User's Manual

NewDEL™ Fiber-Coupled LED

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1) GENERAL INFORMATION

The NewDEL™ Fiber-coupled LED is designed for flexibility and ease of use. Each NewDEL™ model incorporates its own driver and microcontroller circuitry, so that it is ready to operate right out of the package. Using free Windows based software, users have complete control over a range of parameters, including delays, triggers, pulse durations, as well as PWM frequency and duty cycle.

For users comfortable with writing code, the NewDEL can also be programmed using distinct serial commands which are provided in Section 6.

Twenty standard NewDEL models include narrowband sources that span a spectral range from the UV to the near IR, plus broadband sources; additional wavelengths are available on request.

2) SAFETY NOTICES

⚠	Please make yourself familiar with the contents of these operating instructions before using the NewDEL Fiber Coupled LED. Use only as specified in this manual.
⚠	Do not disassemble the unit. There are NO user serviceable parts inside the device. Doing so will void your warranty and create an unsafe operating environment.
⚠	Only allow qualified personnel to operate this unit.
⚠	Do not use the unit if it is damaged in any way. Contact your sales representative for repair or replacement information.
⚠	Always screw in the fiberoptic patch cord to the NewDEL before start-up. (Fiberoptic patch cord sold separately.)
☀	Hazardous optical radiation and UV may be emitted from this light source and the end of an attached fiberoptic patch cord. May be harmful to eyes and skin. Use appropriate shielding to protect from exposure.

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3) SYSTEM SETUP

a. Unpacking

Each NewDEL Fiber-coupled LED is shipped inside its own storage box (Figure 1). The International socket clip attaches to the AC/DC wall adapter. The available clip options are shown in Figure 3.

Figure 1 – Inner storage box contents

Once the NewDEL unit is removed, the USB to RS232 adapter cable is exposed (Figure 2). It is stored under the NewDEL.

Figure 2 – Storage box location of USB to RS232 adapter cable

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Figure 3 - International socket clips for PS12V Universal AC/DC Wall adapter

b. Tabletop Mounting

The NewDEL Fiber-coupled LED is equipped with rubber feet for placement on a flat surface. There are two other options which require additional mounting hardware sold by LumeDEL.

c. MA35R DIN rail mount kit

The mount kit is used to mount a NewDEL LED source to a standard 35 mm DIN rail. Constructed of glass-fiber reinforced Nylon material and designed to work with rail depths of 7.5 mm or greater. When on the DIN rail, the spring-loaded clip "grips" the rail on both the top and bottom lips of the rail.

User installation is possible onto either side of a NewDEL LED source. Remove the cap screws from the selected side of the NewDEL using the hex key wrench and fasten the DIN rail clip on using the (2) flat-head screws (Figure 4) provided in the kit.

Figure 4 - MA35R DIN rail mount kit

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d. MA70S Right-angle flange mount pair

This surface mount flange kit contains 2 brackets and 2 screws (Figure 5). The mounting hardware material is black powder coated aluminum. It requires US #8 machine screw, or metric M4 for surface mounting.

Figure 5 - MA70S Right-angle flange mount pair

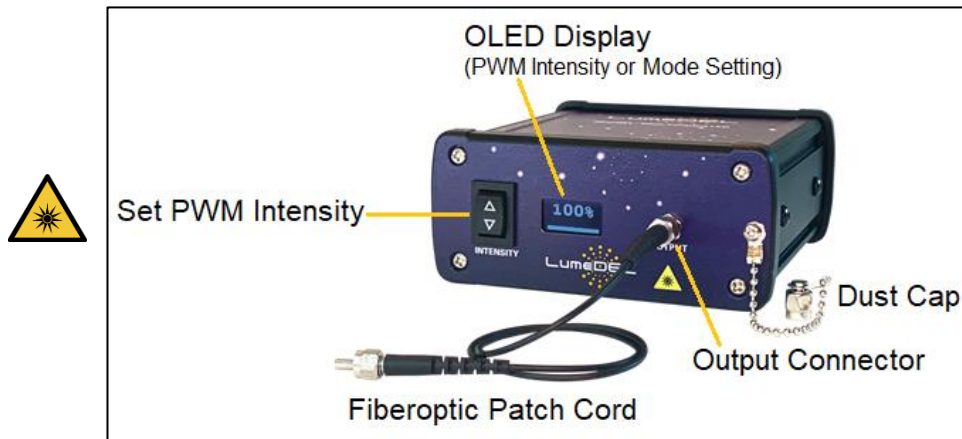| ⚠	This is a factory installed option. The kit is not sold alone.

e. Front Panel

Figure 6 – Front panel

f. Rear Panel

Figure 7 – Rear Panel with DB-9 Pinout (RS-232)

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4) SOFTWARE DOWNLOAD

The software can be downloaded from the website on the Downloads page accessed under "Resources" in the top navigation bar as shown in Figure 8;

Figure 8 Downloading NewDEL software

The file name is NewDEL.exe. Once downloaded, move it to a file folder of the user's choice. The program will run when clicked.

5) USING THE SOFTWARE

a. Connect the serial port
For operation from a Windows® PC, each NewDEL Fiber-coupled LED is supplied with a Model CA23F USB to RS232 adapter cable (Figure 9). The DB-9 connector mates to the NewDEL Fiber-coupled LED.

Figure 9 - Model CA23F USB to RS232 adapter cable

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b. Connecting to the Software

	BEFORE TURNING THE POWER ON FOR THE LED, REMOVE THE DUST CAP AND ATTACH A FIBEROPTIC PATCH CORD! DO NOT STARE INTO THE LIGHT EMITTING END OF THE FIBEROPTIC PATCH CORD!

Power on the NewDEL Fiber-coupled LED then open the NewDEL software. The connection is automatic indicated by the bright green dot and display of the Firmware (FW) version, Model and Serial numbers (Figure 10).
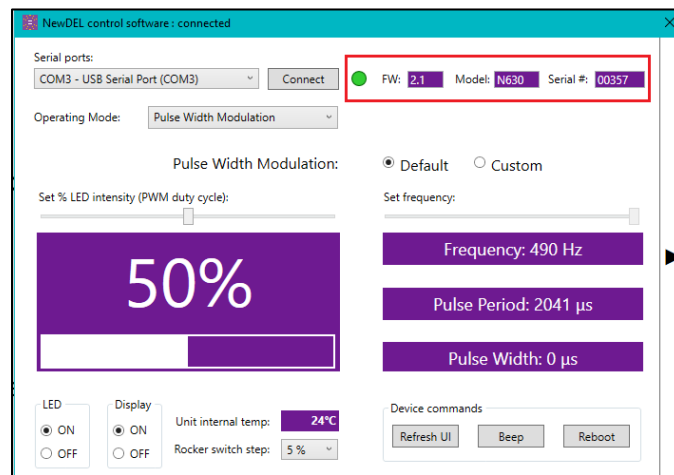

Figure 10 – Automatic connection

If the software is open before the LED power is on, use the Connect button to complete the connection (Figure 11).
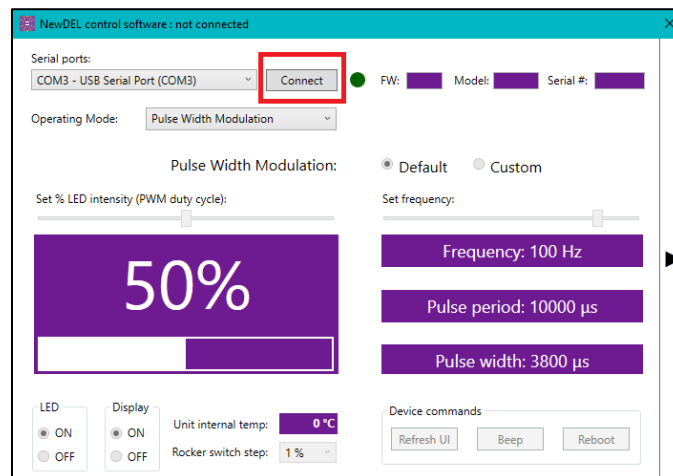

Figure 11- Manual connection

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c. Pulse Width Modulation Operating Mode

Pulse Width Modulation (PWM) is a method of controlling the average power delivered by an electrical signal. It is commonly used with the drive current of LEDs to enable brightness intensity control. Read more about PWM: https://en.wikipedia.org/wiki/Pulse-width_modulation

i. Default PWM

The default PWM frequency is 490 Hz. The slider bar on the left is used to change the PWM duty cycle (i.e. % LED Intensity).
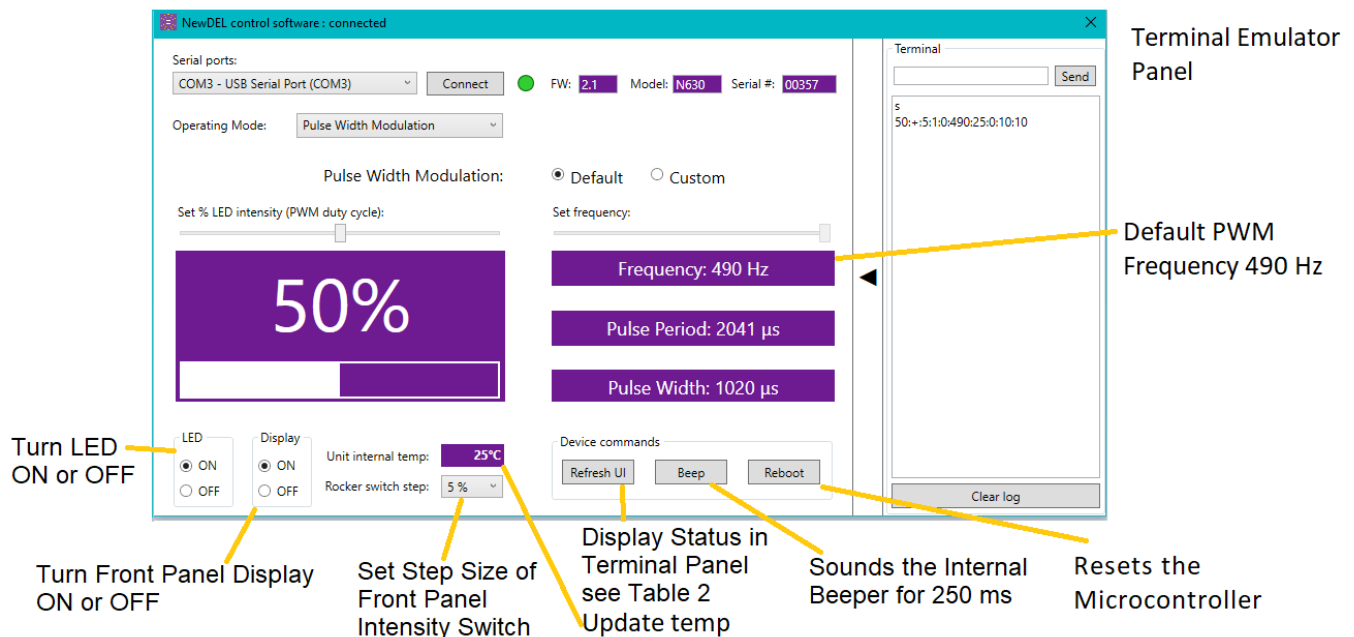

Figure 12 Default PWM GUI Controls

Figure 13 – Front Panel

- Pulse Period is the inverse of the PWM frequency in units of microseconds.
- Pulse Width is the product of the Pulse Period times the Duty Cycle.

ii. Custom PWM

Selecting Custom PWM (Figure 14) allows the PWM frequency to be user set between 1 Hz and 500 Hz using the slider control.
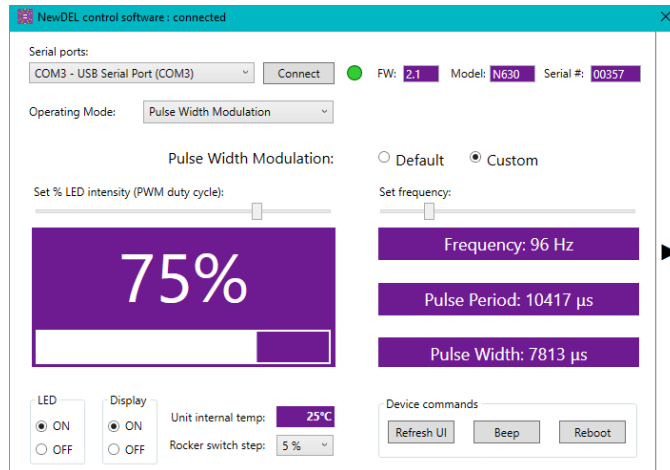

Figure 14 – Custom PWM Operating Mode

d. Internal Trigger Mode

Internal trigger mode (Figure 15) is used to create a pulse cycle by selecting a delay time (LED Off) and a duration time (LED On). Both values can be set from 10 ms to 32000 ms.

These values can be set by using the slider controls or by entering numbers into the value boxes.

Once the desired values are set, click on the Start button.

If the front panel display is ON, a frequency in Hz will be displayed as long as the sum of delay time and duration time is 1000 ms or less.
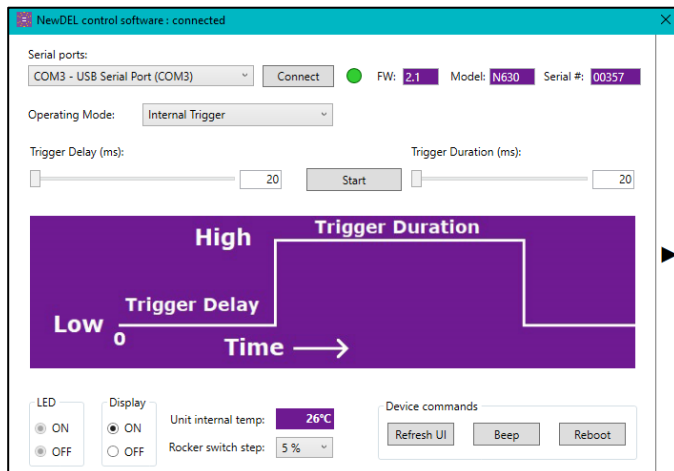

Figure 15 Internal Trigger Mode

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e. External Trigger Mode

Selecting External Trigger Mode provides the operating instructions in the software window (Figure 16). Use 50 ohm BNC cables (not included). The triggering device connects to the TRIGGER port which is opto-isolated. The MONITOR port allows the use of an oscilloscope or multimeter to measure the waveform.
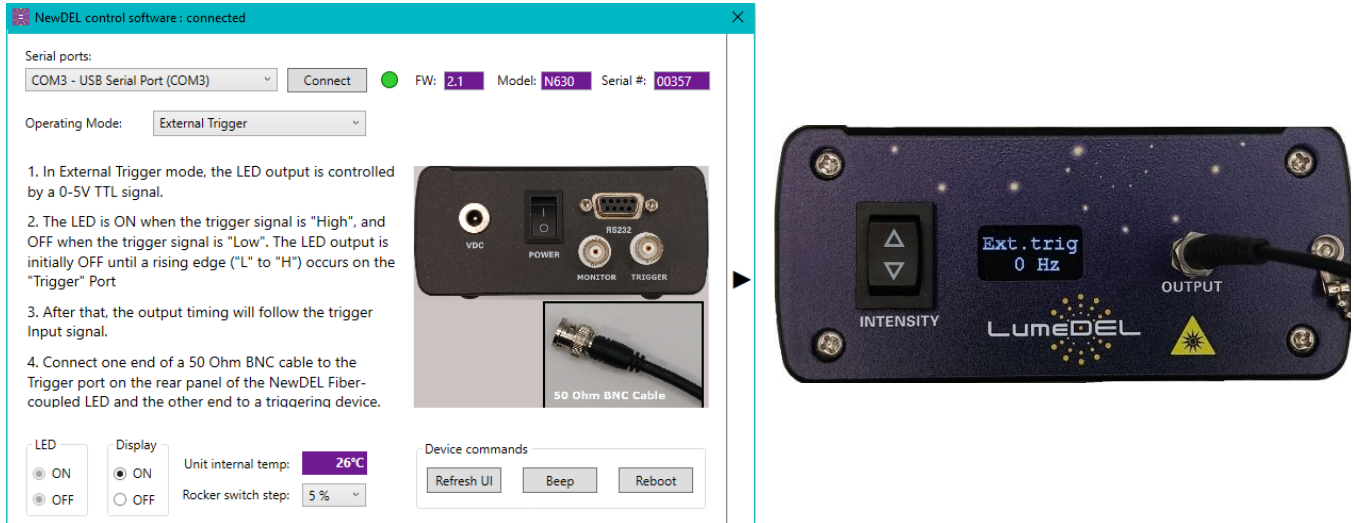
Figure 16 – External Trigger Mode

f. Terminal Panel (Serial Monitor)

Click the black arrow on the right side of the user interface to reveal the terminal panel (Figure 17). The upper text box is used to enter the serial commands listed in Table 1 and Table 2.

If using the graphic controls on the left, the panel creates a log of each command activated starting at power up and continuing until power down, or if the Clear log button is clicked.

Figure 17 - Terminal Panel

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6) SERIAL COMMANDS

a. Terminal Emulator Software

Terminal emulator software provides a command-line or text user interface for remote access to serial RS-232 devices. Termite™ from C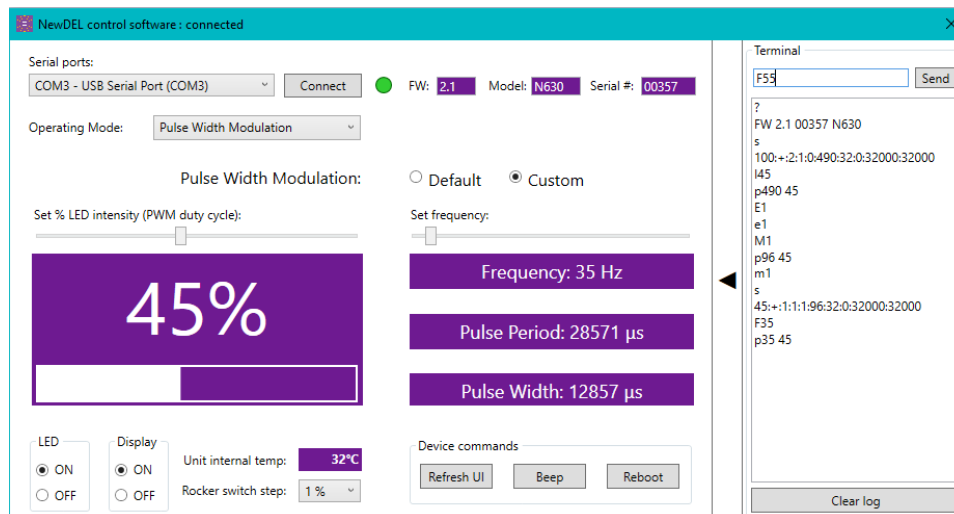ompuphase, for example, is an easy to use and easy to configure RS232 terminal https://www.compuphase.com/software_termite.htm

b. COM port settings

Baud Rate= 115200, Data Bits= 8, Stop Bits= 1, Parity= none

c. Control Commands (Set Numeric Parameter)

Table 1 - Control Commands

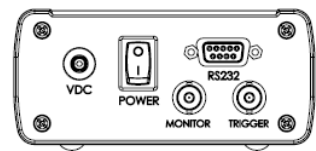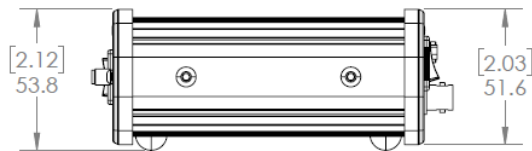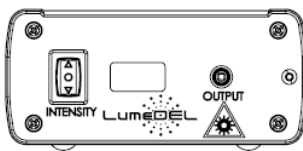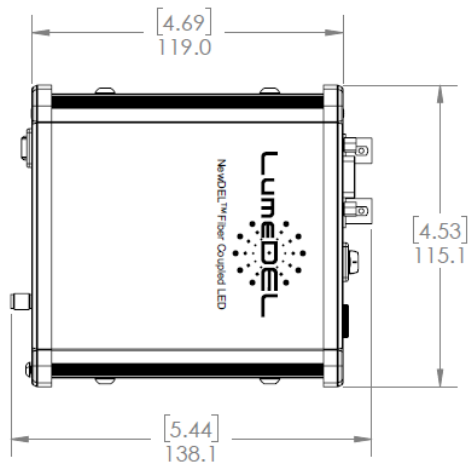| Command	Response	Description
I###	PWM frequency (Hz) Intensity value (%) or "ERR" is returned if the number is invalid.	Adjusts % intensity (PWM duty cycle) to the number entered. To change the LED intensity, enter 'I###' where '###' is an LED intensity from 1 - 100; leading 0 is optional.
E##	e##	Sets incremental step size (%) selected for front panel intensity rocker switch Values: 1,2,4,5, or 10

M#	PWM frequency (Hz) Intensity value (%) or "ERR" is returned if the number is invalid.	Sets Operating Mode # 0,1,2,3
		        M0 – Default PWM (490 Hz)
		        M1 - Custom PWM (1 – 500 Hz)
		        M2 – Internal Trigger
		        M3 – External Trigger

F###	PWM frequency (Hz) Intensity value (%) or "ERR" is returned if the number is invalid.	Mode M1
		Sets Custom PWM frequency in Hz
		        Minimum; 1
		        Maximum; 500

D#####	d#####	Mode M2
		Set delay (ms) for the internal trigger mode
		        Minimum: 10
		        Maximum: 32000

U#####	u#####	Mode M2
		Set pulse duration (ms) for the internal trigger mode
		        Minimum: 10
		        Maximum: 32000

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Table 2 - Status Commands

Command	Response	Description
+	OK	Turns the LED on.
–	OK	Turns the LED off.
m	0, 1, 2, or 3	Get Operating Mode 0 – Default PWM 1 – Custom PWM 2 – Internal Trigger 3 – External Trigger
c	##	Returns the internal unit temperature in °C.
s	III:L:SS:OO:D:M:FFF:TTT:N:DDDDD:UUUUU	Get device operating status in format III:L:SS:OO:D:M:FFF:TTT:N:DDDDD:UUUUU where: III – percent intensity L - LED on/off (+/-) SS – rocker switch steps (%) D - display on/off (1/0) M – operating mode FFF – PWM frequency TTT - unit internal temperature N - internal trigger state (0/1) (stopped/running) DDDDD - delay (ms) for internal trigger mode UUUUU - duration (ms) for internal trigger mode
?	FW #.#.# ######	Gets firmware version and unit serial number
e	1,2,4,5, or 10	Returns incremental step size (%) selected for front panel intensity rocker switch
!	OK	Resets the microcontroller.
b	OK, Audible beep	Sounds the internal beeper for 250 ms
n	OK	Turns OLED display ON.
d	OK	Toggles OLED display ON/OFF.

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Command	Response	Description
t	OK or ERR: invalid mode	Start/Stop internal trigger mode
f	###	Gets the pulse frequency in Hz
p	######	Gets the pulse period in microsecs
w	######	Gets the pulse width in microsecs
Other characters	"ERR" is returned	

7) DIMENSIONAL DRAWING

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8) COMMON SPECIFICATIONS ALL MODELS

Optical coupling	SMA 905 type connector for multi-mode optical fibers with core diameters up to 1000 µm (FC connector optional)
Optical output power (typical)	Model and wavelength dependent
Wavelength range	Model and wavelength dependent

Operating modes	Pulse Width Modulation	Default 490 Hz Custom (user set) 1-500 Hz
	Internal Trigger	Set Pulse Delay 10 ms – 32 s Set Pulse Duration 10 ms – 32 s
	External Trigger	LED output controlled by 0-5V TTL

Serial Interface	RS-232, DB-9 female Converter cable RS-232 to USB-A (FTDI) is included
Trigger connector	Optically isolated BNC, 50 Ohms for External Trigger mode Cable not included
Monitor connector	BNC, 50 Ohms for reading PWM or pulse waveform Cable not included
Manual operation	Front panel intensity switch for Pulse Width Modulation mode Step size set by software; 1, 2, 4, 5, or 10 percent
Remote Operation • **Software**	Windows based GUI, available by download
Remote Operation • **Programmability**	Serial commands are provided to control a unit and query its status using a terminal program or other suitable programming systems
Front Panel Display	Passive Matrix OLED, can be deactivated through software % PWM Intensity or trigger operating mode with frequency
Thermal management	Passive cooling via conduction Internal temperature sensor/monitor readable by software.
Power supply	Universal AC/DC Wall adapter, 90 to 264VAC at 47 to 63Hz input 12V 12W output, 1.5 m cord length, DOE VI Efficiency, Class B EMI, Safety Approvals: cUL/UL, RCM, CB, CE (international socket blade options)
Dimensions/Weight	4.7 x 4.5 x 2.0 in (119.1 x 115.1 x 51.6 mm) / 1.1 lbs (0.5 kg)

For specific model specifications visit https://lumedel.com/lumedel-downloads/ to download PDF data sheets.

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