See the possibilities

Quick Start Guide

for Promotion Samples

WAL-1001-GE
WAL-2001-GE
WAA-0300-GE
WAA-1300-GE

High Performance SWIR Cameras with GigE Interface
Document Version: 1.2
Date: 2026-03-11

⚠Be sure to read this documentation before use.

This documentation includes important safety precautions and instructions on how to operate the unit. Be sure to read this documentation to ensure proper operation.
The contents of this documentation are subject to change without notice for the purpose of improvement.

Table of Contents

About This Quick Start Guide

This documentation is intended for first-time users of the promotion sample to learn about the camera's hardware and use it safely.

Please note that the data in this documentation are tentative values based on promotion samples, and the design, specifications, etc. may change in the final product.

For final product data, software specifications, and detailed regulatory information, please refer to the *User Manual* available for download from the JAI website at the time of product launch.

Notice/Warranty

Notice

The material contained in this manual consists of information that is proprietary to JAI Ltd., Japan, and may only be used by the purchasers of the product. JAI Ltd., Japan makes no warranty for the use of its product and assumes no responsibility for any errors which may appear or for damages resulting from the use of the information contained herein. JAI Ltd., Japan reserves the right to make changes without notice.

Company and product names mentioned in this manual are trademarks or registered trademarks of their respective owners.

Warranty

For information about the warranty on the promotion samples, please contact your factory representative.

Usage Precautions

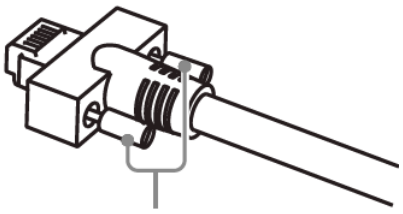
Notes on Cable Configurations

The presence of lighting equipment and television receivers nearby may result in video noise. In such cases, change the cable configurations or placement.

Notes on LAN Cable Connection

The presence of lighting equipment and television receivers nearby may result in video noise. In such cases, change the cable configurations or placement.

Secure the locking screws on the connector manually, and do not use a driver. Do not secure the screws too tightly. Doing so may wear down the screw threads on the camera. (Tightening torque: 0.147 Nm or less)



> **Caution:** Secure manually. Do not secure too tightly.

Notes on Attaching the Lens

Avoiding Dust Particles

When attaching the lens to the camera, stray dust and other particles may adhere to the sensor surface and rear surface of the lens. Be careful of the following when attaching the lens.

- Work in a clean environment.
- Do not remove the caps from the camera and lens until immediately before you attach the lens.
- To prevent dust from adhering to surfaces, point the camera and lens downward and do not allow the lens surface to come into contact with your hands or other objects.
- Always use a blower brush to remove any dust that adheres.
- Never use your hands or cloth, blow with your mouth, or use other methods to remove dust.

Phenomena Specific to InGaAs Image Sensors

The following phenomena are known to occur on cameras equipped with InGaAs image sensors. These do not indicate malfunctions.

- **Aliasing**: When shooting straight lines, stripes, and similar patterns, vertical aliasing (zigzag distortion) may appear on the monitor.
- **Blooming**: When strong light enters the camera, some pixels on the image sensor may receive much more light than they are designed to hold, causing the accumulated signal charge to overflow into surrounding pixels. This “blooming” phenomenon can be seen in the image but does not affect the operation of the camera.
- **Response Non-Uniformity (Fixed pattern noise)**: Owing to inherent constraints in the manufacturing process, subtle discrepancies exist in the photo response characteristics of individual sensor pixels, which manifests as fixed columnar or linear artifacts in the image.
- **Dark Current Temperature Dependence**: As temperature rises, the dark current of the sensor increases exponentially. In dark-field imaging, this manifests as snowflake noise or striped noise on the video monitor screen, and the noise intensifies significantly with increasing temperature.
- **Pixel Cross-talk**: Infrared photons have a long diffusion distance in InGaAs material, which easily causes signal interference between adjacent pixels. It is intuitively reflected in blurred image edges and aliasing of fine textures (similar to details sticking together and being indistinguishable).
- **Defective pixels**: Defective pixels (white and black pixels) of the InGaAs image sensor are minimized at the factory according to shipping standards. However, as this phenomenon can be affected by the ambient temperature, camera settings (e.g., high sensitivity and long exposure), and other factors, be sure to operate within the camera’s specified operating environment.
- **High-Light Inversion**: Excessively high light intensity results in intensity inversion, characterized by an alternating dark-bright-dark response as light brightness increases. This phenomenon can be avoided by reducing the light intensity (only for WAL-1001-GE & WAL-2001-GE).

Features

These WAVE serial cameras are high performance cameras equipped with a global shutter infrared image sensor. They are equipped with GigE Vision Ver 2.0 interface.

> **Caution:** The following are tentative values for promotion samples. For the final values, please refer to the User Manual, which will be available for download from the JAI website at the time of product launch.

Model Name	Image Sensor	Effective Pixels	Pixel Size	Max Line Rate / Frame Rate
WAL-1001-GE	SWIR	1024 x 1	12.5 µm x 12.5 µm	15kHz
WAL-2001-GE	SWIR	2048 x 1 (pixel shift)	12.5 µm x 12.5 µm	40kHz
WAA-0300-GE	SWIR	640 x 512	15 µm x 15 µm	150fps
WAA-1300-GE	SWIR	1280 x 1024	5 µm x 5 µm	90fps

Features Overview

- Global shutter InGaAs/SWIR image sensor
- Video output: Mono8, Mono10, Mono12, Mono14 (Mono14 not supported for WAA-1300-GE)
- Supports horizontal image flip
- Supports ROI and Binning, for WAA-0300-GE & WAA-1300-GE
- Image calibration functions include Non-uniformity correction (only for WAL-1001-GE and WAL-2001-GE), FFC (Flat Field Correction), DPC (defective pixel correction), black level control and LUT
- Exposure time range:
    - WAL-1001-GE: 2µs~992µs exposure control in 1µs step
    - WAL-2001-GE: 2µs~992µs exposure control in 1µs step
    - WAA-0300-GE: 50µs~1s exposure control in 1µs step
    - WAA-1300-GE: 14µs~1s exposure control in 1µs step (@Mono8bit)

- Dynamic Range (DR):
    - WAL-1001-GE: 69dB
    - WAL-2001-GE: 70dB
    - WAA-0300-GE: 69dB
    - WAA-1300-GE: 56dB
- Signal-to-Noise Ratio (SNR):
    - WAL-1001-GE: 46dB
    - WAL-2001-GE: 50dB
    - WAA-0300-GE: 56dB
    - WAA-1300-GE: 50dB
- Lens mount: C-Mount

Preperation

Read this section to learn how the camera connects to devices and accessories. The preparation process is described below.

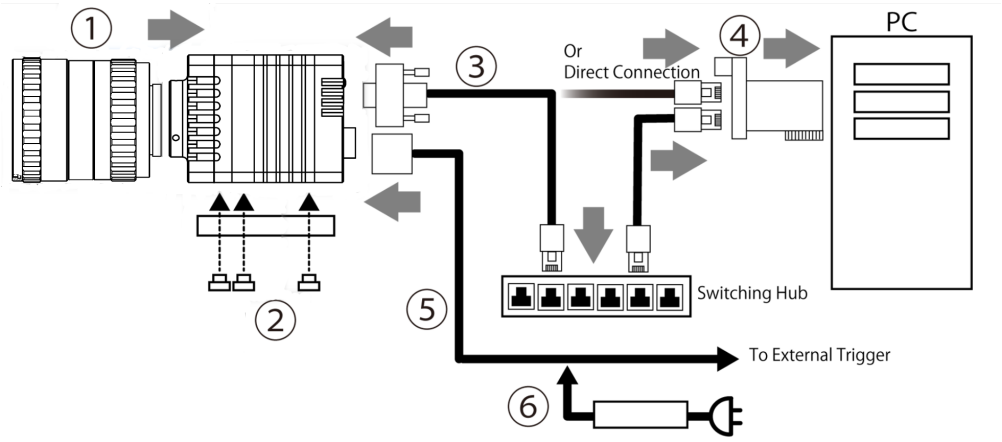
> **Note:** Installation procedures and specifications are described in detail in the *User Manual*, which will be available for download from the JAI website at the time of product launch.

Step 1: Install the Software (First Time Only)

When using the camera for the first time, install the software for configuring and controlling the camera (VisionKit Capture) on the computer.

1. Contact JAI technical support to obtain the installer.
2. Install **VisionKit Capture** onto your computer by following the Setup Wizard.

Step 2: Connect Devices

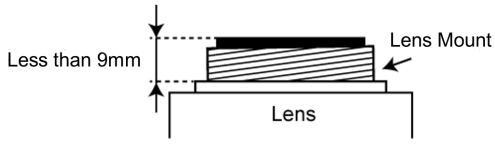


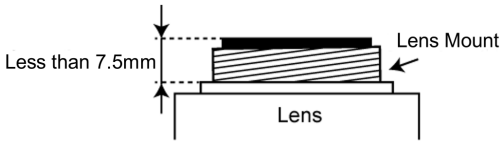
1. Lens
2. Mounting
3. LAN Cable
4. Network Card
5. DC IN / Trigger IN Connection Cable
6. AC Adapter (Power Supply)

1. Lens

C-mount lenses with lens mount protrusions of 9 mm or less can be attached. Except for the WAA-1300-GE, for which the lens mount protrusion shall not exceed 7.5 mm when connecting a lens.

	WAL-1001-GE	WAL-2001-GE	WAA-0300-GE	WAA-1300-GE
Lens mount protrusions	≤ 9 mm	≤ 9 mm	≤ 9 mm	≤ 7.5 mm





Caution: For heavy lenses, be sure to support the lens itself. Do not use configurations in which its weight is supported by the camera.

2. Mounting

When mounting the camera directly to a device, use screws that match the mounting holes on the camera.

Location	WAL-1001-GE	WAL-2001-GE	WAA-0300-GE	WAA-1300-GE
Lower Part	M3, Depth 5mm	No mounting holes	M3, Depth 4mm	M3, Depth 4mm
Upper Part	M3, Depth 5mm	M4, Depth 6mm	M3, Depth 4.5mm	M3, Depth 6mm

Note: Refer to "Dimensions" for the location of the mounting holes.

3. LAN Cable

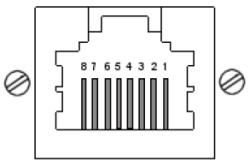
Connect a LAN cable to the RJ-45 connector.

- Use a LAN cable that is Category 5e or higher (Category 6 recommended).
- Use a LAN cable that is STP cable.
- Refer to the specifications of the cable for details on its bend radius.

> **Caution:** See the Notes on LAN Cable Connection as well.

Connector

GigE Vision Interface



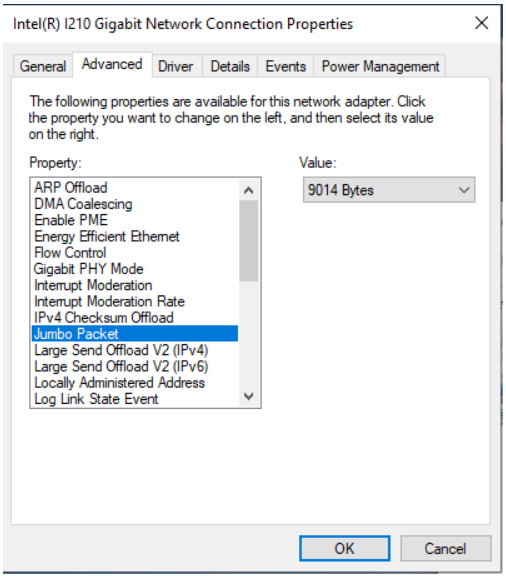
RJ45 with Locking Screws

Pin	Signal
1	TRD+ (0)
2	TRD- (0)
3	TRD+ (1)
4	TRD+ (2)
5	TRD- (2)
6	TRD- (1)
7	TRD+ (3)
8	TRD- (3)

4. Network Card

Install this in the computer that will be used to configure and operate the camera, or use the computer's built-in Gigabit network card. Refer to the instruction manual of the network card, and configure settings on the computer as necessary.

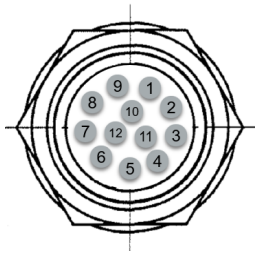
Ensure to set 9014 Bytes for “Jumbo Packet” (in the network card properties).



5. DC IN / Trigger IN Connection Cable

Performs external I/O such as power supply and trigger input.

WAL-1001-GE

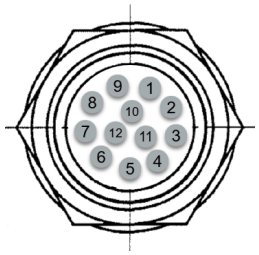


Camera Side: HR10A-10R-12PB (71)

Pin No.	Signal	Description
1	GND	Power Ground
2	DC IN	Power In*, DC+12V ± 1V
3	Disable	No Connect
4	F_TRIGGER_IN	Single-ended Isolated Frame Trigger Input 1
5	L_TRIGGER_IN	Single-ended Isolated Line Trigger Input 2
6	RS422_TX+	No Connect
7	RS422_TX-	
8	RS422_RX-	Differential Line Trigger Signal Input (RS422 Level)
9	RS422_RX+	
10	Disable	No Connect
11	TRIGGER _GND	Single-ended Isolated Input Ground
12	RS422_GND	Differential Line Trigger Signal RS422_GND

Note: * This promotion sample of the WAL-1001-GE can only use 12V.

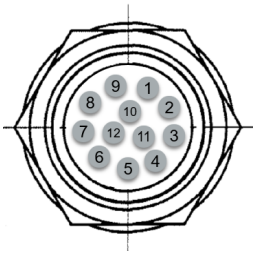
WAL-2001-GE



Camera Side: HR10A-10R-12PB (71)

Pin No.	Signal	Description
1	GND	Power Ground
2	DC IN	Power In, DC 12 V to 24V +/-10%
3	RS422_RX1-	Differential Line Trigger Signal Input (RS422 Level)
4	RS422_RX1+	
5	RS422_RX2-	No Connect
6	RS422_RX2+	
7	F_TRIGGER_IN	Single-ended Isolated Frame Trigger Input
8	TRIGGER _GND	Single-ended Isolated Input Ground
9	SHUTTER_GND	No Connect
10	SHUTTER_OUT	No Connect
11	GND	Differential Line Trigger Signal RS422_GND
12	GND	No Connect

WAA-0300-GE & WAA-1300-GE



Camera Side: HR10A-10R-12PB (71)

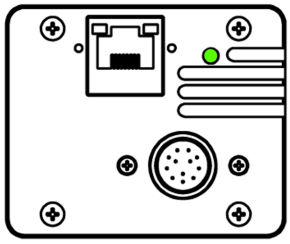
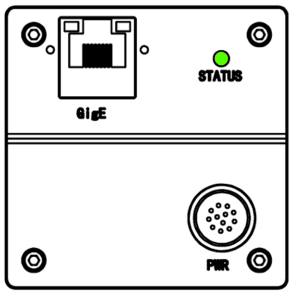
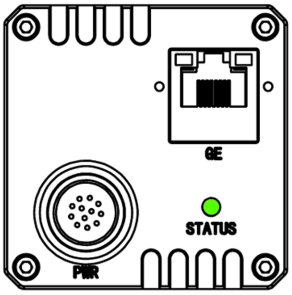
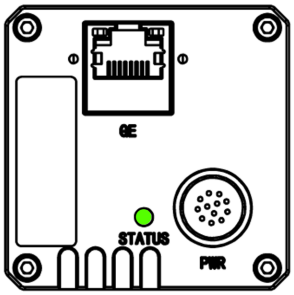
Pin No.	Signal	Description
1	GND	Power Ground
2	DC IN	Power In, DC 12 V to 24V +/-10%
3	SHUTTER_GND	Single-ended Isolated Output Ground
4	TRIGGER_IN	Single-ended Isolated Input
5	SHUTTER_OUT	Single-ended Isolated Output
6	RS422_TX+	No Connect
7	RS422_TX-	
8	RS422_RX-	Differential Trigger Signal Input (RS422 Level)
9	RS422_RX+	
10	Disable	No Connect
11	TRIGGER _GND	Single-ended Isolated Input Ground
12	RS422_GND	Differential Trigger Signal RS422_GND

6. AC Adapter (Power Supply)

Connect the AC adapter and the round connector of the connection cable to the DC IN / Trigger IN connector on the camera.

Step 3: Verify Camera Operation

Indicates the power and trigger status.

WAL-1001-GE	WAL-2001-GE	WAA-0300-GE	WAA-1300-GE
			

LED		Status
	Lit amber	Camera initializing
	Lit green	Camera in operation in Continuous mode

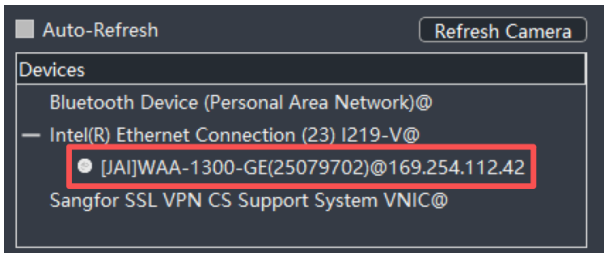
Step 4: Verify the Connection Between the Camera and PC

Verify whether the camera is properly recognized via Control Tool.

1. Launch VisionKit Capture.

   VisionKit Capture startup screen appears.

2. Select the camera you want to configure, then double-click the left mouse button to establish a connection.



Step 5: Change the Camera Settings

This section explains how to change settings by describing the procedure for changing the output format as an example.

Configure the Output Format

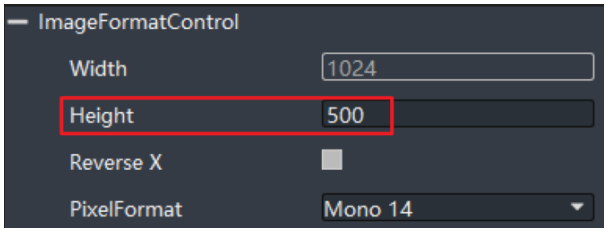
Configure the size, position, and pixel format of the images to be acquired. The factory settings are as follows. Change the settings as necessary.

Factory default values

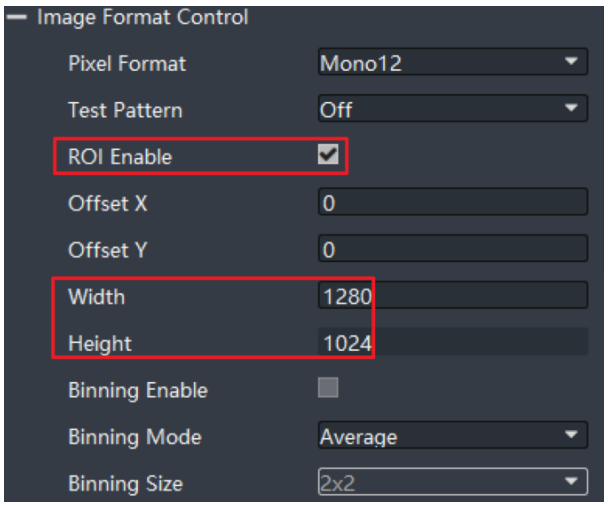
Item		Default Values			
		WAL-1001-GE	WAL-2001-GE	WAA-0300-GE	WAA-1300-GE
ImageFormat Control	Width	1024	2048	640	1280
	Height	500	500	512	1024
	OffsetX	0	0	0	0
	OffsetY	0	0	0	0
	PixelFormat	Mono14	Mono14	Mono14	Mono12

Example: Configure the Width & Height of ImageFormatControl

1. For the cameras WAL-1001-GE and WAL-2001-GE, only the height can be configured, by selecting the item of Height, you can change the value as shown below.



2. For the cameras WAA-0300-GE and WAA-1300-GE, the width and height parameters can only be configured when ROI Enable is checked. Select the item after enabling ROI, you can change the value as shown below.

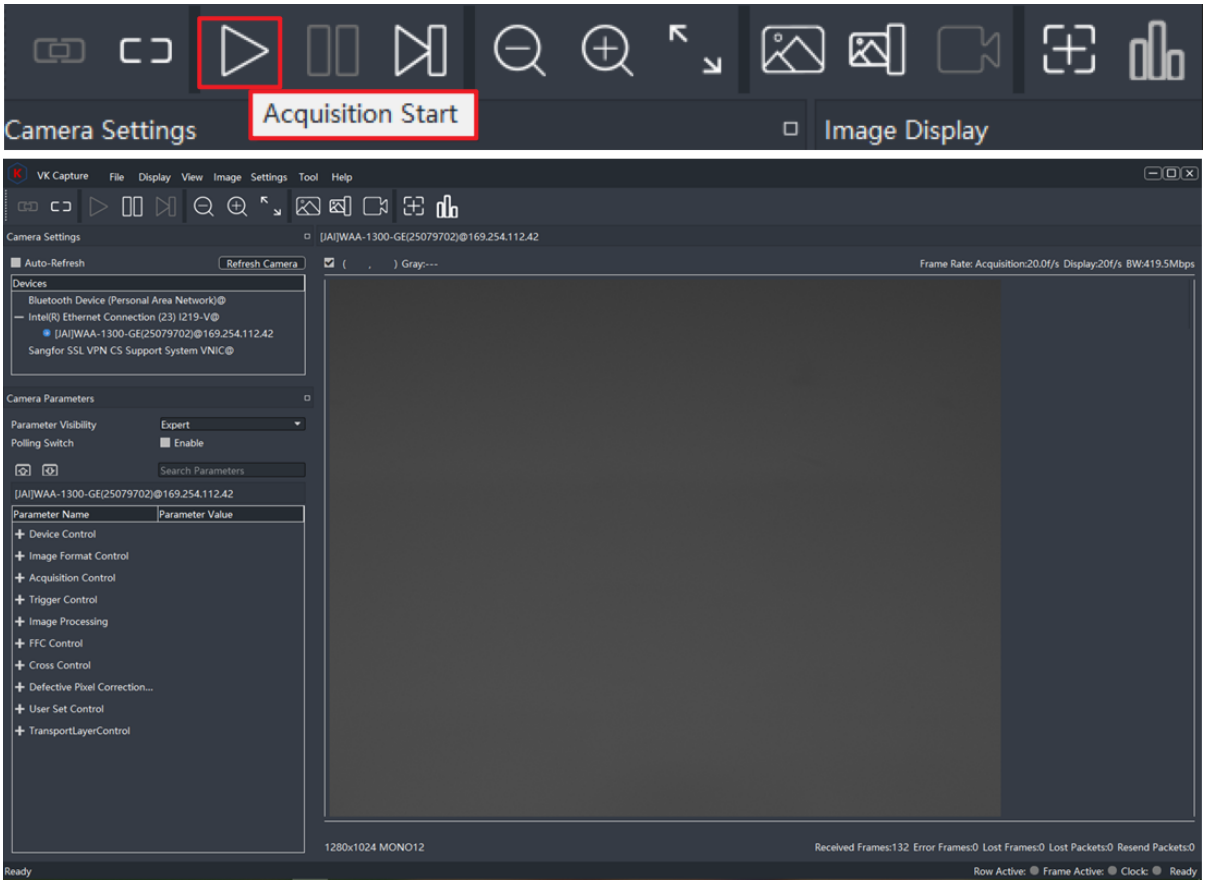


Step 6: Adjust the Image Quality

Display the camera image and adjust the image quality.

Display the Image

Display the image captured by the camera. When you click the **Acquisition Start** button, the camera image appears in right area.

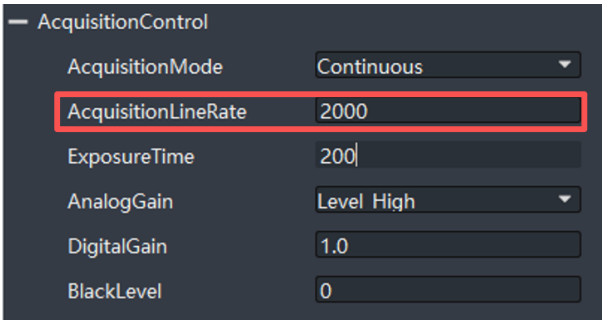


Adjust the FrameRate / LineRate

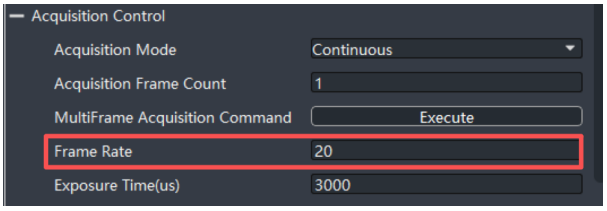
Adjust the frame rate or line rate according to the system requirements using the **Acquisition Control** function.

Manual Adjustment

1. For the cameras WAL-1001-GE and WAL-2001-GE, adjust the line rate by selecting the item of **AcquisitionLineRate**, you can change the value as shown below.



2. For the cameras WAA-0300-GE and WAA-1300-GE, adjust the frame rate by selecting the item of **Frame Rate**, you can change the value as shown below.

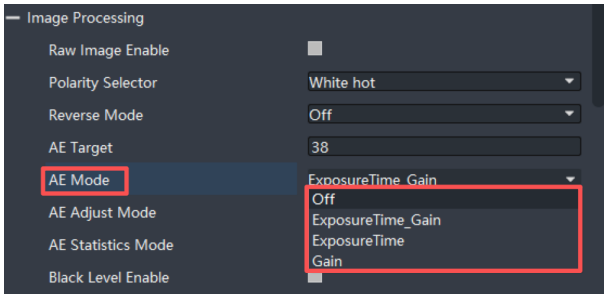


> **Note:** If the camera's trigger mode is **Hardware Trigge**r, its frame rate or line rate will be adjusted according to the external trigger source.

Adjust Exposure Time

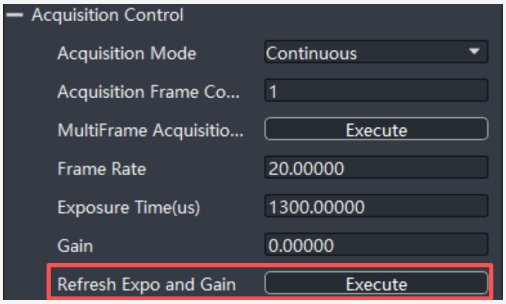
Automatic Adjustment

1. Expand **Image Processing**, if **AE Mode** is set to any mode other than **Off**, the **ExposureTime(μs)** and **Gain** will update automatically*.



Note: ***ExposureTime(μs)** and **Gain** parameters' changes can be viewed via **Refresh Expo and Gain**.

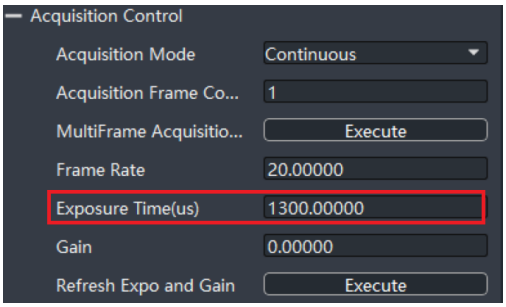
Expand **Acquisition Control**, **Refresh Expo and Gain** will show as below, then click **Execute**, the exposure time and gain will update, and the values could be viewed with **ExposureTime(μs)** and **Gain**.



Manual Adjustment

Expand **Acquisition Control**, and adjust the **Exposure Time(µs)**.

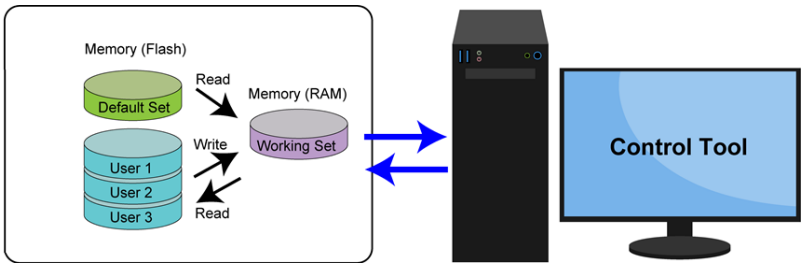
1. Expand **Acquisition Control**, and set the exposure time you want to configure in **Exposure Time (µs)** when **AE mode** is off (Default =Off).



Step 7: Save the Settings

The setting values configured in VisionKit Capture will be deleted when the camera is turned off. By saving current setting values to user memory, you can load and recall them whenever necessary. You can save up to three sets of user settings in the camera. (UserSet1 to 3)

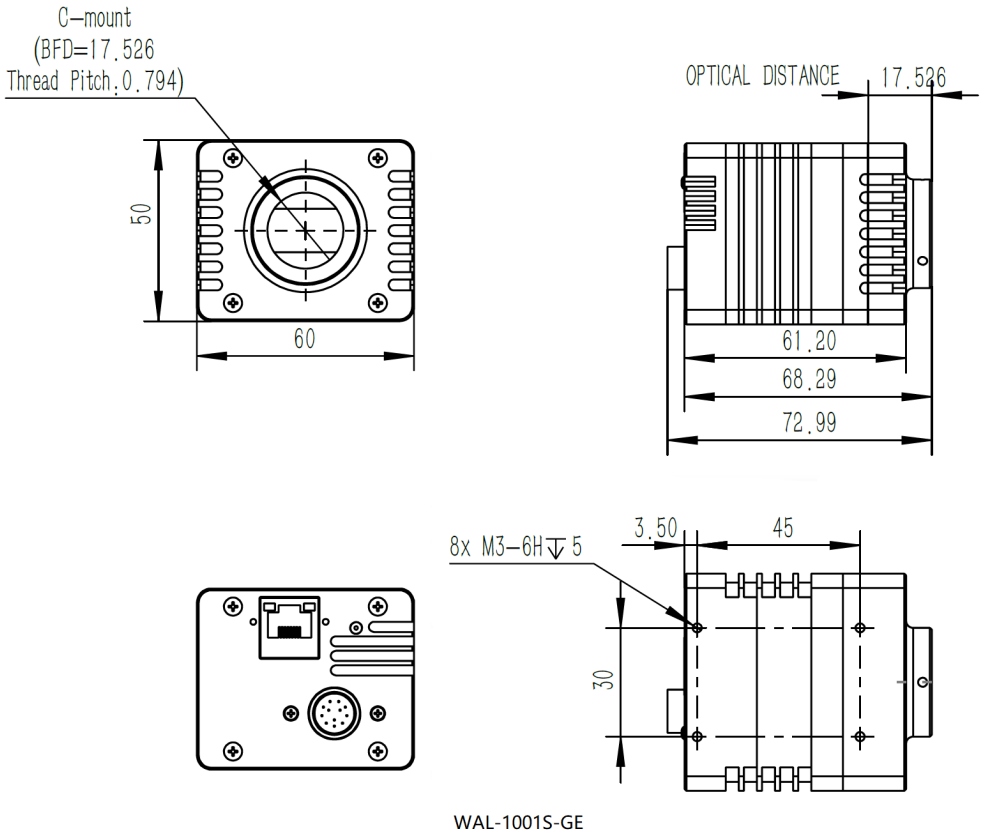
> **Note:** Changes to settings are not saved to the computer (VisionKit Capture).



Dimensions

Caution: The following are tentative dimensions for promotion samples. For the final dimensions, please refer to the *User Manual*, which will be available for download from the JAI website at the time of product launch.

WAL-1001-GE

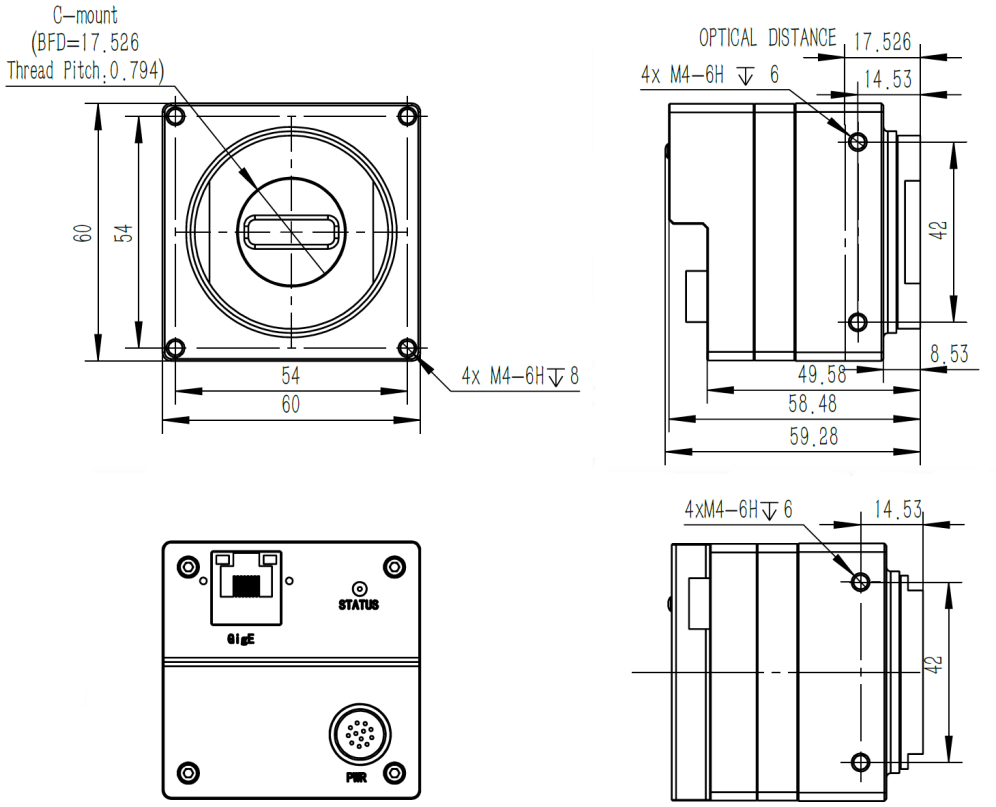


WAL-1001S-GE

Notes:

- Dimensional Tolerance: ± 0.2mm
- Unit: mm

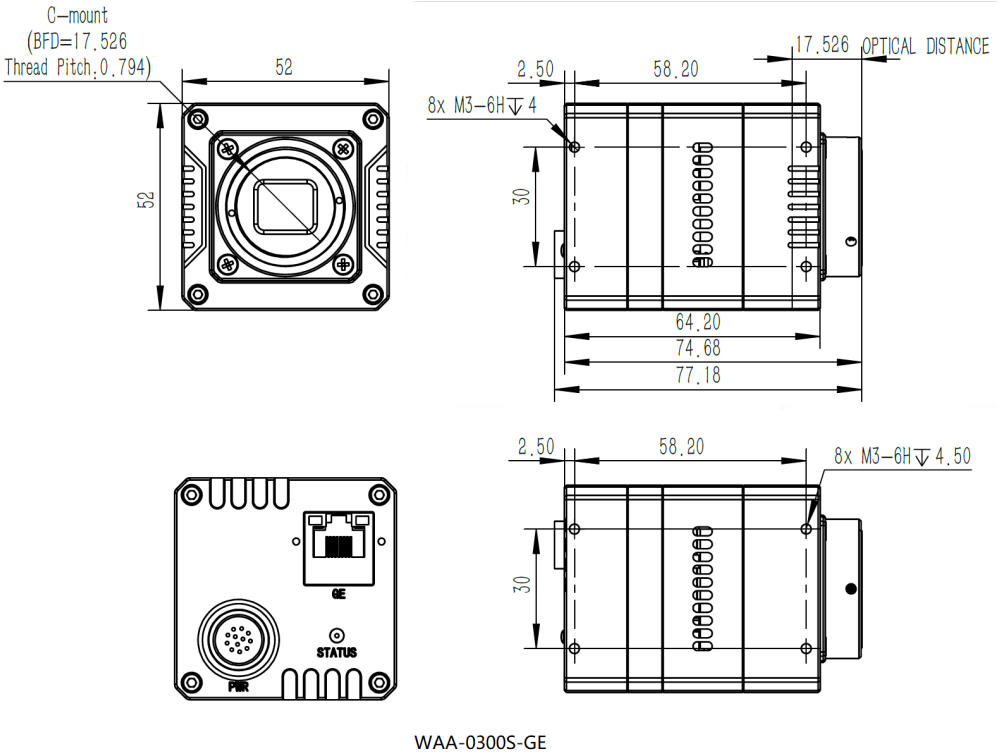
WAL-2001-GE



Notes:

- Dimensional Tolerance: ± 0.2mm
- Unit: mm

WAA-0300-GE

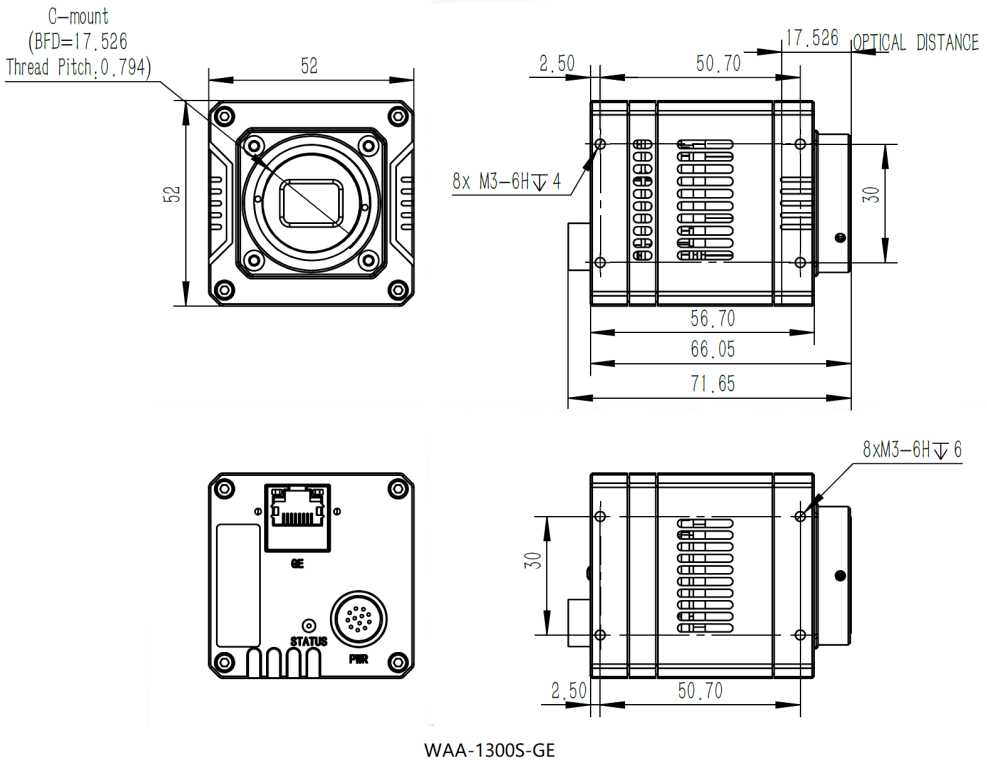


WAA-0300S-GE

Notes:

- Dimensional Tolerance: ± 0.2mm
- Unit: mm

WAA-1300-GE



WAA-1300S-GE

Notes:

- Dimensional Tolerance: ± 0.2mm
- Unit: mm

Specifications

Caution: The following are tentative values for promotion samples. For the final values, please refer to the *User Manual*, which will be available for download from the JAI website at the time of product launch.

<table>
<tr><th>Item</th><th>Specifications</th></tr>
<tr><td>Vibration Resistance</td><td>5G (55 Hz to 500 Hz, XYZ directions)</td></tr>
<tr><td>Impact Resistance</td><td>15G</td></tr>
<tr><td>Power Supply Voltage (12-pin)</td><td>
<table>
<tr><th></th><th>WAL-1001-GE</th><th>WAL-2001-GE</th><th>WAA-0300-GE</th><th>WAA-1300-GE</th></tr>
<tr><td>Input Range</td><td>DC +12 V +/-1V</td><td colspan="3">DC +12 ~ +24 V +/-10%</td></tr>
<tr><td>Consumption</td><td>4.8W Max
@ DC12V</td><td>4.8W Max
@ DC12V</td><td>8W Max
@ DC 12V*</td><td>6.24W Max
@ DC 12V*</td></tr>
<tr><td colspan="5">* TEC & FAN is ON.</td></tr>
</table>

Note: These cameras do not support PoE.
</td></tr>
<tr><td>Lens Mount</td><td>C-Mount
Lens mount protrusion length of 9 mm or less is supported. Except for the WAA-1300-GE, for which the lens mount protrusion shall not exceed 7.5 mm when attaching a lens</td></tr>
<tr><td>Flange Back</td><td>17.526mm, tolerance: 0 mm to -0.05 mm</td></tr>
<tr><td>Verified Performance Temperature/Humidity</td><td>- 10°C to +50°C (20 to 80% non-condensing)</td></tr>
<tr><td>Storage Temperature/Humidity</td><td>- 30°C to + 70°C / 20% to 80% (non-condensing)</td></tr>
<tr><td>Regulations (Tentative)</td><td>CE (EN IEC 61326-1:2021), FCC Part 15 Subpart B, RoHS, KC</td></tr>
<tr><td>Dimensions (Housing) (WHD, excluding connectors & lens mount protrusions)</td><td>
<table>
<tr><th>WAL-1001-GE</th><th>WAL-2001-GE</th><th>WAA-0300-GE</th><th>WAA-1300-GE</th></tr>
<tr><td>60mm x 50 mm x 61.2 mm</td><td>60mm x 60 mm x 50.75 mm</td><td>52mm x 52 mm x 64.2 mm</td><td>52mm x 52 mm x 56.7 mm</td></tr>
</table>
</td></tr>
</table>

Revision History

Revision	Date	Changes
1.2	2026/03/11	Updated the front page. Changed the description on High-Light Inversion (Phenomena Specific to InGaAs Image Sensors). Updated the Dynamic Range and Signal-to-Noise Ration values for WAA-0300-GE (Features Overview).
1.1	2026/02/20	Updated the front page.
1.0	2026/02/18	First Release