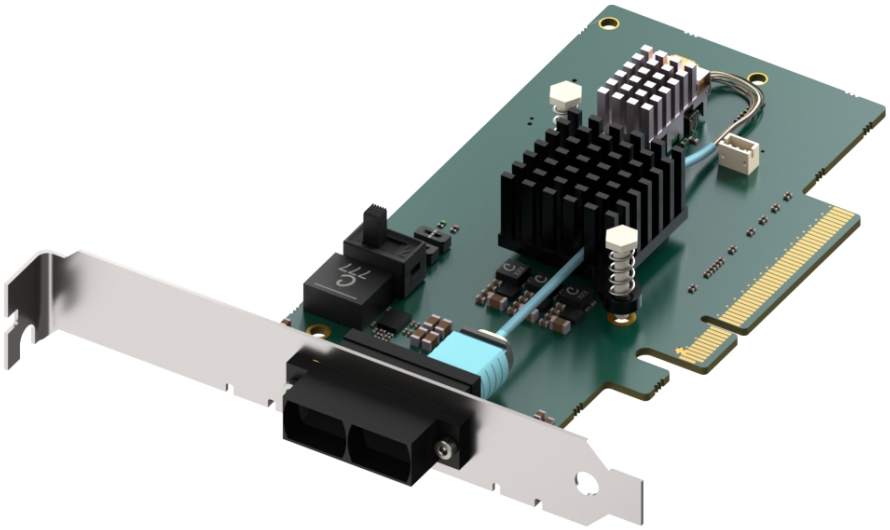
ximea



HA-1P-X4G3-MTP-X8G3

Host 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

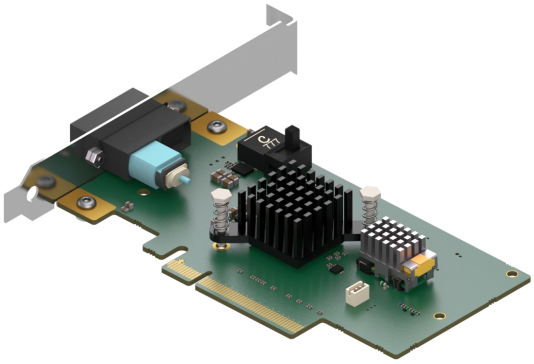


Figure 1: Isometric view of host adapter

The HA-1P-X4G3-MTP-X8G3 is a high-performance host adapter featuring a single port for PCI Express (PCIe®) Gen 3 x4 MTP cabling. The host adapter features an integrated Samtec PCUO cable. 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 with MTP cabling (Active Optical or Copper).
- 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

LED description

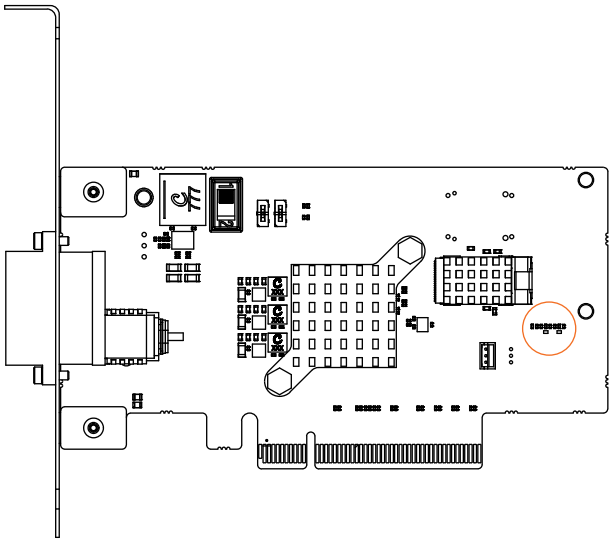


Figure 2: LED location

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 descriptiopn

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

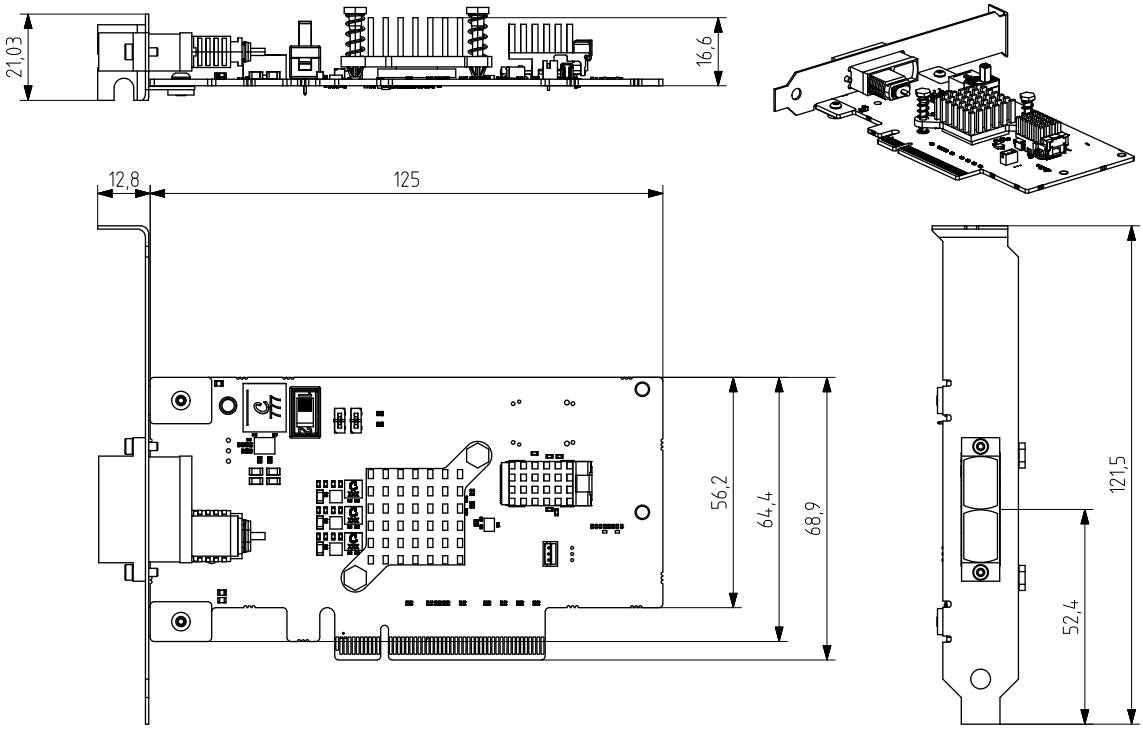


Figure 3: Dimensional drawing of HA-1P-X4G3-MTP-X8G3 host adapter

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

Table 3: Parameters and mass of host adapter

3 Configuration

3.0.1 DIP switches

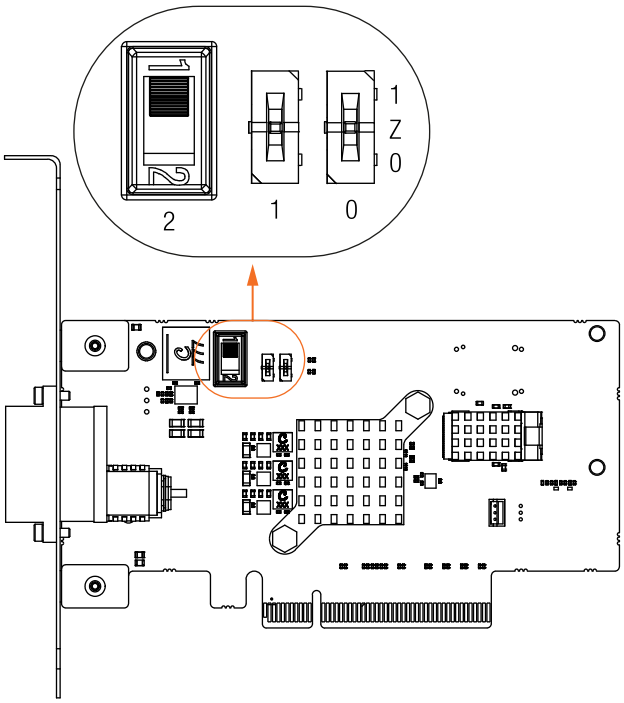


Figure 4: DIP switches

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

[1]MTP/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]

[1]Applicable only with FF host adapter
[2]This 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

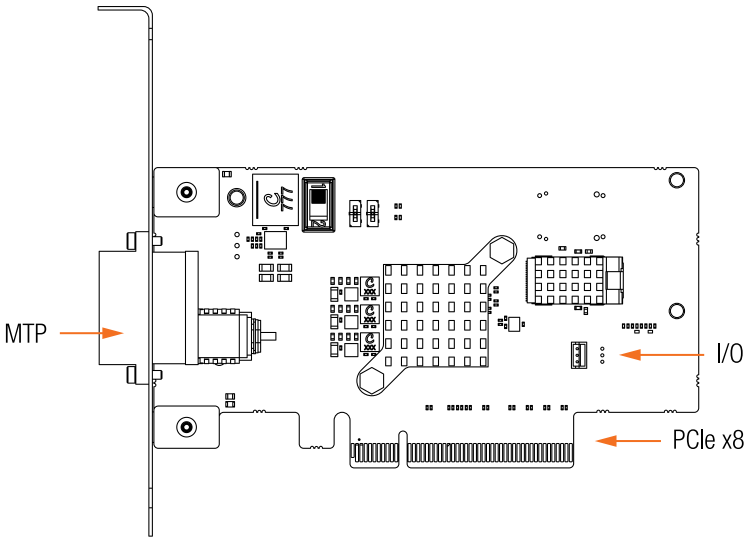


Figure 5: HA-1P-X4G3-MTP-X8G3 connectors location

Name	Description
MTP	MTP optical connector (X4G3)
IO	IO, 3 Positions Header, Shrouded Connector (1.50 mm) Through Hole Tin-Lead
PCIe x8	PCIe x8 PCB Edge connector

Table 6: HA-1P-X4G3-MTP-X8G3 connectors

4.2 Data interfaces

4.2.1 MTP optical fiber connector

The MTP connector on the backside adapter is a 12-fiber male MTP connector. For proper operation, use MTP cables with a 12-fiber female connector, such as CBL-MTP-X4G3-FF-xxxM0, see Section CBL-MTP-X4G3-FF-10M0.

Item	Value
Connector	MTP Male 12-fiber connector (see CBL-PCU0-X4G3-0M15)
Signals	PCIe Gen3 x4, RX lanes, TX lanes
Mating Connectors	US Conec MTP (Pinless) Female connector
Mating Cable	Ximea PN: CBL-MTP-X4G3-FF-5M0, CBL-MTP-X4G3-FF-10M0, CBL-MTP-X4G3-FF-20M0, CBL-MTP-X4G3-FF-30M0, CBL-MTP-X4G3-FF-53M0

Table 7: MTP connector general description

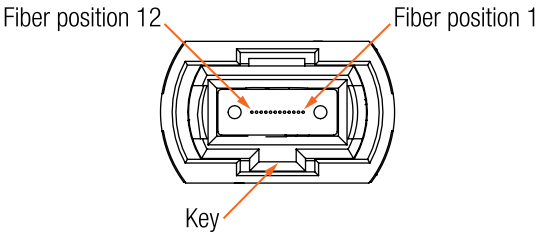


Figure 6: MTP connector pinout

Pin	Name	Description
1	Rx0	Receive channel 0
2	Rx1	Receive channel 1
3	Rx2	Receive channel 2
4	Rx3	Receive channel 3
5	NC	Not connected
6	NC	Not connected
7	NC	Not connected
8	NC	Not connected
9	Tx3	Transmit channel 3
10	Tx2	Transmit channel 2
11	Tx1	Transmit channel 1
12	Tx0	Transmit channel 0

Table 8: MTP connector 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 9: IO connector general description

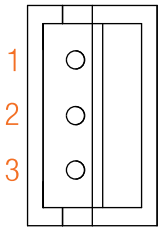


Figure 7: GPIO connector pinout

Pin	Name	Signal
1	ISO_GPI	Isolated input
2	ISO_GND	Isolated ground
3	ISO_GPO	Isolated output

Table 10: GPIO connector pin assigment

5 Additional information

5.1 Cables

5.1.1 CBL-MTP-X4G3-FF-10M0

To connect product with MTP connector to MTP host connector you can use a 10-meter MTP fiber-optic trunk cable supporting PCIe Gen3 x4 with a data rate of 20 Gbit/s. It uses US Conec MTP® (pinless) female-to-female connectors and contains 12 Corning ClearCurve glass fibers. The cable features a minimum bend radius of 7.5 mm and a plenum (OFNP)-rated outer jacket.

It is also available in 5 m, 20 m, 30 m, and 53 m lengths.

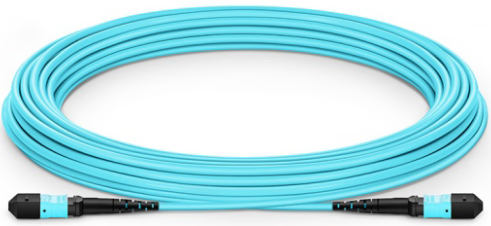


Figure 8: CBL-MTP-X4G3-FF-10M0 cable

5.1.2 CBL-PCUO-X4G3-0M15

The product includes the CBL-PCUO-X4G3-0M15, a 15 cm MTP to Firefly 12-fiber cable supporting PCIe Gen3 x4.

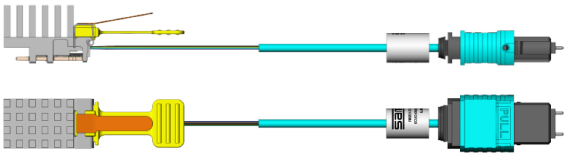


Figure 9: CBL-PCUO-X4G3-0M15 cable

5.1.3 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 10: 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-1P-X4G3-MTP-X8G3 host adapter
- MTP fiber optic cables (e.g. CBL-MTP-X4G3-FF-10M0 or CBL-MTP-X8G3-FF-10M0)

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-1P-X4G3-MTP-X8G3 please contact: sales@ximea.com.

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