NETWORK LED DIMMER

Features

- Provides complete control of LED intensity (0–100%) through serial communication or manual pushbutton
- Uses DMX512-A, Modbus/ASCII, or Optomux protocols
- Uses PWM (pulse width modulation) to control LED performance without flicker or color shift
- Compact, lightweight, sturdy package

Network LED Dimmer

DESCRIPTION

The Opto 22 Network LED Dimmer is a constant voltage PWM (pulse width modulation) dimmer that controls light-emitting diodes (LEDs). Used alone or teamed together, this compact dimmer is suited for applications involving LED color mixing, stage or accent lighting, step or path marking, facade or wall lighting, or any other use that requires variable light from LEDs.

The Network LED Dimmer is suitable for 12–24 VDC constant voltage LED assemblies: lamps, bulbs, strips, bars, and rope. It can also be used for other resistive-type loads.

Pulse width modulation provides linear dimming with minimal color shift and flicker-free performance. The Network LED Dimmer acts by controlling the amount of power sent to the LEDs, rapidly changing the state from on to off. This high switching frequency makes dimming both efficient and effective for LEDs.

The Network LED Dimmer includes a serial communications port, a test pushbutton, and two external indicator lights:

- TX/RX for serial communications—green indicates TX and red indicates RX.
- PWM for ramp activity—Intensifies as LEDs are ramped up.

Manual Control

The built-in test pushbutton on the Network LED Dimmer provides manual control for testing connections and settings:

To turn on or off	Push briefly
To ramp up or down	Push and hold; let go at the level of brightness you want

Once you have ramped to the level you want, you can push briefly to turn LEDs off. When you push again to turn them back on, the setting is retained and they will be at the same level of brightness you set before.

For manual control beyond testing, you can wire your own momentary pushbutton (typically a doorbell or other simple normally open pushbutton) to the dimmer.

System Control

With serial communications included in the Network LED Dimmer, you can now control LEDs through standard RS-485 serial protocols—including DMX512-A, Modbus/ASCII, and Optomux—and incorporate lighting control into existing building, automation, and lighting control systems.

The Network LED Dimmer uses an RS-485 serial network. Serial link connections require no tools: they are made by bare-wire spring connectors. Duplicated positions on the serial connector simplify daisy chaining. Up to 124 dimmers can be on the same serial link (total for all protocols).

Two blocks of DIP switches inside the dimmer's case let you set the following parameters:

- Protocol
- Address
- Serial line termination
- Baud rate (Modbus and Optomux only)
- Parity (Modbus only)

Addresses and baud rates depend on the protocol you use:

	DMX	Modbus	Optomux
Address range	1–512	1–127	1–255
Baud rate	250,000	9600 19,200 115,200 230,400	9600 19,200 115,200 230,400

To set the switches, use your smart phone to scan the QR code (above right; also located inside the dimmer's cover) and follow the link for configuration settings, wiring diagrams, and more. Or see the *Opto 22 Network LED Dimmer User's Guide* (form 2038) for details.

Part Number

Part	Description
LED-SPCV-LV100W	Networkable Constant Voltage LED Dimmer, Serial Modbus/DMX, Push Button, Rated 100 W Low Voltage (12/24 VDC)

MADE IN THE USA

SPECIFICATIONS

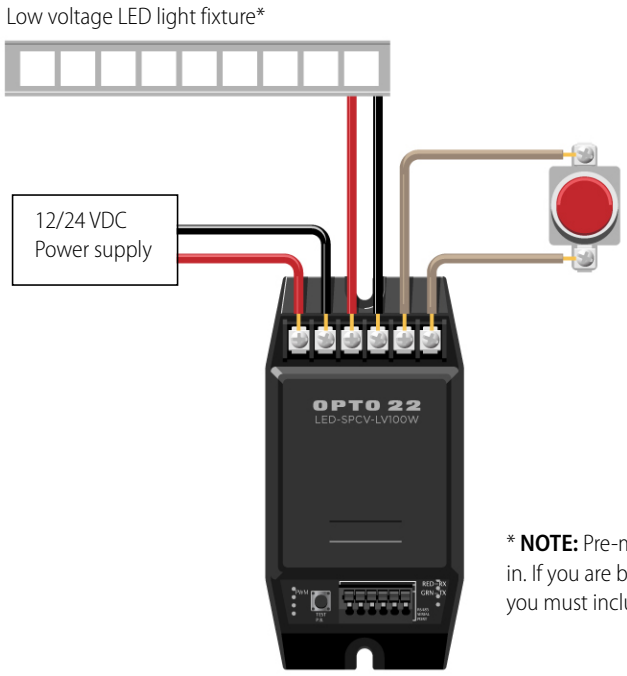
Nominal Input Voltage	12 or 24 VDC (Full range: 9–30 VDC)
Operating Current	20 mA @ 12 V, 0% duty cycle 30 mA with pushbutton pressed
Max. Output Power*	100 W @ 12 V: 8 A @ 50 °C ambient 100 W @ 24 V: 4 A @ 50 °C ambient Derate to 0 A @ 70 °C ambient
On-board Fuse	10 A automotive mini fuse (red)
Torque Specs	Recommended for 6-position screw connector: 6 in.-lb. (0.678 N-m)
External Pushbutton Excitation	Open Circuit Voltage: 8 VDC Typical (P.B. open) Short Circuit Current: 4 mA Typical (P.B. closed)
Protocols	DMX512-A, Modbus ASCII, Optomux
Serial Communication Link	1 RS-485 (shielded twisted-pair, 2 pair: one pair for data, one for common) port with duplicate terminal positions for easy daisy chaining
Max. Turnaround Delay	12 microseconds (Modbus and Optomux only)
Max. Dimmers on Link	124 Opto 22 Network LED Dimmers
Max. Distance	1000 feet (304.8 m.) at 115,200; 500 feet (152.4 m.) at 250,000
Selectable Data Rates (Baud)	DMX: 250,000 Modbus: 9600; 19,200; 115,200; 230,400 Optomux: 9600; 19,200; 115,200; 230,400
Address Range	DMX: 1–512 Modbus: 1–127** Optomux: 1–255**
Termination and Biasing***	Set DIP switch (inside case) if Dimmer is at the physical end of the link. Biasing must be supplied by master for the RS-485 link.
LEDs	TX/RX: Green = TX; Red = RX PWM: Intensifies as LEDs are ramped up; fully lit at duty cycle of 100%
PWM Frequency	244 Hz
PWM Period	4.2 milliseconds
PWM Resolution	Brightness commands are 8-bit logarithmic curve; duty cycle commands are 15-bit resolution
Max. Number of Ramp Steps	256 using logarithmic brightness curve; 32,768 if writing linear duty cycle
Ramp Time Parameter	(Optomux and Modbus protocols only) User selectable with range from 0–255
Operating Temperature	-20 to +70 °C
Storage Temperature	-20 to +85 °C
Humidity	0–95% humidity, non-condensing
Agency Approvals	CE, RoHS
Warranty	30 months

*For rated power, mount to a flat, thermally conductive surface (steel, aluminum).
**Do not use address 0; it is the broadcast address.
***Both ends of the physical link must be terminated. Master must supply bias.

Connectors and LEDs

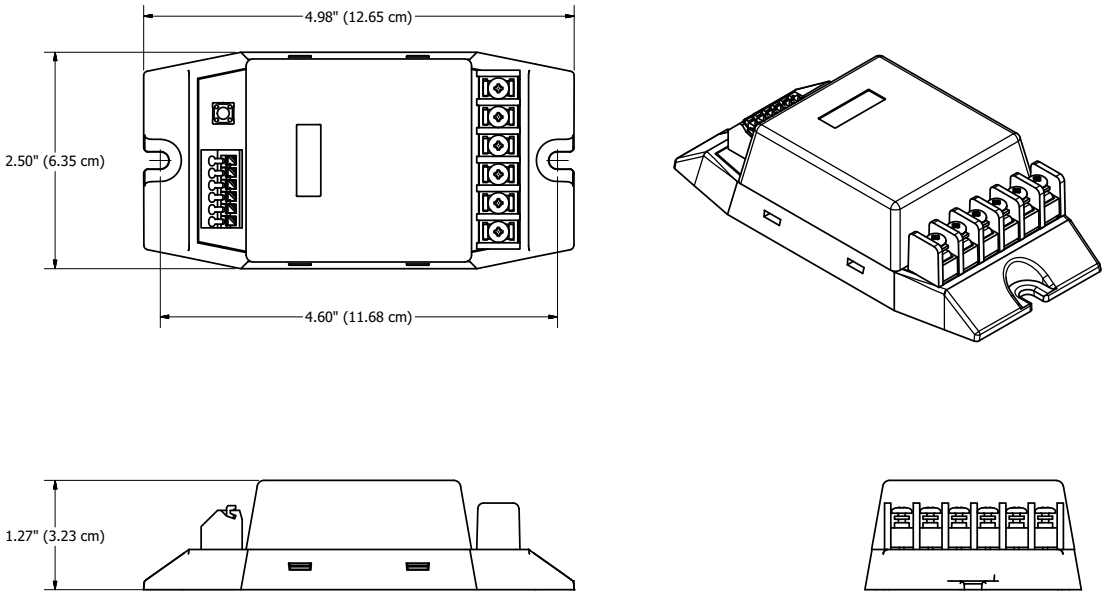
For details on wiring and serial network connections, see the *Opto 22 Network LED Dimmer User's Guide* (form 2038).

Wiring



* **NOTE:** Pre-manufactured LED light fixtures have a resistor built in. If you are building your own assembly from LED components, you must include an appropriate resistor.

DIMENSIONAL DRAWING



More about Opto 22

OPTO 22

PRODUCTS

Opto 22 develops and manufactures reliable, easy-to-use, open standards-based hardware and software products.

Industrial automation, process control, building automation, industrial refrigeration, remote monitoring, data acquisition, and industrial internet of things (IIoT) applications worldwide all rely on Opto 22.

groov EPIC® System

Opto 22's *groov* Edge Programmable Industrial Controller (EPIC) system is the culmination of over 40 years of experience in designing products for the automation industry.

groov EPIC gives you an industrially hardened system with guaranteed-for-life I/O, a flexible Linux®-based controller with gateway functions, and software for your IIoT application or any application.

groov EPIC I/O

I/O provides the local connection to sensors and equipment. *groov* I/O offers up to 24 channels on each I/O module, with a spring-clamp terminal strip, integrated wireway, and swing-away cover.

Opto 22 I/O is so reliable, we can afford to guarantee it for life. *groov* I/O is hot swappable, UL Hazardous Locations approved, and ATEX compliant.

groov EPIC Controller

The heart of the system is the *groov* EPIC controller. It handles a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

In addition, the EPIC provides secure data communications among physical assets, control systems, software applications, online services, and more, both on premises and in the cloud.

Configuring and troubleshooting I/O and networking is easier with the EPIC's integrated high-resolution touchscreen. Authorized users can see your *groov* View HMI locally on the touchscreen or on a monitor connected via the HDMI or USB ports.

groov EPIC Software

Software includes:

- Flowchart-based PAC Control for control programming, or build your own custom application with optional secure shell access
- *groov* View for building and viewing your own device-independent HMI
- Node-RED for creating simple logic flows from pre-built nodes
- Ignition Edge® from Inductive Automation®, with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT/Sparkplug communications for efficient IIoT data transfer

groov Edge Appliance

Visualization, data handling, and connectivity in a compact, industrial box: that's the *groov* Edge Appliance. Included are:

- *groov* View for building and viewing operator interfaces on PCs and mobile
- Node-RED for building simple logic flows
- Ignition Edge® from Inductive Automation®, for OPC-UA drivers and MQTT/Sparkplug IIoT communications

Older products

From solid state relays (our first products) to world-famous G4 and SNAP I/O, to SNAP PAC controllers, Opto 22 products last a long time. You can count on us to give you the reliability and service you expect.

QUALITY

Founded in 1974, Opto 22 has established a worldwide reputation for high-quality products. All are made in the U.S.A. at our manufacturing facility in Temecula, California.

Because we test each product twice before it leaves our factory rather than testing a sample of each batch, we can guarantee most solid-state relays and optically isolated I/O modules for life.

FREE PRODUCT SUPPORT

Opto 22's California-based Product Support Group offers free, comprehensive technical support for Opto 22 products from engineers with decades of training and experience. Support is available in English and Spanish by phone or email, Monday–Friday, 7 a.m. to 5 p.m. PST.

Support is always available on our website, including how-to videos, user's guides, the Opto 22 KnowledgeBase, troubleshooting tips, and OptoForums. In addition, free hands-on training is available at our Temecula, California headquarters, and you can register online.

PURCHASING OPTO 22 PRODUCTS

Opto 22 products are sold directly and through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at **800-321-6786** (toll-free in the U.S. and Canada) or **+1-951-695-3000**, or visit our website at www.opto22.com.

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MADE IN THE USA

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