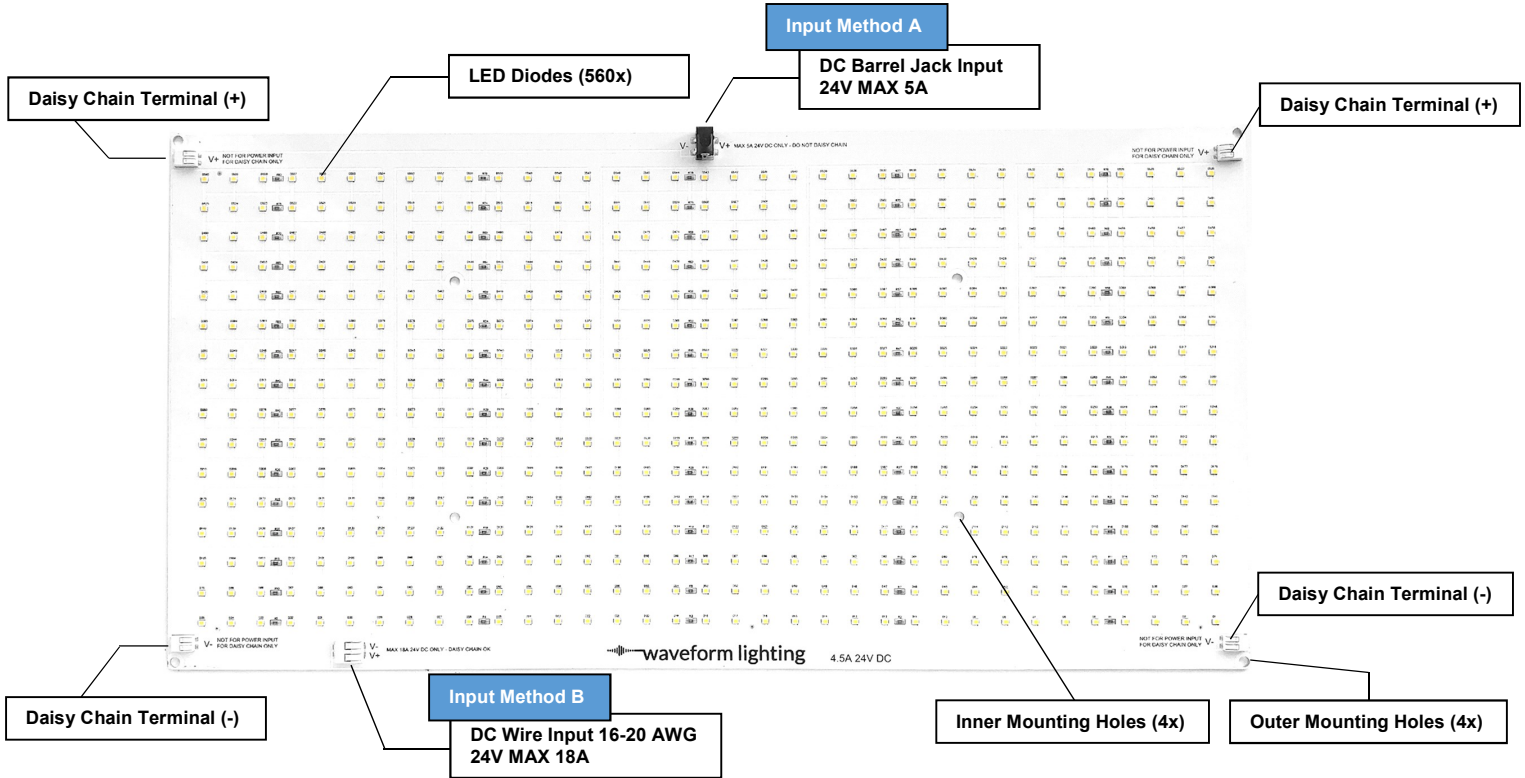**Thank you for purchasing Waveform Lighting's PhotonPanel™ LED Grow Light!**

The PhotonPanel is an innovative circuit board product that requires basic assembly and installation prior to use. Please read the following instructions to ensure you have an appropriate setup to ensure safety and reliability.

⚠ **ALWAYS OBSERVE ELECTRICAL SAFETY PRECAUTIONS. INSTALLATION SHOULD ONLY BE PERFORMED BY QUALIFIED INDIVIDUALS WITH KNOWLEDGE OF LOW VOLTAGE ELECTRONICS COMPONENTS AND SYSTEMS. IF YOU ARE NOT QUALIFIED, SEEK A QUALIFIED ELECTRICIAN'S ASSISTANCE.**

Daisy Chain Terminal (+)
LED Diodes (560x)
Input Method A
DC Barrel Jack Input 24V MAX 5A
Daisy Chain Terminal (+)
Daisy Chain Terminal (-)
Input Method B
DC Wire Input 16-20 AWG 24V MAX 18A
Daisy Chain Terminal (-)
Inner Mounting Holes (4x)
Outer Mounting Holes (4x)

How to Supply Power to the PhotonPanel

Input power must be at 24V DC, with a power supply that has sufficient wattage / amperage capacity. **DO NOT** attempt to connect line voltage (120V/240V AC) directly to the PhotonPanel.

Input Method A accepts any standard male DC barrel jack (2.1 x 5.5 mm) plug, such as what is included with Waveform Lighting's 24V power supply (PN 3092). **IMPORTANT: When using Input Method A, do not connect more than one panel at a time (i.e. daisy-chain) , as this will exceed the power rating of the DC barrel jack.**

Input Method B utilizes terminal block receptacles, and accepts any wires with an AWG between 16 and 20. To achieve a secure clamp-down connection, approximately 0.28 - 0.39 in (7 -10 mm) of insulation should be removed prior to insertion of the wires into the receptacle. You may connect up to 3 additional panels (4 panels total) in a daisy-chain configuration when using this input method, as long as the power supply has sufficient power capacity.

Refer to the chart below for determining power supply requirements and connection method.

# of Panels	Input Voltage	Power Draw	Recommended Power Supply Capacity	Input Method
1	24V DC	4.5A (108W)	5.0A (120W) or more	Input Method A or B
2	24V DC	9.0A (216W)	10.0A (240W) or more	Input Method B ONLY
3	24V DC	13.5A (324W)	15.0A (360W) or more	Input Method B ONLY
4	24V DC	17.0A (432W)	20.0A (480W) or more	Input Method B ONLY

Daisy Chain Connection Diagram

When connecting the power supply to a daisy chain configuration, use only Input Method B. Do not use the DC barrel jack (Input Method A). Boards can be connected together using WAGO 2060-902 or 18 AWG wires.

24V DC Power Supply

Join here using WAGO 2060-902
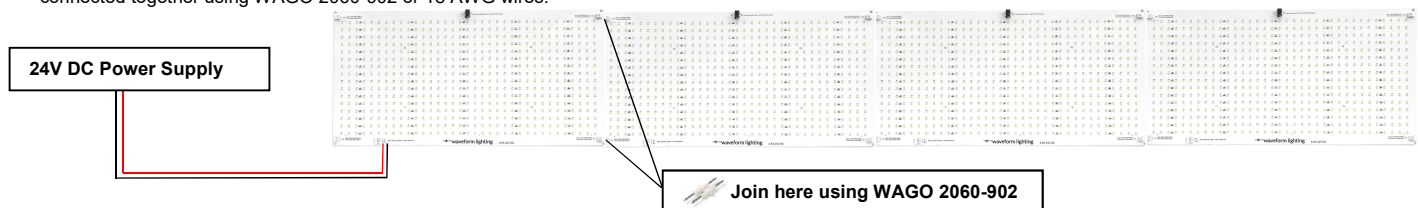
How to Mount or Hang the PhotonPanel

Although the PhotonPanel utilizes high efficiency diodes for maximum light energy output, heat is generated by the components and emanated through the back side of the panel. In open air conditions, the approximate surface temperature rise over ambient is typically 30 C (55 F). Under typical ambient temperatures of < 35C (95 F), the circuitboard and components will remain well below their rated maximum temperatures, and no heatsinking or thermal management is needed. Ensure that these levels of temperature rise are appropriate for your application and mounting surfaces, and if necessary, take the necessary precautions to prevent low temperature burns and injury to plants and humans.

The PhotonPanel is designed to either be mounted or suspended through the mounting holes provided on the circuit board. There are a total of 8x mounting holes: 4x at the outer corners ("Outer Mounting Holes") and 4x near the center ("Inner Mounting Holes"). All mounting holes measure 5.5 mm in diameter.

WARNING: The LEDs mounted on the panel are fragile ESD-sensitive devices. Do not touch them directly or allow them to be subject to excessive mechanical force as this may result in premature failure.

Mounting the PhotonPanel using Screws (Not Included)

You may choose to directly mount the panels to another surface, such as the underside of a wooden shelving unit. We recommend using M5 screws with a maximum screw head diameter of 9 mm. Install screws through all 8x mounting holes for maximum mounting strength.

Use caution and ensure that excessive torque is not applied when tightening the screws, as this may damage the circuitboard. You may choose to use nylon washers as an additional precaution.

Screws are not included with the panel.

Mounting the PhotonPanel using Zip-Ties (Included)

If you choose to mount the panel to a non-flat surface such as the underside of an industrial wire-shelf, securing the panels using zip-ties may be a good option. Simply loop the zip-tie through each of the 4x Outer Mounting Holes, and tighten the zip-tie across the desired mounting location.

To aid in installation, you may want to temporarily bring the panel up close to the mounting surface while installing the zip-ties. You may want to ask another person to hold the panel in place, or place the panel on a stack of books or small boxes to achieve this. Use caution to ensure the LEDs are not inadvertently damaged while the panel is being positioned.

Each panel includes 6x zip-ties for your convenience (2x spares).

Suspending the PhotonPanel using Hanging Cables (Included)

If you anticipate needing to make frequent height and plant proximity adjustments, using a hanging method may be the most optimal solution for you. Secure the two pairs of smaller clips onto the Outer Mounting Holes along the shorter edges of the panel. Then, hook the carabiner onto a suspended system and adjust the height according to your needs.

Each panel includes 2x sets of cable hangers for your convenience – one set for each side.

You may choose to place the power supply (e.g. PN 3092) directly on the backside of the panel. Use care to ensure that the power supply is securely placed and that it will not fall off during operation. Confirm that the rubber feet are facing down against the panel, and make sure that no loose cables or wires can accidentally get caught. PN 3092 can be used in this manner as long as ambient temperatures are below 35C. If using a third-party power supply in this manner, confirm that the corresponding temperature ratings are not exceeded.