X-PoE Integrated LED Driver Specification

OVERVIEW

The Luum X-PoE lighting controller includes an integrated dual-channel LED driver on every port, purpose-built for low-voltage digital lighting systems. This document defines the electrical characteristics, integration guidelines, and compatibility requirements for fixture manufacturers intending to use the X-PoE port as the primary LED driver.

Each port on the X-PoE lighting controller behaves like a 2-channel Class 2 constant current driver, capable of powering and dimming modern LED modules directly, without the need for a separate local driver.

DRIVER SUMMARY (PER PORT)

PARAMETER	VALUE/RANGE	NOTES
Max Output Current (Per Channel)	1115mA	Hardware limited to Class 2 per channel
Output Voltage	24-54VDC	Fixture must operate within this range
Number Of Channels	2	Independently controllable (CH1, CH2)
Total Power (Per Port)	Up to 130W (typical)	Port-level power budget across 2 channels
Dimming Type	Digital (0-100%, 12-bit resolution)	Dimming control via Luum system
Isolation	Class 2	Limited energy, inherently safe

INTEGRATION GUIDELINES

Voltage Compatibility

- Fixtures **must operate above 24V** (Vf >23V).
- Fixtures that operate closer to **48V will draw less current** and better utilize port power (due to lower cable losses and switching overhead).
- Voltage must not exceed **54V** at any point in the load.

Current And Power Rules

- Each channel delivers a **maximum of 1115mA**.

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- In most cases, fixtures will be energized with 200mA of current to “glow”, then configured via software to the correct current output.
- **Power = Forward Voltage × Field Programmed Current** (max of 1.115 A per channel).

Channel Usage

- Two channels are available per port:
  - **Single-channel fixtures** can use CH1 or CH2.
  - **Dual-channel fixtures** (e.g. tunable white, up/downlight) should map each LED circuit to its own channel.
- Channels are software addressable and controlled independently in the Luum commissioning software.

> **COMBINING (AGGREGATING) CHANNELS**
>
> - Single-channel fixtures that require between 1115-2230mA can utilize a purpose built XPD that combines both X-PoE channels on a port to power the fixture. This XPD must come installed on the fixture and the wiring must be internal to the fixture.
> - Contact Luum.io to discuss options for any fixtures that require greater than 2230mA.

Fixture Wiring

- Fixtures should be terminated with clearly labeled **+ / − wires** per channel.
- Shared neutral or other creative wiring schemes are not recommended unless validated with Luum.
- Label channel usage in fixture documentation (e.g. “CH1 = Downlight, CH2 = Uplight”).

Fixture Design Considerations

- Prefer **constant current** modules over constant voltage designs.
- LED strings should be designed for forward voltages within the optimal operating range (36–48 V recommended), with voltages closer to 48 V being ideal to most efficiently optimize the use of each channel.
- If a fixture already includes a remote constant current driver, replacing it with the X-PoE integrated driver is typically straightforward. Fixture manufacturers should confirm compatibility and remove any redundant driver electronics before integration.
- Avoid adding local drivers, regulators, or converters unless absolutely necessary.

FIXTURE CERTIFICATION

To be listed as **X-PoE Compatible**, fixtures must:

1. Operate reliably with 1115mA constant current input.
2. Maintain forward voltage between 24–54V across all temperatures.
3. Be tested and approved by Luum's hardware integration team.

EXAMPLE FIXTURE LOADS

FIXTURE TYPE	FORWARD VOLTAGE	POWER (W)	NOTES
Linear Static White	40V	46W	Typical for direct-lit linear
Tunable White	36V x 2	83W	One channel per CCT circuit
High-Power Pendant	48V	110W	Efficient full-port usage
Low-Power Accent	28V	32W	May leave power headroom

NOTES FOR FIXTURE ENGINEERS

- Treat the port like a **DC output with current source behavior**, not a voltage source.
- If integrating test jacks or EMC filters, verify they are safe for a 1115 mA CC circuit.
- The system does not support analog dimming or local potentiometer control — **all control is via Luum's networked system or 3rd party integration**.

OVERDRIVING VS. UNDERDRIVING

LEDs are tolerant of being slightly underdriven without performance issues. For instance, a fixture rated at 70 W might perform acceptably at 65 W if the photometric performance remains within spec. Fixture manufacturers are encouraged to verify the delivered output at the expected current and confirm lumen delivery with photometric testing rather than relying solely on nominal wattage.

RELATED INFORMATION

Technical Support

Questions about this specification can be sent to support@luum.io. Fixture options above 2230 mA can be sent to sales@luum.io.

Document Feedback

While we have taken great care to ensure the accuracy and completeness of this document, we welcome your feedback and suggestions. If you notice any errors or omissions, or feel a topic could benefit from further explanation, please email your feedback to support@luum.io.

Revision History

Date	Revision	Notes
11/3/2026	A	Converted to the current guide format.

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