

# iBoost Series SWIR GigE Line Scan Camera User Manual

V23.08, Aug. 2023

---

## Preface

### Purpose

---

This Manual is a basic description of iBoost series SWIR GigE Line Scan Cameras, which mainly includes the product description, quick installation guide and Simple introduction of SDK. This manual may be updated due to product upgrades or other reasons. If you need, please contact the sales engineer for the latest version of this manual.

---

Copyright ©2023  
Hangzhou Vision Datum Technology Co., Ltd.  
Tel.: +86 571-86888309  
Add.:No. 8 Xiyuan 9th Road, West Lake District Hangzhou Zhejiang 310030 China.

All rights reserved. The information contained herein is proprietary and is provided solely for the purpose of allowing customers to operate and/or service Vision Datum manufactured equipment and is not to be released, reproduced, or used for any other purpose without written permission of Vision Datum.

### Disclaimer

The information and specifications described in this manual are subject to change without notice.

### Latest Manual Version

For the latest version of this manual, see the Download Center on our web site at: <http://www.visiondatum.com/en/service/005001.html>

### Technical Support

For technical support, e-mail: [support@visiondatum.com](mailto:support@visiondatum.com).

### Warranty

To ensure that your warranty remains in force, adhere to the following guidelines:

**Do not remove the camera's serial number label**

If the label is removed and the serial number can't be read from the camera's registers, the warranty is void.

**Prevent ingress or insertion of foreign substances into the camera housing**

Prevent liquid, flammable, or metallic substances from entering the camera housing. If operated with any foreign substances inside, the camera may fail or cause a fire.

**Avoid electromagnetic fields**

Do not operate the camera in the vicinity of strong electromagnetic fields. Avoid electrostatic charging.

**Clean with care**

Avoid cleaning the sensor if possible.

**Handle this camera with care**

Do not abuse the camera. Avoid striking, shaking, etc. The camera could be damaged by improper handling.

**Read the manual**

Read the manual carefully before using the camera.

## CHAPTER 1 PRODUCT INTRODUCTION

### Camera Features

- Resolution: 512\*1 & 1024\*1
- Maximum Line Rate: 10kHz & 20 kHz
- Data Interface: GigE
- Complete functions, stable performance, simple operation
- Provide SDK, support secondary development and product customization

### Human Machine Interface

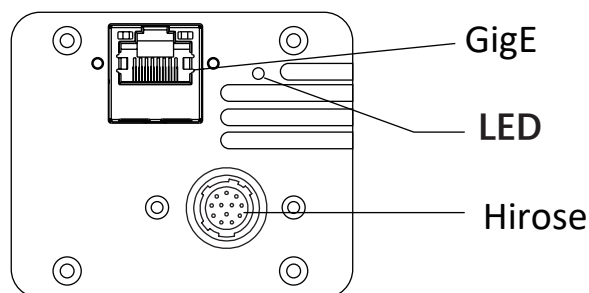
Provide for the customer with dedicated PC software, Including Image display, Gain, Line Rate, Exposure time, Data output bit depth adjustment and other functions.

### Camera Interface

Camera Output: GigE。

Power connector: Power the camera by one 12-pin Hirose connector, the Part Number is HR10A-10R-12PB. For the I/O Connection Definition and Assignments, please refer to section 2.

LED: The camera's status is indicated by two-color LED light.



### Status LED Description

Status LED	Description
LED is OFF	No power to the camera
The Green is steady ON then Red is ON one time	Power connected and in initial-ization
Flashing Green	Normal operation, The user is expected to see a normal image coming out of the camera
Other status LED	Faulty

## Mechanical Dimensions

The dimensions is in millimeters:

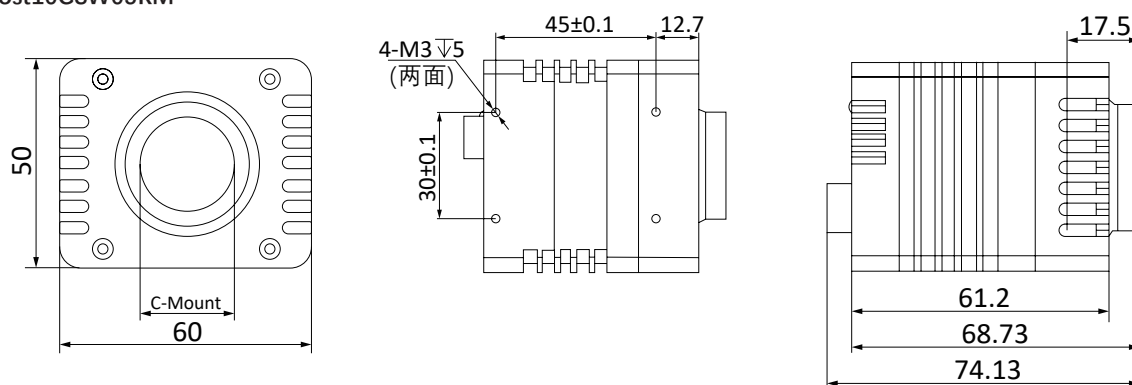
Different models of cameras have different appearances, which are distinguished by resolution.

The Industrial camera contains standard RJ45 GigE interface, 12pin power, I/O input connector and camera working status indicator light.

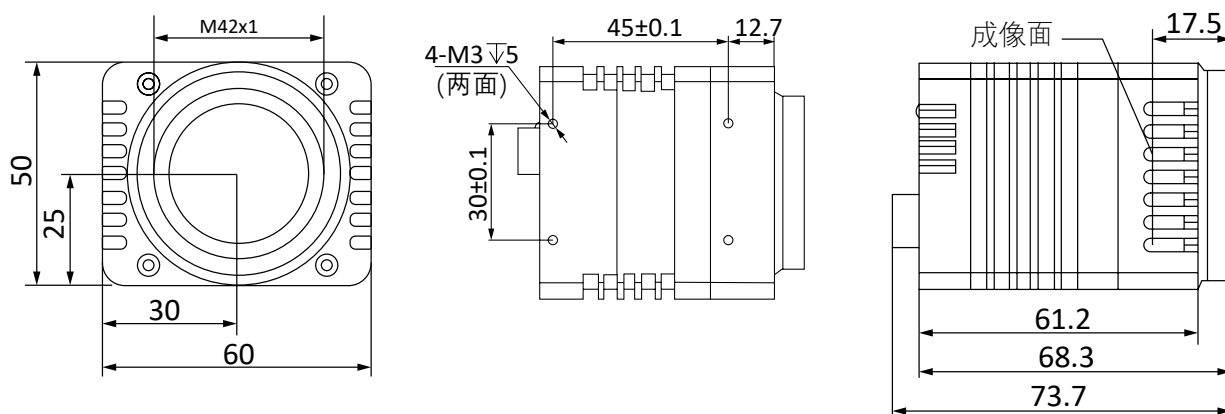
Use M3 specification locking screw holes to fix the camera.

Camera Housing and Base Mounting Hole Size(mm):

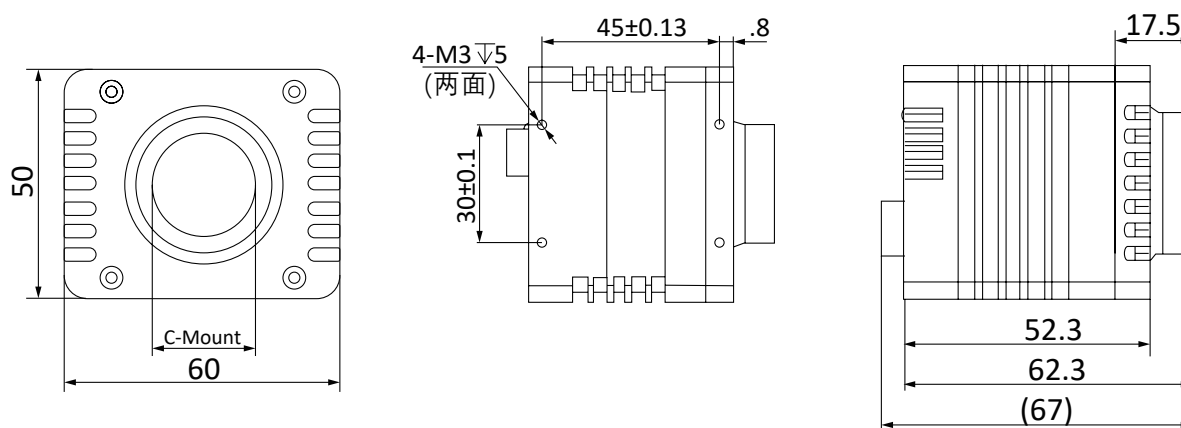
### iBoost10GSW05KM



### iBoost20GSW05KM



### iBoost9GSW1KM



# CHAPTER 2 POWER AND I/O INTERFACE DEFINITION

## I/O Connection Definition and Assignments

All GigE line scan cameras have a 12-pin power and I/O interface, as shown below:

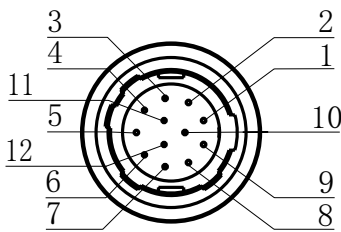


Table 2-1:  
Numbering and assignments for  
12Pin Connector:

Color	Pin	Signal	Designation
Black	1	POWER_GND	Power supply ground
Red	2	DC-PWR	DC Power +
Brown	3	N/A	
Orange	4	F_TRIGGER_IN	Single ended Frame Trigger Input
Yellow	5	L_TRIGGER_IN	Single ended Line Trigger Input
Green	6	N/A	
Blue	7	N/A	
Purple	8	RS422_RX-	RS422 Output
Gray	9	RS422_RX+	RS422 Input
White	10	N/A	
Pink	11	TRIGGER_GND	Frame/Line Trigger GND
Light green	12	N/A	



- Before connecting power to the camera, test all power supplies. You must check whether the power input voltage is correct. The stable working current of the camera is 350mA±30mA.
- Single-ended trigger signal: the input voltage threshold is "+0~+24VDC": "0~+1.4VDC" means logic 0, "> +2.2VDC" means logic 1;
- Differential Trigger Signal: trigger with RS422 signal。
- The unused wires and reserved wires in the power cable must be insulated to avoid short-circuiting;
- The camera's power voltage is DC+12V, and the current limit need be  $\geq 1A$ .

The wire color of this user manual is the color of Vision Datum. If you use other manufacturers' cable color definitions may be different, random connection may cause the camera to burn out, please connect according to the I/O port type and pin definition or contact our technical staff for advise.

## CHAPTER 3 INSTALLATION AND SETUP

You should perform the software installation procedure first and the hardware installation procedure second.

### Software Installation

#### ■ Software Installation

If you use a firewall on your computer, disable the firewall for the network adapter to which your camera is connected.

##### Close the Firewall

In order to ensure the camera software keep running and image transmission stability, please close the firewall before using the software.

##### System Requirements

iBoost Camera Software Suite for Windows requirements that one of the following operating systems is installed on your computer:

- Windows 7 ( 64 bit)
- Windows 10 (64 bit)

##### Installation Steps

- 1.You can download the software from: <http://www.visiondatum.com/service/005001.html>
- 2.Double click installation package to install the client.
- 3.Before use the Camera Control software please install vc2015\_redist.x64.exe (included in the Driver File)



The Camera control software only support the operating system with 64-bit.

## Hardware Installation

### ■ Camera Installation

*The installation procedures assume that you will be making a peer-to-peer connection between your camera and a computer.*

Make sure that the following items are available before starting the installation:

- iBoost SWIR GigE Line Scan Camera
- Applicable power supply or a Gigabit Ethernet Switch
- It refers to the lens that matches with lens mount of the camera.
- The computer with a GigE network adapter installed
- The computer must be equipped with appropriate operating system
- The cameras use standard Ethernet cable (CAT5 above or CAT6).

#### Steps:

- Mount lens that matches with lens mount of the camera
- Connect the camera to the computer and power
  - Direct supply:
    - Use the 12-pin power and I/O cable to connect the camera to a power adapter.

### Network Settings

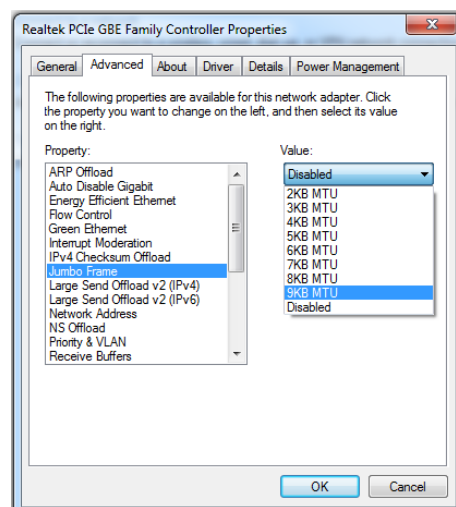
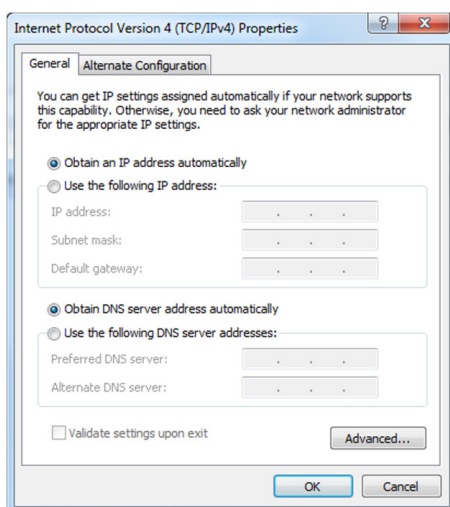
1) Before using the camera, you need to configure IP is in the same network segment with the computer.

- Disable all anti-virus programs and computer fire-walls:

2) Local Network Configuration :

- Click "Control Panel"> "Network and Internet"> "Network and Sharing Center"> "Change Adapter Configuration. "Then select corresponding network card to configure it automatically obtain IP address or manually assign it as same network segment address with the camera. Shown as below:
  - Click the Intel Ethernet Connection's Properties interface → Advanced:
    - (1) Transmit buffers: 2048. (2) Reduce speed when power is off: Disable. (3) Receive Buffers: 2048.
    - (4) Energy-saving Ethernet: Disable. (5) Jumbo Packet: 9014. (6) Flow Control: Disable.
    - (7) Applicability Packet spacing adjustment: Enable.

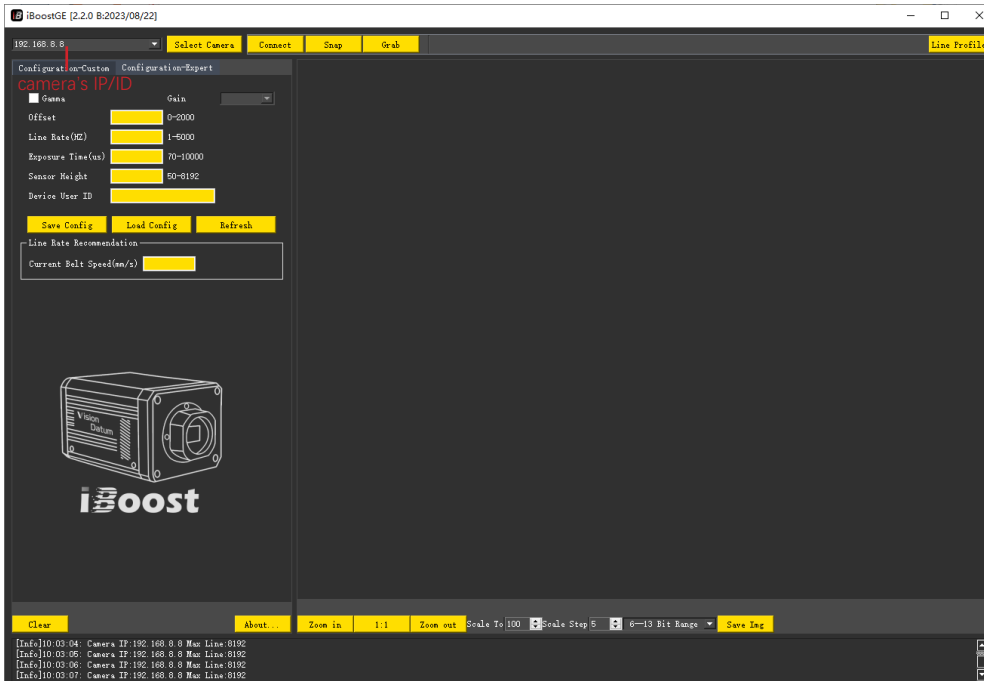
These maximum values mentioned above depend on the specific network card. Shown as below:



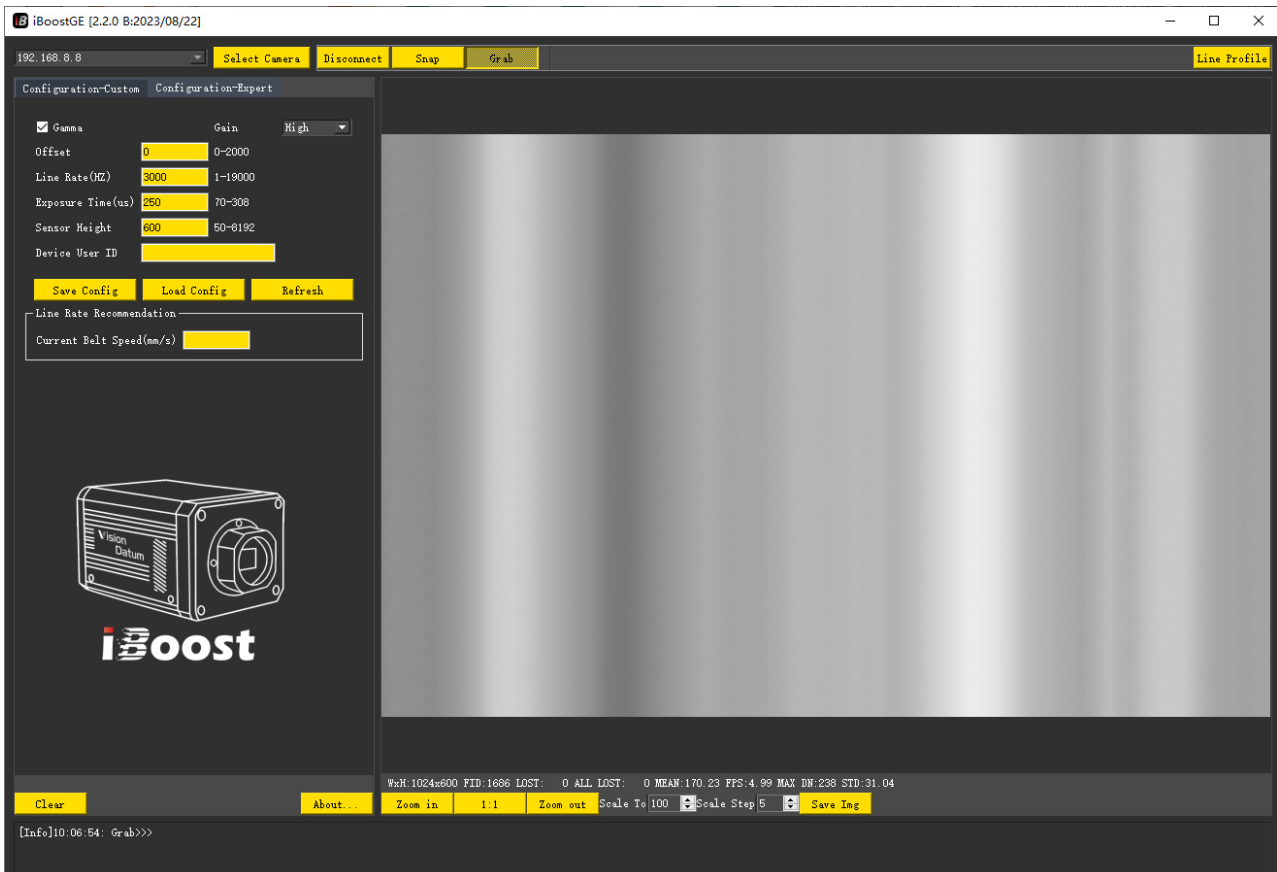
## Software Operation

### ■ Driver installation and running

1. After confirming the camera is successfully powered on, the user could double click the iBoost.exe as Figure below, then the Camera Control software is started.
2. Click "Select Camera", the user can select a camera which is with the camera's ID or camera's IP Address, then click "Connect" to connect the camera.



3. The Camera Control software will automatically read the camera's configuration, click "Continuous Grab" to start live grab.

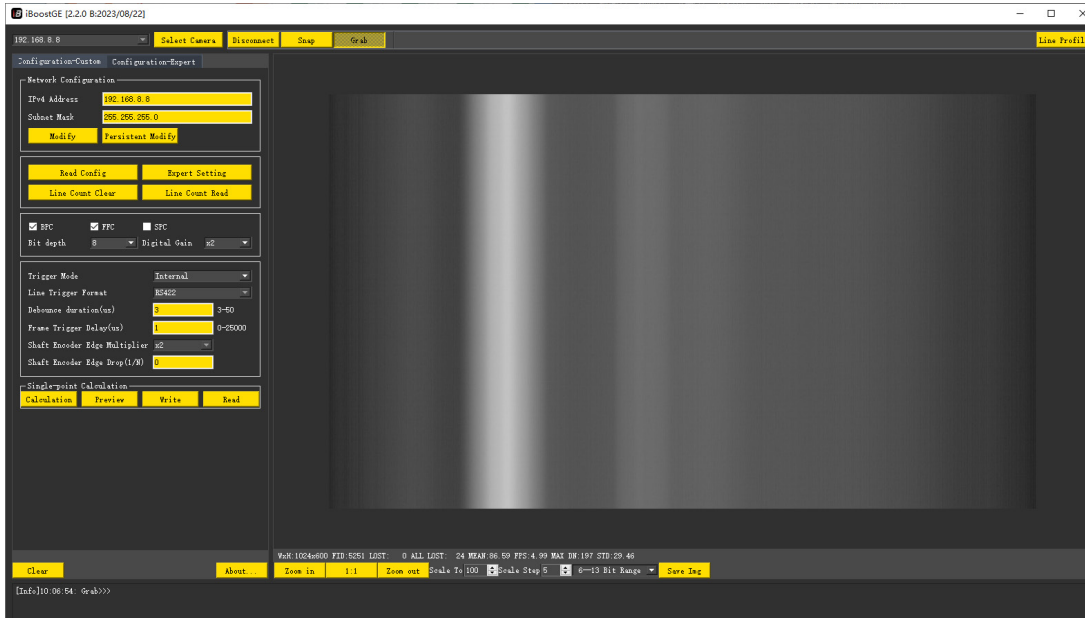




## Software Operation

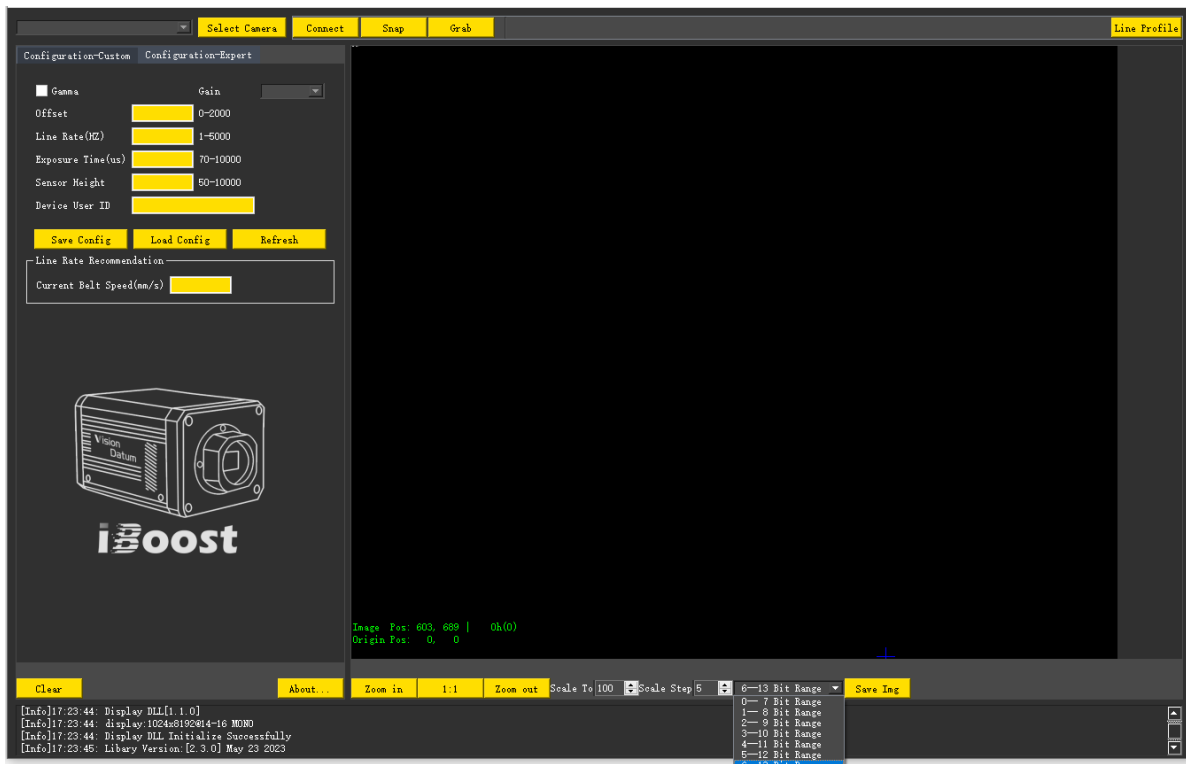
### 5.Acquisition Display Window

- (1) When the Mouse Cursor point in the acquisition display window, it will show its position coordinates, pixel value (hex,decimal) and current origin coordinate.
- (2) The window can show the acquired image's Width/Height, Frame Number, Lost Packets, Total Lost Packets, Average Pixel Value, Frame Rate, Maximum Pixel Value and Standard Deviation.



- (3) Click once "About..." will show the camera's Qt Version, Software Version, Class Library Version, Firmware Version, Firmware Software, Part Number and Serial Number .

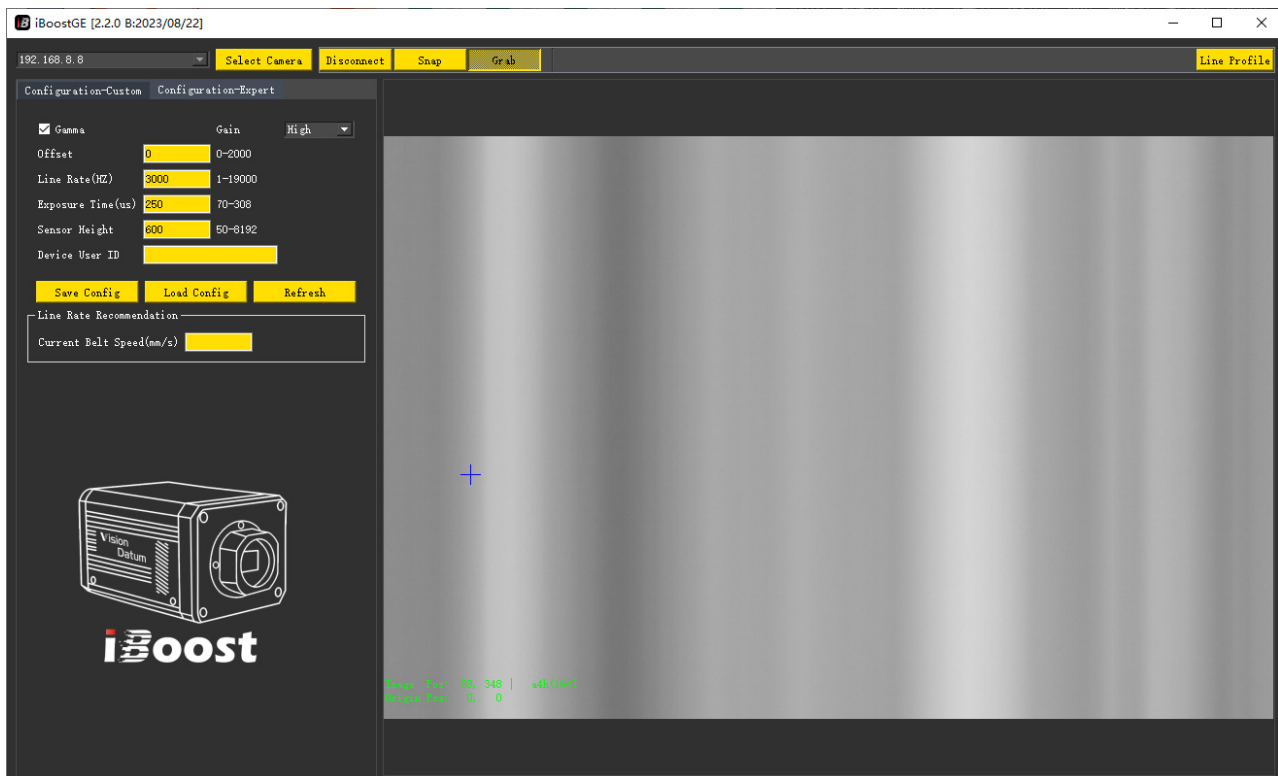
- (4) Image Display Control: The user can set image "Zoom In", set image display to original size "1:1", set image "Zoom Out", or zoom the image to any size and ratio with "Specified Ratio"(range is 50~5000), and adjust "Room Step"(range is 1~200).If the user would like to achieve these features, just place the mouse cursor on the area where the image needs to be zoomed in or out,and slide the scroll wheel to zoom in accordance with the zoom step.Also the user can set the image "Bit Range"(0-7bit display, 1-8 bit display, 2-9 bit display, 3-10 bit display,4-11 bit display, 5-12 bit display, 6-13 bit display).



## Software Operation

### 6.Camera Configuration (Custom):

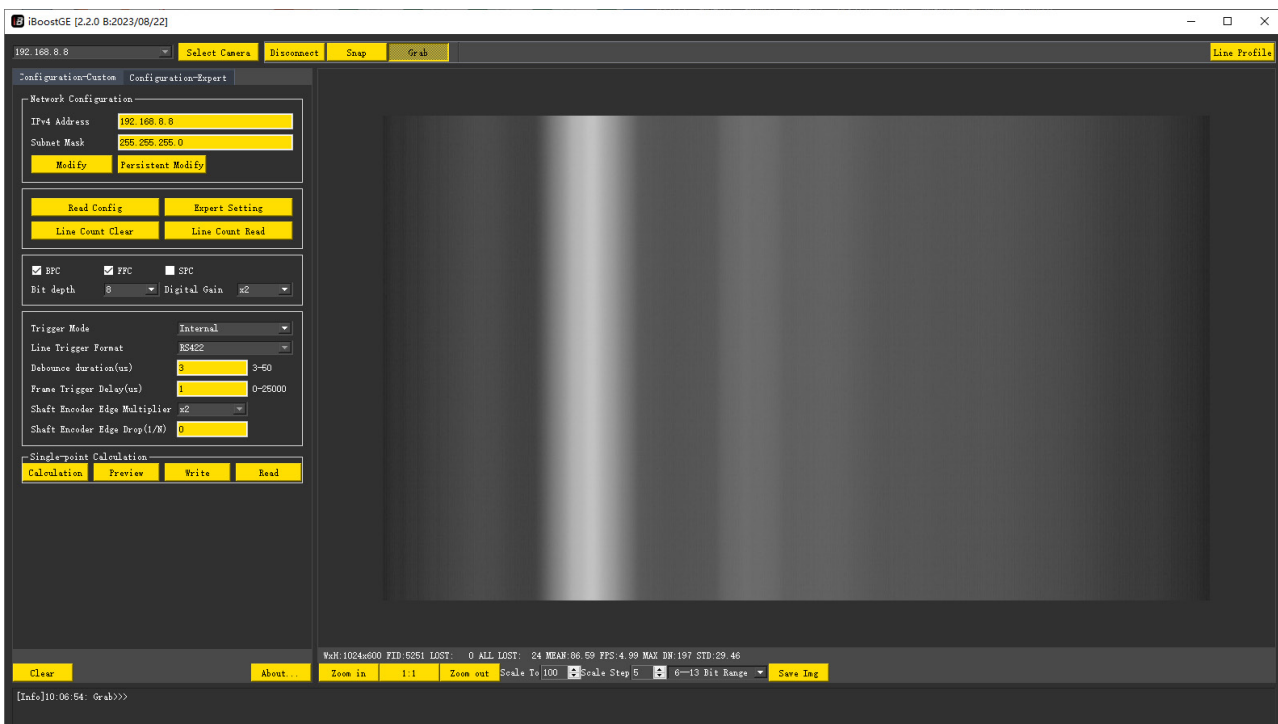
- (1) Gamma: Check Gamma, the image will become brighter and the average pixel value will increase. When uncheck it, the image will become darker and the average pixel value will decrease (Not Recommended).
- (2) Offset: After entering the value (range: 0~2000) in the Offset box, then press the Enter key, the feature is enabled. When the offset value increase, the corresponding average pixel value will decrease.
- (3) Line rate (HZ): Values can be entered in from 0 to 10000.
- (4) Exposure time ( $\mu$ s): Values can be entered in (the range is adjusted according to the line rate of the camera).
- (5) Sensor height: Defines the sensor height in active lines (range: 50~the value set by the maximum number of lines).
- (6) Device User ID: Enter one ID then click Enter key, when select the camera by "Select Camera" the user ID will show (after save configuration the parameter will be saved to the camera and will load after re-powering the camera).
- (7) Save Configuration: Click the button it will save the current configurations to the camera, after re-powering the camera, the configuration will be loaded.
- (8) Load Configuration: Click the button, the camera will load the default settings.
- (9) Refresh: Click the button, the camera configurations will refresh.
- (10) Line Rate Recommendation: Enter the speed of the conveyor belt of the user's platform to be tested in the "Current Belt Speed (mm/s)", and the corresponding recommended line rates value will be fed back.(For reference only).



## Software Operation

### 7.Camera Configuration (Expert):

- (1) Network Configuration: When stop grab image, the users can modify the camera's IP Address and Subnet Mask with "Modification" and "Persistent Modification". When select with "Modification", after re-powering the camera, it will load the default IP settings. When select with "Persistent Modification", the IP settings will be saved to the camera, and after re-powering the IP of the user settings will be loaded.
- (2) Read-back Configuration: Click it to read-back the parameters in Flash and save them to the file (The file is user\_CCD\_CFG\_rdbk).
- (3) Line Counts Reading: Click it to read the current cumulative line counts. This function only takes effect with "Single Grab" and "Continuous Grab".
- (4) Line Count Reset: Click it to reset the line count to zero.
- (5) Expert Settings: Click it then enter the password to open the camera debugging interface (Do not operate!).
- (6) Blind Element Correction: Compensation for the blind element of the CCD sensor. In order to ensure the image quality, normally it must be checked.
- (7) Flat-field Correction: These corrections compensate for Photo-response Non-uniformity and Fix Pattern noise, check it will make the image more uniform.
- (8) Output Bit Depth: Users can choose the output bit depth according to the application (8/10/12/14bit).
- (9) Digital Gain: Users can select 1,2,4,8,16, and 32, the image will become brighter and also the pixel value will increase as the Digital Gain amplification increases.
- (10) Trigger Mode: Users can select Internal trigger, Line trigger, Frame&Line trigger, Frame trigger.
- (11) Line Trigger Format: Users can select Single-ended signal (PIN5:L\_TRIGGER\_IN, PIN11:TISO\_GND) and RS422 level Signal(PIN9: RS422\_RX+, PIN8:RS422\_RX-). This function only takes effect when the trigger mode is Line trigger, Frame trigger or Frame&Line trigger.
- (12) Frame Debouncing Duration( $\mu$ s): Enter a value (range:3~6) then click the Enter key, it can eliminate the clutter signals to avoid false triggering. This function only takes effect when the trigger mode is Frame trigger(PIN4:F\_TRIGGER\_IN, PIN11:TISO\_GND) and Frame&Line trigger.
- (13) Frame Trigger Delay( $\mu$ s): Enter a value(range:0~ the effective time that the pulse remains at a high level before falling to a low level) and it can cut off the image which is from the start of signal to the end of the delay time. This function only takes effect when the trigger mode is Frame trigger and Frame&Line trigger.
- (14) Shaft Encoder Edge Multiplier: 1、2、4、8、16、32 are optional. This function only takes effect when the trigger mode is Line trigger and Frame trigger.
- (15) Shaft Encoder Edge Drop(1/N): Enter a value(range:1~255) then click the Enter key it will be available. This function only takes effect when the trigger mode is Line trigger and Frame trigger.



Default Configuration: Gamma is OFF, Blind Element Correction is ON, Flat-field Correction is ON, High Gain is ON, Trigger mode is Internal Trigger, Output Bit Depth is 14bit, Digital Gain is x1, Line Rate is 2600, and Exposure Time is 250.

---

## Camera Operation

---

### ■ Requirements for the first use of the camera

Follow the below steps to use the camera for the first time:

- All system, operating platform and users should take electrostatic protection measures.
- If necessary, please install the necessary environment and image acquisition software.
- Please check and test the power cable and data cable to ensure that all the voltage meets the requirements of CHAPTER 2
- Connect the data cable and power cable to the camera, then power on.

### ■ Caution Notes

- Do not plug or unplug the power connector when the power supply is ON.
- Insulate the unused camera power cable.
- Protecting against electrostatic discharge (ESD).
- Ensure the power supply and the PC are properly connected to earth ground and can withstand high ESD events.

### ■ Camera ESD Protection

Camera's electrostatic discharge (ESD) protection is very important. In order to prevent possible ESD damage, it is recommended to follow the steps below:

- The users who contact the camera must be reliably grounded, using an anti-static wristband and electrostatic discharge device.
- Ensure that the operating platform and tools which contact with the camera must be reliably grounded.
- It is best to wear cotton gloves when touching the camera.
- Do not directly touch the sensor cover glass.

### ■ Cleaning the Sensor Window

- Use dry and clean compressed air to blow off loose particles. This step alone is usually sufficient to clean the sensor window.
- Use lint-free ESD-safe cloth to wipe the window carefully and slowly.

## CHAPTER 4 OTHER

### FAQs

---

This section helps users quickly solve issues that occur during controlling and using the camera. The issues may appear in the following parts: Power supply, Cable, PC, Light Source, Lens and Environment.

#### ■ LED is OFF.

- Check whether the connection of the camera power cable is normal.
- Check whether the voltage of the power supply is normal with 12V.
- Check whether the current of the power supply is normal with  $360\text{mA}\pm 10\text{mA}$ .

#### ■ Camera control software can't control the camera:

- Check whether the connection of the Ethernet cable is normal.
- Check whether the network settings and firewall settings are correct.
- Check whether the camera control software version corresponds to the camera firmware correctly or not.

#### ■ Live view is black

- Check whether the lens aperture is on, and restart the camera with power off

#### ■ Live view is normal, but the camera cannot be triggered.

- Check whether the trigger mode of the camera is enabled and whether the selected trigger source and the IO interface used are consistent
- Check that the trigger signal input and wiring are normal

#### ■ The client was able to enumerate to the camera, but the connection failed

- Check whether the camera is on the same LAN as the client
- Check whether the camera is already controlled by another client, disconnect the control of the camera from another program, and reconnect it

#### ■ The client can enumerate to the camera, the connection is normal, but there is no image

- Check whether the Lines per frame setting is too small and increase the setting appropriately
- Check whether the firewall and antivirus software are not completely turned off
- Check whether the network properties are misconfigured, and detect jumbo frame packets and other configurations

## CHAPTER 5 TECHNICAL SUPPORT

If you need advice about your camera or if you need assistance troubleshooting a problem with your camera, it's highly recommended to describe your issue in details and contact us via E-mail at [support@visiondatum.com](mailto:support@visiondatum.com)

It would be helpful if you can fill-in the following table and send to us before you contact our technical support team.

Camera Model:		Camera's SN:	
Describe the issue in as much detail as possible:			
If known, what's the cause of the issue?			
How often did/does the issue occur?			
How severe is the issue?			
Parameter set			

### Hangzhou Vision Datum Technology Co., Ltd

No.8 Xiyuan 9th Road, West Lake District Hangzhou Zhejiang 310030 China  
Tel: 86-571-86888309  
[www.visiondatum.com](http://www.visiondatum.com)