltage after calibration; unavailable until calibrated. |
| Link Quality | Packet-delivery percentage, not RF power in dBm. |
| CRMX | Paired/unpaired receiver state. |
| DMX | Whether valid DMX is currently being received. |
| Actor Switch | Current local actor-switch state. |

**Demo Mode**
Demo mode simulates a connected flashlight for learning the application. Demo values are not live device measurements and are not written to a physical flashlight.

# 6. Output Test and Battery Calibration

## 6.1 Local Output Test

The Test tab allows temporary local control of the flashlight without a lighting console. Intensity and CCT fields can be typed directly, and the optional on-screen controls can also be used.

**1.** Open Test.

**2.** Set a low intensity first, then adjust CCT as required.

**3.** Verify the warm/cool response and output.

**4.** Select Return to DMX, or leave the Test page when finished.

The flashlight continues to receive DMX while local Test is active. Test output does not overwrite the stored hold-last DMX look.

> **Automatic Test Timeout**
> The app renews the temporary test command while the connection is healthy. If the renewal stops, the flashlight exits Test automatically after approximately 1.5 seconds and returns to its normal DMX/held-look behavior.

## 6.2 Battery Calibration

The battery display is intentionally unavailable until the flashlight has been calibrated against a real multimeter reading.

**1.** Measure the flashlight battery pack with a trusted multimeter.

**2.** Connect the flashlight to the Programmer according to the approved service-power procedure.

**3.** Enter the measured pack voltage in the battery calibration field. The field accepts direct typing/paste.

**4.** Save the calibration. The flashlight stores the correction internally.

**5.** Compare the reported voltage to the meter again at a second battery level when practical.

## 6.3 Device Tab

The Device page shows identification and firmware information for the connected flashlight. The Programmer is a configuration/diagnostic tool; it is not a general firmware flasher, device renamer, or CRMX linking-key editor.

## 7. Normal Setup Procedure

**1.** Install a charged battery and power the flashlight.
**2.** Confirm the flashlight is paired with the intended CRMX transmitter.
**3.** Set the desired DMX address with the Mac app if required.
**4.** Disconnect the USB service cable and return the flashlight to normal production power configuration.
**5.** Confirm DMX reception from the console.
**6.** Test intensity, CCT, and the actor tail switch before handing the flashlight to talent.

## 8. Troubleshooting

| Problem | Check |
|---|---|
| App does not detect the flashlight | Use a verified USB data cable; connect only one flashlight; Refresh and reconnect. |
| CRMX says Paired but console has no control | Check link quality and DMX Receiving separately; verify transmitter output and DMX address. |
| Flashlight will not pair to a new transmitter | Unlink the existing pairing in Wireless, then start Link from the transmitter. |
| Wrong fixture responds | Verify the stored DMX start address. |
| Output stays at the previous look after signal loss | This is normal hold-last behavior. Power-cycle to clear it, or restore valid DMX. |
| Battery voltage is unavailable | Perform battery calibration with a real multimeter reading. |
| Local Test works but console does not | Return to DMX and verify CRMX link, DMX Receiving, and the selected address. |

## 9. Quick Reference

| Item | Value / Behavior |
|---|---|
| DMX footprint | 2 channels |
| Channel 1 | Intensity |
| Channel 2 | CCT |
| Start address | 1-511 |
| Signal loss | Hold last valid DMX look while powered |
| Default actor switch | Momentary toggle; starts Off |
| Configuration | USB-C + Flashlight Programmer for macOS |
| CRMX pairing | Started from the transmitter |
| CRMX unlink | Wireless tab in the Programmer |

## 10. Support

For configuration help, service, or repair, contact Five Twelve Engineering.