

# Basler blaze-101

## GETTING STARTED GUIDE



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For detailed technical information, go to [docs.baslerweb.com](https://docs.baslerweb.com).

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## 1 Introduction

The purpose of this guide is to familiarize you with the basic capabilities of Basler blaze-101 camera and to provide some important information that you should know before using your camera.

This *Getting Started Guide* does not include comprehensive information about installing the camera or learning how to use it. This information is available in the user documentation (see Chapter 7 of this *Getting Started Guide*).

## 2 Precautions

### WARNING

#### Electric Shock Hazard

Unapproved power supplies may cause electric shock. Serious injury or death may occur.

You must use a camera power supply that meets the Safety Extra Low Voltage (SELV) and Limited Power Source (LPS) requirements.

### WARNING

#### Fire Hazard

Unapproved power supplies may cause fire and burns.

You must use a camera power supply that meets the Limited Power Source (LPS) requirements.

### WARNING

#### Laser Safety Instructions

To avoid injuries, always follow these safety instructions:

- Invisible laser radiation. The blaze-101 camera is a Class 1 laser product that is safe to use if used as intended. As it hasn't been designed for operation in close proximity to living beings, Basler recommends not looking directly into the beam and not pointing the camera at humans or animals at close range (0.5 m or less).
- If operation at close range can't be avoided, suitable eye protection should be worn, e.g., the laserservice F22.P1H02.1001 or similar.
- The camera contains no serviceable parts. Unauthorized modification or operation in a fully or partially disassembled state are prohibited.
- The camera should be handled with care. Do not expose it to environmental conditions outside the specifications. Do not drop it, subject it to heavy mechanical shock, or expose it to extreme temperatures, intense vibration, or humidity.
- If there is reason to believe that safe operation is no longer possible, put the camera out of operation and secure it against unintended use. In particular, safe operation is no longer possible in the following situations:
  - if the camera shows visible damage (especially to a diffusor or the cover glass of the laser aperture)
  - if the camera no longer works as intended

### WARNING

#### Don't operate the camera when a diffusor shows signs of damage.

If a diffusor is missing or damaged, the accessible emission can exceed the safe limits of a Class 1 laser product.

In this case, safe operation is no longer possible. In particular, there is a risk of thermally induced injury to the retina and the cornea of the eye even during short-term exposure. Also, there is a possibility of long-term effects on the lens of the eye (cataractogenesis).

### WARNING

#### Don't operate the camera when the cover glass in front of the laser aperture shows signs of damage.

If the glass is damaged, safe operation is no longer possible. In particular, there is a risk of burns to the skin or the anterior parts of the eye.

**CAUTION****Allergy Warning**

The nickel coating of the Basler blaze-101 camera may cause allergies or allergic reactions.

- If you already have a nickel allergy, avoid contact.
- To avoid developing an allergy, avoid prolonged skin contact.
- Implement the applicable health and safety measures

**NOTICE****Extreme temperatures can damage the camera.**

To avoid damaging the camera and to achieve optimum performance, observe the maximum and minimum housing temperatures set out in the "Environmental Requirements" section.

**NOTICE****Shock and vibration beyond the specified limits can damage the camera.**

The camera has been subjected to and passed the following shock and vibration tests:

- Sine sweep test according to DIN EN 60068-2-6  
Test parameters (x/y/z): 10 sweeps, 10–58 Hz/±1,5 mm; 58–50 Hz/20 g; 1 oct./min
- Shock test according to DIN EN 60068-2-27  
Test parameters (x/y/z): 100 shocks @ 20 g/11 ms; pos./neg.
- ESS according to DIN EN 60068-2-64  
Test parameters (x/y/z): 15–500 Hz/0.05 PSD (ESS standard profile); 00:30 h

Subjecting the camera to forces beyond these conditions can damage vital parts of the camera, e.g., diffusors. This can render the camera unsafe for use.

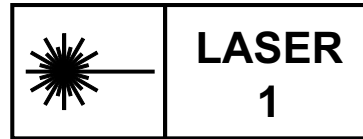
**Observe the following:**

- Don't operate the camera in a fully or partially disassembled state.
- Don't remove any of the camera's labels.
- Prevent ingress or insertion of foreign substances into the camera housing. If operated with any foreign substances inside, the camera may fail or cause a fire.
- Don't operate the camera in the vicinity of strong electromagnetic fields. Avoid electrostatic discharge (ESD).
- Transport the camera in its original packaging only. Do not discard the packaging.
- Only use water, alcohol, or neutral cleaning agents when cleaning the camera; other cleaning agents can damage the surface finish.
- Before using the camera, carefully read this document and observe the safety information.

The camera comes with a 1-year warranty.

**3 Laser Illumination****Characteristics**

The blaze-101 camera is equipped with VCSEL (vertical cavity surface-emitting lasers) that emit invisible, near-infrared laser light. The camera is classified as a Class 1 laser product according to EN/IEC 60825-1:2014 Edition 3.

**Certification Information Printed on the Product Label:**

IEC 60825-1:2014 Ed. 3

Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1:2014 Ed. 3, as described in Laser Notice No. 56, dated May 8, 2019

The location of the laser aperture and the beam angle of the laser are shown in Figure 3.

**Laser Safety**

The camera is classified as a Class 1 laser product. This means that it is safe under all reasonably foreseeable conditions of normal use.

The technical safety elements described in this section ensure that the accessible emission stays within safe limits. Their correct function is guaranteed by quality management measures that include a 100 % test after assembly.

**Electric Power Control**

The camera is equipped with electronic safety circuitry that turns off the laser illumination within 1 ms or less when excess electrical power consumption of the illumination is detected.

**Optical Diffusors**

Diffusors are optical elements mounted at the laser aperture of each VCSEL. They act both as beam shapers and as beam attenuators. Their presence is required to reduce the accessible emission to safe limits.

Under normal operating conditions, Basler regards the failure of a diffusor as unlikely beyond the point of what can reasonably be foreseen.

However, in cases of severe damage to the camera (e.g., caused by mechanical stress beyond the specified limits or unauthorized modification), the failure of a diffusor can't be ruled out definitively. In case of a diffusor failure, observe the warning information in the "Precautions" chapter.

**Cover Glass**

The VCSEL are shielded by a cover glass. This prevents users from accidentally touching the surface of the VCSEL and ensures a minimum distance to the eyes.

**4 Environmental Requirements****During Operation**

Housing temperature: 0–50 °C (32–22 °F)

Humidity: 20–80 %, relative, non-condensing

During operation, the camera heats up. To ensure reliable operation, consider the following measures to avoid overheating:

- Install a heat sink to ensure efficient heat dissipation.
- Install a fan to provide a cooling air flow.

Note also that the camera won't start if the housing temperature is below 0 °C.

**During Storage**

Housing temperature: -20–80 °C (-4–176 °F)

Humidity: 20–80 %, relative, non-condensing

### 5 Physical Interface

The blaze-101 camera conforms to the GigE Vision standard.

The camera is interfaced to external circuitry via two connectors:

- M12 8-pin X-coded female connector (ERNI, 394811)  
Used to provide a 1000 Mbit/s Ethernet connection to the camera.
- M12 8-pin A-coded female connector (ERNI, 494166)  
Used to provide power to the camera.

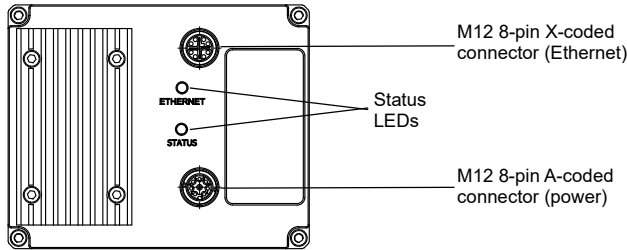


Fig. 1: Back View of the Camera

For details of the connector pins, see the following drawing and table.

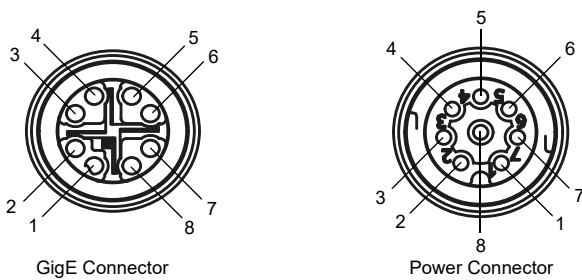


Fig. 2: Connector Pin Numbering

Pin Number	GigE Connector	Power Connector
1	Bidirectional Data Pair A+	Camera Power VCC
2	Bidirectional Data Pair A-	Camera Power Ground
3	Bidirectional Data Pair B+	Camera Power Ground
4	Bidirectional Data Pair B-	Reserved, do not connect
5	Bidirectional Data Pair D+	Reserved, do not connect
6	Bidirectional Data Pair D-	Reserved, do not connect
7	Bidirectional Data Pair C-	Camera Power VCC
8	Bidirectional Data Pair C+	Reserved, do not connect

i Always connect both Power VCC and Power GND pins.

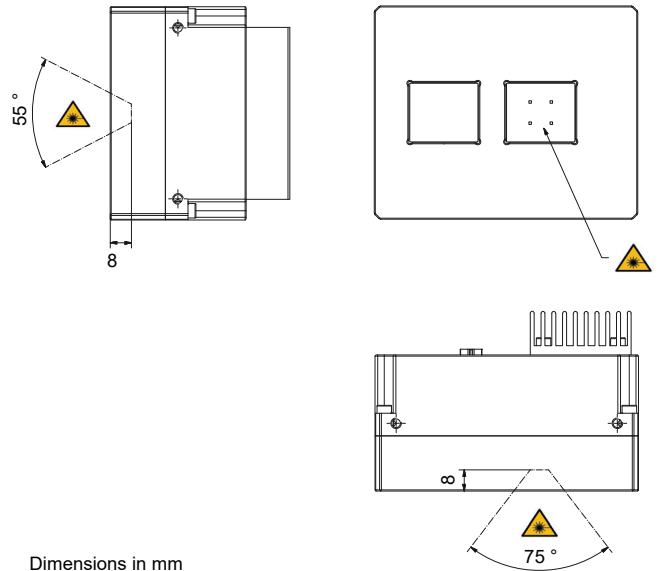


Fig. 3: Front, Top, and Side Views of Camera Housing Showing Laser Aperture and Laser Beam Angle

### 6 Power Requirements

Power Requirements	Power Consumption
24 VDC (± 10 %)	<22 W mean @ 24 VDC <55 W peak @ 24 VDC

NOTICE

**Voltage outside of the specified range can damage the camera.**

If you are supplying camera power via the camera's power connector and the voltage of the power is greater than 24 VDC (± 10 %), the camera may get damaged. If the voltage is lower than that, the camera may not work as expected and you may not be able to acquire images.

### 7 Installing and Operating the Camera

To operate the camera, Basler recommends downloading the Basler blaze SDK free of charge from the Basler website: [www.baslerweb.com/blaze](http://www.baslerweb.com/blaze)

The software package includes necessary drivers and useful tools for operating the camera as well as sample code.

Also included is the **readme.pdf** document which contains information about the installation and the feature scope of the camera.

For information about installing and using the blaze-101 camera, refer to the *Basler Product Documentation* available at [docs.baslerweb.com](http://docs.baslerweb.com).

i **Coordinate System of the Camera**  
 The origin of the coordinate system is in the optical center inside the camera. This creates an offset from the front of the camera housing that needs to be taken into account when you're processing the resulting depth data. For more information, refer to the *Basler Product Documentation*.