ximea



• ADPT-MU-CX3-TC-V
USB Type-C adapter for MU

XIMEA Accessories •
Technical Manual •
Version v260901 •

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.

Contact XIMEA

XIMEA is a worldwide operating company

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1 General description



Figure 1: Camera with adapter

The mini backside adapter extension provides a compact USB3 Type-C interface and IO connector for camera triggering and output signaling. Adapter is designed for integration with small-format MU cameras with a 15 x 15 mm form factor.

The IO connector is compatible with MQ-S7-FL accessories.
The adapter is mounted on the camera rear using 2x M1.6x12 countersunk TRX screws.

- Camera compatibility: MU 15 x 15 mm cameras
- Interface: USB3 Type-C
- Functionality: Camera triggering and output signaling through 3-pin M5 I/O connector
- Accessory compatibility: MQ-S7
- Mounting: 2 x M1.6 x 5 countersunk TRX screws
- Alternative version: 17 x 17 mm variant available for the MU051 camera model

2 Dimensional drawings

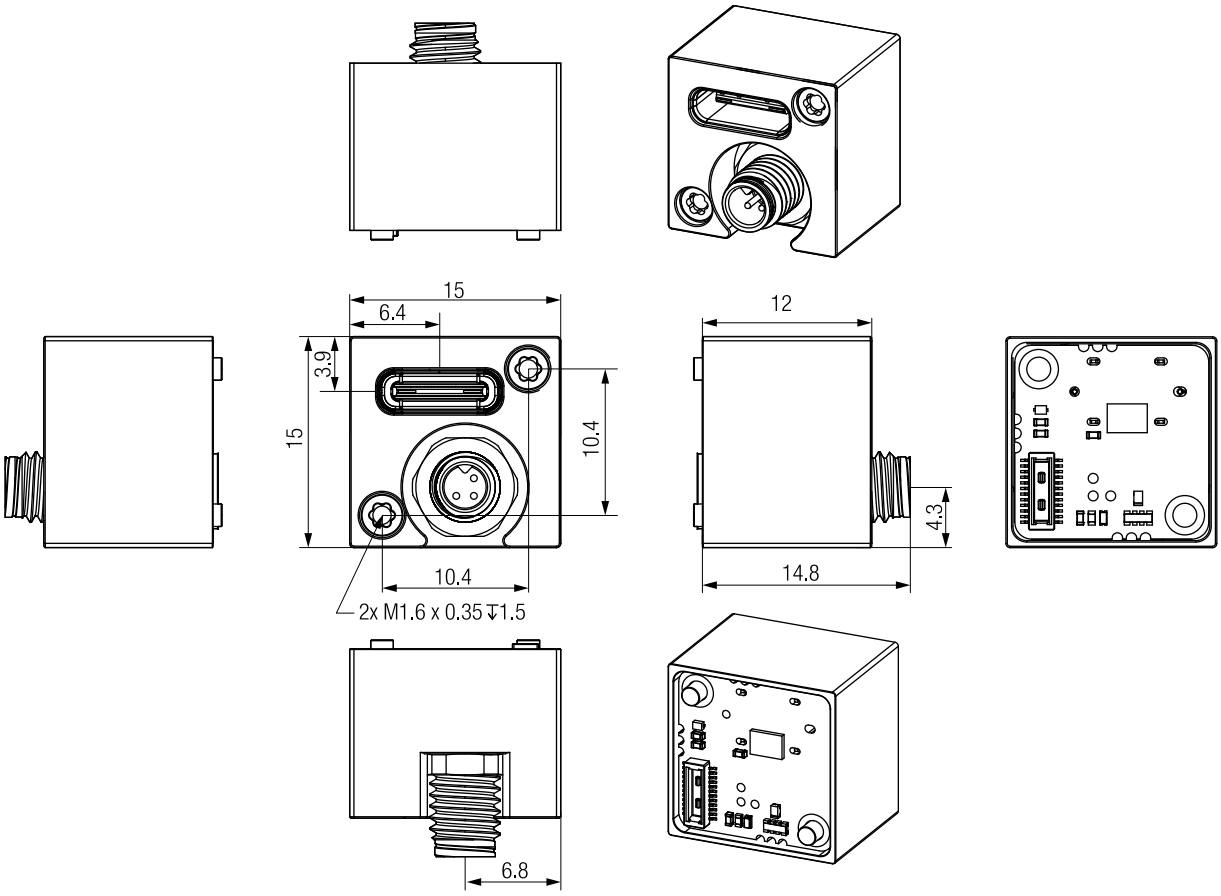


Figure 2: Dimensions of ADPT-MU-CX3-TC-V

Width [W]	Height [H]	Depth [D]	Mass [M]	Material
15 mm	15 mm	12(14.8)mm	6.1 g	Machined Aluminum alloy

Table 1: Parameters of ADPT-MU-CX3-TC-V

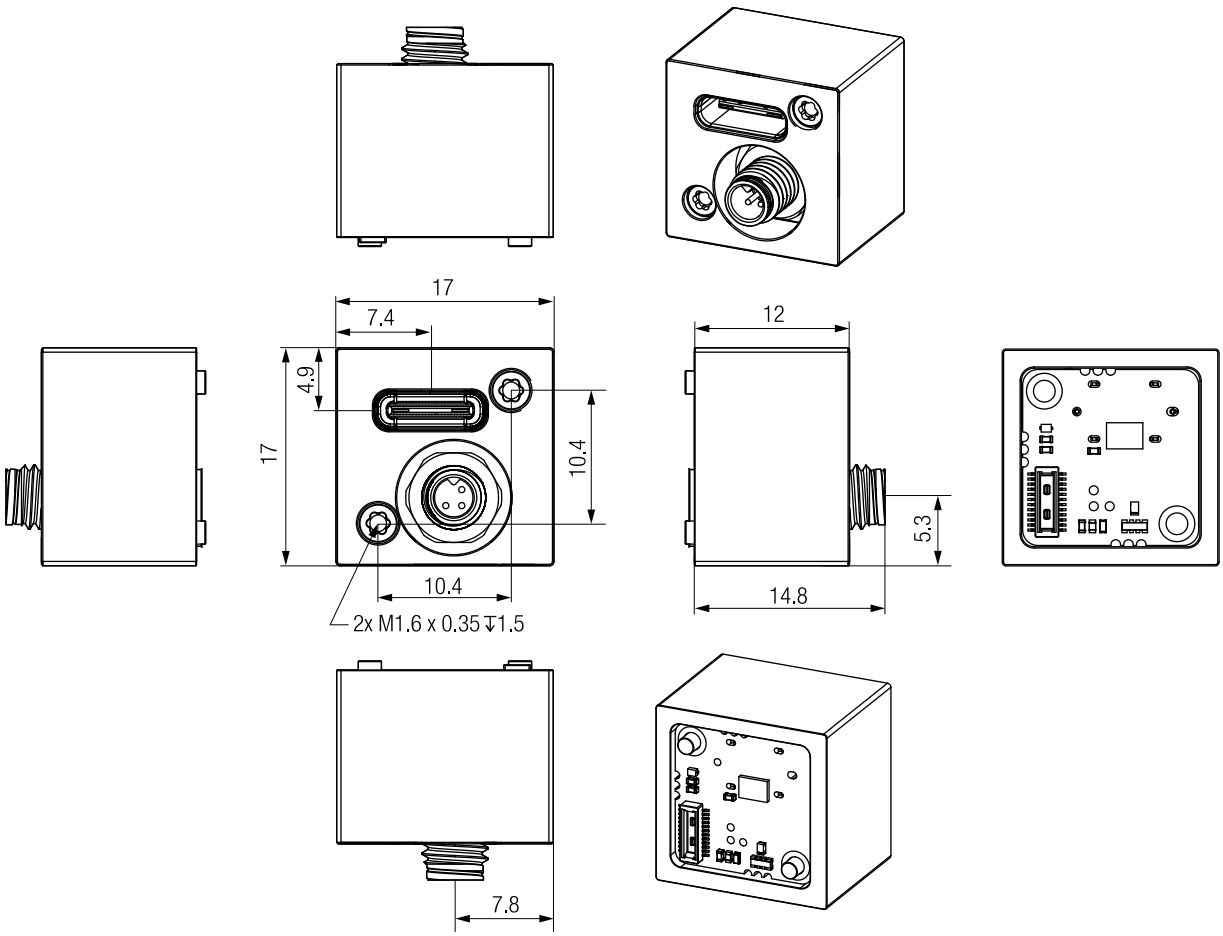


Figure 3: Dimensions of ADPT-MU-17X17-CX3-TC-V

Width [W]	Height [H]	Depth [D]	Mass [M]	Material
17 mm	17 mm	12(14.8)mm	8.2 g	Machined Aluminum alloy

Table 2: Parameter of ADPT-MU-17X17-CX3-TC-V

3 Connectors

3.1 Location of connectors

Num.	Connector
1	USB 3.1 Gen1 Type-C
2	IO connector

Table 3: ADPT-MU-CX3-TC-V connectors

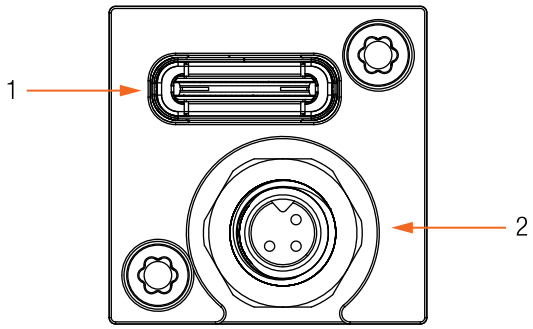


Figure 4: ADPT-MU-CX3-TC-V connectors location

3.2 Data interfaces

3.2.1 USB3 Type-C

Item	Value
Connector	Standard USB Type-C
Signal	USB 3.1 Gen1, power, ground
Mating cables	Cables specified by USB Type-C specification

Table 4: USB3 Type-C connector description

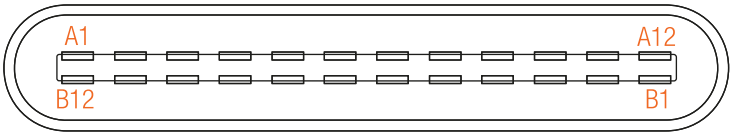


Figure 5: Type-C connector pinout

Pin	Signal	Description	Pin	Signal	Description
A1	GND	Ground return	B12	GND	Ground return
A2	SSTXp1	SuperSpeed differential pair #1, TX, pos.	B11	SSRXp1	SuperSpeed differential pair #2, RX, pos.
A3	SSTXn1	SuperSpeed differential pair #1, TX, neg.	B10	SSRXn1	SuperSpeed differential pair #2, RX, neg.
A4	V¬BUS	Bus power	B9	VBUS	Bus power
A5	CC1	Configuration channel	B8	SBU2	Sideband use (SBU)
A6	Dp1	Non-SuperSpeed diff. pair, position 1, pos.	B7	Dn2	Non-SuperSpeed diff. pair, position 2, neg.
A7	Dn1	Non-SuperSpeed diff. pair, position 1, neg.	B6	Dp2	Non-SuperSpeed diff. pair, position 2, pos.
A8	SBU1	Sideband use (SBU)	B5	CC2	Configuration channel
A9	VBUS	Bus power	B4	VBUS	Bus power
A10	SSRXn2	SuperSpeed differential pair #4, RX, neg.	B3	SSTXn2	SuperSpeed differential pair #3, TX, neg.
A11	SSRXp2	SuperSpeed differential pair #4, RX, pos.	B2	SSTXp2	SuperSpeed differential pair #3, TX, pos.
A12	GND	Ground return	B1	GND	Ground return

Table 5: USB3 type-C connector pin assignment

3.2.2 GPIO

Item	Value
Connector	Binder 09 3105 81 03
Signal	Digital Input and Output
Mating connectors	Binder 77 3550 0000 40003-0x000
Ximea PN	CBL-S-M5-3P-PT-5M0

Table 6: ADPT-MU-CX3-TC-V GPIO connector description

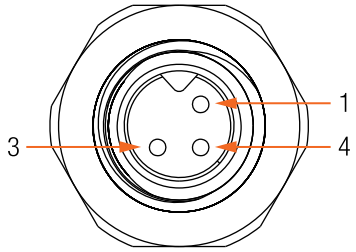


Figure 6: ADPT-MU-CX3-TC-V IO connector pinout

Pin	Name	GPI/GPO index API	Description
1	GPIO_GND	None	Common ground for Input and Output
3	INOUT	2/2	Nonisolated Input/Ouput
4	OUT	-/1	Nonisolated TTL Output

Table 7: GPIO connector pin assignment

Digital Input/Output (INOUT)

Item	Parameter / Note
Maximal input voltage	24 V DC
Common pole	YES
Effect of incorrect input terminal connection	Reverse voltage polarity protected
Effects when withdrawing/inserting input module under power	no damage, no lost data
Protection	Reverse voltage
Input Impedance- minimum	15 kΩ
Input Level for logical 0	< 0.3 V
Input Level for logical 1	> 1.3 V
Input debounce filter	NO
Input delay - rising edge	<300 ns / VINPUT=2 V
Input delay - falling edge	<450 ns / VINPUT=2 V
Output Impedance- minimum	15 kΩ
Output Level for logical 0	< 0.3 V, Rload = 100 kΩ
Output Level for logical 1	> 1.6 V, Rload = 100 kΩ
Output delay - rising edge	<100 µs, Rload = 100 kΩ, TAMBIENT=25 °C
Output delay - falling edge	<100 µs, Rload = 100 kΩ, TAMBIENT=25 °C

Table 8: General info for digital input / output, ADPT-MU-CX3 adapter

Digital Output (OUT)

Item	Parameter / Note[1]
Common pole	YES
Effects when withdrawing/inserting input module under power	May damage camera electronics
Protection	ESD and short circuit[2]
Maximal output sink current	20 m A
Inductive loads	NO
Output Level logical 0	< 0.8 V, Load 100 kΩ
Output Level logical 1	> 4.5 V, Load 100 kΩ
Output delay - rising edge	<20 ns, Load 100 kΩ threshold 1.5 V
Output delay - falling edge	<20 ns, Load 100 kΩ threshold 0.5 V

[1]Note that the GPO signals are routed through unidirectional level translators, therefore High Impedance GPO mode setting is not supported

[2]ESD HBM ANSI/ESDA/JEDEC JS-001 Class 2 exceeds 2 kV; CDM JESD22-C101E exceeds 1000 V

Table 9: General info for digital output, ADPT-MU-CX3 adapter

4 Quickstart guide

4.1 Hardware setup

4.1.1 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.

- camera with adapter ADPT-MU-CX3-TC-V or ADPT-MU-17X17-CX3-TC-V
- host PC
- USB type-C cable (e.g.CBL-U3-P-TC-xM)
- IO cable (CBL-S-M5-3P-PT-5M0)

4.1.2 Connecting the components

Step 1. Connect USB type-C cable (CBL-U3-P-TC-xM) to adapter (camera)

Step 2. Connect CBL-U3-P-TC-xM to the host (PC)

Step 3. Connect IO cable (CBL-S-M5-3P-PT-5M0) to adapter (camera)

Step 4. Turn on the computer

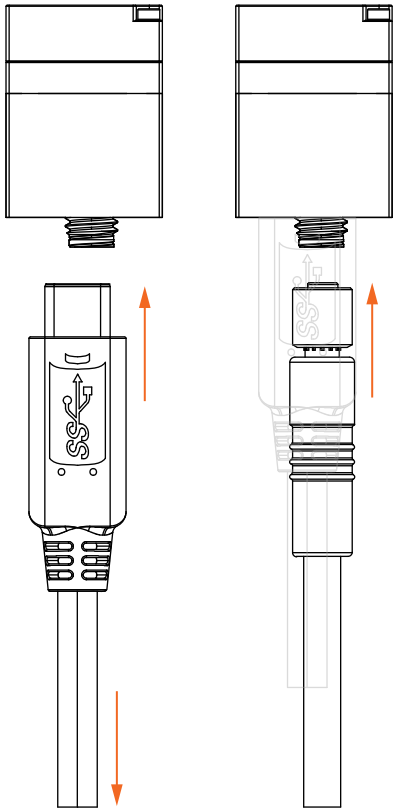


Figure 7: Connecting steps

For more information about ADPT-MU-CX3-TC-V please contact: sales@ximea.com.

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