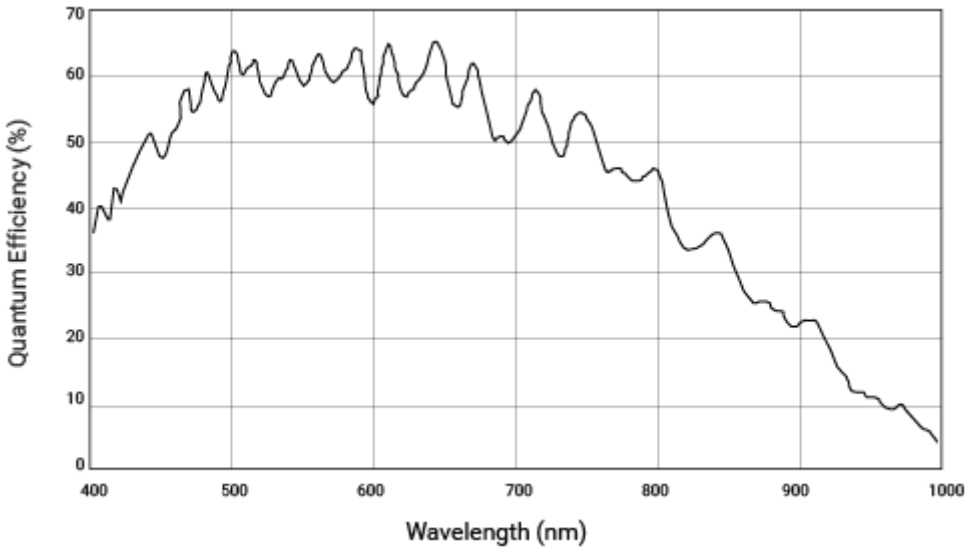
General Specifications

Specification	acA2040-25gmNIR
Resolution (H x V Pixels)	2048 x 2048
Sensor Type	CMOSIS CMV4000-2E12M Progressive scan CMOS Global shutter
Optical Size	1"
Effective Sensor Diagonal	15.9 m
Pixel Size (H x V)	5.5 µm x 5.5 µm
Frame Rate (at Default Settings)	25 fps
Product Line	ace classic
Mono / Color	Mono (NIR)
Image Data Interface	Fast Ethernet (100 Mbit/s) Gigabit Ethernet (1000 Mbit/s)
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	Power over Ethernet (PoE) 802.3af compliant supplied via Ethernet connector 12 VDC supplied via I/O connector
	≈3.1 W when using Power over Ethernet ≈2.6 W @ 12 VDC when supplied via I/O connector
I/O Lines	1 opto-coupled input line 1 opto-coupled output line

Lens Mount	C-mount
Size (L x W x H)	42.0 mm x 29 mm x 29 mm (without lens mount or connectors) 60.3 mm x 29 mm x 29 mm (with lens mount and connectors)
Weight	<90 g
Conformity	CE (includes RoHS), UL Listed, FCC, GenICam, GigE Vision, IP30, IEEE 802.3af (PoE), 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

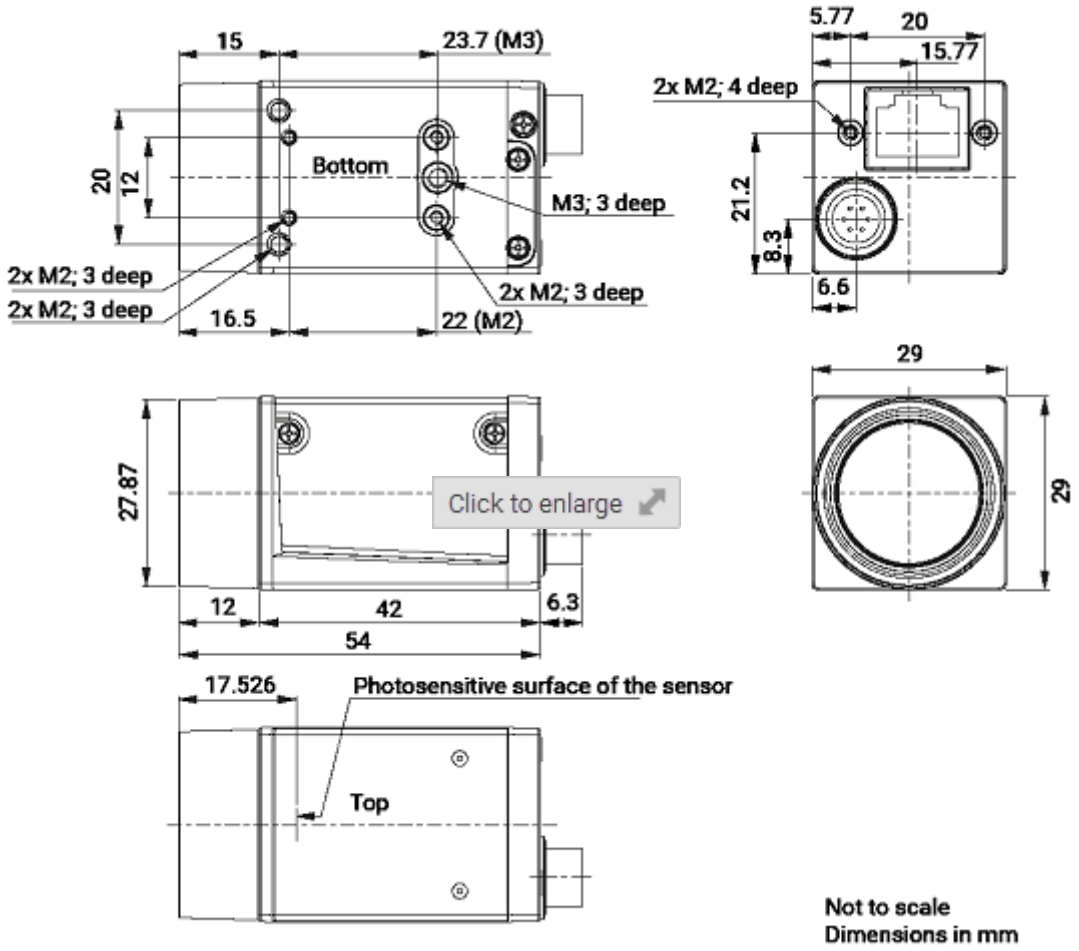
Spectral Response



The spectral response curve excludes lens characteristics and light source characteristics.

Mechanical Specifications

Camera Dimensions and Mounting Points



Maximum Allowed Lens Intrusion

→ See Maximum Allowed Lens Intrusion.

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
Housing temperature according to UL 60950-1	max. 70 °C (158 °F)
Ambient temperature according to UL 60950-1	max. 30 °C (86 °F)

UL 60950-1 test conditions: no lens attached to camera; no heat dissipation measures; ambient temperature kept at 30 °C (86 °F).

Heat Dissipation

→ See Providing Heat Dissipation.

Electrical Requirements

⚠ DANGER

Electric Shock Hazard

⚠ WARNING

Fire Hazard

NOTICE

Incorrect voltage can damage the camera.

Camera Power

NOTICE

Dual camera power supply can damage the camera.

- **Power supply via Power over Ethernet (PoE):** Power must comply with the IEEE 802.3af specification.
- **Power supply via I/O connector:** The nominal operating voltage is 12 VDC (10.8 VDC minimum, 13.2 VDC maximum), includes <1 % ripple.

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 state is not defined in this region.
>2.2 VDC	Indicates a logical 1 (with inverter disabled).

- **Minimum current:** 5 mA
- **Current draw:** 5–15 mA
- If the camera is connected to a PLC device, Basler recommends using a cable that adjusts the voltage level of the PLC to that of the camera.

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.

- **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:
- 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

Ethernet Cable

- Use a high-quality Ethernet cable. Use of shielded CAT 5E or better cables with S/STP shielding is recommended.
- Use either a straight-through (patch) or a cross-over Ethernet cable.
- As a general rule, applications with longer cables or applications in harsh EMI conditions require higher category cables.
- Close proximity to strong magnetic fields should be avoided.
- Basler recommends using Ethernet cables from the Basler Vision Components range.

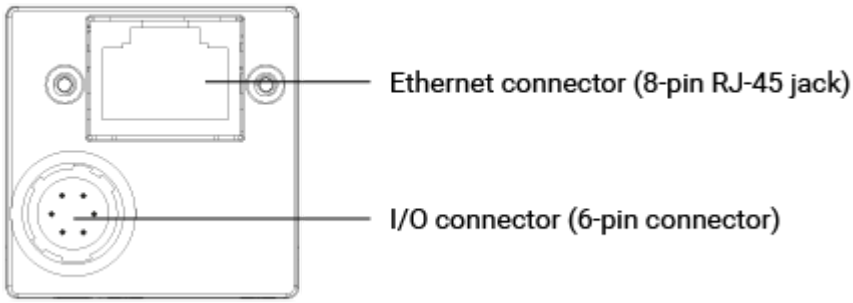
I/O Cable

- The I/O cable must be shielded.

- The I/O cable must have a cross-section of at least 0.14 mm² (close to AWG26).
- Use a twisted pair wire cable.
- 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.
- If you are supplying power to the camera via Power over Ethernet, the I/O cable will not be used to supply power. However, you can still use the cable to connect to the I/O lines.
- Basler recommends using I/O cables from the Basler Vision Components range:
  - Opto-I/O cable, 10 m (blue cable): For use with the opto-coupled I/O lines of your camera. Does not provide camera power. Therefore, when using this cable, you must provide power via Power over Ethernet (PoE).
  - Power-I/O cable, 10 m (gray cable): For use with the opto-coupled I/O lines of your camera. Unlike the opto-I/O cable (blue cable, see above), this cable provides camera power.
  - Opto-GPIO Y-cable, 2 x 10 m (yellow-blue cable): Offers two separate wires. One can be used to connect the opto-coupled I/O lines of your camera. The other one can be used to provide camera power.
  - Power-I/O PLC+ cable, 10 m (gray cable): For use with the opto-coupled I/O lines of Basler cameras connected to a programmable logic controller (PLC). It adapts the signal level for zero voltage from PLC level (<8.4 VDC) to TTL level (<1.4 VDC).

Physical Interface

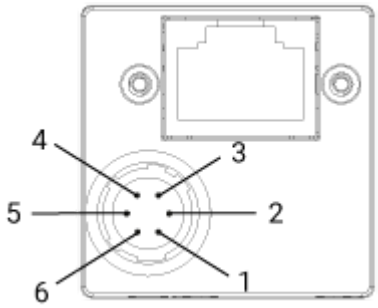
Camera Connectors



Connector	Description
Ethernet connector	• 100/1000 Mbit/s Ethernet connection to the camera • If power is not supplied via I/O connector: Power over Ethernet (PoE) • 8-pin RJ-45 jack Recommended mating connector: 8-pin RJ-45 plug (snap-in or with locking screws). • When using locking screws, note the horizontal orientation of the screws.

I/O Connector	• If power is not supplied via Power over Ethernet (PoE): Power supply • Hirose micro receptacle (part number HR10A-7R-6PB) Recommended mating connector: Hirose micro plug (part number HR10A-7P-6S)

Connector Pin Numbering and Assignments



Pin	Line	Function
1	-	12 VDC camera power
2	Line 1	Opto-coupled I/O input line
3	-	Not connected
4	Out 1	Opto-coupled I/O output line
5	-	Ground for opto-coupled I/O lines
6	-	Ground for camera power

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.