

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)

SPECIFICATIONS

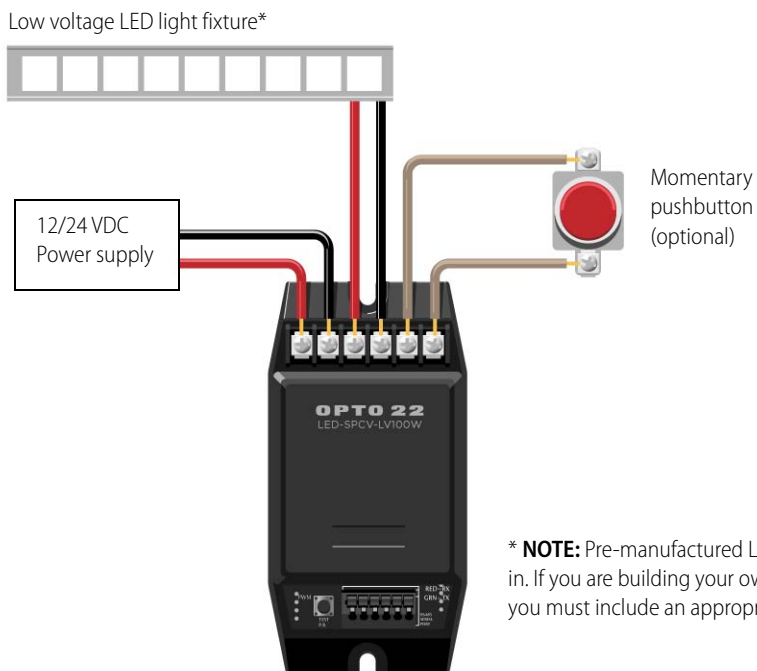
Nominal Input Voltage	12 or 24 VDC (Full range: 9–30 VDC)
Operating Current	20 mA @ 12 V, 0% duty cycle 30 mA with pushbutton pressed
Max. Output Power*	100 W @ 12 V: 8 A @ 50 °C ambient 100 W @ 24 V: 4 A @ 50 °C ambient Derate to 0 A @ 70 °C ambient
On-board Fuse	10 A automotive mini fuse (red)
Torque 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; UKCA
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



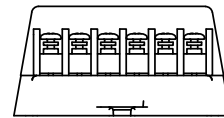
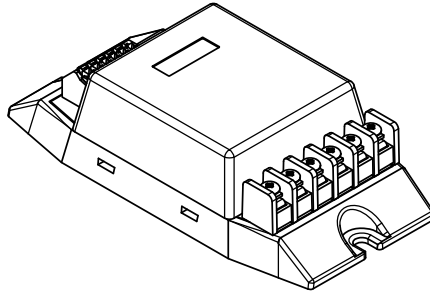
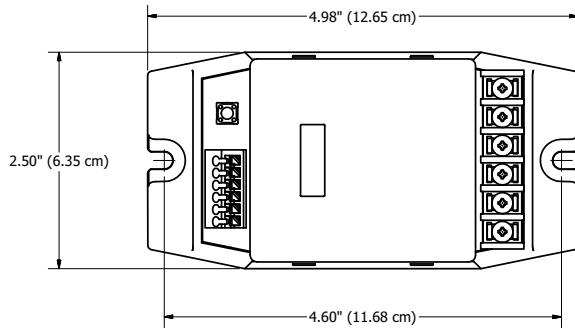
For details on wiring and serial network connections, see the [Opto 22 Network LED Dimmer User's Guide](#) (form 2038).

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



PRODUCTS

Opto 22 develops and manufactures reliable, easy-to-use, open standards-based hardware and software products. Industrial automation, process control, remote monitoring, data acquisition, and industrial internet of things (IIoT) applications worldwide all rely on Opto 22.

groov RIO®

groov RIO edge I/O offers a single, compact, PoE-powered industrial package with web-based configuration and IIoT software built in, support for multiple OT and IT protocols, and security features like a device firewall, data encryption, and user account control.

Standing alone, *groov RIO* connects to sensors, equipment, and legacy systems, collecting and securely publishing data from field to cloud. Choose a universal I/O model with thousands of possible field I/O configurations, with or without Ignition from Inductive Automation®, or a *RIO EMU energy monitoring unit* that reports 64 energy data values from 3-phase loads up to 600 VAC, Delta or Wye.

You can also use *groov RIO* with a Modbus/TCP master or as remote I/O for a *groov EPIC* system.

groov EPIC® System

Opto 22's *groov Edge Programmable Industrial Controller (EPIC) system* gives you industrially hardened control with a flexible Linux®-based processor with gateway functions, guaranteed-for-life I/O, and software for your automation and IIoT applications.

groov EPIC Processor

The heart of the system is the *groov EPIC* processor. 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, and online services, both on premises and in the cloud. No industrial PC needed.

Configuring and troubleshooting I/O and networking is easier with the EPIC's integrated high-resolution color touchscreen. Authorized users can manage the system locally on the touchscreen, on a monitor connected via the HDMI or USB ports, or on a PC or mobile device with a web browser.

groov EPIC I/O

groov I/O connects locally to sensors and equipment. Modules have a spring-clamp terminal strip, integrated wireway, swing-away cover, and LEDs indicating module health and discrete channel status. *groov I/O* is hot swappable, UL Hazardous Locations approved, and ATEX compliant.

groov EPIC Software

The *groov EPIC* processor comes ready to run the software you need:

- Programming: Choose flowchart-based PAC Control, CODESYS Development System for IEC61131-3 compliant programs, or secure shell access (SSH) to the Linux OS for custom applications
- Node-RED for creating simple IIoT logic flows from pre-built nodes
- Efficient MQTT data communications with string or Sparkplug data formats
- Multiple OPC UA server options
- HMI: *groov View* to build your own HMI viewable on touchscreen, PCs, and mobile devices; PAC Display for a

Windows HMI; Node-RED dashboard UI

- Ignition or Ignition Edge® from Inductive Automation (requires license purchase) with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications

Older products

From solid state relays, to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and working hard at thousands of installations worldwide. You can count on us for the reliability and service you expect, now and in the future.

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 afford to 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 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 [free online training](#) at OptoU, how-to [videos](#), [user's guides](#), the Opto 22 KnowledgeBase, and [OptoForums](#).

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.

