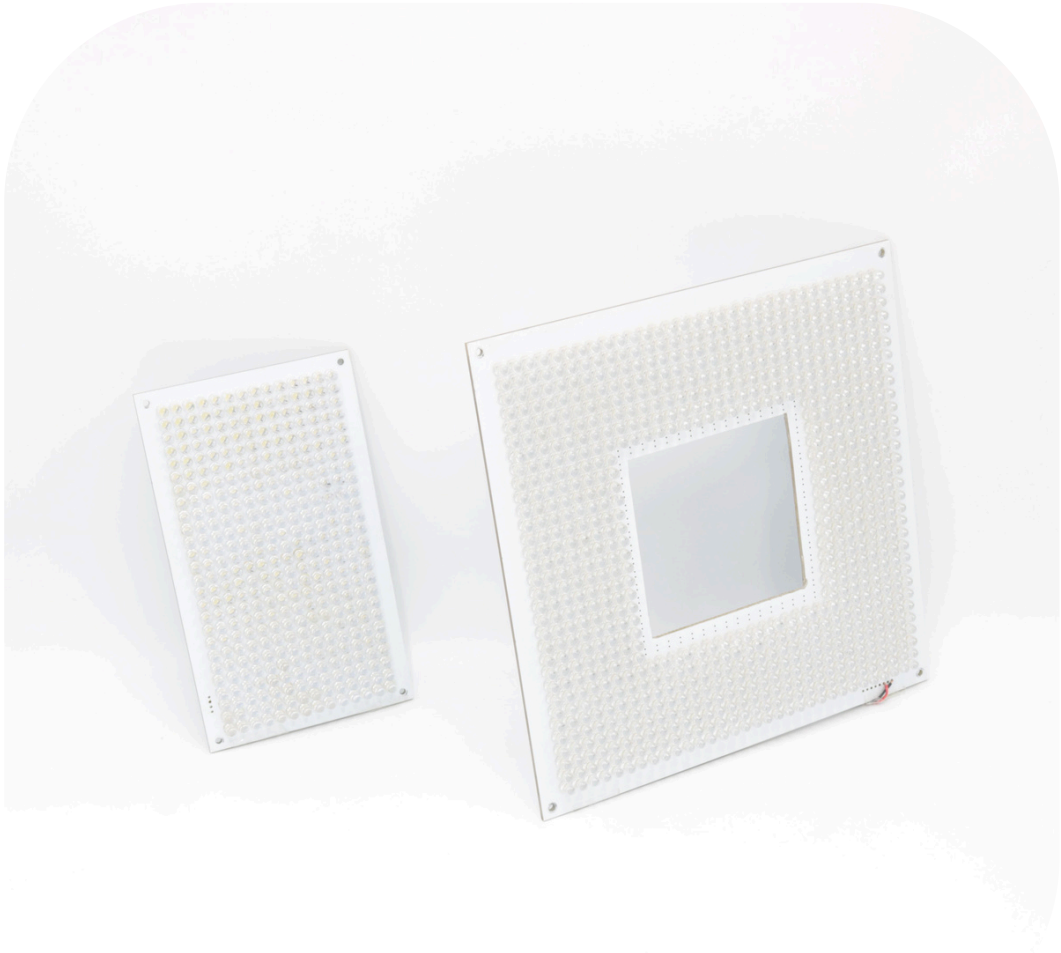
Prion Machine Vision Light



User Manuel

Back Light L Series

Contents

1 GENERAL INFORMATION

1.1 Disclaimer

Always use and store Prion Machine Vision Light products in the prescribed conditions in order to ensure their proper operation: failing to comply with the prescribed conditions may shorten the product lifetime and/or result in malfunctioning, performance degradation or failure. Be aware that incorrect operation of this equipment may cause dangerous situations or significant financial losses. It is essential that the users ensure that the operation of the product is suitable for their applications. All trademarks mentioned herein belong to their respective owners. Except where prohibited by law:

• All hardware, software and documentation are provided on an "as is" basis.

• Prion Machine Vision Light accepts no liability for consequential loss, of any kind. Upon receiving your Prion Machine Vision Light product, visually examine it for any damage that could be occurred during shipping. If the product is damaged upon receipt, please notify Prion Machine Vision Light immediately.

1.2 Forbidden use

Please read the following notes before using this product. Contact your distributor or dealer for any doubts or further advice.

• Do not disassemble, modify or repair the product yourself. It may cause permanent malfunctioning, fire hazard or electric shock, possibly resulting in serious injury;

• Do not place the product in dusty, humid or hot places or near flames. These conditions may cause malfunctioning and damage, fire or electric shock, possibly resulting in serious injury;

• Do not spray or apply pesticides or other volatile chemicals on or in the proximity the product;

• This device must not be used in applications where its failure could pose a safety hazard or damage to other equipment. Keep in mind that if the device is used in a manner not foreseen by the manufacturer, the protection provided by its circuits and by its enclosure may be impaired;

• This is a low voltage device. As such, the voltage between any combination of applied signals must not exceed the supply voltage at any time;

• Higher voltages may cause a fault and could pose a safety hazard;

• This device has limited protection against transients caused by inductive loads. If necessary, use external protection devices like fast diodes or other specific transient protectors;

• Do not allow foreign objects to enter the unit or drop into holes, terminals and other openings or gaps. This may cause fire or electric shock, possibly resulting in serious injury;

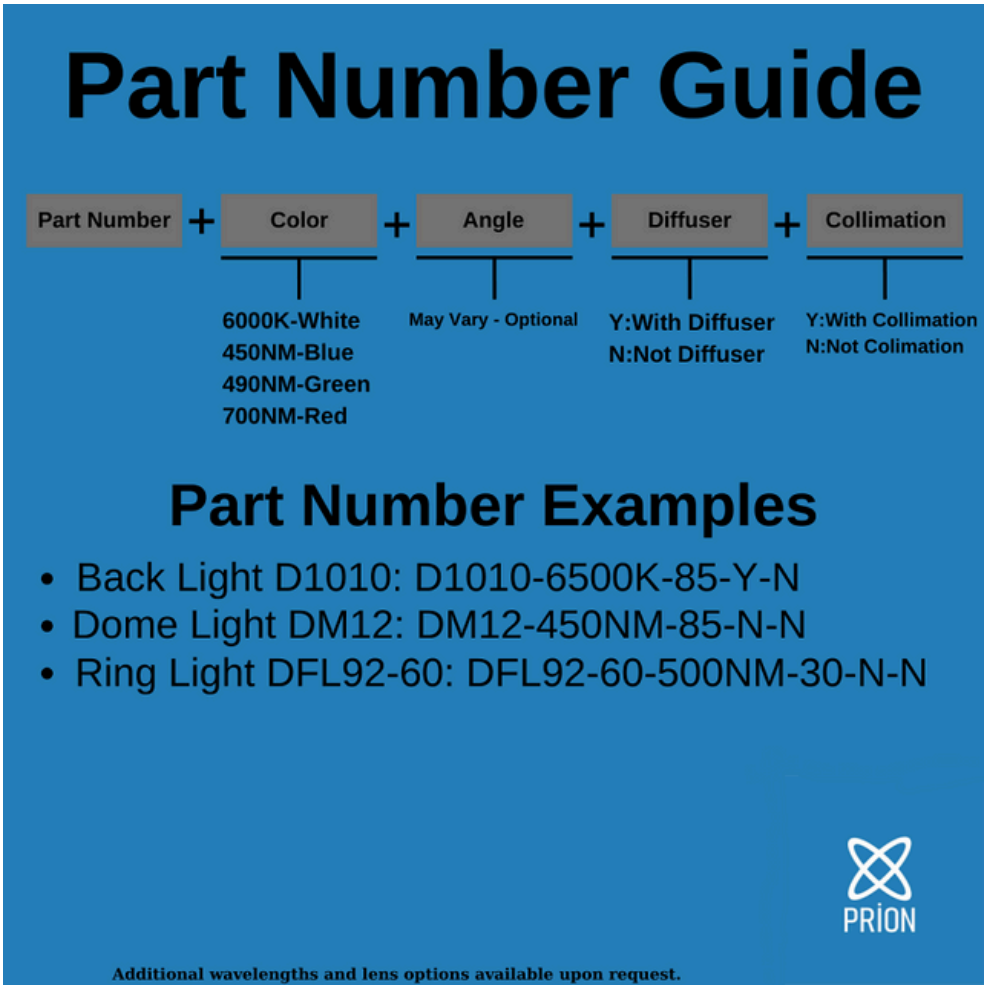
• Disconnect the power cable before moving the product. Failure to comply with this precaution may damage the power cable or cause fire or electric shock, possibly resulting in serious injury;

• Do not scratch, cut, open or twist the power cables. It may cause malfunctioning, fire or electric shock, possibly resulting in serious injury;

• If the power cable is damaged or cracked, please contact our technical support and do not use the product. Damaged cables may cause malfunctioning, fire or electric shock, possibly resulting in serious injury;
• Do not insert or remove the plug of the power cable with wet hands. It may cause electric shock, possibly resulting in serious injury;
• Do not use the product in presence of flammable gas. It may cause outbreaks and flames, possibly resulting in serious injury;
• If you notice any abnormality such as smell, smoke or overheating, turn off the power and disconnect the power cables. Continuing to use the product in these conditions may cause fire or electric shock, possibly resulting in serious injury;
• If you have dropped the product or damaged the product case, turn off the power and disconnect the power cables. Continuing to use the product in these conditions may cause fire or electric shock, possibly resulting in serious injury.

1.3 Ordering code

The product part number is composed as follows:



2 WARRANTY

2.1 Warranty

The device warranty is 24 months from the effective delivery date with reference to the device serial number. Warranty covers the replacement or the repair of the defective part (components, device or part of it) with the exclusion of dismantling and shipping costs. The replacement of one or more components does not renew the warranty period of the entire device. The electronics and parts subjected to normal use or deterioration due to atmospheric agents and external environment are excluded from the warranty. Also, all failure caused by the lack of, insufficient or incorrect maintenance performed by unskilled or unauthorized personnel or due to unintended use or unauthorized replacements, alterations or repairs is excluded from the warranty. The general validity of the warranty depends on:

• Maintenance being performed correctly as described in the device manual;
• The intended use of the device as specified in this manual.

3 INTRODUCTION

3.1 Manual and conventions Prion Machine Vision Light, with its registered office in Dumlupınar Mahalesi, Pelin Sok. No:51 D16 Kadıköy / İstanbul, hereinafter the manufacturer, provides all the necessary information in this installation, use and maintenance manual in a clear and simple way to install, use and service the Back Light Series products. The recipients of this manual are all those who have the knowledge, experience and capability of understanding the standards, prescriptions and safety measures indicated in this manual. Such people will be later identified as qualified personnel who are authorized to transport, install, use and service the products described in this manual. This material can only be used by the customer whom this manual has been delivered to, in order to install, use and service the product. The manufacturer will retain the right to modify or improve the manual and/or the product referred to in this manual without any prior notice.

3.2 Storage conditions

Avoid thermal shock by not exposing the product to sudden changes in temperature. Store the product in a dry place: storage environment with relative humidity (RH) less than 80% (no condensation).

3.3 Operating conditions

Extreme temperatures affect the product functionality, compromising LED irradiance and lifetime. Avoid any thermal shock and exposure of the product to sudden changes in temperature. The product includes high power LEDs: it’s very important to dissipate an appropriate amount of.

In general, avoid to store and use the product in the following environments:

• Environments with strong electric/magnetic fields.
• Places exposed to direct sunlight, rain or snow.
• Environments exposed to particular gas and dangerous substances.
• Extremely vibrating systems.
• Dusty places.
• Extremely humid places.
• Excessive hot/cold environments.

3.4 Cleaning and maintenance

When cleaning the product, please remember:

• To avoid disassembling the product.

• To avoid liquids or inappropriate cleaning chemicals like benzene, alcohol, spray-like cleaners.

• To use an appropriate soft cloth or soft brush. The opaline of the product can be cleaned using compressed air or a cotton swab soaked with isopropyl alcohol.

4 GETTING STARTED

4.1 Overview

Backlight is a critical lighting solution, especially in image processing and computer vision applications. In industrial imaging systems, backlighting is used to clearly distinguish the contours, edges, and details of objects. This technology is often preferred in high-precision computer vision systems and offers significant advantages in applications such as quality control, defect detection, and measurement.

Backlighting enables objects to create a silhouette by allowing light to pass through or around them, rather than being directly observed by a camera. This method enhances the sharp contrast around objects, making it easier to separate them from the background. As a result, the dimensions, positions, and shapes of objects can be detected with high accuracy.

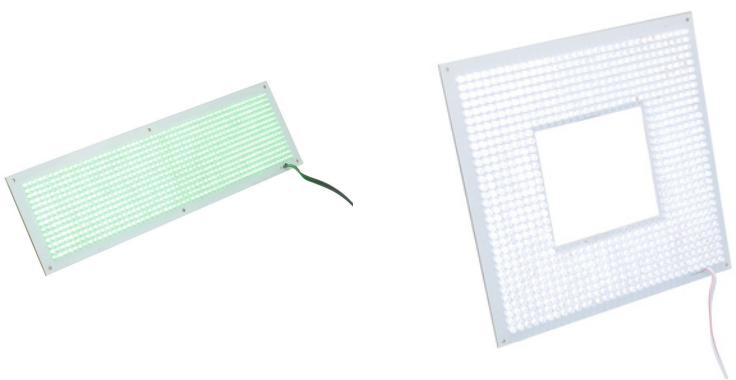
Image processing algorithms can perform tasks such as object detection, classification, and defect analysis more efficiently with the help of backlighting. Additionally, providing high-quality data is crucial for deep learning models used in computer vision systems to produce accurate results. Backlight plays a key role in ensuring this data quality.

Backlighting also excels in challenging tasks such as barcode recognition, precise hole measurement, edge detection, and micro-detail analysis. These applications are especially important in automation systems, robotic production lines, and advanced technologies like medical imaging.

In summary, backlight illumination is an indispensable element for increasing both the accuracy and efficiency of image processing and computer vision applications. Choosing the right type of lighting is one of the key factors that directly impacts the success of a high-performance computer vision system.

4.2 Accessories

As shown in the image, the product is shipped to you fully assembled and ready for use with the socket-cable assembly. In case of any missing items in the package, please contact your sales advisor.



5 TECHNICAL SPECIFICATIONS

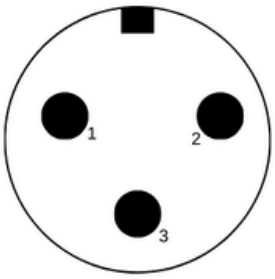
5.1 LED color

There are different options available within our product range. These are listed in the table below. The product lighting colors can be selected based on the content of machine vision projects and may vary each time.

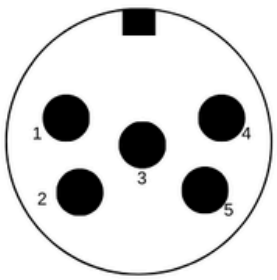
Blue	490-450nm
Red	700-635nm
Green	560-490nm
White	6000-6500K

5.2 Connectors and pinout

There are different options available within our product range. These are listed in the table below. The product lighting colors can be selected based on the content of machine vision projects and may vary each time.



3 pins



5 pins

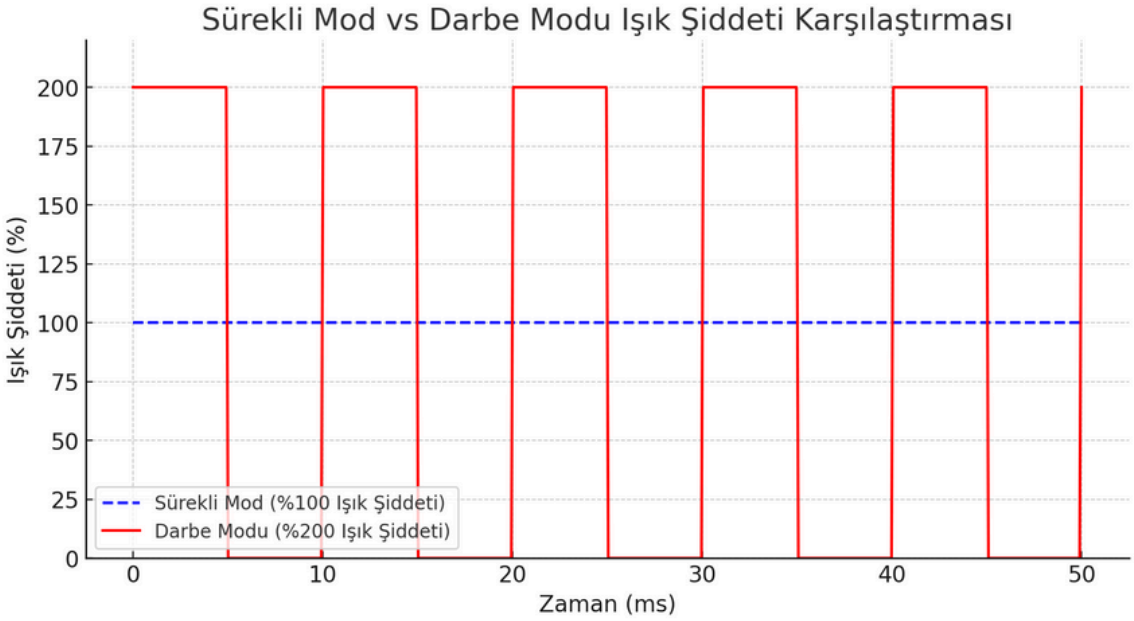
1	**+24vDC**
2	**GND**
3	-

1	**+24vDC**
2	**+24vDC**
3	-
4	GND
5	GND

5.3 Operating modes

The device can operate in various modes to meet different application requirements. The supported operating modes are summarized below:

- Continuous Mode: The LEDs operate continuously, regardless of the input trigger signal.
- Pulsed Mode: The LEDs are activated for a specified duration by an external trigger signal.



5.4 Advantages and Disadvantages

- Pulsed and continuous operating modes are two fundamental modes commonly used in lighting systems and industrial image processing applications. The advantages and disadvantages of these two modes can vary depending on the application requirements. Below are the differences between the two modes:

Pulsed Operating Mode

In the pulsed operating mode, light is emitted in short bursts (pulses) at specific intervals. The light is delivered in brief, intense bursts.

Advantages:

1. Low Heat Generation: In the pulsed mode, light is only on for short durations, preventing heat buildup and reducing cooling requirements.
2. High Light Intensity: Short, intense light bursts provide more light energy. This is particularly beneficial for capturing fast-moving objects.
3. Better Timing: Cameras can be synchronized to capture light during specific time frames, making it ideal for capturing moving parts.
4. Lower Energy Consumption: Since light is only on when needed, energy consumption is reduced.

Disadvantages:

1. Limited Light Duration: Each pulse of light is very brief, so it may not be sufficient for applications that require continuous illumination.
2. Flicker Risk: At high frequencies, pulsed light can cause noticeable flickering, which may degrade quality in some applications.
3. Complexity: Pulsed light control can be more complex and requires synchronization, which may add challenges in some applications.

Continuous Operating Mode

In the continuous operating mode, light is emitted continuously. The light source remains on without interruption.

Advantages:

1. Continuous Light Source: Since the light is continuously emitted, there are no timing or synchronization issues. It is ideal for applications that require large areas to be illuminated.
2. Simple Control: Continuous light typically has simpler control mechanisms. There is no need for timing or pulsing, which simplifies the application.
3. Higher Light Intensity: Continuous light provides consistent illumination, which can be beneficial for more precise applications.
4. No Flicker: Continuous light usually does not cause noticeable flickering.

Disadvantages:

1. Heat Issues: Continuous light generates more heat, which may increase cooling requirements and shorten the lifespan of the light source during prolonged use.
2. Higher Energy Consumption: Continuous light requires constant power, leading to higher energy consumption.
3. Lower Light Intensity: Continuous light sources may provide lower intensity compared to short, intense pulses of light in certain applications.

Which Mode to Choose?

The choice depends on the specific requirements of the application:

- For fast-moving objects or applications requiring high light intensity, pulsed operation is generally more suitable.
- For consistent and stable illumination, continuous operation mode may be more advantageous.

By considering the advantages and disadvantages of both modes, selecting the most appropriate operating mode for a given application is key to achieving efficient results.

5.5 Technical Specification

Input Voltage	+24V DC
Input Current	0,2 - 3A
Illumination Intensity	0.385 lm
Illumination Color	6000K-Red-Blue-Green
Illumination Angle	30°-60°

5.6 Physically Specification

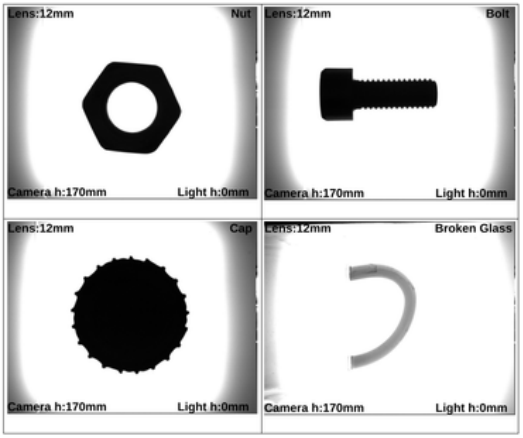
Dimensions	105x83x23 - 428x260x23
Weight	0,5 - 1 Kg
Housing Material	PCB
Mounting Method	Bolt Nut Assembly
Operating Temperature Range	30° - 85°

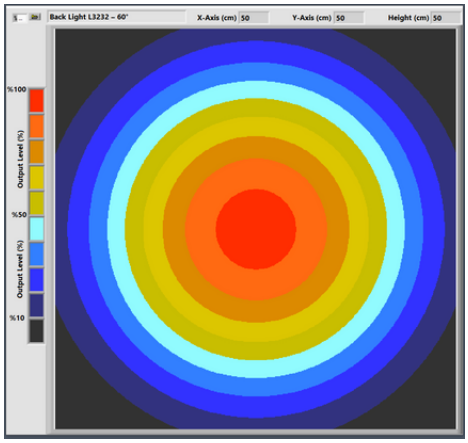
5.7 Application Areas

Machine Vision	Glass
Image Proccesing	Agriculture-Food
Packaging	Plastic
Automotive	Metal-Steel

6 Application Examples

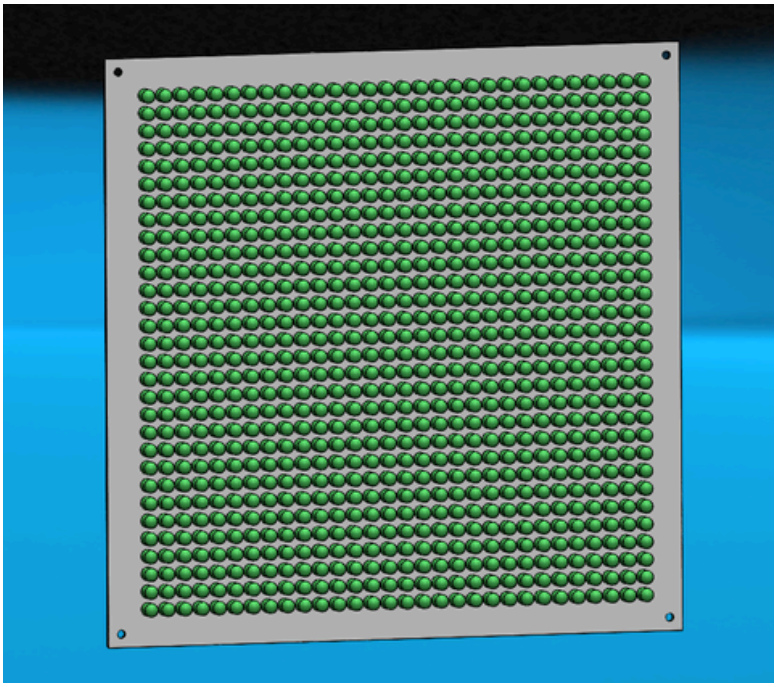
6.1





7 Product Models

Model NO	Product Size	MAX CONTINUOUS CURRENT
L1411	105x83x23	0,22 A
L1423	122x77x23	0,27 A
L1426	180x105x23	0,52 A
L1616	122x122x23	0,32 A
L1454	264x77x23	0,64 A
L4040	264x264x23	1,2 A
L3224	225x225x23	0,96 A
L3232	225x225x23	1,28 A
L3864	428x260x23	3 A



PRİON

Machine Vision Light

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