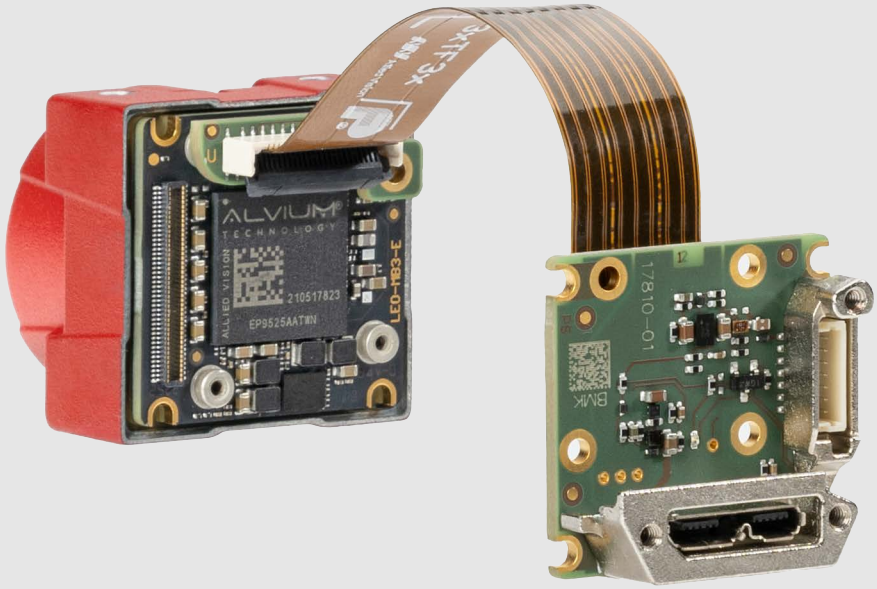
Allied Vision



ALVIUM MIPI CSI-2 AND USB3 VISION CAMERAS

Alvium Flex

Design and Accessory Guide

V1.2.0

Allied Vision Technologies GmbH // Taschenweg 2a, 07646 Stadtroda / Germany

2026-Sep-29

Quick links

- This document at a glance on page 9
- Contact us on page 15
- Contents on page 16

Read before use

EN - English

Safety

Before using the product, read these safety instructions. Observe the warnings at all times. Use the product only as stated in the Intended use on page 23.



CAUTION

Risk of burns

Products in operation can reach temperature levels which could cause burns.

Intended use

Intended use of Allied Vision product is the integration into vision systems by professionals. All Allied Vision product is sold in a B2B setting.

DA - Dansk

Sikkerhed

Læs sikkerhedsanvisningerne, før produkt bruges. Overhold alle advarsler. Brug kun produkt som anført i Intended use på side 23.



FORSIGTIG

Forbrændingsfare

Når produkt bruges, kan det blive meget varmt og forårsage forbrændinger.

Tilsigtet brug

Allied Vision produktets tilsigtede brug er en indbygning i et visionssystem, udført af fagfolk. Alle Allied Vision produkter sælges i B2B.

DE - Deutsch

Sicherheit

Bevor Sie das Produkt benutzen, lesen Sie diese Sicherheitshinweise. Beachten Sie diese Hinweise immer. Verwenden Sie das Produkt nur wie beschrieben in Intended use auf Seite 23.



VORSICHT

Gefahr von Verbrennungen

Im Betrieb kann das Produkt Temperaturen erreichen, die zu Verbrennungen führen.

Bestimmungsgemäßer Gebrauch

Allied Vision Produkte sind bestimmt für die Integration in Bildverarbeitungs-systeme durch Fachpersonal. Alle Allied Vision Produkte werden in einer B2B-Umgebung verkauft.

ES - Español

Seguridad

Antes de utilizar el producto lea estas instrucciones de seguridad. Observe las advertencias en todo momento. Utilice el producto solo tal y como se estipula en el Intended use en la página 23.



ATENCIÓN

Riesgo de quemaduras

Un producto en funcionamiento puede alcanzar temperaturas que podrían provocar quemaduras.

Uso previsto

El uso previsto del producto Allied Vision es la integración en el sistema de visión por parte de profesionales. Todos los productos Allied Vision se venden dentro de una relación B2B.

FI - Suomi

Turvallisuus

Lue nämä turvallisuusohjeet ennen tuotteen käyttöä. Noudata tuotetta joka hetki. Käytä tuotteen ainoastaan kohdassa Intended use sivulla 23 kuvatulla tavalla.



HUOMIO

Palovammojen vaara

Tuotteen käytössä saavuttamat lämpötilat voivat aiheuttaa palovammoja.

Käyttötarkoitus

Allied Vision-tuotteen käyttötarkoitus on integrointi kuvajärjestelmiin ammattilaisten toimesta. Kaikki Allied Vision-tuotteet myydään B2B-ympäristössä.

FR - Français

Sécurité

Veuillez lire ces consignes de sécurité avant d’utiliser le produit. Respectez continuellement les avertissements. Utilisez le produit uniquement comme indiqué sous Intended use, page 23.



ATTENTION

Risque de brûlures

Le produit en service peut atteindre des niveaux de température susceptibles d’entraîner des brûlures.

Utilisation prévue

L’utilisation prévue du produit Allied Vision est son intégration dans des systèmes de vision par le soin de professionnels. Tout produit Allied Vision est vendu dans un cadre B2B.

HE - עברית

בטיחות

לפני השימוש במוצר, עליך לקרוא את הוראות הביטחון האלו. עליך לממש הוראות ביטחון אלו תמיד.
השימוש במצלמה הוא רק לפי מה שכתוב ב"כוונת השימוש" (Intended use בעמוד 23).

זהירות



סכנת כוויה

בזמן הפעלת המוצר עלולות לעלות טמפרטורות גבוהות, שיכולות לגרום לכוויות.

שימוש מיועד

מוצרי AlliedVision מיועדים לשילוב במערכות ממוחשבת לעיבוד צילומים ע"י אנשי מקצוע.
כל מוצרי AlliedVision נמכרים לשימוש בסביבת B2B.

IT - Italiano

Sicurezza

Leggere queste istruzioni per la sicurezza prima di utilizzare il prodotto. Osservare sempre tutte le avvertenze. Utilizzare il prodotto come descritto alla sezione Intended use a pagina 23.

ATTENZIONE



Pericolo di ustioni

Durante il funzionamento un prodotto può raggiungere temperature elevate che possono essere causa di ustioni.

Uso previsto

Il prodotto Allied Vision è concepito per essere integrato in sistemi di monitoraggio in campo professionale. Tutti i prodotti Allied Vision sono venduti in uno scenario B2B.

JA – 日本語

安全性

本製品を使用する前に、この安全ガイドをお読みください。警告を必ず守ってください。必ず21ページのIntended use 23 ページに従って使用してください。



注意

やけどの危険性

動作中の製品は、やけどをするほど高温になることがあります。

用途

Allied Vision製品は、専門家が視覚装置に統合することを意図したものです。すべてのAllied Vision製品は、企業間取り引き用に販売されています。

NL - Nederlands

Veiligheid

Lees deze veiligheidsinstructies voordat u het product gebruikt. Neem deze waarschuwingen altijd in acht. Gebruik het product uitsluitend, zoals aangegeven in het Intended use op pagina 23.



VOORZICHTIG

Risico van verbranding

Een product die gebruikt wordt, kan temperatuurwaarden bereiken die brandwonden kunnen veroorzaken.

Beoogd gebruik

Het beoogde gebruik van het Allied Vision-product is de integratie in optische systemen door professionals. Alle Allied Vision-producten worden verkocht in de B2B-markt.

NO - Norsk

Sikkerhet

Les disse sikkerhetsinstruksene før du bruker produkt. Følg advarslene til en hver tid. Bruk kun produkt i samsvar med Intended use på side 23.



FORSIKTIG

Risiko for brannskader

Det produktet i bruk kan nå temperaturnivåer som kan forårsake brannskader.

Tiltenkt bruk

Den tiltenkte bruken av Allied Vision-produktet er integrering i visjonssystemer av profesjonelle. Alle Allied Vision-produkter selges i en forretning til forretning-situasjon.

SV - Svenska

Säkerhet

Läs igenom säkerhetsinstruktionerna innan du använder produkten. Var hela tiden särskilt uppmärksam på varningarna. Använd enbart produkten på det sätt som anges i Intended use på sida 23.



VARNING

Risk för brännskada

Produkten i drift kan komma upp i temperaturer som kan orsaka brännskador.

Avsedd användning

Den avsedda användningen av Allied Vision-produkter är integrering i visionssystem av fackmän. Samtliga Allied Vision-produkter säljs i en B2B-miljö.

ZH - 简体中文版

安全需知

在使用产品之前，请阅读这些安全说明。请务必遵守相关警告 和 Intended use on page 23.



注意事项

烫伤风险

在产品运行过程中，温度可能会上升，导致烧伤的危险。

预期用途

Allied Vision 产品的预期用途是由专业人士整合到视觉系统中。所有 Allied Vision 的产品均通过 B2B 渠道销售。

This document at a glance

This chapter includes:

Alvium Flex- more flexibility 10
Product overview 13
Scope of delivery 14
What else do you need? 14

Read this document carefully

Learn to use Alvium Flex components in the most safe and efficient way and avoid damage to your vision system:

Alvium Flex - more flexibility

Hardware options for standard Alvium cameras support various digital interfaces, housings, and lens mounts to enable a wide range of applications.

You have found that Alvium CSI-2 cameras with Hirose FH55-22S-0.5SH FPC connector or Alvium USB cameras with USB 3.0 Micro-B connector do not offer enough flexibility for your application? You want to use your own cables and connectors?

Alvium Flex cameras with Hirose DF40C-50DP-0.4V board-to board connector enable individual connections. Alvium Flex accessories can be used for developing and first testing. Figure 1 shows how Add-on Boards connect to Alvium Flex cameras.

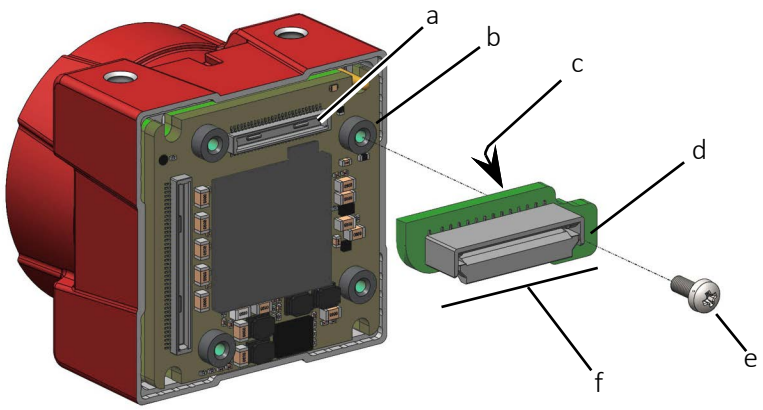


Figure 1: Alvium Flex camera, Add-on Board, and screw

a: Hirose DF40C-50DP-0.4V camera connector
b: Mounting thread
c: Hirose DF40C-50DS-0.4V board connector
d: Mounting hole
e: Fastening screw
f: Add-on Board

Get an overview of Alvium Flex accessories Alvium CSI-2 Flex on page 11 and Alvium USB Flex on page 12.

Alvium CSI-2 Flex

The following options are offered for **Alvium CSI-2 Flex** cameras. Above developing and testing, Alvium Flex adds flexibility to **standard Alvium CSI-2** cameras.

Individual solutions

Hirose DF40 board-to-board connector enables individual connections to your own boards and cables.

Off-the-shelf solution

Alvium CSI-2 Flex accessories enhance existing applications based on Hirose FH55 connector. As an alternative, the Add-on Board with a Hirose TF38 connector can be used. It connects the cable tightly and perpendicular to the camera back plane. For the setup shown in Figure 2, FPC cables connect in a straight line without bending:

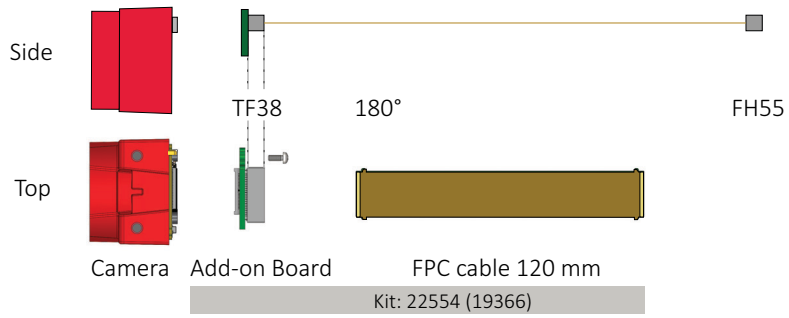


*Figure 2: **Alvium CSI-2 Flex** camera connection*

Alvium USB Flex

The following options are offered for **Alvium USB Flex** cameras. Above developing and testing, Alvium Flex can solve typical issues with **standard Alvium USB** cameras.

Individual solutions

Hirose DF40 board-to-board connector enables individual connections to your own boards and cables.

Off-the-shelf solutions

You are about to build an Alvium USB camera into your machine, but you want to separate the connectors for USB and I/Os from the camera back panel? Or you prefer to connect your Alvium USB camera to your own board without using clumsy USB cables? **Alvium USB Flex Interface Board Screw-on** enables moving the standard back panel to a new position, and it supports individual solutions.

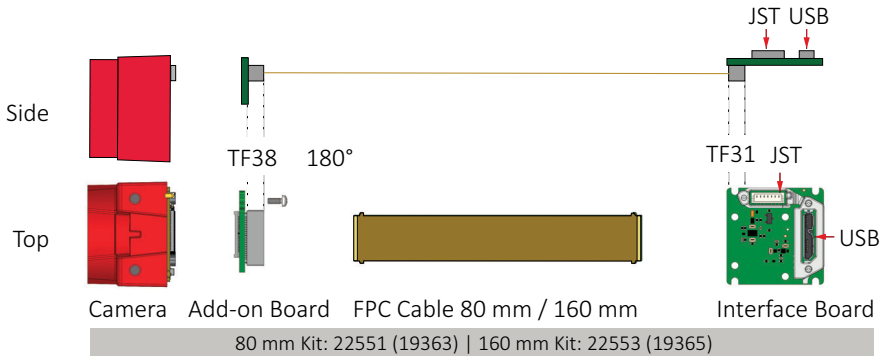


*Figure 3: **Alvium USB Flex** camera connections with Interface Board Screw-on*

Alvium USB Flex Interface Board Compact supports solutions for minimum space.

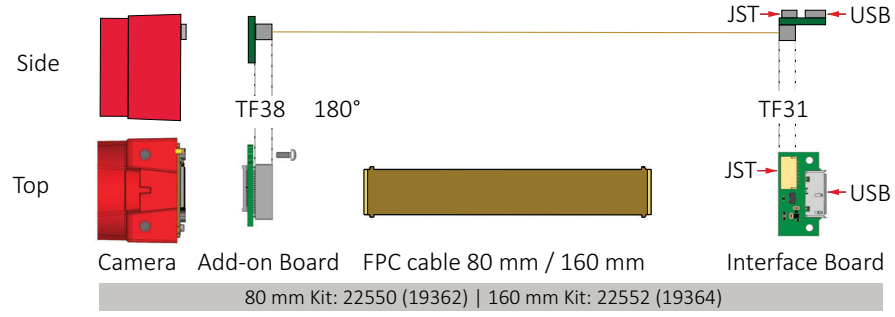


*Figure 4: **Alvium USB Flex** camera connections with Interface Board Compact*

Alvium USB Flex accessory kits without interface boards

USB Add-on Board + FPC Cable 80 mm: 22555 (previously 19367)

USB Add-on Board + FPC Cable 160 mm: 22556 (previously 19368)

Product overview

Alvium Flex cameras

All sensor models are available as Alvium Flex open housing or bare board.

Alvium Flex kits



Components in kits: Accessories to connect Alvium Flex cameras to embedded boards are offered as kits shown in Table 1. Product codes for single components are stated for reference in Specifications on page 29.

Product code column: For organizational reasons, numbers in parentheses are replaced progressively by numbers on the left, while products stay unchanged. Product codes **(new)** relate to FPC cables added with V1.1.0 of this document.

Product code	Product	Included components
22554 (19366)	Kit Alvium Flex CSI-2 120 mm	CSI-2 Add-on Board, FPC cable 120 mm
22551 (19363)	Kit Alvium Flex USB3 80 mm Screw-on	USB Add-on Board, FPC cable 80 mm, USB Interface Board Screw-on
22553 (19365)	Kit Alvium Flex USB3 160 mm Screw-on	USB Add-on Board, FPC cable 160 mm, USB Interface Board Screw-on
22550 (19362)	Kit Alvium Flex USB3 80 mm Compact	USB Add-on Board, FPC cable 80 mm, USB Interface Board Compact
22552 (19364)	Kit Alvium Flex USB3 160 mm Compact	USB Add-on Board, FPC cable 160 mm, USB Interface Board Compact
22555 (19367)	Kit Alvium Flex USB3 80 mm Open	USB Add-on Board, FPC cable 80 mm
22556 (19368)	Kit Alvium Flex USB3 160 mm Open	USB Add-on Board, FPC cable 160 mm

Table 1: Kit components and product codes

Scope of delivery

All components are delivered in plastic bags, Add-on Boards and Interface Boards in ESD protective bags. Add-on Boards are delivered with M1.2 × 3 mounting screws.

What else do you need?

You can find further information on the Allied Vision website. This includes camera user guides with such as: Technical drawings and interface descriptions.

Download or contact	Link
Alvium CSI-2 cameras and accessories	www.alliedvision.com/en/support/technical-documentation/alvium-csi-2-documentation
Alvium USB cameras and accessories	www.alliedvision.com/en/support/technical-documentation/alvium-usb-documentation
Alvium and Alvium Flex STEP files	www.alliedvision.com/en/support/alvium-step-file-downloads/
Inquiries to the Allied Vision Sales team	www.alliedvision.com/en/about-us/contact-us/contact-sales

Table 2: Downloads and contacts

Contact us

Quick links

Products
www.alliedvision.com/en/products

Distribution partners
www.alliedvision.com/en/company/where-to-buy

Contact
www.alliedvision.com/en/company/contact-us
Info@alliedvision.com

Support
www.alliedvision.com/en/support

Headquarter

Allied Vision Technologies GmbH
Taschenweg 2a
07646 Stadtroda, Germany
T// +49 36428 677-0 (Reception)
T// +49 36428 677-230 (Sales)
F// +49 36428 677-28

Worldwide network

www.alliedvision.com/en/company/about-us/locations/office-locations

Contents

Read before use . . . 2

This document at a glance . . . 9
Alvium Flex - more flexibility . . . 10
Alvium CSI-2 Flex . . . 11
Alvium USB Flex . . . 12
Product overview . . . 13
Alvium Flex cameras . . . 13
Alvium Flex kits . . . 13
Scope of delivery . . . 14
What else do you need? . . . 14

Contact us . . . 15

Document history and conventions . . . 18
Document history . . . 19
Conventions used in this user guide . . . 20
Typographical styles . . . 20
Symbols and notes . . . 20
Component and connector naming . . . 21

Compliance, safety, and intended use . . . 22
Compliance notifications . . . 23
Intended use . . . 23
Liability, trademarks, and copyright . . . 23
Your safety . . . 24
Handling hot Alvium Flex components . . . 24
How to avoid product damage . . . 24
Sensitive cameras and components . . . 24
Threads on the PCBA . . . 24
Reverse polarity . . . 25
Possible damage to camera’s image sensors . . . 25
Electrostatic discharge (ESD) . . . 25
Damage to cameras and peripherals . . . 25
Add-on Boards . . . 26
FPC connectors . . . 26
MIPI CSI-2 FPC cables . . . 27

Specifications . . . 29
Alvium Flex camera specs . . . 30
Alvium CSI-2 Flex accessory specs . . . 30
Add-on Board . . . 30

FPC Cable . . . 33
Alvium USB Flex accessory specs . . . 34
Add-on Board . . . 34
FPC cables . . . 37
USB Interface Board Screw-on . . . 38
USB Interface Board Compact . . . 41
PCB numbers . . . 44
FPC cable numbers . . . 44

Using Alvium Flex components . . . 45
Precautions . . . 46
Assembly overview . . . 47
Connecting to Hirose FH55 and TF31 . . . 48
Connecting to Hirose TF38 . . . 49
Connecting Alvium CSI-2 Flex . . . 50
Connecting cameras to Add-on Boards . . . 50
Connecting Add-on Boards to FPC cables . . . 51
Connecting FPC cables to the host . . . 51
Quick check . . . 51
Connecting Alvium USB Flex . . . 52
Connecting cameras to Add-on Boards . . . 52
Connecting Add-on Boards to FPC cables . . . 53
Connecting FPC cables to Interface Boards . . . 53
Quick check . . . 53
USB camera status by LEDs . . . 54

Document history and conventions



This chapter includes:

Document history 19
Conventions used in this user guide 20
Component and connector naming 21

Document history

Version	Date	Remarks
V1.2.0	2026-Sep-29	• Updated Contact us on page 15. • Added Liability, trademarks, and copyright on page 23. • To avoid camera damage by unintended use, added Threads on the PCBA on page 24 and warning messages in Connecting Alvium CSI-2 Flex on page 50 and Connecting Alvium USB Flex on page 52. • Applied editorial changes.
V1.1.1	2025-Jul-11	• Removed UKCA logo from Compliance notifications on page 23. • Removed contents for ISO 13485 and updated definitions for Intended use on page 23.
V1.1.0	2025-Apr-03	• Updated product codes for existing Alvium Flex kits. • Added Assembly overview on page 47 with drawings to ease assembling components. • Applied editorial changes.
V1.0.5	2024-Nov-22	• Updated the title page image. • Updated addresses in Contact us on page 15. • Updated temperature values in Specifications on page 29. • Applied editorial changes.
V1.0.4	2024-May-13	• Added icon for compliance with UKCA in Compliance notifications on page 23. • Added references to Alvium camera user guides in What else do you need? on page 14 and to Alvium Flex camera specs on page 30. • Corrected typos.
V1.0.3	2023-Nov-09	• Added contents to avoid permanent damage to the camera's image sensor by ESD: - Extended the note for Electrostatic discharge (ESD) on page 25. - Added Possible damage to camera's image sensors on page 25. - Added a warning to the installation chapter in Precautions on page 46. • Added Figure 21: Correct orientation of FPC cables on page 47 to ease using FPC cables between CSI-2 Add-on Boards and hosts or adapter boards. • Applied editorial changes.

Table 3: Document history (Sheet 1 of 2)

Version	Date	Remarks
V1.0.2	2023-Aug-03	• Added Hebrew safety notes in Read before use on page 2. • Updated product codes in images for Alvium CSI-2 Flex on page 11 and Alvium USB Flex on page 12.
V1.0.1	2023-May-17	Updated Product overview on page 13.
V1.0.0	2023-Feb-21	Release version

Table 3: Document history (Sheet 2 of 2)

Conventions used in this user guide

To give this user guide an easily understood layout and to emphasize important information, the following typographical styles and symbols are used:

Typographical styles

Style	Function
Emphasis	Highlighting important things
Web links and references	Links to webpages and internal cross references

Table 4: Typographical styles

Symbols and notes



CAUTION

Risk of burns

Precautions are described.



NOTICE

Material damage

Precautions are described.

Practical tip

Additional information helps to understand or ease handling the camera and components.



Additional information

Web link or reference to an external source with more information is shown.

Component and connector naming

Components and their naming are described below:

Term	Definition(and long term)
Adapter Board	PCB to connect Alvium CSI-2 cameras with embedded boards, with such as NVIDIA Jetson TX2 Developer Kit
Add-on Board	PCB screwed on an Alvium Flex camera, with Hirose TF38 connector for FPC cables **Types for USB and CSI-2 are different and must not be confused.**
Hirose DF40C-50DP	Connector on Alvium cameras with Alvium Flex option, connecting to Alvium Flex Add-on Boards (Hirose DF40C-50DP-0.4V)
Hirose DF40C-50DS	Connector on Alvium Flex Add-on Boards, connecting to Alvium cameras with Alvium Flex option (Hirose DF40C-50DS-0.4V)
Hirose FH55	Connector on standard Alvium CSI-2 cameras, Adapter Boards, and on embedded boards (Hirose FH55-22S-0.5SH)
Hirose TF31	Connector on Alvium USB Flex Interface Boards, connecting to FPC cables (Hirose TF31-24S-0.5SH)
Hirose TF38	Connector on Alvium Flex Add-on Boards, connecting to FPC cables Hirose TF38-24S-0.5SV)
FPC cable	Flexible printed circuit cable Types for USB and CSI-2 are different
Interface Board	PCB to separate USB and I/O connectors from the camera
PCB	Printed circuit board

Table 5: Component naming

Compliance, safety, and intended use

This chapter includes:

Compliance notifications 23
Intended use 23
Liability, trademarks, and copyright 23
Your safety 24
How to avoid product damage 24

Compliance notifications



National regulations on disposal must be followed.

Intended use

Allied Vision's objective is the development, design, production, maintenance, servicing and distribution of digital cameras and components for image processing. We are offering standard products as well as customized solutions.

Intended use of Allied Vision product is the integration into Vision systems by professionals. All Allied Vision product is sold in a B2B setting.

Unless expressly agreed otherwise, we design, manufacture, and supply in accordance with the standards of the machine vision industry.

In the event of requirements going beyond this, the customer must:

- Notify us of the special use for each model before the first order is placed so that the models in question can be separated out from the standard processes using their own part numbers, and
- Conclude a quality assurance agreement with us prior to purchasing, to define its requirements in a legally secure manner.

This may require a surcharge, as our prices are very tightly tailored to standard requirements.

Liability, trademarks, and copyright

Allied Vision has tested the product under the described conditions. The customer assumes all risk of product damage, application compromise or potential failure, and Sales Warranty loss related to deviation from the described conditions. Allied Vision's acknowledgement of such deviations in the customer's modified product or applications does not constitute advice for use. No Warranty is offered or implied by Allied Vision regarding the customer's assumed risk or legal responsibilities with such modified products or applications.

All text, pictures, and graphics are protected by copyright and other laws protecting intellectual property. All content is subject to change without notice. All trademarks, logos, and brands cited in this document are property and/or copyright material of their respective owners. Use of these trademarks, logos, and brands does not imply endorsement.

Your safety

This section informs about issues related to your personal safety. Descriptions explain how to avoid hazards and use Alvium Flex components safely.

Handling hot Alvium Flex components

Electrical components of PCBs get hot during operation. Before operation, include Cameras with Add-on Boards and Interface Boards in housings that disable any contact to hot components.

How to avoid product damage

To prevent material damage, read the following to understand risks in using Alvium Flex components.

Sensitive cameras and components

Alvium Flex components and Alvium cameras with Alvium Flex components can easily be damaged. If you are unfamiliar with the Alvium Flex system, be extremely careful. Follow the instructions in this document and read the corresponding user guides.

Threads on the PCBA

Alvium Flex cameras are equipped with 4 threads on the PCBA (printed circuit board assembly) of the camera backside. If these threads are used for a purpose other than the intended use, the cameras can be damaged.

Figure 5 shows the camera backside:

- Use only thread (b) with Alvium Flex Interface Boards by Allied Vision, following the instructions in Using Alvium Flex components on page 45.
- The other 3 threads (a) are reserved for manufacturing purposes.
- For any questions, please contact our Support team.

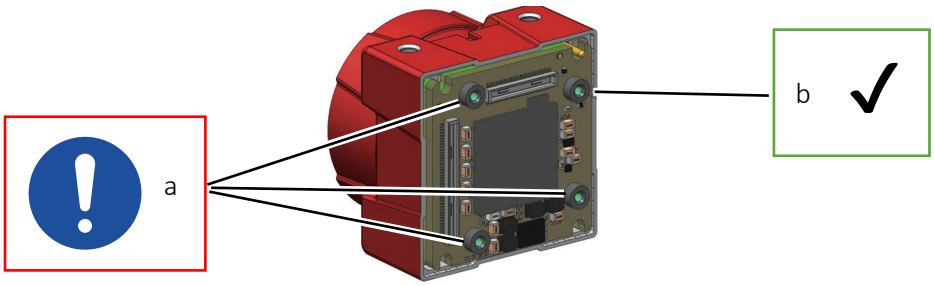


Figure 5: Alvium CSI-2 Flex camera, PCBA with threads

Reverse polarity

Alvium cameras are not protected against damage caused by reverse polarity. To avoid damage, read the product specifications and follow the instructions carefully.

Possible damage to camera's image sensors

Generally, bare board cameras and cameras with incomplete housings are very sensitive to electrostatic discharge (ESD) as electronics components are not protected.

In some rare cases, electrostatic charge occurring on the surface of the image sensor may cause damages to particular pixel groups, which may become visible as bubbles or blobs in the image generated by the sensor.

Therefore, it is very important to comply with ESD protection measures in accordance with technical standards.

Follow the instructions in Electrostatic discharge (ESD) on page 25.

Electrostatic discharge (ESD)

Follow these instructions to avoid damage to the camera, including possible **damage to the sensor**, see Possible damage to camera's image sensors on page 25.

ESD is dangerous for electronic devices, especially when tools or hands get in contact with connectors and electronic components. We recommend measures to avoid damage by ESD:

- Unpacking: Remove the product from its anti-static packaging only when your body is grounded.
- Workplace: Use a static-safe workplace with static-dissipative mat and air ionization.
- Wrist strap: Wear a static-dissipative wrist strap to ground your body.
- Clothing: Wear ESD-protective clothing. Keep components away from your body and clothing. Even if you are wearing a wrist strap, your body is grounded but your clothes are not.
- Housing: use an ESD protective housing, including the camera and the Alvium Flex components.

Damage to cameras and peripherals

If Alvium Flex components are connected to unsuitable Alvium Flex cameras, to standard Alvium CSI-2 cameras, or to unsuitable peripherals, all the components can be damaged.

- Connect only Alvium CSI-2 Flex components to Alvium CSI-2 Flex cameras and suitable peripherals.
- Connect only Alvium USB Flex components to Alvium USB Flex cameras and suitable peripherals.

Add-on Boards

By appearance, Add-on Boards for CSI-2 and USB are the same. But pin assignment differs. To avoid damage to the camera by short circuits, **only use the compatible type for the corresponding interface**:

- Add-on Boards for CSI-2 cameras identify by the letter **C**.
- Add-on for Boards USB cameras identify by the letter **U**.

Connect Alvium Flex Add-on Boards to cameras only as shown in Using Alvium Flex components on page 45.

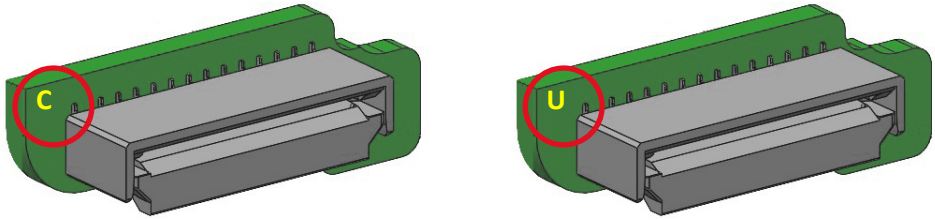


Figure 6: Identfiers for Add-on Boards for CSI-2 (left) and for USB (right)

FPC connectors

Standard Alvium CSI-2 cameras and Alvium Flex components use Hirose FPC connectors.

Additional information

For technical data and more instructions on the Hirose connectors, see www.hirose.com.

These small-sized connectors enable compact camera design. Therefore, they are sensitive to mechanical stress. Especially if you are inexperienced with these, be very cautious. If FPC connectors are broken, the complete device must be replaced. Follow the instructions in Using Alvium Flex components on page 45 carefully.

- Avoid stress to FPC connectors.
- Allow only the FPC cable to touch conductors.

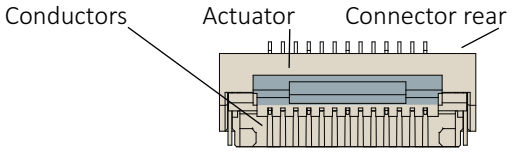


Figure 7: Hirose FH55-22S-0.5SH FPC connector

Mating and unmating cycles

FPC connectors on **standard Alvium CSI-2 cameras** (Hirose FH55) and on **Alvium Flex** components:(Hirose TF31 and TF38) are designed for one-time installation, with the opportunity for corrections. Therefore, these connectors are specified for **maximum 20** mating and unmating cycles.

Handling the actuator

- Move the actuator only as described in the instructions.
- Carefully flip the actuator at the middle with your finger nail as described in the instructions.
- Follow the instructions in Connecting to Hirose FH55 and TF31 on page 48 and in Connecting to Hirose TF38 on page 49.

MIPI CSI-2 FPC cables

FPC cable position and orientation

Short circuits of the FPC cable can damage the camera or connected hardware.

- **Hirose FH55 and TF31** FPC connectors: Insert the FPC cable into the connector with cable guiding tabs matching the connector's side guides. See Using Alvium Flex components on page 45.
- **Hirose TF38** FPC connectors: Insert the FPC cable into the connector until the FPC cable touches the inside shell of the FPC connector. See Connecting to Hirose TF38 on page 49.

FPC cables and stress

Over-stressed FPC cables can damage the camera and connected hardware. When camera and embedded board are twisted against each other or pulled apart from each other with too much force, the FPC cable is over-stressed. Spring contacts of FPC connectors are worn out, causing short circuits and unreliable electrical connections.

- Allow only slight bending of the FPC cable (minimum bending radius: 10 mm).
- For strain relief, we recommend you to mount PCB components, (embedded boards), and cameras to a common base.
- **Hirose FH55 and TF31** FPC connectors: Insert the FPC cable into the FPC connector at 12° to the PCB board surface. See Connecting to Hirose FH55 and TF31 on page 48.

No hot-plugging for Alvium Flex

Alvium Flex cameras do not support hot-plugging. Hot-plugging can destroy the camera and connected hardware by high inrush current.

- Disconnect power supplies before connecting FPC cables.

FPC cable signal quality

Noise and electromagnetic interference can disable camera functions.

- Avoid contact to metal surfaces, causing electromagnetic interference.
- Please use cables recommended by Allied Vision.

Specifications



This chapter includes:

Alvium Flex camera specs 30
Alvium CSI-2 Flex accessory specs 30
Alvium USB Flex accessory specs 34
PCB numbers 44
FPC cable numbers 44

Alvium Flex camera specs

This document includes all information for Alvium Flex accessories, including specifications, technical drawings, and interface descriptions.

For camera specifications

See the Alvium camera user guides at:

- www.alliedvision.com/en/support/technical-documentation/alvium-csi-2-documentation
- www.alliedvision.com/en/support/technical-documentation/alvium-usb-documentation.

Alvium CSI-2 Flex accessory specs

Add-on Board

Specifications

Feature	Specification
Product code	18859
PCB number	17807 (see PCB numbers on page 44)
Supported cameras	Alvium CSI-2 Flex cameras
Supported FPC cables for host connections	Allied Vision 19281, see FPC Cable on page 33
Connector to the camera	Hirose DF40
Connector to the FPC cable	Hirose TF38
Dimensions (Length × width × height [mm])	22.45 × 8.0 × 8.08
Mass (Add-on Board only)	<10 g
Storage temperature	-20 °C to +85°C (ambient)
Operating temperature	-20 °C to +65 °C (ambient)
Relative humidity	0% to 80% (non-condensing)

Table 6: CSI-2 Add-on Board: Specifications

Technical drawings

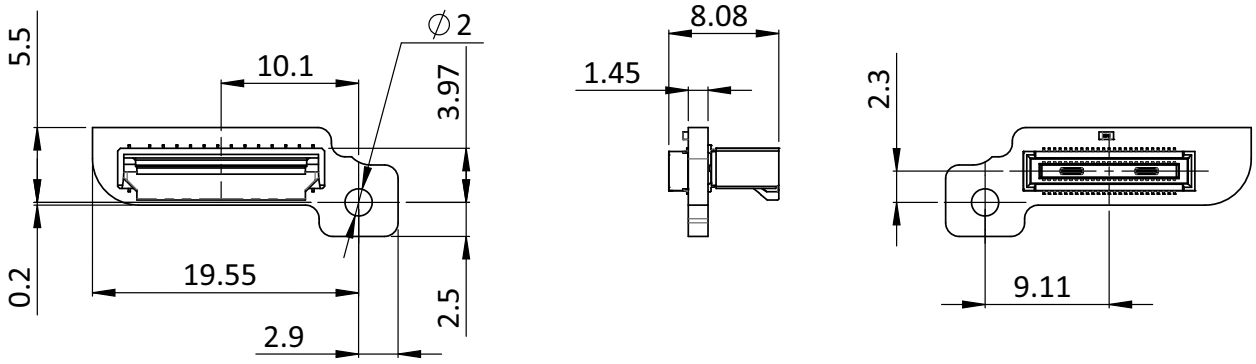


Figure 8: CSI-2 Add-on Board: Technical drawings

Electronic schematics

Relevance for this information

You need these electronic schematics only if you intend to use your own accessories.

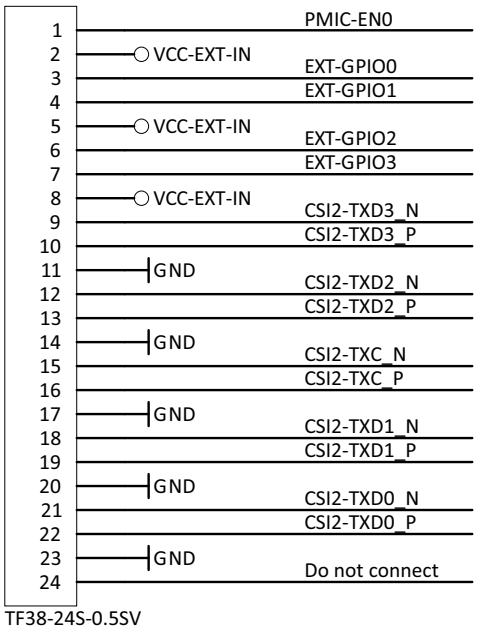


Figure 9: CSI-2 Add-on Board, TF-38 connector: I/O pin assignment

Pin assignment and levels TF38 connector

Pin	Signal	Direction	Level	Description
1	PMIC-EN0	IN	U_{in} (low) = -0.3 to 0.4 VDC U_{in} (high) = 1.4 to 5.5 VDC	Camera power supply enable switch (active high, internal 100 kΩ pull-up resistor, default on)
2	VCC-EXT-IN	PWR IN	4.5 to 5.5 VDC	Power supply voltage Maximum input current: 1.5 A
3	EXT-GPIO0	IN/OUT	U_{in} (low) = -0.3 to 0.8 VDC U_{in} (high) = 2.0 to 5.5 VDC U_{out} (low) = 0 to 0.4 VDC U_{out} (high) = 2.4 to 3.3 VDC at 12 mA	I2C Control Internal pull-up resistor: 33 to 63 kΩ
4	EXT-GPIO1	IN/OUT	See Pin 2, EXT-GPIO0	
5	VCC-EXT-IN	PWR IN	4.5 to 5.5 VDC	Power supply voltage Maximum input current: 1.5 A
6	EXT-GPIO2	IN/OUT	U_{in} (low) = -0.3 to 0.8 VDC U_{in} (high) = 2.0 to 5.5 VDC U_{out} (low) = 0 to 0.4 VDC U_{out} (high) = 2.4 to 3.3 VDC at 12 mA	GPIO Internal pull-up resistor: 33 to 63 kΩ
7	EXT-GPIO3	IN/OUT	See Pin 5, EXT-GPIO2	
8	VCC-EXT-IN	PWR IN	4.5 to 5.5 VDC	Power supply voltage Maximum input current: 1.5 A
9	CSI2-TXD3_N	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX data lane 3 negative rail
10	CSI2-TXD3_P	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX data lane 3 positive rail
11	GND	PWR	0 VDC	Power supply ground
12	CSI2-TXD2_N	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX data lane 2 negative rail
13	CSI2-TXD2_P	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX data lane 2 positive rail
14	GND	PWR	0 VDC	Power supply ground
15	CSI2-TXC_N	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX clock lane negative rail
16	CSI2-TXC_P	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX clock lane positive rail
17	GND	PWR	0 VDC	Power supply ground
18	CSI2-TXD1_N	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX data lane 1 negative rail
19	CSI2-TXD1_P	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX data lane 1 positive rail
20	GND	PWR	0 VDC	Power supply ground
21	CSI2-TXD0_N	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX data lane 0 negative rail
22	CSI2-TXD0_P	OUT	According to MIPI CSI-2 D-PHY V1.1	CSI-2 TX data lane 0 positive rail
23	GND	PWR	0 VDC	Power supply ground
24	Do not connect			

Table 7: CSI-2 Add-on Board, TF38 connector: Pin assignment and levels

FPC Cable

Specifications

Feature	Specification
Product code	19281
PCB number	17813 (see FPC cable numbers on page 44)
Supported devices	Alvium CSI-2 Flex cameras, Allied Vision embedded board adapters
Matching connector on the Add-on Board	Hirose TF38
Matching connector on the host	Hirose FH55
Length × width	120 ± 0.1 mm × 11.35 ± 0.1 mm
Connector thickness	0.3 mm ± 0.03 mm
Cable thickness	~ 0.2 mm
Classification	Industrial grade for static applications
Static bending radius (min.)	10.0 mm
Dynamic bending radius (min.)	For static applications only
Bending cycles (max.)	300
Differential impedance Z_{Diff}	100 Ω
Shielding	Impedance controlled (100 Ω)
Number of connectors FH55 side	22
Number of connectors TF38 side	24
Connector pitch	0.5 mm
Mass	<10 g
Storage temperature	-20 °C to +85°C (ambient)
Operating temperature	-20 °C to +65 °C (ambient)
Relative humidity	0% to 80% (non-condensing)

Table 8: Alvium CSI-2 Flex: FPC Cable: Specifications

Technical drawing

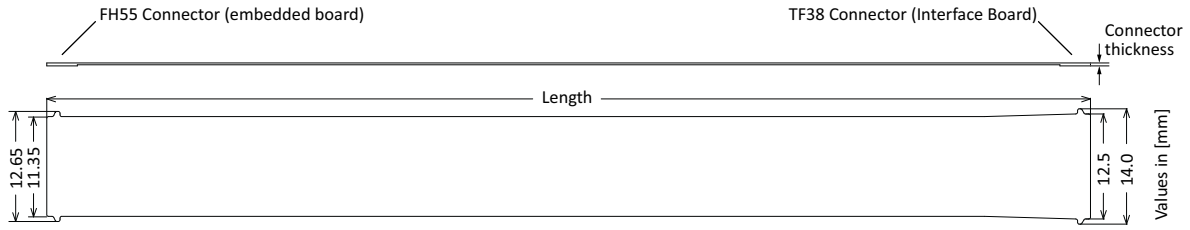


Figure 10: Alvium CSI-2 Flex: FPC Cable: Technical drawing

Alvium USB Flex accessory specs

Add-on Board

Specifications

Feature	Specification
Product code	18854
PCB number	17805 (see PCB numbers on page 44)
Supported cameras	Alvium USB Flex cameras
Supported FPC cables for host connections	Allied Vision 18860, 19280, see FPC cables on page 37
Connector to the camera	Hirose DF40
Connector to the FPC cable	Hirose TF38
Dimensions (Length × width × height [mm])	22.45 × 8.0 × 8.08
Mass (Add-on Board only)	<10 g
Storage temperature	-20 °C to +85°C (ambient)
Operating temperature	-20 °C to +65 °C (ambient)
Relative humidity	0% to 80% (non-condensing)

Table 9: USB Add-on Board: Specifications

Technical drawings

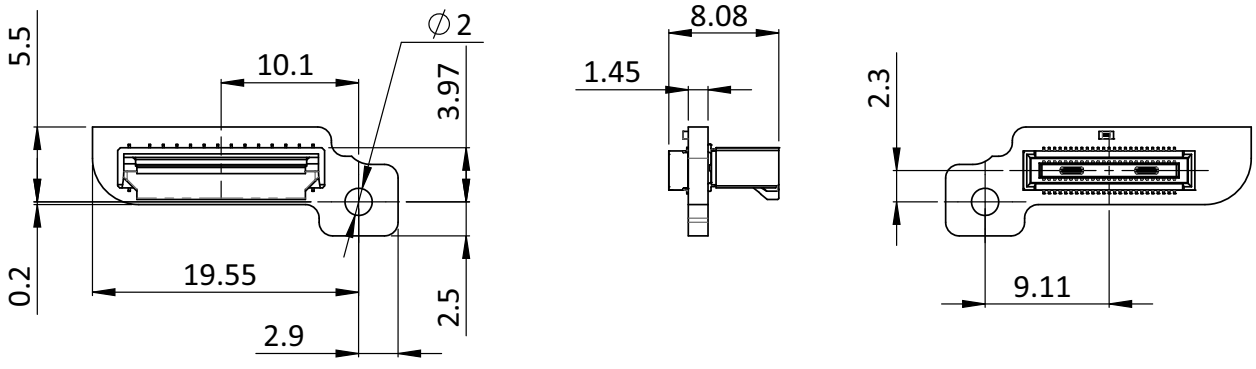


Figure 11: USB Add-on Board: Technical drawings

Electronic schematics

Relevance for this information

You need these electronic schematics only if you intend to use your own accessories.

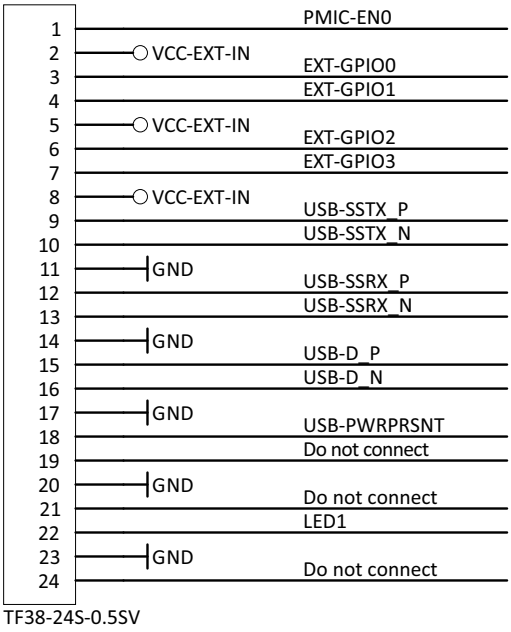


Figure 12: USB Add-on Board, TF38 connector: I/O pin assignment

Pin assignment and levels TF38 connector

USB Receiver and Transmitter

The signals for USB Receiver and Transmitter are seen from the camera side, as defined by the USB specification.

Pin	Signal	Direction	Level	Description
1	PMIC-EN0	IN	U_{in} (low) = -0.3 to 0.4 VDC U_{in} (high) = 1.4 to 5.5 VDC	Camera power supply enable switch (active high, internal 100 kΩ pull-up resistor, default on)
2	VCC-EXT-IN	PWR IN	4.5 to 5.5 VDC	Power supply voltage Maximum input current: 1.5 A
3	EXT-GPIO0	IN/OUT	U_{in} (low) = -0.3 to 0.8 VDC U_{in} (high) = 2.0 to 5.5 VDC U_{out} (low) = 0 to 0.4 VDC U_{out} (high) = 2.4 to 3.3 VDC at 12 mA	I2C Control Internal pull-up resistor: 33 to 63 kΩ
4	EXT-GPIO1	IN/OUT	See Pin 2, EXT-GPIO0	
5	VCC-EXT-IN	PWR IN	4.5 to 5.5 VDC	Power supply voltage Maximum input current: 1.5 A
6	EXT-GPIO2	IN/OUT	See Pin 2, EXT-GPIO0	
7	EXT-GPIO3	IN/OUT	See Pin 2, EXT-GPIO0	
8	VCC-EXT-IN	PWR IN	4.5 to 5.5 VDC	Power supply voltage Maximum input current: 1.5 A
9	USB-SSTX_P	Defined by the USB specification		USB SuperSpeed transmitter differential pair
10	USB-SSTX_N			
11	GND	PWR	0 VDC	Power supply ground
12	USB-SSRX_P	Defined by the USB specification		USB SuperSpeed receiver differential pair
13	USB-SSRX_N			
14	GND	PWR	0 VDC	Power supply ground
15	USB-D_P	Defined by the USB specification		USB 2.0 differential pair
16	USB-D_N			
17	GND	PWR	0 VDC	Power supply ground
18	USB-PWRPRSNT	IN	U_{in} (low) = -0.3 to 0.8 VDC U_{in} (high) = 2.0 to 5.5 VDC	Connect to USB-VBUS via resistor divider (R1 10 kΩ, R2 100 kΩ), add 100 nF capacitor to GND
19	Do not connect			
20	GND	PWR	0 VDC	Power supply ground
21	Do not connect			
22	LED1	OUT	U_{out} (low) = 0 to 0.4 VDC U_{out} (high) = 2.4 to 3.3 VDC at 4 mA	Status LED output
23	GND	PWR	0 VDC	Power supply ground
24	Do not connect			

Table 10: USB Add-on Board, TF38 connector: Pin assignment and levels

FPC cables

Specifications

Feature	Specification	
Product code	19279	19280
PCB number (see FPC cable numbers on page 44)	17811	17812
Supported devices	Alvium USB Flex cameras, Alvium USB Flex Interface Boards	
Matching connector on Add-on Board	Hirose TF38	
Matching connector on Interface Board	Hirose TF31	
Length × width	80 ± 0.1 mm × 12.5 ± 0.1 mm	160 ± 0.1 mm × 12.5 ± 0.1 mm
Connector thickness	0.3 mm ± 0.03 mm	
Cable thickness	~ 0.2 mm	
Classification	Industrial grade for static applications	
Static bending radius (min.)	10.0 mm	
Dynamic bending radius (min.)	For static applications only	
Bending cycles (max.)	300	
Differential impedance Z_{Diff}	90 Ω ±10%	
Shielding	Impedance controlled (90 Ω ±10%)	
Number of connectors	24	
Connector pitch	0.5 mm	
Mass	<10 g	
Storage temperature	-20 °C to +85°C (ambient)	
Operating temperature range	-20 °C to +65 °C (ambient)	
Relative humidity	0% to 80% (non-condensing)	

Table 11: Alvium USB Flex FPC Cables: Specifications

Technical drawing

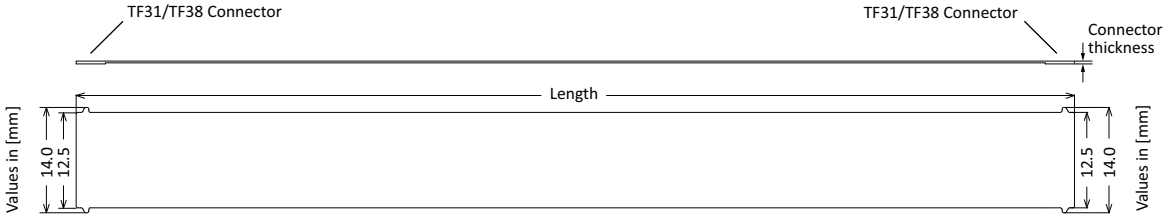


Figure 13: Alvium USB Flex FPC Cables: Technical drawing

USB Interface Board Screw-on

Specifications

Feature	Specification
Product code	19527
PCB number	17809 (see PCB numbers on page 44)
Supported cameras	Alvium USB Flex cameras
Supported FPC cables for Interface Board connections	Allied Vision 18860, 19280, see FPC cables on page 37
Connector to the FPC cable	Hirose TF31
USB connector	Micro-B USB 3.1 Gen 1 with screw locks
I/O connector	JST BM07B-SRSS-TBT
Dimensions (Length × width × height [mm])	26.4 × 26.4 × 11.14
Mass	<10 g
Storage temperature	-20 °C to +85°C (ambient)
Operating temperature	-20 °C to +65 °C (ambient)
Relative humidity	0% to 80% (non-condensing)

Table 12: USB Interface Board Screw-on: Specifications

Technical drawings

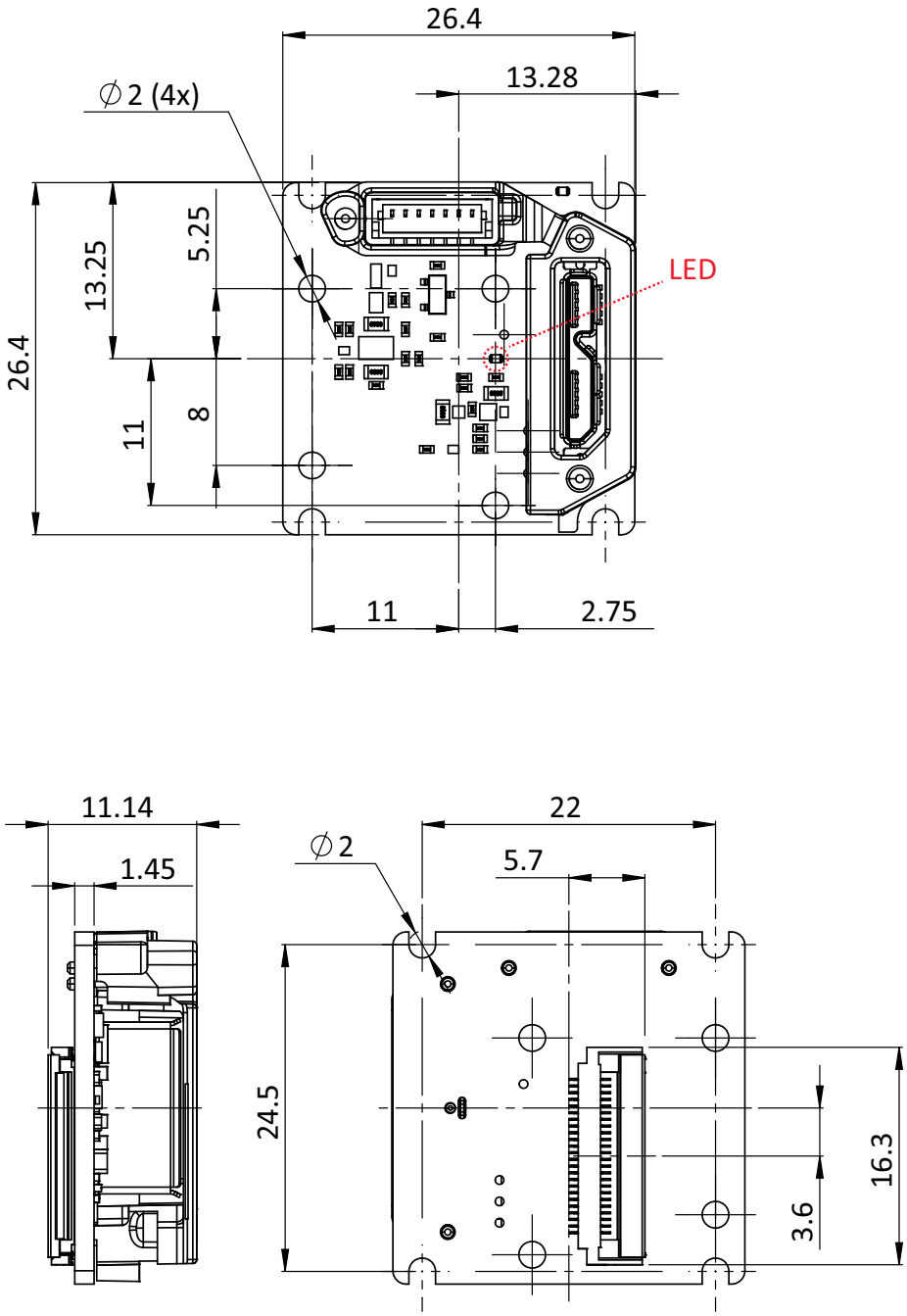


Figure 14: USB Interface Board Screw-on: Technical drawings

I/O pin assignment and levels

The following data applies to the JST BM07B-SRSS-TBT type I/O connector.

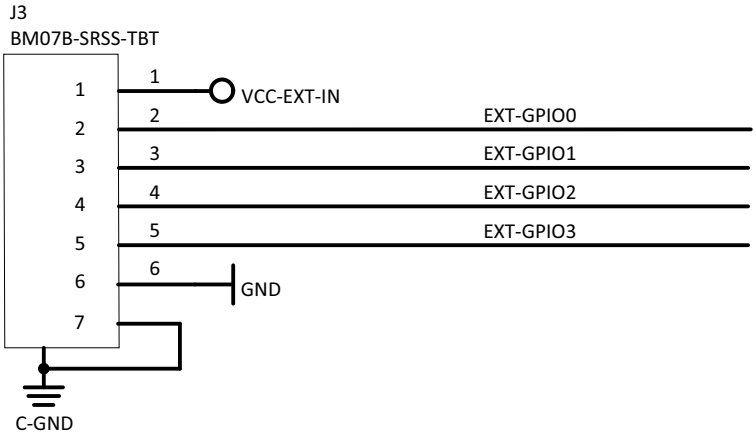


Figure 15: USB Interface Board Screw-on: I/O pin assignment

Pin	Signal	Direction	Level	Description
1	VCC-EXT-IN	PWR IN	4.5 to 5.5 VDC	Power supply voltage See the Alvium USB Cameras User Guide for power supply voltage depending on the length of I/O cables.
2	EXT-GPIO0	IN/OUT	U_{in} (low) = -0.3 to 0.8 VDC U_{in} (high) = 2.0 to 5.5 VDC U_{out} (low) = 0 to 0.4 VDC U_{out} (high) = 2.4 to 3.3 VDC at max. 12 mA	GPIOs Internal pull-up resistor: 33 kΩ to 63 kΩ
3	EXT-GPIO1	IN/OUT	See Pin 2, EXT-GPIO0	
4	EXT-GPIO2	IN/OUT	See Pin 2, EXT-GPIO0	
5	EXT-GPIO3	IN/OUT	See Pin 2, EXT-GPIO0	
6	GND	PWR	0 VDC	Power supply ground
7	C-GND	PWR	0 VDC	Chassis ground and shielding

Table 13: USB Interface Board Screw-on: I/O pin assignment and levels

USB Interface Board Compact

Specifications

Feature	Specification
Product code	19528
PCB number	17889 (see PCB numbers on page 44)
Supported cameras	Alvium USB Flex cameras
Supported FPC cables for camera connections	Allied Vision 18860, 19280, see FPC cables on page 37
Connector to the FPC cable	Hirose TF31
USB connector	Micro-B USB 3.1 Gen 1 with screw locks
I/O connector	JST BM07B-SRSS-TBT
Dimensions (Length × width × height [mm])	23.0 × 12.8 × 6.4
Mass	<10 g
Storage temperature	-20 °C to +85°C (ambient)
Operating temperature	-20 °C to +65 °C (ambient)
Relative humidity	0% to 80% (non-condensing)

Table 14: USB Interface Board Compact: Specifications



Pin assignment and levels

For pin assignment and levels, see I/O pin assignment and levels on page 40.



Camera power

The Alvium USB Flex Interface Board Compact supports only Power over USB, not external power, using the I/O connector.

Technical drawings

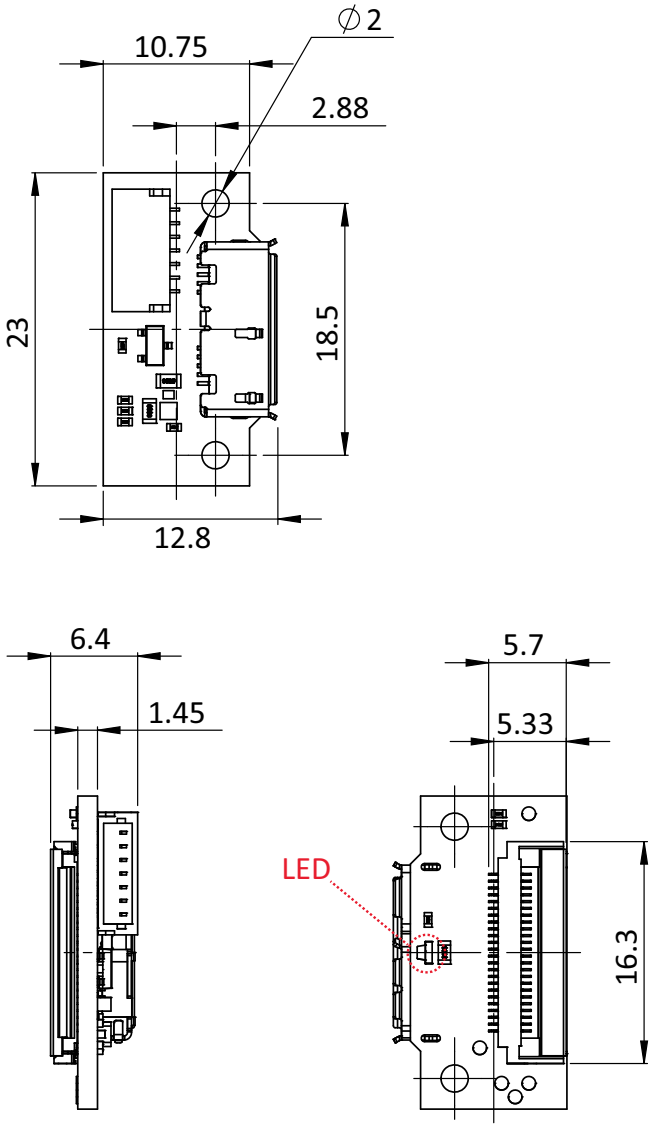


Figure 16: USB Interface Board Compact: Technical drawings

I/O pin assignment and levels

The following data applies to the JST BM07B-SRSS-TBT type I/O connector.

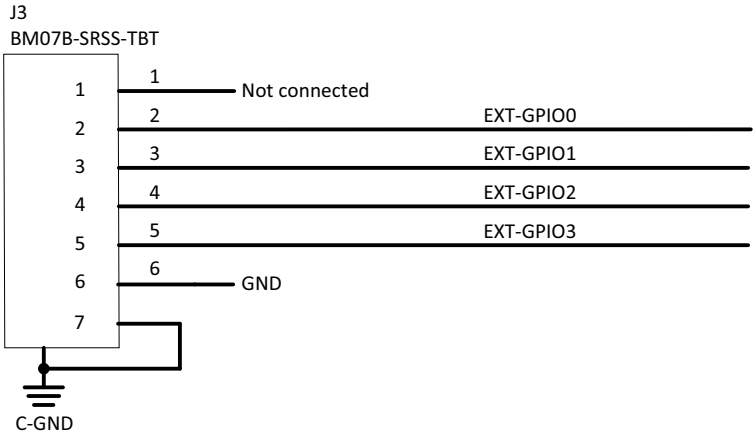


Figure 17: USB Interface Board Compact: I/O pin assignment

Pin	Signal	Direction	Level	Description
1			Not connected	
2	EXT-GPIO0	IN/OUT	U_{in} (low) = -0.3 to 0.8 VDC U_{in} (high) = 2.0 to 5.5 VDC U_{out} (low) = 0 to 0.4 VDC U_{out} (high) = 2.4 to 3.3 VDC at max. 12 mA	GPIOs Internal pull-up resistor: 33 kΩ to 63 kΩ
3	EXT-GPIO1	IN/OUT	See Pin 2, EXT-GPIO0	
4	EXT-GPIO2	IN/OUT	See Pin 2, EXT-GPIO0	
5	EXT-GPIO3	IN/OUT	See Pin 2, EXT-GPIO0	
6	GND	PWR	0 VDC	Power supply ground
7	C-GND	PWR	0 VDC	Chassis ground and shielding

Table 15: USB Interface Board Compact: I/O pin assignment and levels

PCB numbers

The PCB numbers are printed on the board surface as shown in Figure 18.

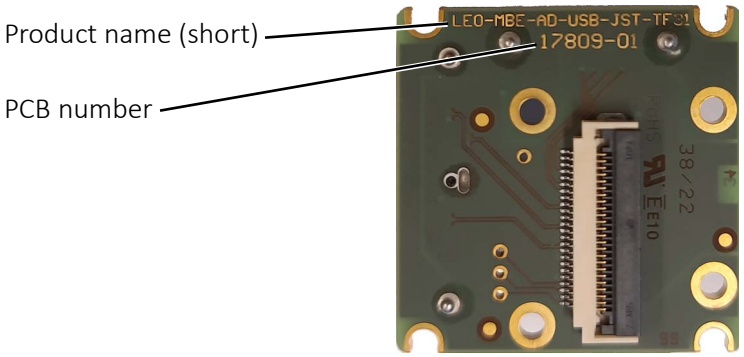


Figure 18: PCB number on an Alvium USB Flex Interface Board Screw-on

FPC cable numbers

The FPC cable numbers are printed on the cable surface as shown in Figure 19.



Figure 19: FPC cable number on an Alvium Flex FPC cable

Using Alvium Flex components



This chapter includes:

Precautions 46
Assembly overview 47
Connecting to Hirose FH55 and TF31 48
Connecting to Hirose TF38 49
Connecting Alvium CSI-2 Flex 50
Connecting Alvium USB Flex 52
USB camera status by LEDs 54

Precautions



CAUTION

Risk of burns

Electrical components get hot during operation.

Before operation, include adapter boards in housings that disable any contact to hot components.



NOTICE

Damage to the camera and connected peripherals

To avoid short circuits and damage by wrong polarity:

- Disconnect all power supplies before installing Alvium Flex cameras and components.
- Reconnect power only after installation is complete.
- Mount Alvium Flex components, the camera, and, if applicable, the embedded board on a common base for strain relief.



NOTICE

Damage to the camera and connected peripherals

Before connecting the Alvium cameras and Alvium Flex components to your system:

- Read the corresponding Alvium camera user guide.
- Read the instructions in this chapter.
- Carefully read Specifications on page 29 for the FPC connector pin assignment.



NOTICE

Possible damage to the sensor

In Alvium Flex cameras, sensors can be damaged by ESD. In the output image, this may become visible as bubbles or blobs, for example. For details, see Possible damage to camera's image sensors on page 25.

- Provide ESD protection measures in accordance with technical standards.
- Follow the instructions in Electrostatic discharge (ESD) on page 25.

Assembly overview

After installing, assemblies look as shown in Figure 20.

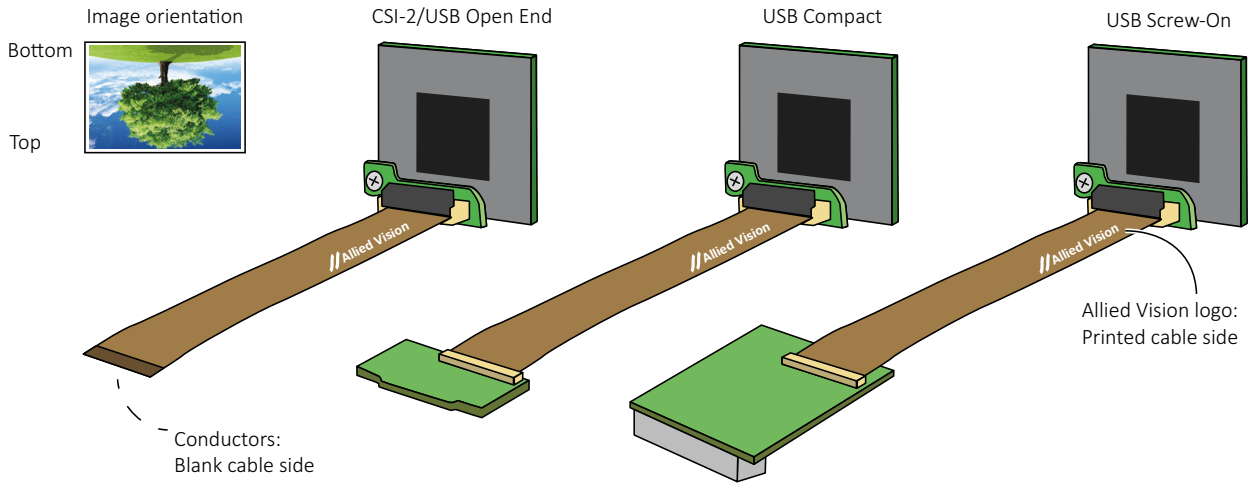
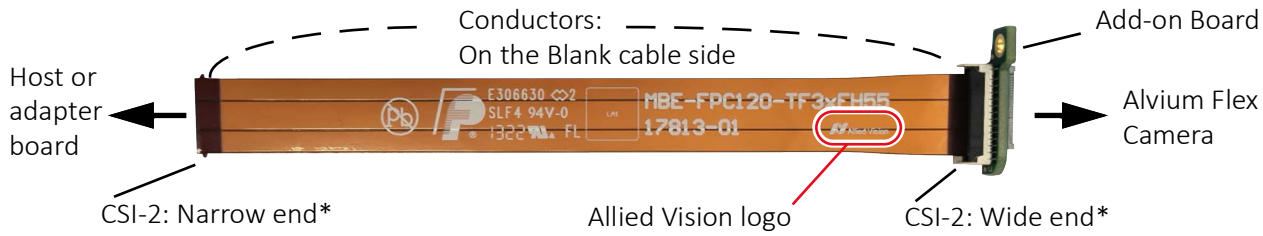


Figure 20: Alvium Flex assemblies (schematic view)

Orientation of FPC cables

CSI-2 and USB: Ensure that the printed side of cables is positioned as shown in Figure 20, with the Allied Vision logo pointing towards Add-on Boards.

CSI-2: FPC cables between CSI-2 Add-on Boards and hosts or adapter boards have different ends to avoid malfunctions or damage by wrong polarity. Connect these cables only as shown in Figure 21:



*For FPC cables for Alvium Flex **USB**, both ends are the same.

Figure 21: Correct orientation of FPC cables

Proper usage of the Hirose FPC connectors is vital for connecting Alvium Flex components. Therefore, instructions start with usage of the FPC connectors. See Connecting to Hirose FH55 and TF31 on page 48 and Connecting to Hirose TF38 on page 49.

If you are familiar with using FPC connectors, go to the instructions directly:

- Connecting Alvium CSI-2 Flex on page 50
- Connecting Alvium USB Flex on page 52.

Connecting to Hirose FH55 and TF31

Connecting CSI-2 hosts and USB Interface Boards

Figure 22 shows how the FPC cable connects to the FPC connector.

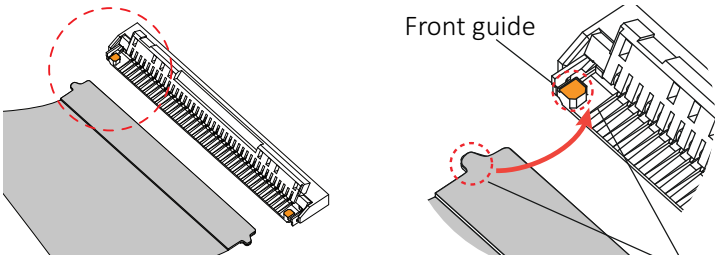


Figure 22: FPC cable and FPC connector (open position)

1. Opening the FPC connector:
   With your fingernail*, flip the actuator to open position at 105° to the PCB surface, see Figure 23.

   *Or use a plastic tool, as metal tools can damage the actuator.

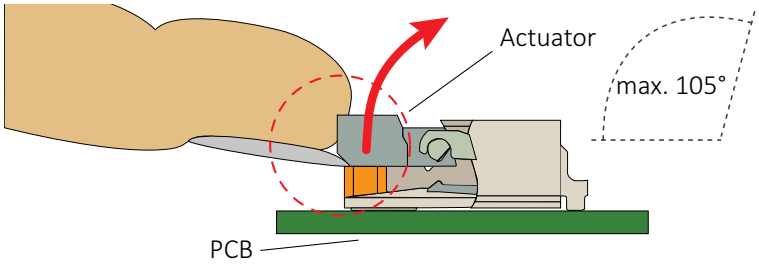


Figure 23: Opening the FPC connector

2. **Ensuring proper cable direction between host and camera**, take the FPC cable with conductors facing the FPC connector conductors (see Figure 24).

3. Inserting the FPC cable:
   At a horizontal angle of 90° to the connector's rear (see Figure 24) and at a vertical angle of 12° to the PCB (see Figure 25), slowly insert the FPC cable into the actuator...

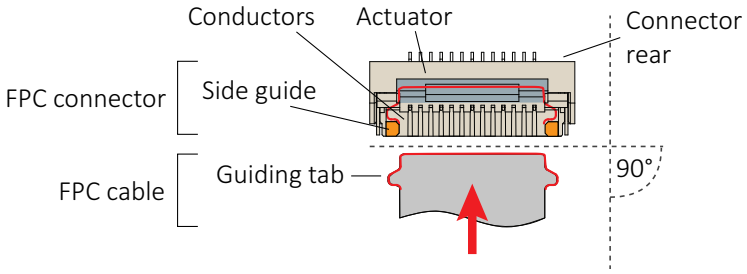


Figure 24: FPC cable and FPC connector

4. ...until cable guiding tabs are caught between connector rear and side guides (see Figure 24). Pull the cable slightly to ensure guiding tabs are properly engaged.

5. Holding the FPC cable in position, flap down the actuator to closed position (see Figure 25).

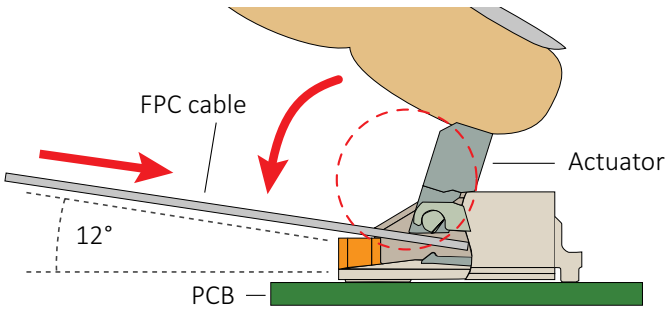


Figure 25: Engaging the FPC cable in the FPC connector

Connecting to Hirose TF38

Connecting Add-on Boards

Figure 26 shows how the FPC cable connects to the FPC connector.

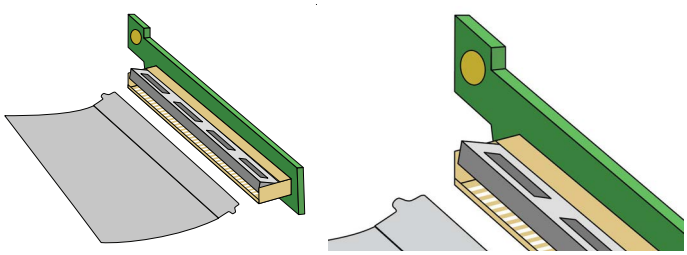


Figure 26: FPC cable and FPC connector (open position)

1. Opening the FPC connector:
   With your fingernail*, flip the actuator to open position at approximately 70° to the PCB surface, see Figure 27.

   *Or use a plastic tool, as metal tools can damage the actuator.

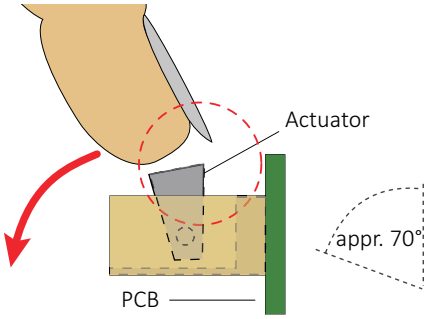


Figure 27: Opening the FPC connector

2. **Ensuring proper cable direction between host and camera**, take the FPC cable with conductors facing the FPC connector conductors (see Figure 28).

3. Inserting the FPC cable:
   At a horizontal angle of 90° to the connector's rear (see Figure 28) and at a vertical angle of 90° to the PCB (see Figure 29), slowly insert the FPC cable into the actuator...

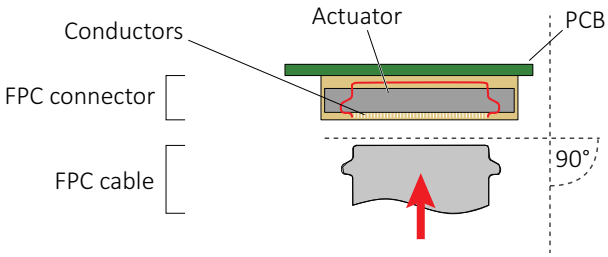


Figure 28: FPC cable and FPC connector

4. ...until the FPC cable touches the inside shell of the FPC connector (see Figure 28).
5. Holding the FPC cable in position, flip up the actuator until it engages in closed position (see Figure 29).

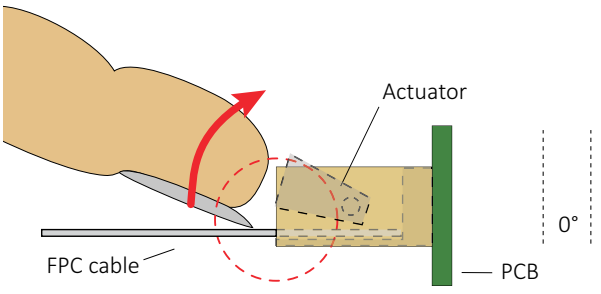


Figure 29: Engaging the FPC cable in the FPC connector

Connecting Alvium CSI-2 Flex

Connecting cameras to Add-on Boards

Required items

- Alvium CSI-2 Flex camera
- 18859 Alvium CSI-2 Flex Add-on Board (incl. oval-head screw M1.6 × 3)
- Philips screwdriver

Precautions



NOTICE

Damage to the camera

Alvium Flex cameras are equipped with 4 threads on the PCBA (printed circuit board assembly) of the camera backside. If these threads are used for a purpose other than the intended use, the cameras can be damaged.

- Use only thread (b) in Figure 30 on page 51 with Alvium Flex Interface Boards by Allied Vision, following the Instructions on page 51.
- The other 3 threads are reserved for manufacturing purposes.
- For any questions, please contact our Support team.



NOTICE

Damage to the camera and connected peripherals

If Alvium Flex components are **connected to unsuitable** Alvium Flex cameras, to standard Alvium CSI-2 cameras, or to unsuitable peripherals, all the components can be damaged.

- Connect only Alvium CSI-2 Flex Add-on Boards to Alvium CSI-2 Flex cameras.
- Connect Alvium CSI-2 Flex Add-on Boards only as shown in Figure 30 on page 51.
- Connect Alvium CSI-2 Flex FPC cables only to Alvium CSI-2 Flex Add-on Boards, Adapter Boards for embedded boards, and to embedded boards.

Instructions

1. Read the warning messages in Precautions on page 50.
2. Make sure the Add-on Board (f) has a letter **C** (g) to identify as CSI-2 type.
3. Plug the DF40C-50DS-0.4V connector (c) of the Alvium CSI-2 Flex Add-on Board to the Hirose DF40C-50DP-0.4V connector (a) of the camera, see Figure 30.
4. Feed the screw (e) through the mounting hole (d) of the Add-on Board into the mounting thread (b) of the camera.
5. Tighten the screw at 0.1 Nm maximum torque.

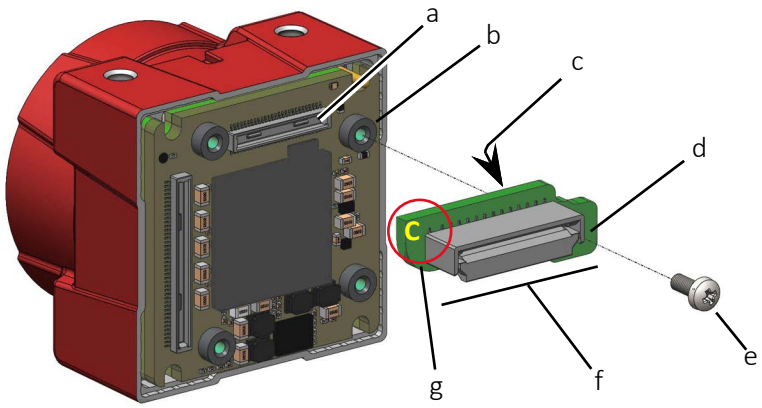


Figure 30: Alvium CSI-2 Flex camera, Add-on Board, and screw

Connecting Add-on Boards to FPC cables

For connecting Add-on Boards to FPC cables, see Connecting to Hirose TF38 on page 49.

Connecting FPC cables to the host

To connect the other end of the FPC cable to adapter boards or embedded boards, see Connecting to Hirose FH55 and TF31 on page 48.

Quick check

FPC cables can easily be connected in the wrong orientation. Before powering your application, we recommend you to look at the schematic setups shown in Assembly overview on page 47.

Instructions for Alvium USB Flex

For instructions on Alvium USB Flex components, see Connecting Alvium USB Flex on page 52. For LEDs, see USB camera status by LEDs on page 54.

Connecting Alvium USB Flex

Connecting cameras to Add-on Boards

Required items

- Alvium USB Flex camera
- 18854 Alvium USB Flex Add-on Board (incl. oval-head screw M1.6 × 3)
- Philips screwdriver

Precautions



NOTICE

Damage to the camera

Alvium Flex cameras are equipped with 4 threads on the PCBA (printed circuit board assembly) of the camera backside. If these threads are used for a purpose other than the intended use, the cameras can be damaged.

- Use only thread (b) in Figure 31 on page 53 with Alvium Flex Interface Boards by Allied Vision, following the Instructions on page 53.
- The other 3 threads are reserved for manufacturing purposes.
- For any questions, please contact our Support team.



NOTICE

Damage to the camera and connected peripherals

If Alvium Flex components are **connected to unsuitable** Alvium Flex cameras, to standard Alvium CSI-2 cameras, or to unsuitable peripherals, all the components can be damaged.

- Connect only Alvium USB Flex Add-on Boards to Alvium USB Flex cameras.
- Connect Alvium USB Flex Add-on Boards only as shown in Figure 31 on page 53.
- Connect only Alvium USB Flex FPC cables to Alvium USB Flex Add-on Boards and to Alvium USB Flex Interface Boards.

Instructions

1. Make sure the Add-on Board (f) has a letter **U** (g) to identify as USB type.
2. Plug the DF40C-50DS-0.4V connector (c) of the Alvium USB Flex Add-on Board to the Hirose DF40C-50DP-0.4V connector (a) of the camera, see Figure 31.
3. Feed the screw (e) through the mounting hole (d) of the Add-on Board into the mounting thread (b) of the camera.
4. Tighten the screw at 0.1 Nm maximum torque.

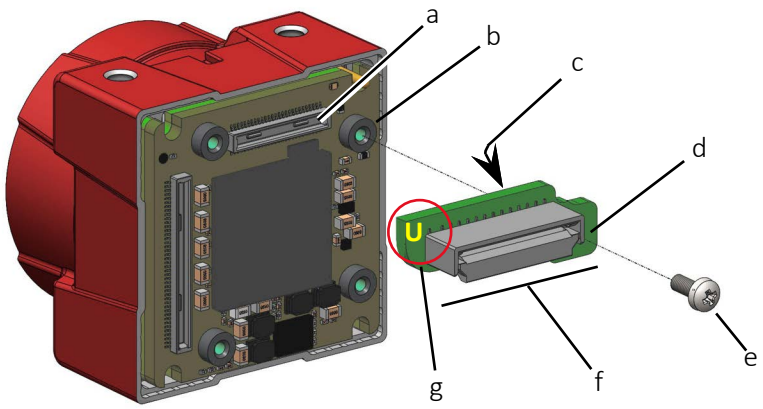


Figure 31: Alvium USB Flex camera, Add-on Board, and screw

Connecting Add-on Boards to FPC cables

For connecting Add-on Boards to FPC cables, see Connecting to Hirose TF38 on page 49.

Connecting FPC cables to Interface Boards

For connecting FPC cables to Interface Boards, see Connecting to Hirose FH55 and TF31 on page 48.

Quick check

FPC cables can easily be connected in the wrong orientation. Before powering your application, we recommend you to look at the schematic setups shown in Assembly overview on page 47.

USB camera status by LEDs

If you design Alvium cameras with Flex option into housings, the LEDs at the camera backside may not be visible. Therefore, Interface Boards for USB cameras have LEDs to signal the camera status. You can direct the LED light to the surface of your housing by light pipes.

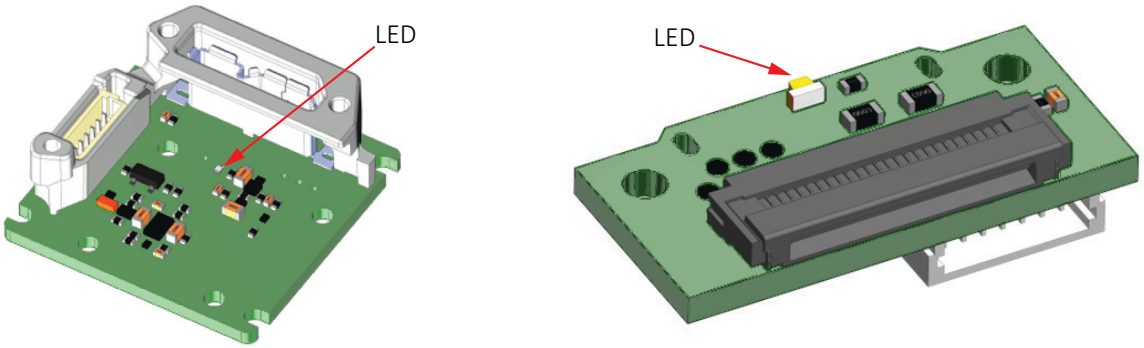


Figure 32: LEDs on Interface Boards: Screw-on (left), Compact (right)