2020

EHD-130SWIR-USB3 Manual

EHD imaging GmbH

22.1.2020

Contents

1. Attention

■ About this manual

1. Before using the camera, please read this manual thoroughly.
2. Please keep this manual reachable and always refer to the contents when needed.
3. Please contact us if the manual is lost or damaged. We will provide a replacement.
4. We cannot guarantee the safety of improper uses of the camera.
5. For your safety, please follow the directions of this manual.
6. All contents are subject to change.
7. Images in this manual may have been simplified to be easier comprehended.
8. Please contact us if you find any unclear points or mistakes in this manual.
9. Quoting, copying or altering some or all parts of the manual without our permission is prohibited.
10. We are not responsible for any lost or damages on your profits due to the use of our products.
11. Please understand that our oversea branches do not provide maintenance or repair services.

■ About the Icons

To keep the safety of the user, other people and their properties, please pay attention to the following icons.

⚠ Warning

If the user fails to follow the instruction, serious injury or death may occur.

⚠ Caution

If the user fails to follow the instruction, physical injury on human or damages on hardware may occur.

■ For Safe Use

⚠ Warning

● In following circumstances, please stop using the product and turn off the power immediately to prevent the risks of fires and electric shocks. If the product is defective, please contact us for repair or exchange. For your safety, please do not disassemble, modify or repair the camera on your own.

Please stop using the product and turn off the power immediately when:
・ The product becomes smoky or gets extremely hot on the surface, or makes unusual smells or sounds.
・ Foreign material or water gets into the product.
・ The product falls and becomes damaged.

● Do not place the product on unstable surfaces. The product may be fallen and people may get hurt.

⚠ Caution

● Do not expose the product to steam or fumes to avoid electric shocks and fires.

● Do not leave the product in high temperature places such as inside of vehicles or under direct sunlight.
High temperature may cause damages to the camera, or even cause fires.

● Do not cover the product with cloth or other materials. The product may get extremely hot and the heat may cause deformations on the parts or even cause fires.

● Please avoid dropping or shocking the product as the product may be damaged.

● Do not touch the cable with a wet hand. Such action may cause electric shocks.

● Please avoid continuously contacting the surface of the camera to your skin when the camera is being used. The surface temperature of the camera may cause burns.

■ Other Notices

● Please do not use the camera under strong lights such as sun light for a long period. Also please do not expose the camera under strong lights even when the product is not being used because the sensor might be damaged.

Maintenance
● Wipe the dirt on surface with soft cloth or tissue paper. Do not use alcohol, thinner or benzene to avoid damaging the surface paints.

Electro Magnetic Interference
● The camera may interference with electronic devices such as TV and radio. Please do not place the camera next to such equipment.

■ Export Control

This product is a List Control item subject to the Foreign Exchange and Foreign Trade Act and its relevant legislations No.1 10 (2) and (4). To export this product from Germany, obtaining export licenses from the Ministry of Economy, Trade and Industry is required. It is also necessary for our company to manage the information of users and the purposes of use. If the end users or purposes of use change after the purchase and thus cause the need to apply export licenses from Ministry of Economy, Trade and Industry, please contact the sales representative in advance.

■ Guarantee

To save the environment, we do not issue warranty in printed format. Instead, all records of the warranty periods, delivery dates and the customer information are well kept in our system.

For more details, please refer to the sites below:

Hardware Warranty: https: //www.ehd.de/AGB.pdf

■ Dispose

To dispose this product, please return the camera to us. If you decide to dispose the camera without returning it us, please follow related regulations and have the camera disposed as an industrial waste. Please always keep records of the dispose, and make sure the disposed camera cannot be accessed or used by any 3rd party.

■ Limited Responsibility

We do not guarantee the functions of this product or the descriptions on this manual to be completely adapted to the users' end applications or marketing purposes. We are also not held responsible for any direct or indirect damages caused by our products under any circumstances.

Please do not use this product on applications that require high reliability. This product is not manufactured to be used as medical, nuclear, aerospace, transportation equipment or equipment that is highly related to human safety. We are not held responsible for any damages on the users' property, equipment or personal safety caused by this product.

2. Introduction

This manual is to identify the specification of EHD-130SWIR-USB3, NIR camera adopts InGaAs (Indium gallium arsenide) sensor with USB3.0 interface.

3. Main Features

● NIR Detection with High Sensitivity

The InGaAs sensor can detect radiation invisible to human eyes and CCD/CMOS cameras in the wavelength range between 400 nm to 1700 nm bond.

Otherwise, in spite of InGaAs sensor, it has 35% of quantum efficiency between 600 nm to 900 nm, so it can be applied to detection a wide range of wavelength.

● High Resolution, High Frame Rate

1280 x 1024 pixel and delivers image at 30 frame/second.

● USB3.0 interface

We adopt high reliability USB3.0 interface as industial application.
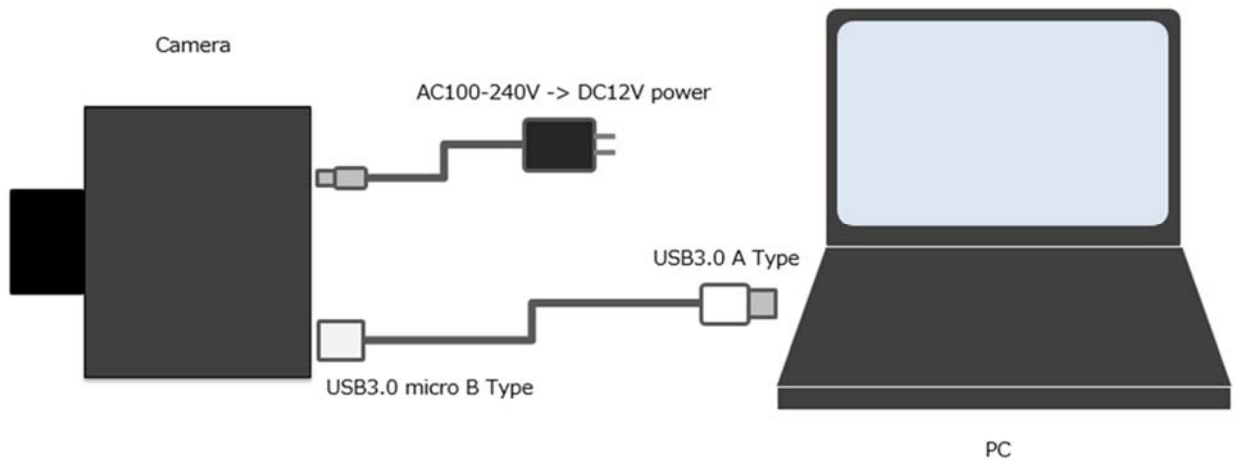
4. The Product

1) Camera
2) USB3.0 cable   TYPE A – micro B connecter   Approx. 3M
3) AC adapter (AC100-240V -> DC12V)
4) Software CD

<Options>
1) C Mount lens

5. Setup

5.1. Camera connection method (connection example)

Camera

AC100-240V -> DC12V power

USB3.0 A Type

USB3.0 micro B Type

PC

6. Specifications

6.1. Camera Specification

6.1.1. Camera specification list

ITEM	
Sensor Type	1.3 M pixels InGaAs Image Sensor
Interface	USB3.0 (Bulk transfer)
Number of Output Bits	13bit
Frame Rate	30 fps (When shutter speed is 1/1000000 sec)
Shutter Speed	1/1000000 ~ 1.04857sec
Synchronization System	Internal Synchronization
Lens Mount	C Mount
Power	DC12V External Input
Power Consumption	Approx.3W (During normal operation)
Ambient Conditions	Operating Temperature / Humidity : 10 ~ 35°C / 10 ~ 80% (Non-condensing) Storage Temperature / Humidity : 0 ~ 60°C / 10 ~ 95% (Non-condensing)
External Dimensions	61.5(W) × 71.6(H) × 59.0(D)mm * Lens, tripod and cables not included
Weight	Approx. 360g * Lens, tripod and cables not included

### 6.1.2.   External Dimensions
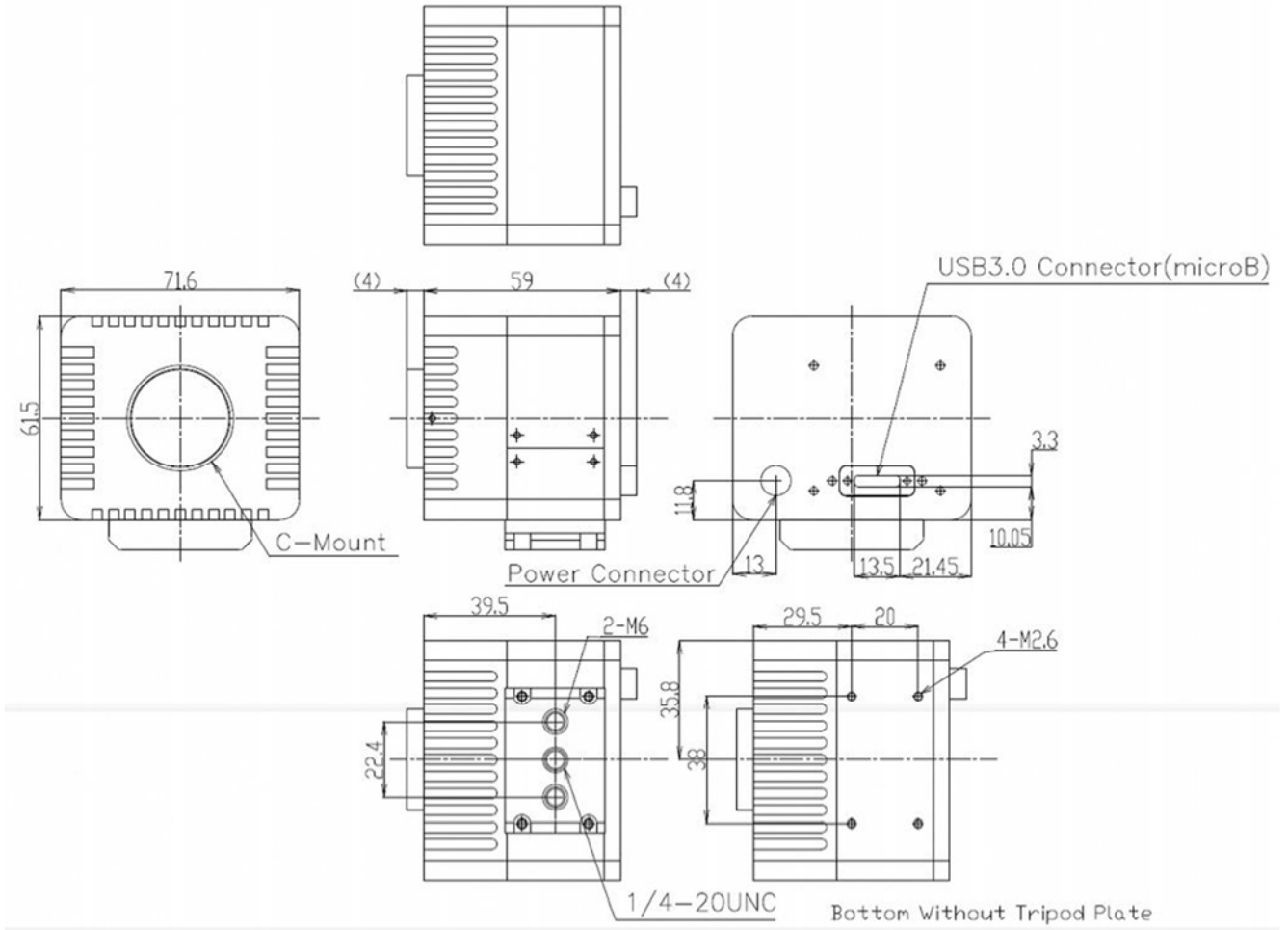
6.1.3.   Sensor Surface Perimeter Dimension
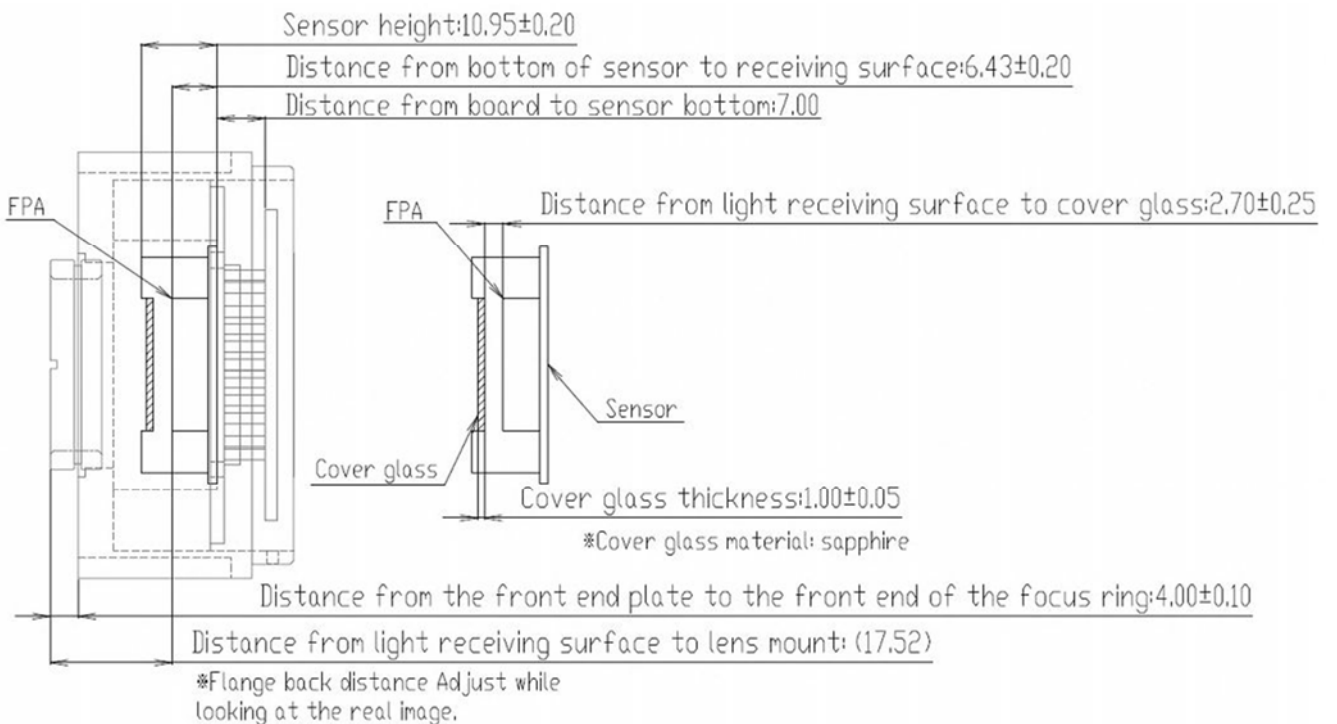
6.2. Sensor specification (based on sensor manufacturer's data)

6.2.1. List of sensor specifications

ITEM	
Image pickup device	SCD InGaAs sensor Cardinal1280
Number of effective pixels	1280(W) x 1024(H)
Number of output pixels	1280(W) x 1024(H)
Pixel Size	10[μm] x 10[μm]
Imaging Area	12.8[mm] x 10.24[mm] (Diagonal 17.173 mm, equivalent to approximately 1 inch)
Detection frequency band	400 to 1700 nm (whole) 800 to 1600 nm (quantum efficiency 35% or more) Peak wavelength: 1550 nm (quantum efficiency 80% or more)
Saturation capacity / readout noise	High Gain: 10Ke / 35e Mid Gain: 500Ke / 170e Low Gain: 1Me / 350e
A/D Resolution	13bit

### 6.2.2. Spectral sensitivity characteristics
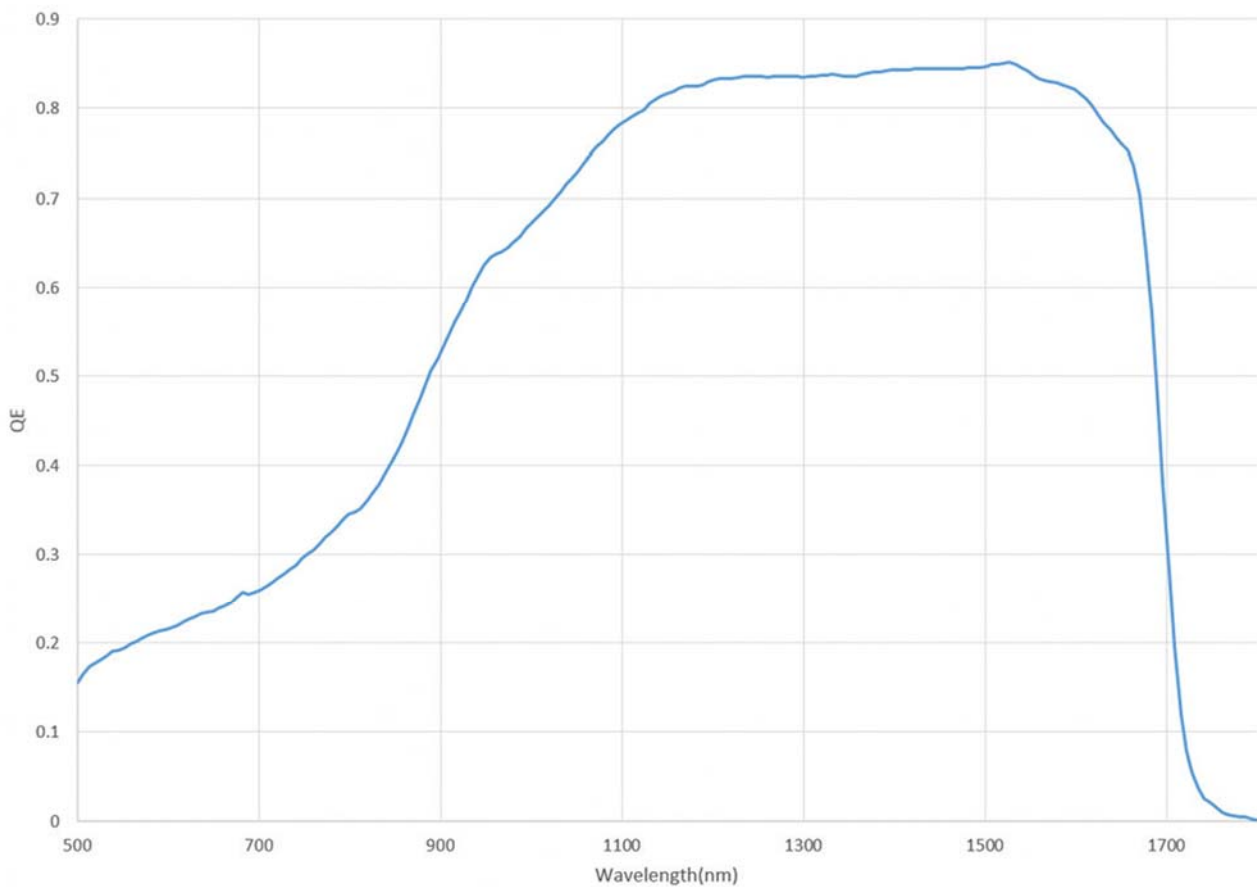
6.3. Camera function

6.3.1. Camera function list

The functions of the camera are as follows.

NO	ITEM	SETTING RANGE	DEFAULT VALUE	REMARKS
1	Reset	-	-	Initialize the camera
2	Shutter Speed	1〜1000000	100	Changing the shutter speed Shutter speed [μ sec] = set value * 100
3	Analog Gain	Low/Mid	Low	Cell capacity selection of sensor (High Gain cannot be selected)
4	Digital Gain	0〜255 (0〜7.97times)	32	Gain magnification = set value * 1/32 ON / OFF selectable
5	Offset	0〜255	0	Offset = set value * 64 (14 bit value) ON / OFF selectable
6	Black Level Correction	ON/OFF	ON	
7	Sensitivity Correction	ON/OFF	ON	
8	Defect Pixel Correction	ON/OFF	ON	

6.3.2. Camera function block diagram
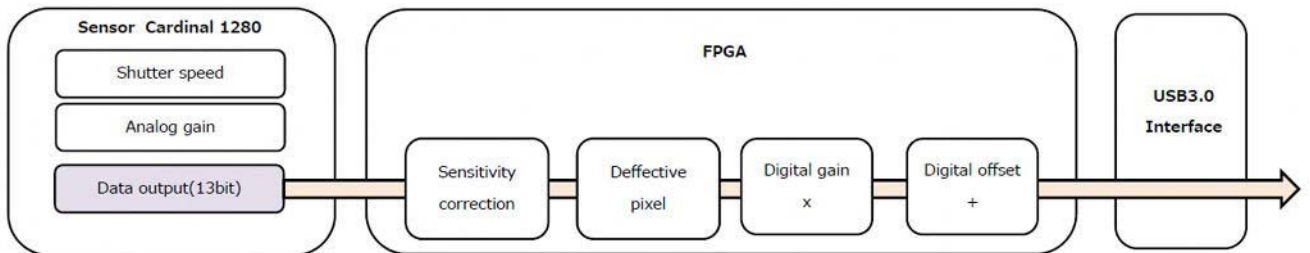
7. Recommended PC

7.1. Recommended System Requirements

- Intel chip set, Southbridge above ICH6
- CPU: Intel core i7 6700 or higher
- Memory: $\geqq$ 1024 MB
- OS: $\geqq$ Windows 7

7.2. Minimum System Requirements

- USB3.0 eXtensible Host Controller
- CPU: Intel core i5 4590 or higher
- Memory: $\geqq$ 512 MB
- OS: $\geqq$ Windows 7

Caution

■ Please refer the restrictions below when you use EHD camera.

  (1) Recommended System Requirements

If the system specifications do not meet the requirements recommended above, it may be difficult to run at the maximum frame rate.

(2) Use of other USB3.0 Hardware

The data on our camera/converter is transferred in bulk mode. For this reason, when using our camera/converter, please avoid using other bulk transferred USB3.0 hardware such as Memory stick, External HDD, External DVD, CDROM etc.

(3) USB3.0 Cable Extension

We cannot guarantee the functionality of the USB3 camera if the user adopts USB3.0 extension cables or repeaters which are not confirmed by us. With the extension cables or repeaters, the bandwidth of transfer may differ, and thus caused malfunctions such as a low frame rate or recognition failure on the camera.

What may cause the problem is that the regulation of the power lines becomes not enough, and so causes impudence mismatch on data signals.

*For the recommended extension cable, please contact our sales department. (TEL: +49-5491-2090)

EHD imaging GmbH
Zum Rennplatz 15, D-49401
Damme (Germany)
Tel: +49-5491-2090
email info@ehdimaging.de
www.ehd.de