

• ADPT-2P-X2G3-FF-X4G3-SFF

Firefly to SFF adapter

XIMEA Accessories •
Technical Manual •
Version v260831 •

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: Isometric view of ADPT-2P-X2G3-FF-X4G3-SFF

- Adapter to connect XIMEA FireFly cameras to SFF cable
- Connects 2x PCIe Gen3 x2 cameras
- Copper FireFly cable from camera turns to fiber optic SFF-8644 cable
- Offers Po wer and IO connectors for synchronization and triggering
- Suitable for cameras from: xiX family

This adapter offers a streamlined way to connect your PCIe/FireFly camera directly to your PC, eliminating the need for an xSwitch. A FireFly ECUE copper cable is needed for connecting a camera(s) to the adapter. This allows for a high-speed connection to your PC using an optical SFF cable. The adapter comes bundled with a power cable (CBL-XEC2-PWR-0M15) to ensure smooth operation. The adapter have connector for GPI/GPO signals from the camera, enabling control and synchronization with other devices (cables required for GPI/GPO functionality).

LED Description

LED	Color	ON meaning	Description
1	Red	The power is provided	Power
2	Green	Not active - device did not reset on PCIe	PERST signal

Table 1: LED Description

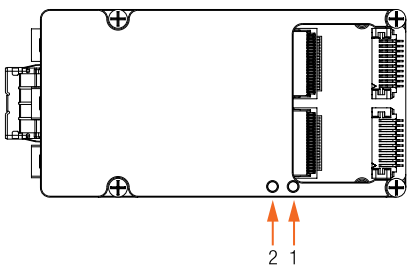


Figure 2: LEDs position

2 Dimensional drawings

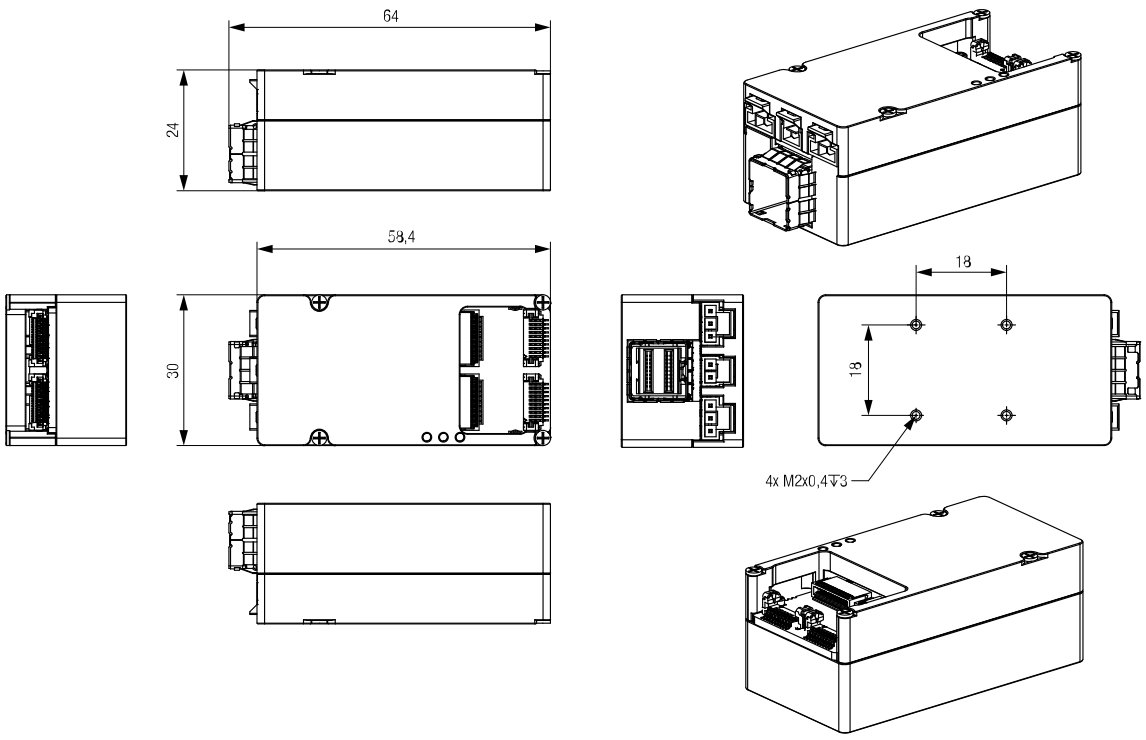


Figure 3: Dimensional drawing

Width [W]	Height [H]	Depth [D]	Mass [M]
30 mm	24 mm	64 mm	TBD

Table 2: Parameters

3 Connectors

3.1 Location of connectors

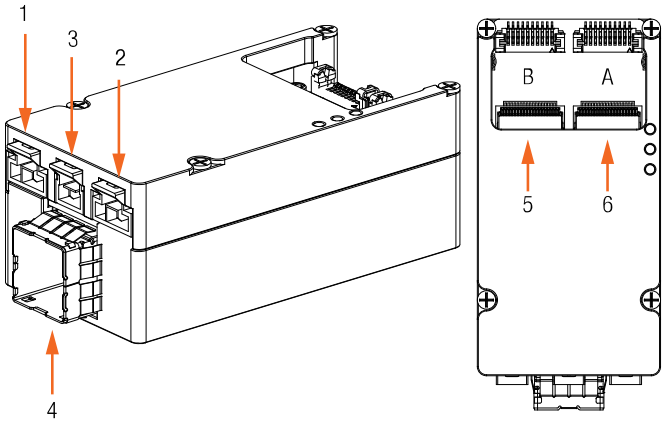


Figure 4: Location of connectors

num.	connector
1	IO connector B
2	IO connector A
3	PWR connector
4	SFF connector
5	FireFly connector B
6	FireFly connector A

Table 3: Connectors location

	Usage	Identification
IO connector		1053131203
Power connector		1053131202

Table 4: Global identification of the connectors

3.2 Data interfaces

3.2.1 PCIe iPass+ HD connector

Item	Value
Connector	Conn Receptacle MINI-SAS HD RIGHT ANGLE PUSH-IN, 2149966-1, 2x36pos
Signals	Data delivery
Mating cables	Ximea PN: CBL-SFF-X4G3-10M0, CBL-SFF-X4G3-30M0, CBL-SFF-X4G3-50M0

Table 5: PCIe iPass+ HD connector description

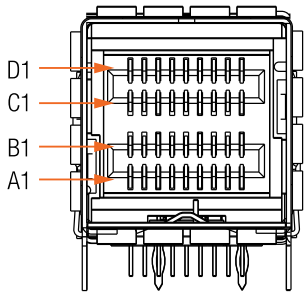


Figure 5: PCIe iPass+ HD SFF connector pinout

Pin	Name	Description	Pin	Name	Description
A1	CADDR	Control Address	C1	CMISCL	Clock line for Control Management Interface
A2	CINT	Control Interrupt	C2	CMISDA	Data line for Control Management Interface
A3	GND	Ground	C3	GND	Ground
A4	PCIe_PERP_0	PCIe RX differential signal (Lane 0)	C4	PCIe_PETP_0	PCIe TX differential signal (Lane 0)
A5	PCIe_PERN_0	PCIe RX differential signal (Lane 0)	C5	PCIe_PETN_0	PCIe TX differential signal (Lane 0)
A6	GND	Ground	C6	GND	Ground
A7	PCIe_PERP_3	PCIe RX differential signal (Lane 3)	C7	PCIe_PETP_3	PCIe TX differential signal (Lane 3)
A8	PCIe_PERN_3	PCIe RX differential signal (Lane 3)	C8	PCIe_PETN_3	PCIe TX differential signal (Lane 3)
A9	GND	Ground	C9	GND	Ground
B1	PWR	Power supply	D1	PWR	Power supply
B2	CBLPRSNT	Cable Present signal	D2	MGTPWR	Multi-Gigabit Transceiver Power
B3	GND	Ground	D3	GND	Ground
B4	PCIe_PERP_1	PCIe RX differential signal (Lane 1)	D4	PCIe_PETP_1	PCIe TX differential signal (Lane 1)
B5	PCIe_PERN_1	PCIe RX differential signal (Lane 1)	D5	PCIe_PETN_1	PCIe TX differential signal (Lane 1)
B6	GND	Ground	D6	GND	Ground
B7	PCIe_PERP_2	PCIe RX differential signal (Lane 2)	D7	PCIe_PETP_2	PCIe TX differential signal (Lane 2)
B8	PCIe_PERN_2	PCIe RX differential signal (Lane 2)	D8	PCIe_PETN_2	PCIe TX differential signal (Lane 2)
B9	GND	Ground	D9	GND	Ground

Table 6: PCIe iPass+ HD connector pin assignment

3.2.2 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

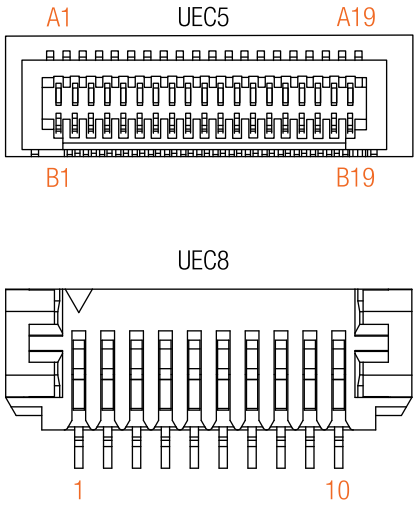


Figure 6: Firefly connector pinout

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	PCIe_PETN_2	PCIe TX differential pair 2	B2	PCIe_PETN_3	PCIe TX differential pair 3
A3	PCIe_PETP_2	PCIe TX differential pair 2	B3	PCIe_PETP_3	PCIe TX differential pair 3
A4	GND	Signal	B4	GND	Signal and power ground
A5	PCIe_PETN_1	PCIe TX differential pair 1	B5	PCIe_PETN_0	PCIe TX differential pair 0
A6	PCIe_PETP_1	PCIe TX differential pair 1	B6	PCIe_PETP_0	PCIe 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	PCIe 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	PCIe_PERP_2	PCIe RX differential pair 2	B14	PCIe_PERN_3	PCIe RX differential pair 3
A15	PCIe_PERN_2	PCIe RX differential pair 2	B15	PCIe_PERP_3	PCIe RX differential pair 3
A16	GND	Signal and power ground	B16	GND	Signal and power ground
A17	PCIe_PERP_1	PCIe RX differential pair 1	B17	PCIe_PERN_0	PCIe RX differential pair 0
A18	PCIe_PERN_1	PCIe RX differential pair 1	B18	PCIe_PERP_0	PCIe RX differential pair 0
A19	GND	Signal and power ground	B19	GND	Signal and power ground

Table 9: FireFly connector UEC5 pin assignment

3.2.3 Power connector

Item	Value
Connector	Power Connector Header Through Hole, Right Angle 2 position 1053131202
Signals	Power, Ground
Mating Connectors	2 Position, Rectangular Socket
Mating Cable	XIMEA PN: CBL-XEC2-PWR-0M15

Table 10: Power connector general description

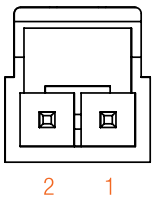


Figure 7: Power connector pinout

Pin	Name	Signal
1	GND	Ground
2	PWR	12 to 24 V

Table 11: Power connector (2POS) pin assigment

3.2.4 GPIO

Item	Value
Connector	Connector Header Through Hole, Right Angle 3 position 1053131203
Signals	Input, Output, Ground
Mating Connectors	3 Position, Rectangular Socket

Table 12: IO connector general description

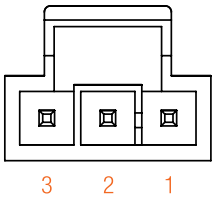


Figure 8: IO connector pinout

Pin	Name	Signal
IO A		
1	GPI	Opto-isolated input
2	IO_GND	Isolated ground for the IO subsystem
3	GPO	Opto-isolated output
IO B		
1	GPI	Opto-isolated input
2	IO_GND	Isolated ground for the IO subsystem
3	GPO	Opto-isolated output

Table 13: IO connectors pin assigment

4 Additional information

4.1 Cables

4.1.1 CBL-SFF-X4G3-10M0

The cable is available in 30 m, and 50 m lengths. PCIe Gen3 x4 fiber SFF cable (SFF-8644) is a high-speed optical connection used to link PCIe devices over longer distances. It uses Corning ClearCurve glass fiber (OM3, 850 nm) and provides four bi-directional data lanes, reaching up to 12 Gbps per lane (48 Gbps in total).



Figure 9: CBL-SFF-X4G3-10M0

4.1.2 CBL-SFF-X4G3-COP-5M0

The CBL-SFF-X4G3-30M0 is a PCIe Gen3 x4 copper cable (SFF-8644) designed to connect compatible XIMEA products. Cable provides four data lanes with speeds of up to 12 Gbps per lane (48 Gbps total). The cable length is 5 m, making it suitable for short-distance, high-bandwidth camera connections.



Figure 10: CBL-SFF-X4G3-COP-5M0

4.1.3 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.

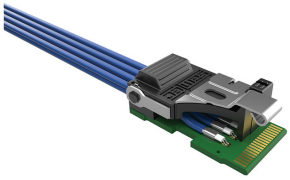


Figure 11: CBL-ECUE-X4G3-1M0

5 Quickstart guide

5.1 Hardware setup

5.1.1 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.

- a camera with firefly interface
- host PC with supported SFF host adapter card inside
- ADPT-2P-X2G3-FF-X4G3-SFF
- SFF-8644 fiber optical cable (e.g. Ximea CBL-SFF-X4G3-10M0)
- Firefly ECUE copper cable (CBL-ECUE-X4G3-xM0)
- power cable (CBL-XEC2-PWR-0sM15)

5.1.2 Connecting the components

Step 1. Connect SFF-8644 fiber optic cable to adapter (ADPT-2P-X2G3-FF-X4G3-SFF)
Step 2. Connect SFF-8644 fiber optic cable to PC
Step 3. Connect Firefly ECUE cable (CBL-ECUE-12-010-T1-FF-01-1) to adapter
Step 4. Connect Firefly ECUE cable to the cameras
Step 5. Connect power cable (CBL-XEC2-PWR-0M15) to adapter
Step 6. Turn on the power for the adapter
Step 7. Turn on the computer

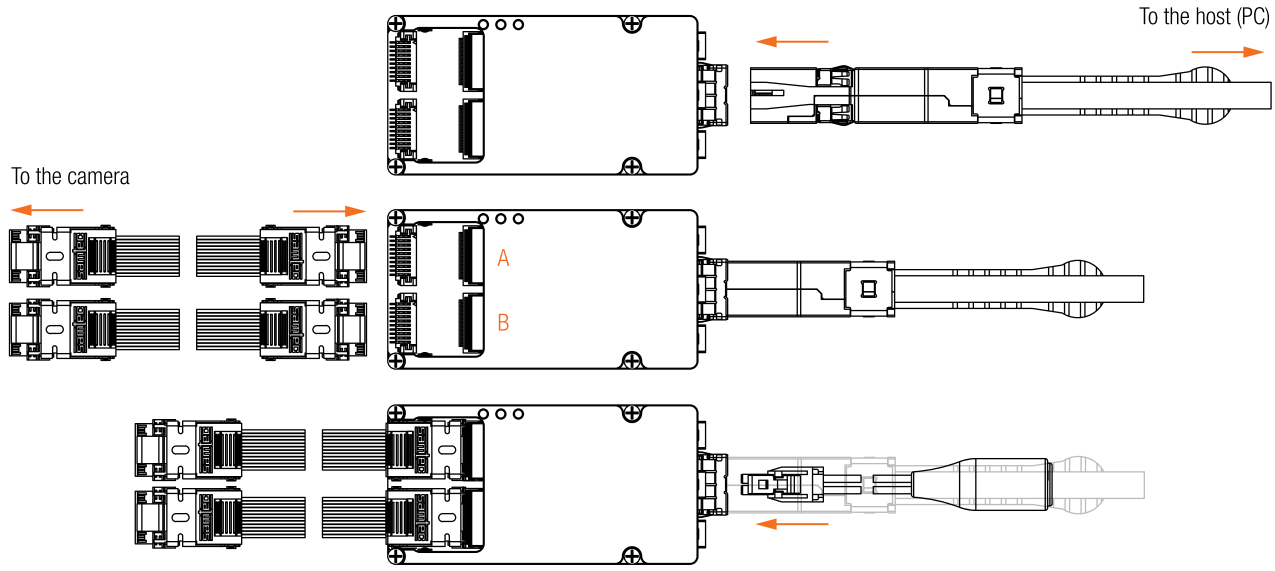


Figure 12: Connecting steps

For more information about ADPT-2P-X2G3-FF-X4G3-SFF please contact: sales@ximea.com.

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