

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

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.



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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

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)

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.

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.

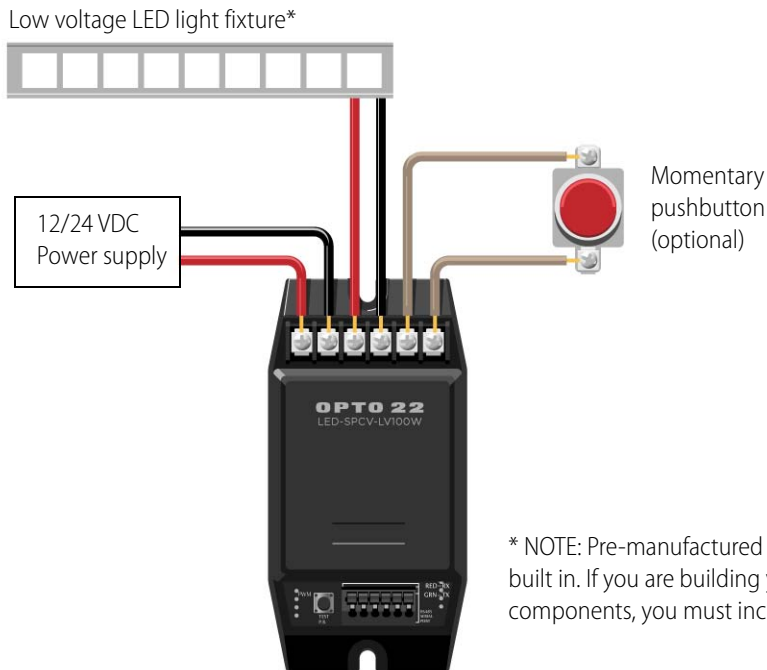
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Connectors and LEDs



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

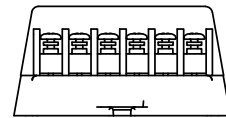
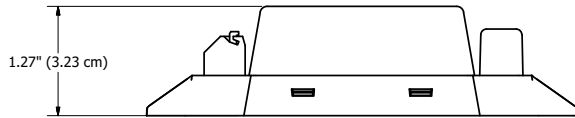
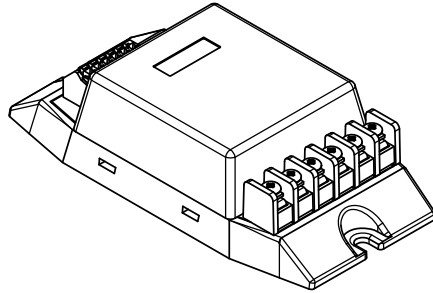
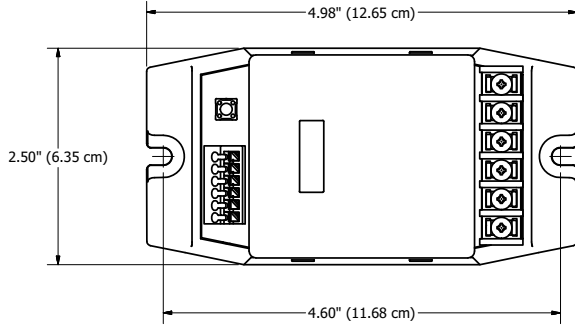
Wiring



* 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.

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Dimensional Drawing



More About Opto 22

Products

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

Industrial automation, process control, building automation, industrial refrigeration, remote monitoring, data acquisition, Industrial Internet of Things (IIoT), and information technology applications all rely on Opto 22.



groov

Monitor and control your equipment from anywhere using your smartphone or tablet with groov. Build your own mobile app easily—just drag, drop, and tag. No programming or coding. Visit groov.com for more information and your free trial.

SNAP PAC System

Developer- and IIoT-ready, the SNAP PAC System connects physical assets to databases and applications using open standards. The SNAP PAC System consists of four integrated components:

- SNAP PAC controllers
- PAC Project™ Software Suite
- SNAP PAC brains
- SNAP I/O™

SNAP PAC Controllers

SNAP PAC programmable automation controllers handle a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

For IIoT applications and easier integration with company systems, standalone and rack-mounted SNAP PACs include a built-in HTTP/HTTPS server and **RESTful API** (application program interface). The REST API gives you secure, direct access to I/O and variable data using your choice of programming languages. No middleware, protocol converters, drivers, or gateways needed.

Based on open Ethernet and Internet Protocol (IP) standards, SNAP PACs make it easier to build or extend a system without the expense and limitations of proprietary networks and protocols.

PAC Project Software Suite

Opto 22's PAC Project Software Suite offers full-featured, cost-effective control programming, HMI (human machine interface), OPC server, and database connectivity software.

Control programming includes both easy-to-learn flowcharts and optional scripting. Commands are in plain English; variables and I/O point names are fully descriptive.

PAC Project Basic offers control and HMI tools and is free for download on our website, www.opto22.com. PAC Project Professional, available for separate purchase, adds one SoftPAC software-based controller, OptoOPCServer, OptoDataLink, options for controller redundancy or segmented networking, and support for legacy Opto 22 serial *mistic*™ I/O units.

SNAP PAC Brains

While SNAP PAC controllers provide central control and data distribution, SNAP PAC brains provide distributed intelligence for I/O processing and communications. Brains offer analog, digital, and serial functions, including thermocouple linearization, local PID loop control, watchdog, totalizing, and much more.

SNAP I/O

I/O provides the local connection to sensors and equipment. Opto 22 SNAP I/O offers 1 to 32 points of reliable I/O per module. Analog, digital, and serial modules are mixed on one mounting rack and controlled by a SNAP PAC brain or rack-mounted PAC.

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 only 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.

Additional support is always available on our website: how-to videos, OptoKnowledgeBase, self-training guide, troubleshooting and user's guides, and OptoForums.

In addition, hands-on training is available for free 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 951-695-3000, or visit our website at www.opto22.com.

{RESTful API}



www.opto22.com

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