



**ULDC-Z**  
**TECHNICAL DATASHEET**

---

# ULDC-Z Universal LED Driver Controller Technical Datasheet

## Overview

The ULDC-Z is a versatile lighting control device designed for controlling 0-10V dimmable LED drivers. With advanced features including temperature sensing, motion detection, and multiple communication protocols, it provides sophisticated control for modern lighting applications.

## Features

- Advanced 0-10V dimming control
- Temperature-based adaptive control
- Motion-based lighting control
- RS-485 communication with multiple protocols
- Wireless connectivity
- Over-the-air firmware updates
- Comprehensive protection features
- Industrial-grade reliability

## Regulatory Approvals (pending)

- CE
- UL Component Recognition
- FCC Part 15 Class B
- RoHS Compliant
- EN 61547 EMC Immunity
- EN 55015 EMC Emissions

---

## Power Specifications

- Operating Voltage: 9-36V DC
- Power Consumption
  - Operating: < 2W typical
  - Standby: < 0.5W
- Protection
  - Reverse polarity protected
  - Surge protected to IEC 61000-4-5
  - Overcurrent protected

## 0-10V Output Ratings

- Control Signal
  - Voltage Range: 0-10V DC
  - Current Sink: 20mA maximum
  - Resolution: 12-bit (4096 steps)
  - Update Rate: 1kHz
  - Continuous Feedback Control
- Output Characteristics
  - Short circuit protected
  - Surge protected
  - Isolation: Class 2
- Performance
  - Accuracy:  $\pm 1\%$  of full scale
  - Temperature Stability:  $\pm 0.01\%/^{\circ}\text{C}$
  - Response Time: < 5ms

## Temperature Sensing

- NTC Input
  - Compatible Sensors: 10K NTC ( $\beta=3950\text{K}$ )
  - Measurement Range:  $-20^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$
  - Accuracy:  $\pm 0.5^{\circ}\text{C}$  typical
  - Resolution:  $0.1^{\circ}\text{C}$
  - Sampling Rate: 10Hz

---

## Motion Detection Input

- Input Characteristics
  - Voltage Range: 12-24V DC
  - Input Current: 1mA typical
  - Input Impedance: 22k $\Omega$
- Response
  - Debounce Time: 50ms default (programmable)
  - Edge Detection: Both edges

## Communication

- RS-485 Interface
  - Protocols: DMX512, Modbus RTU
  - Baud Rates: Up to 115200 bps
  - Address Range: 1-247 (Modbus)
  - Network Size: Up to 32 devices
  - Termination: Software selectable 120 $\Omega$
- Wireless Interface
  - Protocol Support: BLE,Wi-Fi
  - Range: Up to 100m line of sight
  - Security: AES-128 encryption
  - OTA Updates: Supported with secure boot

## Environmental Specifications

- Temperature
  - Operating: -20°C to +60°C
  - Storage: -40°C to +85°C
- Humidity
  - Operating: 10% to 90% RH (non-condensing)
  - Storage: 5% to 95% RH (non-condensing)
- Altitude
  - Operating: Up to 2000m
  - Storage: Up to 3000m
- Protection Rating: IP20

---

## Mechanical Specifications

- Dimensions
  - Width: 90 mm
  - Height: 70 mm
  - Depth: 25 mm
- Weight: 120g
- Mounting
  - DIN Rail: 35mm
  - Surface Mount: 4 points
- Connections
  - Terminal Type: Spring cage
  - Wire Size: 24-14 AWG
  - Stripping Length: 8mm

## Performance Specifications

### Dimming Performance

- Dimming Range
  - Full Range: 0-100%
  - Adjustable High End: 100-70%
  - Adjustable Low End: 0-30%
- Dimming Resolution
  - Digital: 12-bit (4096 steps)
  - Analog: Better than 0.1V
- Response Characteristics
  - Turn-On Time: < 100ms
  - Turn-Off Time: < 100ms
  - Dimming Speed: Adjustable 0.1-100% per second
- Dimming Curve
  - Linear

---

## Configuration Parameters

### 0-10V Output Configuration

- Minimum Output Level: 0-30% (1% steps)
- Maximum Output Level: 70-100% (1% steps)
- Power-On Level: 0-100% (1% steps)
- Fade Time Range: 0-60 minutes
- Response Curve: Linear/Logarithmic/Custom

### Motion Control Configuration

- Hold Time: 1 second to 60 minutes
- Grace Period: 0-60 seconds
- Light Level Change: 0-100%
- Fade Up Time: 0-60 seconds
- Fade Down Time: 0-60 seconds

### Network Configuration

- RS-485 Settings
  - Mode: Master
  - Baud Rate: 9600/19200/38400/57600/115200
  - Parity: None/Even/Odd
  - Stop Bits: 1/2
- Wireless Settings
  - Network SSID: 32 characters max
  - Security: WPA2-PSK, WPA3
  - Encryption: AES-128

---

## LED Indicators

- Power (Green)
  - On: Normal operation
  - Off: No power
- Status (Blue)
  - On: Connected to the network
  - Blinking: Flash operation
  - Off: Not Connected to the network

## Reliability

- MTBF: >100,000 hours at 25°C
- Service Life: >10 years
- Warranty: 1 year

## Application Notes

- Maximum Cable Lengths
  - 0-10V: 300m (shielded twisted pair)
  - RS-485: 1200m
  - NTC Sensor: 100m (shielded)
  - PIR Input: 100m (shielded)
- Recommended Wire Types
  - 0-10V: 18-22 AWG shielded twisted pair
  - RS-485: CAT5e or better
  - Power: 18-14 AWG
- Load Compatibility
  - 0-10V LED Drivers: Up to 25 units (2mA each)
  - Other 0-10V Loads: Up to 50mA total sink current

---

## Accessories (Sold Separately)

- PS-24V-60W: 24V/60W DIN rail power supply
- NTC-10K-IP67: Waterproof temperature sensor