

ADPT-MX-X4G3-FF-X4G3-SFF

Firefly to SFF adapter

XIMEA Accessories

Technical Manual

Version v260903

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: Cameras with ADPT-MX-X4G3-FF-X4G3-SFF

The ADPT-MX-X4G3-FF-X4G3-SFF is a backside adapter for connecting XIMEA X4G3 Firefly cameras to fiber optic SFF devices. The backside adapter converts the camera's PCIe Gen3 x4 copper Firefly interface to an SFF fiber-optic interface.

The adapter provides power and I/O connections through separate connector for camera synchronization and triggering.

Suitable for xiX-XL and xiX-Xtreme camera families.

Note: This backside adapter must be attached by XIMEA service.

2 Dimensional drawings

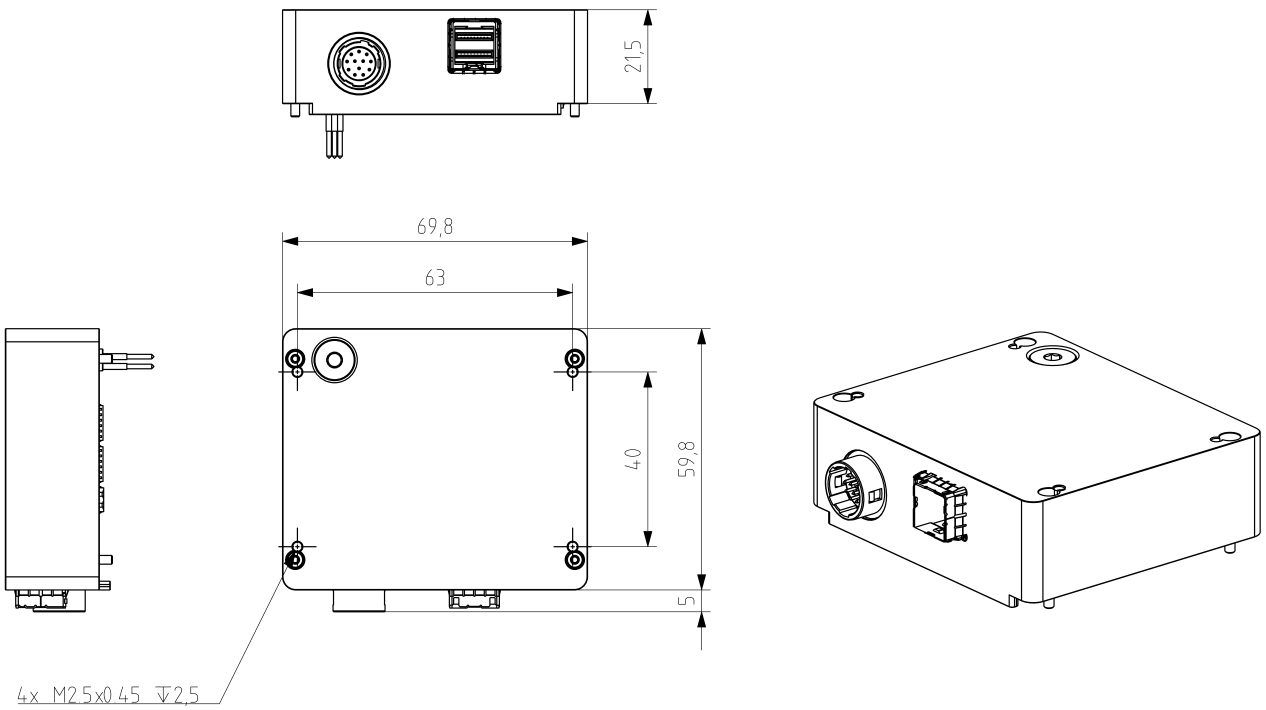


Figure 2: Dimensional drawing

Width [W]	Height [H]	Depth [D]	Mass [M]	Material and technology
69.8 mm	59.8 mm	21.5 mm	122.9 g	Machined Aluminum alloy

Table 1: Parameters and mass

3 Connectors

3.1 Location of connectors

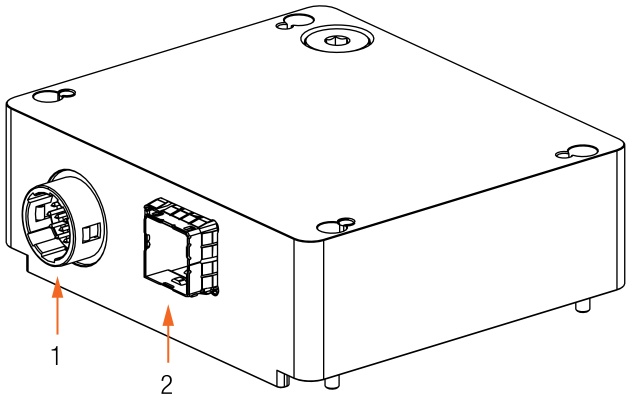


Figure 3: Connectors location

Num.	Connector
1	I/O & Power 12-pin Alysium 60-30-1112
2	1x port for SFF-8644

Table 2: Connectors description

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 3: PCIe iPass+ HD connector description

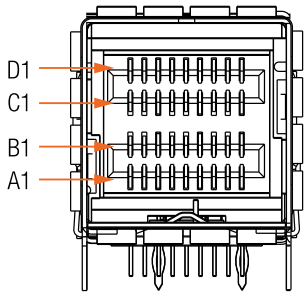


Figure 4: PCIe iPass+ HD SFF connector pinout

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 4: PCIe iPass+ HD connector pin assignment

3.2.2 GPIO

Item	Value
Connector	I/O and Power 12-pin Alysium 60-30-1112
Signals	Opto-isolated trigger input and non-isolated I/O plus camera power
Mating Connectors	Alysium 60-41-1012, 60-41-1112, 60-01-1012, 60-01-1112, 60-03-1012, 60-03-1112
Mating Cable	Ximea PN: CBL-MT-PWR-SYNC-3M0 for 3 m cable

Table 5: GPIO connector general description

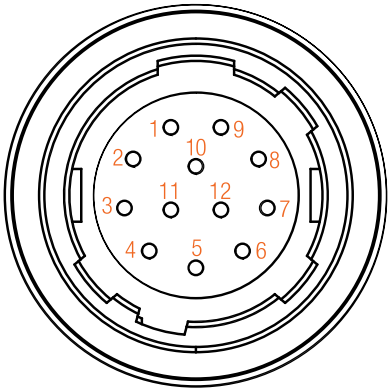


Figure 5: GPIO connector pinout

Pin	Name	GPI/GPO index API	Type
1	IN2	2/-	Optically isolated Digital Input (IN)
2	IN1	1/-	Optically isolated Digital Input (IN)
3	OUT2	-/2	Optically isolated Digital Output (OUT)
4	OUT1	-/1	Optically isolated Digital Output (OUT)
5	AUX PWR	None	Power input
6	GND	None	External grounds for power and non-isolated I/O
7	INOUT1	3/3	Non-isolated digital lines - Digital Input-Output (INOUT)
8	INOUT3	5/5	Non-isolated digital lines - Digital Input-Output (INOUT)
9	INOUT2	4/4	Non-isolated digital lines - Digital Input-Output (INOUT)
10	IN GND	None	Ground for Opto-Isolated Inputs
11	OUT GND	None	Ground for Opto-Isolated Out
12	INOUT4	6/6	Non-isolated digital lines - Digital Input-Output (INOUT)

Table 6: GPIO connector pin assignment

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 6: 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 7: CBL-SFF-X4G3-COP-5M0

4.1.3 CBL-MT-PWR-SYNC-3M0

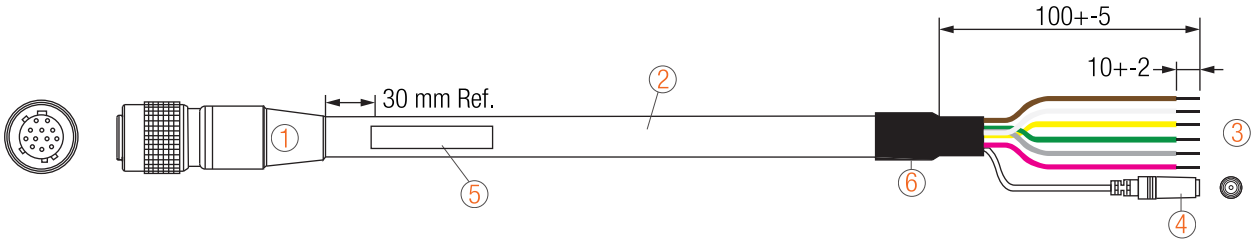


Figure 8: CBL-MT-PWR-SYNC-3M0 drawing

1 Series60 Female Circular Plug 60-01-1112 IO <BLK>
2 TBAUL20276 4STP#28 + 4C#28 + 2C#24 [OD=6.80mm] <BLK>
3 Process end with wire end stripped and tin soldered
4 DC power in socket female (OD5.5/ID2.1) <BLK>
5 Cable label
6 Heat shrinkable tube

Pin	1	2	3	4	5	6	7	8	9	10	11	12
Signal	IN2	IN1	OUT2	OUT1	AUX PWR	GND	INOUT1	INOUT3	INOUT2	IN GND	OUT GND	INOUT4

Table 7: CBL-MT-PWR-SYNC-3M0 pin assignment

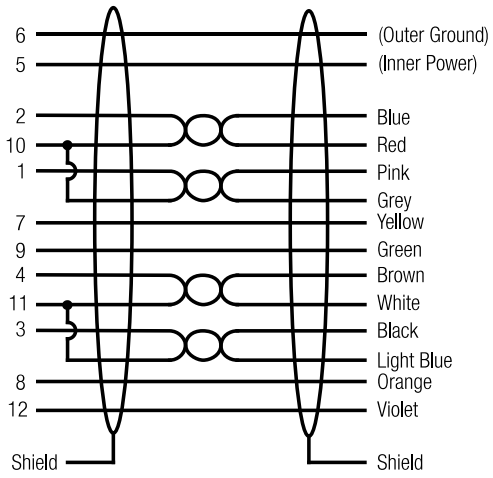


Figure 9: Wiring diagram of the CBL-MT-PWR-SYNC-3M0

4.2 Cooling possibilities

Back part attachment is compatible with CB-X8G3-FAN-COOLER-KIT or CB-X8G3-WAT-COOLER-KIT. To detach or attach the fan module, you will need a hex 2.0 screwdriver and four M2.5x14 screws. In case of water module it is hex 2.0 screwdriver and four M2.5x18 screws.



Figure 10: Backside adapter cooling options

ATTENTION: When removing or inserting the fan assembly, it's important to be careful not to damage the spring pins that connect the cooling unit to the camera electronics, see image below.

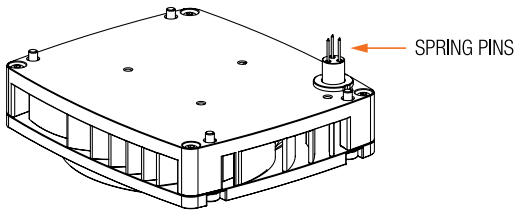


Figure 11: CB-X8G3-FAN-COOLER-KIT spring pins

4.2.1 Water cooler tube connection

There are various 6 mm OD tubes available from multiple manufacturers that can be used with the camera cooler. It is recommended to consult the websites of the push-in fitting manufacturer for a list of compatible tubes and specific tube specifications necessary to ensure a leak-free connection. Adherence to their provided installation instructions is crucial. Always conduct a leak inspection after making tube connections. XIMEA disclaims any liability for damages resulting from improper installation. Following these guidelines correctly is vital for protecting your equipment and ensuring its peak performance.

XIMEA has conducted tests and endorses the use of PISCO brand tubes (part number UCQ06-2F-20-C) along with insert rings (part number WR0640) for creating secure and leak-proof connections. The recommended procedure for connecting and disconnecting tubes is as follows

Please refer to the pictures and steps below for the correct connection of the water cooler.

Ring inserting

The insert ring is designed to prevent deformation of the tube. A soft tube can be connected to the Fitting.

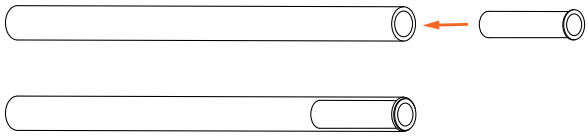


Figure 12: Inserting the ring into the tube

Tube insertion

Insert the tube into the Push-In Fitting until it reaches the end. The collet will secure the tube automatically, while the elastic sleeve creates a seal around it.

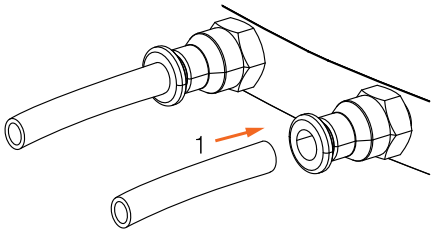


Figure 13: Tube insertion

Tube disconnection

To disconnect the tube, simply push the collet. Ensure that the water supply is halted before disconnecting the tube.

Step 1. Push the collet.

Step 2. Pull the tube out.

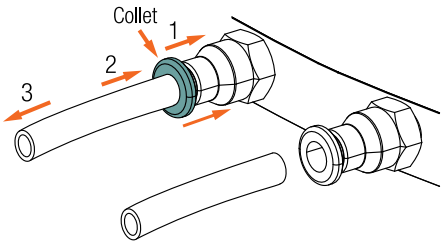


Figure 14: Tube disconnection

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.

- host PC with supported SFF host adapter card (e.g. Ximea HA-2P-X4G3-SFF-X4G3) inside
- SFF-8644 fiber optic cable (e.g. Ximea CBL-SFF-X4G3-10M0)
- Power cable CBL-MT-PWR-SYNC-3M0
- any xiX camera equipped with ADPT-MX-X4G3-FF-X4G3-SFF adapter

5.1.2 Connecting the components

Step 1. Make sure the DIP switches on the host adapter card are in position for x4 ports

Step 2. Connect SFF-8644 fiber optic cable to the camera adapter ADPT-MX-X4G3-FF-X4G3-SFF

Step 3. Connect the cable from the port on the host adapter to the port on the HA-2P-X4G3-SFF-X4G3

Step 4. Connect CBL-MT-PWR-SYNC-3M0 to the ADPT-MX-X4G3-FF-X4G3-SFF

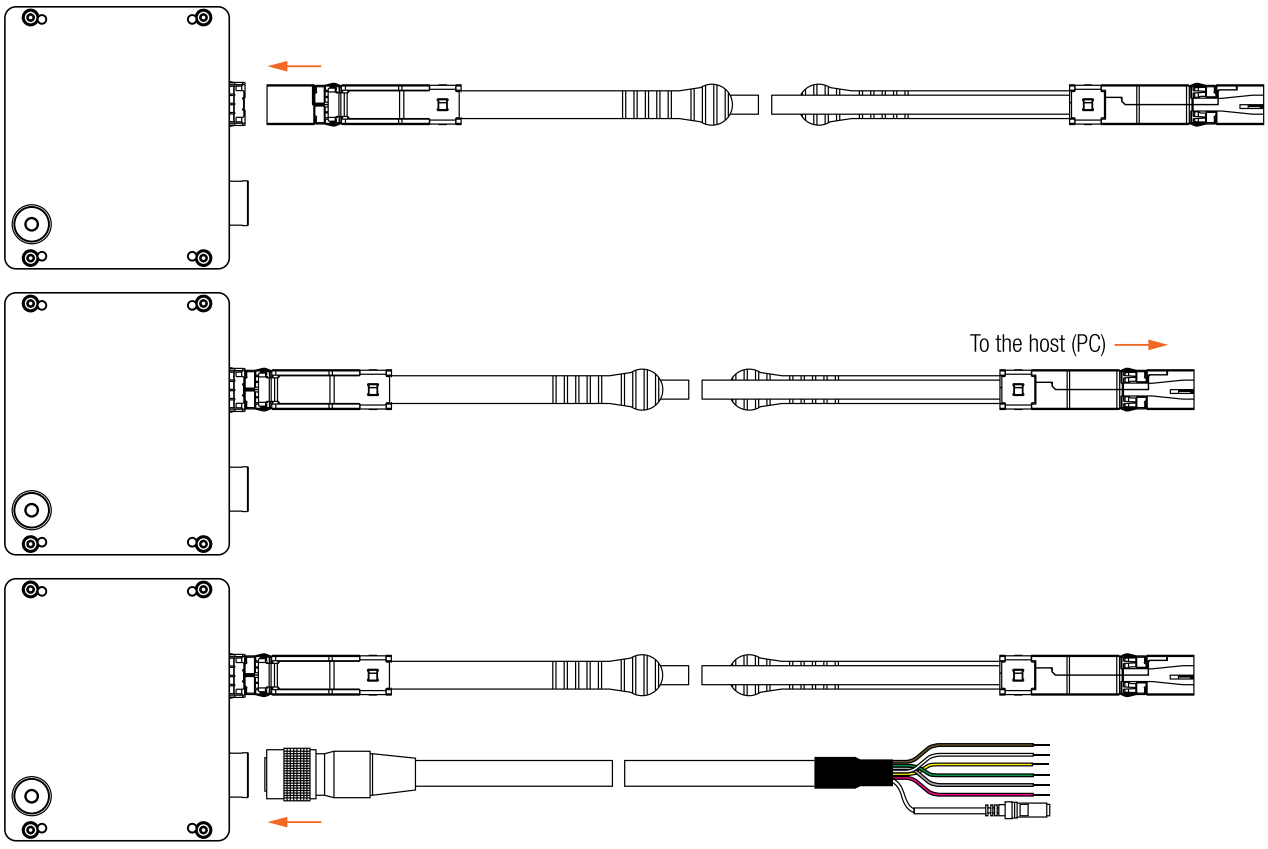


Figure 15: Connecting steps

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

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