

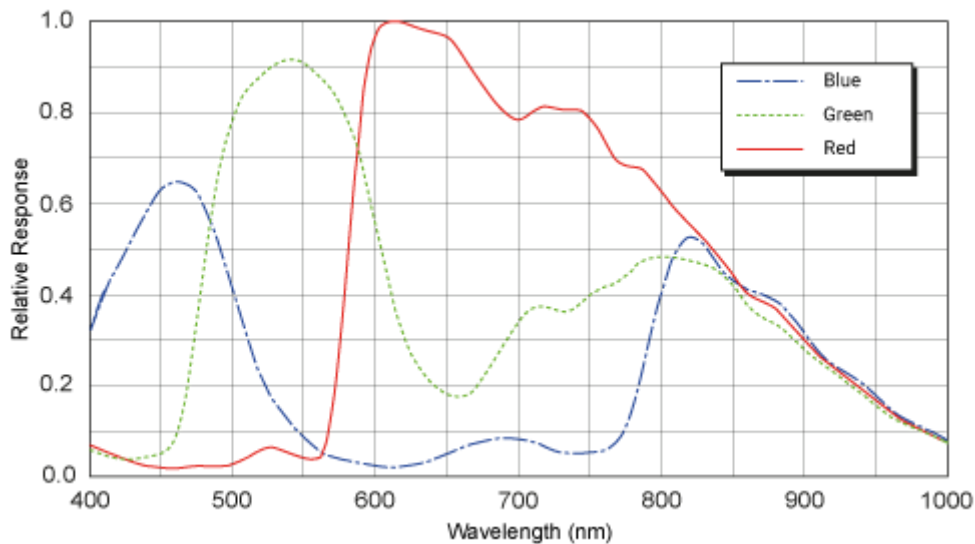
Specifications

General Specifications

| Specification | acA4112-30uc |
|------------------------------|--|
| Resolution (H x V Pixels) | 4112 x 3008 (full resolution) 4096 x 3000 (default resolution) You can change the resolution by changing the Image ROI . |
| Sensor Type | Sony IMX253LQR Progressive scan CMOS Global shutter |
| Optical Size | 1.1" |
| Effective Sensor Diagonal | 17.6 mm |
| Pixel Size (H x V) | 3.45 μm x 3.45 μm |
| Frame Rate | 30.9 fps |
| Product Line | ace L |
| Mono / Color | Color |
| Image Data Interface | USB 3.0, nominal max. 5 Gbit/s (SuperSpeed) |
| Pixel Formats | See Pixel Format . |
| Synchronization | Via hardware trigger Via software trigger Via free run |
| Exposure Time Control | Via hardware trigger Programmable via the camera API |
| Camera Power Requirements | Nominal 5 VDC supplied via the camera's USB 3.0 port |
| | 3.8 W (typical) @ 5 VDC |
| I/O Lines | 1 opto-coupled input line 1 opto-coupled output line |

| | |
|------------------|--|
| | 2 general purpose I/O (GPIO) lines |
| Lens Mount | C-mount |
| Size (L x W x H) | 35.8 mm x 40 mm x 30 mm (without lens mount or connectors) 48.2 mm x 40 mm x 30 mm (with lens mount and connectors) |
| Material | Aluminum, nickel plated |
| Weight | < 80 g |
| Conformity | CE (includes RoHS), UL Listed, FCC, GenICam 2.x (including PFNC 2.x and SFNC 2.x), IP30, USB3 Vision, REACH The EU Declaration of Conformity is available on the Basler website . |
| Software | Basler pylon Camera Software Suite (version 4.0 or higher) Available for Windows, Linux x86, Linux ARM, and OS X |
| Accessories | Cables for your camera model Lenses for your camera model Additional accessories for your camera model |

Spectral Response



The spectral response curve excludes lens characteristics, light source characteristics, and IR cut filter characteristics.

IR Cut Filter

Color cameras are equipped with an IR cut filter. The filter is mounted in a filter holder inside the lens mount.

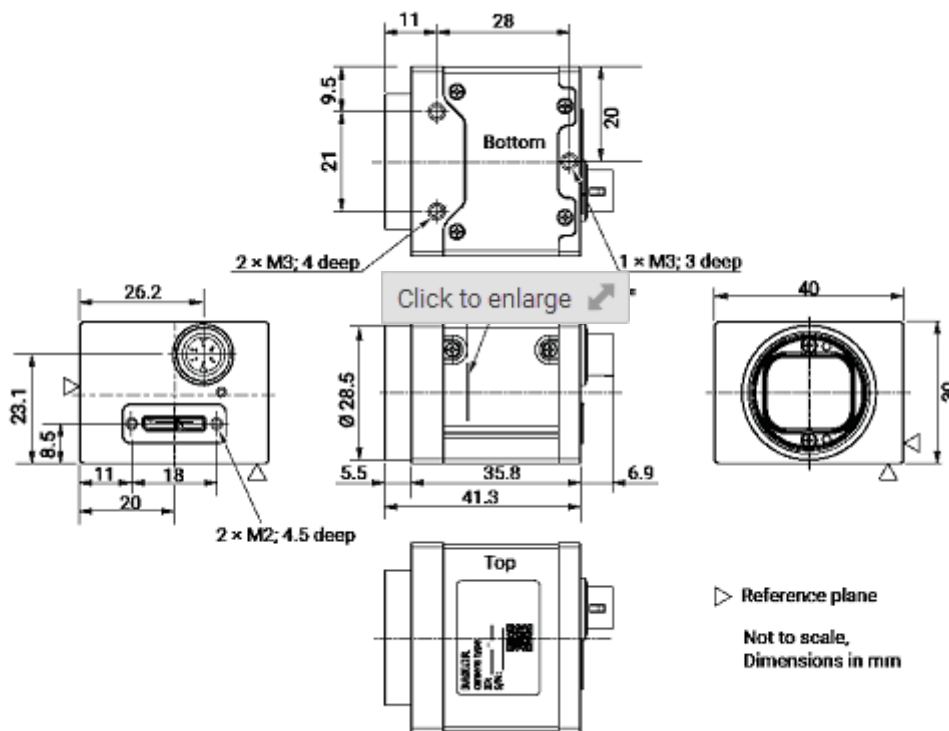
The IR cut filter has the following spectral characteristics:

| Wavelength [nm] | Transmittance |
|-----------------|--------------------------|
| 450–610 | $T_{\min} > 90 \%$ |
| 450–620 | $T_{\text{avg}} > 93 \%$ |
| 645 ± 10 | $T = 50 \%$ |
| 700–1070 | $T_{\max} < 4 \%$ |
| 690–1070 | $T_{\text{avg}} < 1 \%$ |

The filter holder can be removed. For more information, see the [IR Cut Filter Holder Removal Procedure](#) application note.

Mechanical Specifications

Camera Dimensions and Mounting Points



Maximum Allowed Lens Intrusion

→ See [Maximum Allowed Lens Intrusion](#).

Mounting Instructions

→ See [Mounting Instructions](#).

Stress Test Results

→ See [Stress Test Results](#).

Requirements

Environmental Requirements

Temperature and Humidity

| | |
|--------------------------------------|-----------------------------------|
| Housing temperature during operation | 0–50 °C (32–122 °F) |
| Humidity during operation | 20–80 %, relative, non-condensing |
| Storage temperature | -20–80 °C (-4–176 °F) |
| Storage humidity | 20–80 %, relative, non-condensing |

Heat Dissipation

→ See [Providing Heat Dissipation](#).

Electrical Requirements

| | |
|--|---|
| ⚠ DANGER | |
| Electric Shock Hazard | ▼ |
| ⚠ WARNING | |
| Fire Hazard | ▼ |
| NOTICE | |
| Incorrect voltage can damage the camera. | ▼ |

Camera Power

You must supply camera power that complies with the Universal Serial Bus 3.0 specification.

The camera's nominal operating voltage is 5 VDC, effective on the camera's USB 3.0 connector.

Opto-Coupled I/O Input Line

| Voltage | Description |
|----------|---|
| 30 VDC | Absolute maximum. This voltage must never be exceeded. Doing so may damage the camera and voids the warranty. |
| 0–24 VDC | Safe operating range. |

| | |
|--|---|
| 0–1.4 VDC | Indicates a logical 0 (with inverter disabled). |
| >1.4–2.2 VDC | Region where the logic level transition occurs; the logical status is not defined in this region. |
| >2.2 VDC | Indicates a logical 1 (with inverter disabled). |
| <ul style="list-style-type: none"> • Minimum current: 5 mA • Current draw: 5–15 mA | |

Opto-Coupled I/O Output Line

| Voltage | Description |
|--|---|
| 30 VDC | Absolute maximum. This voltage must never be exceeded. Doing so may damage the camera and voids the warranty. |
| 3.3–24 VDC | Safe operating range. |
| <3.3 VDC | Unreliable I/O output. |
| <ul style="list-style-type: none"> • Leakage current: <60 μA. Actual leakage depends on operating temperature and production spread of electronic components. • Maximum load current: 50 mA • Minimum load current: Not specified. Consider the following: <ul style="list-style-type: none"> • Leakage current will have a stronger effect when load currents are low. • Propagation delay of the output increases as load currents decrease. • Higher-impedance circuits tend to be more susceptible to EMI. • Higher currents cause higher voltage drops in long cables. | |

General Purpose I/O Lines

| <i>NOTICE</i> | |
|---|---|
| Applying incorrect electrical signals to the camera's GPIO line can severely damage the camera. | ▼ |

Operation as Input

| Voltage | Description |
|---------|---|
| 30 VDC | Absolute maximum. This voltage must never be exceeded. Doing so may damage the camera and voids the warranty. |
| 0–5 VDC | Safe operating range. The minimum external pull-up voltage is 3.3 VDC. |
| | |

| | |
|---|---|
| 0–0.8 VDC | Indicates a logical 0 (with inverter disabled). |
| >0.8–2 VDC | Region where the logic level transition occurs; the logical status is not defined in this region. |
| >2 VDC | Indicates a logical 1 (with inverter disabled). |
| <ul style="list-style-type: none"> • Current draw (high-level): <100 μA • Sink current: Your application must be able to accept 2 mA sink current from the GPIO input line without exceeding 0.8 VDC. | |

Operation as Output

| Voltage | Description |
|---|---|
| 30 VDC | Absolute maximum. This voltage must never be exceeded. Doing so may damage the camera and voids the warranty. |
| 3.3–24 VDC | Safe operating range. |
| <3.3 VDC | Unreliable GPIO output. |
| <ul style="list-style-type: none"> • Internal pull-up resistor: \approx2 kΩ, with open collector. Many applications will have to provide an additional pull-up resistor. • Residual voltage ("on" state): \approx0.4 V at 50 mA and 25 °C (77 °F) housing temperature. Actual residual voltage depends on operating temperature, load current, and production spread of electronic components. • Leakage current: <60 μA. Actual leakage depends on operating temperature and production spread of electronic components. • Maximum load current: 50 mA • Minimum load current: Not specified. However, consider the following: <ul style="list-style-type: none"> • Leakage current will have a stronger effect when load currents are low. • Propagation delay of the output increases as load currents decrease. • Higher-impedance circuits tend to be more susceptible to EMI. • Higher currents cause higher voltage drops in long cables. | |

Circuit Diagrams

→ See [Circuit Diagrams for Basler ace Cameras](#).

Cable Requirements

USB 3.0 Cable

- Use a high-quality USB 3.0 cable with a Micro-B plug.
- To [avoid EMI](#), cables must be shielded, as specified in the USB 3.0 standard.

- Basler recommends using USB 3.0 cables from the [Basler Vision Components](#) range.

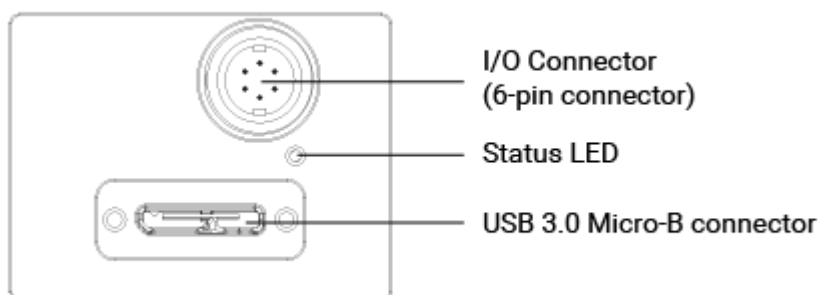
For more information about recommended USB 3.0 cables, see the [Recommended Accessories for Basler USB 3.0 Cameras](#) document.

I/O Cable

- The I/O cable must be shielded.
- The I/O cable must have a cross-section at least 0.14 mm² (close to AWG26).
- Use twisted pair wire cables.
- Maximum recommended cable length: 10 m
- Camera-side connector: Hirose micro plug (part number HR10A-7P-6S) or equivalent
- Close proximity to strong magnetic fields should be avoided.
- Basler recommends using I/O cables from the [Basler Vision Components](#) range:
 - [GPIO cable, 10 m](#) (yellow cable): For use with the [GPIO lines](#) of your camera. To avoid interferences due to crosstalk, the opto-coupled I/O lines are not connected.
 - [Opto-I/O cable, 10 m](#) (blue cable): For use with the [opto-coupled I/O lines](#) of your camera. To avoid interferences due to crosstalk, the GPIO lines are not connected.
 - [Opto-GPIO Y-cable, 2 x 10 m](#) (yellow-blue cable): Allows you to use the [GPIO lines](#) and the [opto-coupled I/O lines](#) simultaneously without interferences due to crosstalk. There are two separate wires to split both I/O types.

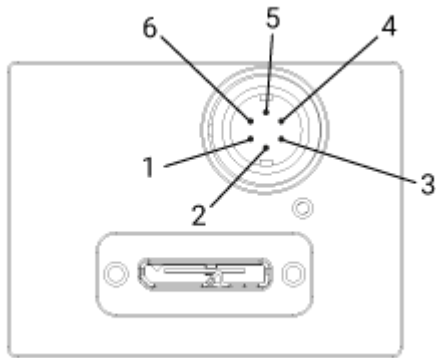
Physical Interface

Camera Connectors and Status LED



| | |
|---------------------------|---|
| 6-pin connector | Hirose micro receptacle (part number HR10A-7R-6PB) Recommended mating connector: Hirose micro plug (part number HR10A-7P-6S) |
| USB 3.0 Micro-B connector | Standard USB 3.0 Micro-B connector with screw lock Recommended mating connector: Standard connector with screws |
| Status LED | Indicates camera operation (LED lit = camera operating). |

Connector Pin Numbering and Assignments



| Pin | Line | Function |
|-----|--------|---|
| 1 | Line 3 | General purpose I/O (GPIO) line |
| 2 | Line 1 | Opto-coupled I/O input line |
| 3 | Line 4 | General purpose I/O (GPIO) line |
| 4 | Line 2 | Opto-coupled I/O output line |
| 5 | - | Ground for opto-coupled I/O lines |
| 6 | - | Ground for General Purpose I/O (GPIO) lines |

Precautions

→ See [Safety Instructions for Basler ace Cameras](#).

Installation

→ See [Camera Installation](#).

Features

→ See the [camera features section](#).

Suggestions for improving the documentation? Send us your [feedback on this topic](#).

For technical questions, please contact your [local distributor](#) or use the [support form](#) on the Basler website.