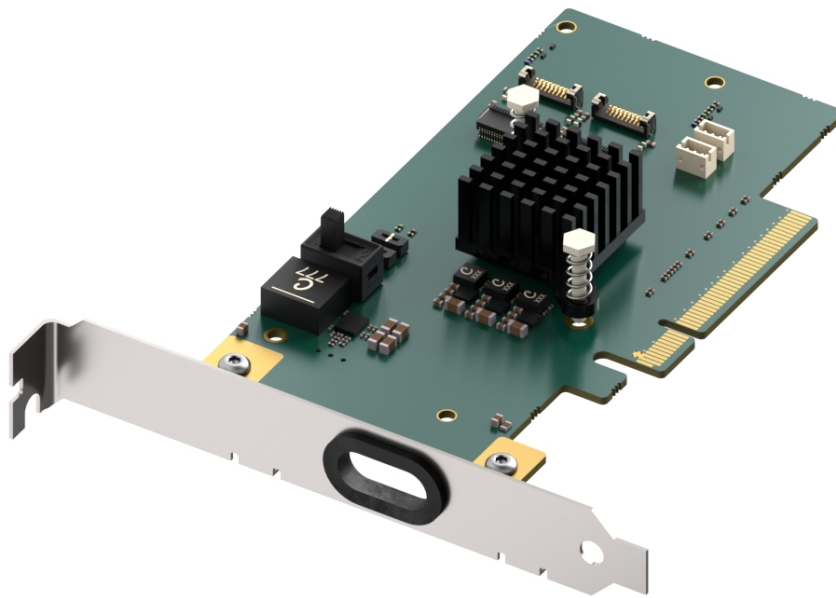




- HA-2P-X4G3-FF-X8G3
Host adapter

Introductions

About this manual

Dear customer,

Thank you for purchasing a product from XIMEA.

We hope that this manual can answer your questions, but should you have any further queries or if you wish to claim a service or warranty case, please contact your local dealer or refer to XIMEA Support on our website: www.ximea.com/support

The purpose of this document is to provide a description of XIMEA Accessories and to describe the correct way to install related software, drivers and run it successfully. Please read this manual thoroughly before operating your new XIMEA Accessories for the first time. Please follow all instructions and observe the warnings.

This document is subject to change without notice.

About XIMEA

XIMEA is one of the worldwide leaders for innovative camera solutions with a 30-year history of research, development and production of digital image acquisition systems. Based in Slovakia, Germany and the US, with a global distributor network, XIMEA offers their cameras worldwide. In close collaboration with customers XIMEA has developed a broad spectrum of technologies and cutting-edge, highly competitive products.

XIMEA's camera centric technology portfolio comprises a broad spectrum of digital technologies, from data interfaces such as USB 2.0, USB 3.1 and PCIe to cooled digital cameras with CCD, CMOS and sCMOS sensors, as well as X-ray cameras.

XIMEA has three divisions – generic machine vision and integrated vision systems, scientific imaging and OEM/custom.

Our broad portfolio of cameras includes thermally stabilized astronomy and x-ray cameras, as well as specialty cameras for medical applications, research, surveillance and defense.

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1 General description

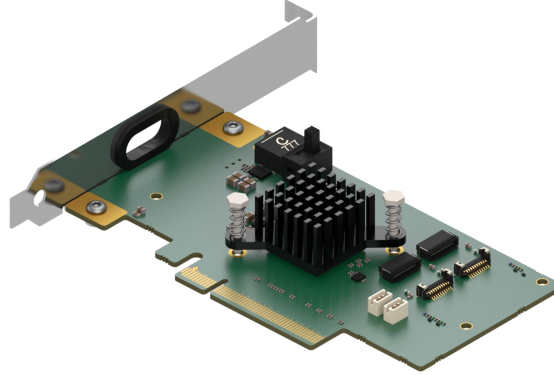


Figure 1: Isomeric view of host adapter

The HA-2P-X4G3-FF-X8G3 is a high-performance host adapter featuring a two slots for PCI Express (PCIe®) Gen 3 x4 FireFly cabling. This low-profile I/O card is designed for use in high-bandwidth applications requiring reliable data transmission and compatibility with advanced PCIe standards.

- Compatible Active Fiber Optical Cable or copper cables.
- Supports PCIe Gen 1, Gen 2, and Gen 3 signaling rates, including:
 - Gen 1: 2.5 GT/s
 - Gen 2: 5.0 GT/s
 - Gen 3: 8.0 GT/s
- Input bandwidth per camera: 32 Gbps
- Low-profile PCIe card suitable for compact and space-constrained systems.
- For use with xiB and xiX series
- Requires one PCIe Gen 3 x8 slot

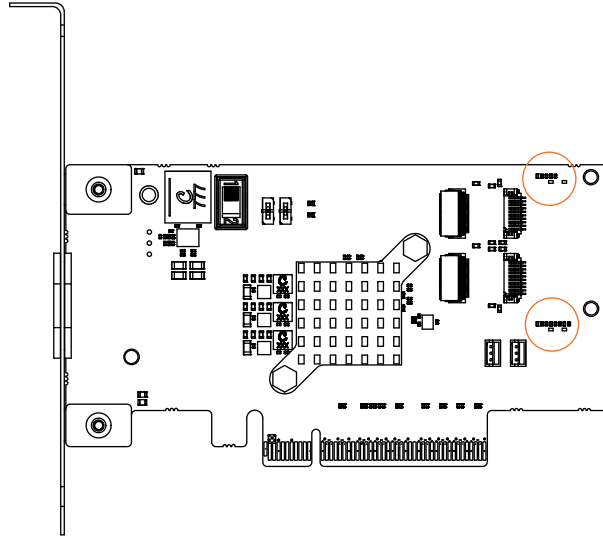


Figure 2: LED location

LED	Description
PERST	ON when not active
PORT_GOOD0	Upstream port trained speed
PORT_GOOD1	Downstream port 1 trained speed
PORT_GOOD2	Downstream port 2 trained speed
PORT_GOOD3	Downstream port 3 trained speed
PORT_GOOD4	Downstream port 4 trained speed

Table 1: LED description

LED status	Description
OFF	Link is down
Blinking 1 Hz (512 ms ON / 512 ms OFF)	Link is up, 2.5 GT/s, any negotiated link width
Blinking 2 Hz (256 ms ON / 256 ms OFF)	Link is up, 5.0 GT/s, any negotiated link width
ON	Link is up, 8.0 GT/s, any negotiated Link Width

Table 2: LED status description

2 Dimensional drawings

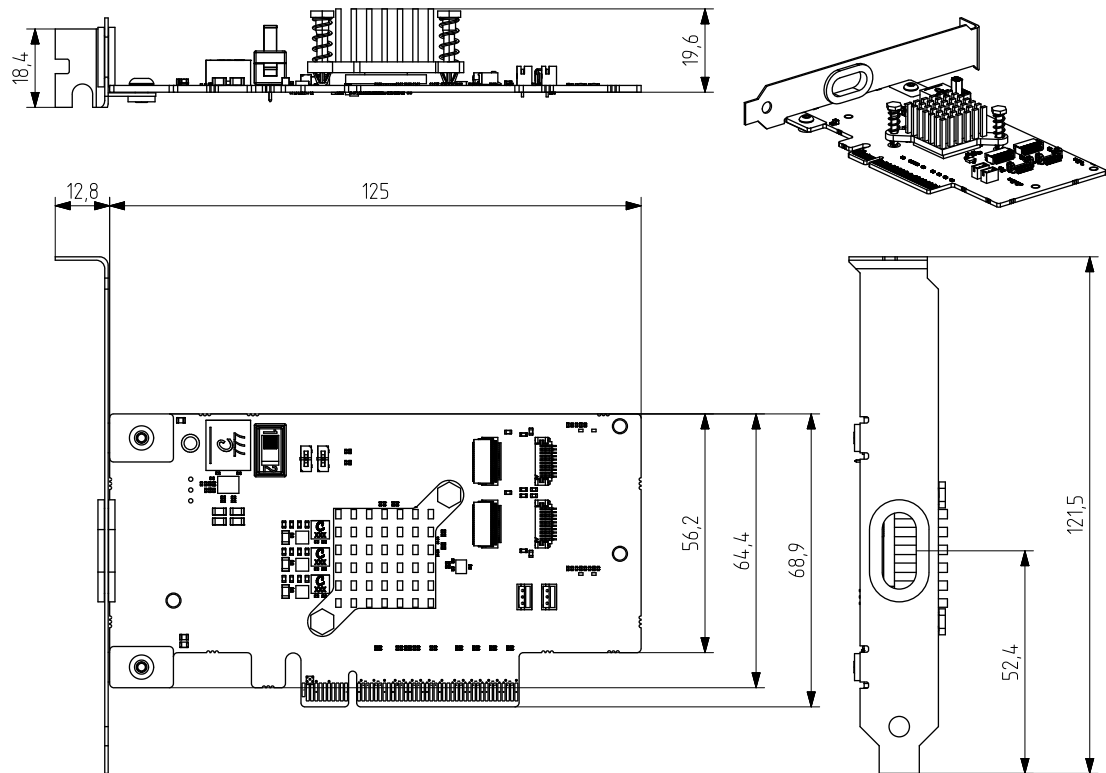


Figure 3: Dimensional drawing of HA-2P-X4G3-FF-X8G3 host adapters

Width [W]	Height [H]	Depth [D]	Mass [M]
109 mm	121.5 mm	21 mm	TBD

Table 3: Parameters and mass of host adapters

3 Configuration

3.0.1 DIP switches

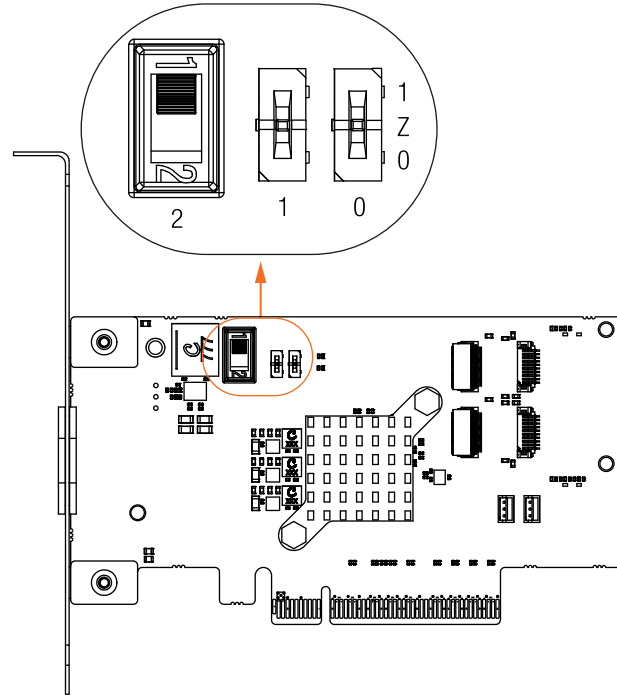


Figure 4: DIP switches

DIP switch [1] position	DIP switch [0] position	PCIe blade lines	MTP PORT A lines	MTP PORT B lines	PCIe PORT configuration
0	1	x8	(A+B)=x8	(A+B)=x8	Port A / B - Port 1 ¹
Z	0	x8	x4	x4	Port A - Port 1 Port B - Port 2
Z	1	x8	x2, x2	x2, x2	Port A - Port 1 / Port 2 Port B - Port 3 / Port 4

¹MTP/FF ports A and B together work as a single X8G3 PCIe port

Table 4: DIP switch configuration

DIP switch 2 position	Function
24 V	Intended for use with longer FF cables, where power is also distributed through the FF cable ¹
Off	Power delivery through the FF cable is disabled, the power supply must be provided on the device end ²
12 V	Intended for shorter FF cables ¹

¹Applicable only with FF host adapter

²This option is recommended when the connected device requires more than 25 W

Table 5: DIP switch 2 (CAM PWR)

4 Connectors

4.1 Location of connectors

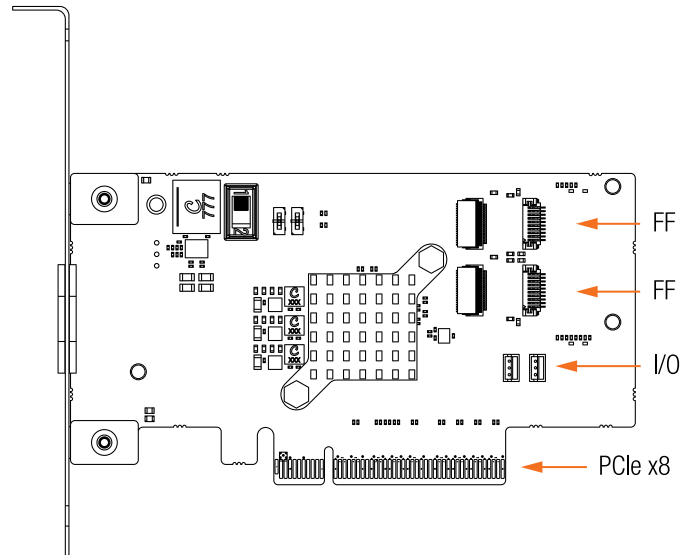


Figure 5: ADPT-1P-X4G3-FF-X8G3 connectors location

Name	Description
IO	2x IO, 3 Positions Header, Shrouded Connector (1.50 mm) Through Hole Tin-Lead
FF	2x PCIe FireFly connectors
PCIe x8	PCIe x8 PCB Edge connector

Table 6: ADPT-1P-X4G3-FF-X8G3 connectors description

4.2 Data interfaces

4.2.1 FireFly connector

Item	Value
Connector	Samtec (UEC5-019-1-H-D-RA-1-A + UCC8-010-1-H-S-1-A)
Signals	PCIe, IO, GND
Mating cables	Ximea PN: CBL-ECUE-X4G3-1M0, CBL-ECUE-X4G3-2M0

Table 7: FireFly connector description

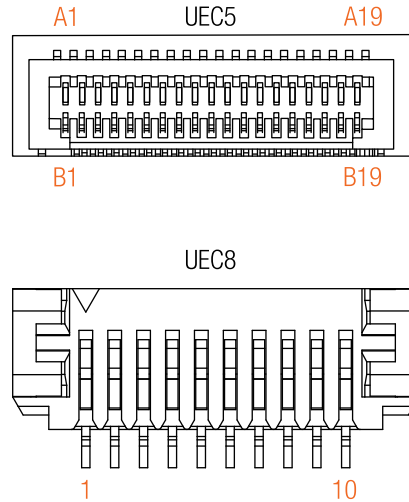


Figure 6: Firefly connector pinout

Pin	Name	Description
1	VCC_TX	TX Power output
2	GND	Ground
3	PRESENTL	Module presence detect
4	SELECT	Signal for selection
5	CPERST	PCIe reset signal
6	CPRSNT	Card presence detect
7	SDA	I2C data line
8	SCL	I2C clock line
9	GND	Ground
10	VCC_RX	RX power output

Table 8: FireFly connector UCC8 pin assignment

Pin	Name	Description	Pin	Name	Description
A1	GND	Signal and power ground	B1	GND	Signal and power ground
A2	PCle_PETN_2	PCle TX differential pair 2	B2	PCle_PETN_3	PCle TX differential pair 3
A3	PCle_PETP_2	PCle TX differential pair 2	B3	PCle_PETP_3	PCle TX differential pair 3
A4	GND	Signal	B4	GND	Signal and power ground
A5	PCle_PETN_1	PCle TX differential pair 1	B5	PCle_PETN_0	PCle TX differential pair 0
A6	PCle_PETP_1	PCle TX differential pair 1	B6	PCle_PETP_0	PCle TX differential pair 0
A7	GND	Signal and power ground	B7	GND	Signal and power ground
A8	SPARE	Unused/reserved pin	B8	PWR	Power input
A9	CPERST	PCle reset signal	B9	PWR	Power input
A10	GND	Signal and power ground	B10	GND	Signal and power ground
A11	ISO_GND	Isolated Ground	B11	ISO_GND	Isolated Ground
A12	ISO_GPI	Isolated Input	B12	ISO_GPO	Isolated Output
A13	GND	Signal and power ground	B13	GND	Signal and power ground
A14	PCle_PERP_2	PCle RX differential pair 2	B14	PCle_PERN_3	PCle RX differential pair 3
A15	PCle_PERN_2	PCle RX differential pair 2	B15	PCle_PERP_3	PCle RX differential pair 3
A16	GND	Signal and power ground	B16	GND	Signal and power ground
A17	PCle_PERP_1	PCle RX differential pair 1	B17	PCle_PERN_0	PCle RX differential pair 0
A18	PCle_PERN_1	PCle RX differential pair 1	B18	PCle_PERP_0	PCle RX differential pair 0
A19	GND	Signal and power ground	B19	GND	Signal and power ground

Table 9: FireFly connector UEC5 pin assignment

4.2.2 GPIO

Item	Value
Connector	Connector Header Through Hole, 3 position B3B-ZR
Signals	Input, Output, Ground
Mating Connectors	JUMPER 03ZR-8M-P - 03ZR-8M-P
Mating Cables	XIMEA PN: CBL-ZR3-ZR3-0M25

Table 10: IO connector general description

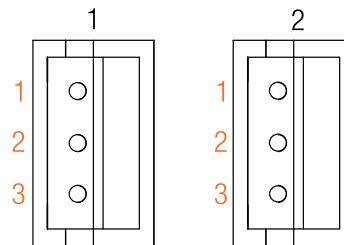


Figure 7: GPIO connector pinout

Pin	Name	Description	Pin	Name	Description
Connector 1			Connector 2		
1	ISO_GPI_2	Isolated input	1	ISO_GPI_1	Isolated input
2	ISO_GND	Isolated ground	2	ISO_GND	Isolated ground
3	ISO_GPO_2	Isolated output	3	ISO_GPO_1	Isolated output

Table 11: GPIO connector pin assignment

5 Additional information

5.1 Cables

5.1.1 CBL-ECUE-X4G3-1M0/2M0/3M0

The FireFly copper cables are bidirectional and flexible. PCIe Gen3 x4 lanes with performance to 28 Gbps, 12 differential pairs. Both sides are equipped with locking mechanism. The cable is available in 1 m, 2 m, and 3 m lengths. The EMI/EMC performance should be evaluated by customer.

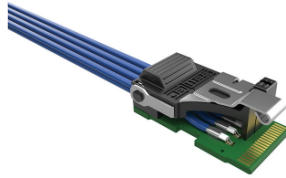


Figure 8: CBL-ECUE-X4G3-1M0

5.1.2 CBL-ZR3-ZR3-0M25

0.25 m I/O and synchronization cable. Cable has rectangular socket-to-socket with a 3-pin JST ZR connector on both ends (JUMPER 03ZR-8M-P to 03ZR-8M-P).



Figure 9: CBL-ZR3-ZR3-0M25

6 Quickstart guide

6.1 Hardware setup

6.1.1 Essential components

It is important that the power is turned off when inserting/detaching the cables. General ESD precautions need to be applied. Failing this requirement may lead to product damage.

- host PC (all host adapters require at least x8 PCIe Gen.3 slot on the computer side)
- HA-2P-X4G3-FF-X8G3 host adapter
- MTP fiber optic cables (e.g. CBL-MTP-X4G3-FF-10M0 or CBL-MTP-X8G3-FF-10M0) or Firefly ECUE copper cable (e.g. CBL-ECUE-X4G3-1M0)

6.1.2 Connecting the components

- Step 1.** Deploy the host adapter to the turned-off PC and ensure the PC is also unplugged from the power source
- Step 2.** Connect the cable to the host adapter
- Step 3.** Connect the necessary cables to the connected device (e.g., the camera)
- Step 4.** Power up the connected device
- Step 5.** Power up the PC

For more information about HA-2P-X4G3-FF-X8G3 please contact: sales@ximea.com.

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