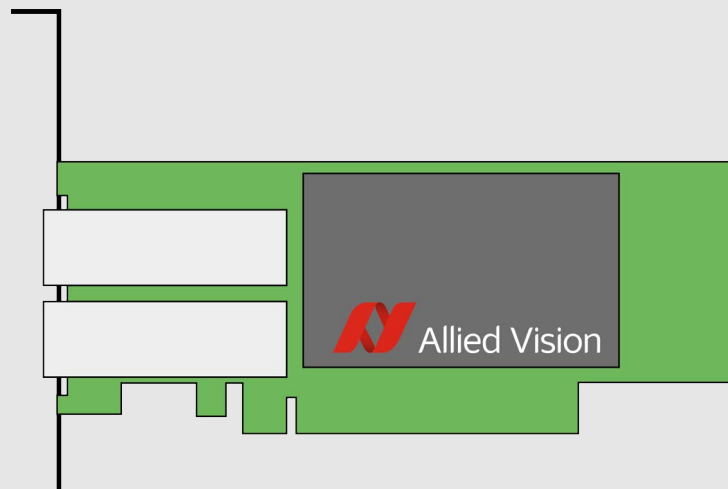




NETWORK CONNECTIONS

25GigE Interface Cards User Guide

V1.0.0

Network interface cards have the
Model ID: AEF that is used in the DoC
(EU declaration of conformity) document.

Actual products may differ from the example images on this page.

**Quick links**

- [This document at a glance](#) on page 15
- [Contact us](#) on page 17
- [Contents](#) on page 18

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 24.

**CAUTION****Risk of burns**

The product in operation can reach temperature levels which could cause burns.

**CAUTION****Risk of cuts by sharp edges**

The product can have sharp edges.

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.

EMC for interface cards

Because they are supplied without enclosures, interface cards must be installed in a PC chassis or integrated into suitable housings to ensure EMC shielding. Installation must be performed by qualified personnel in accordance with applicable local EMC provisions.

DA - Dansk

Sikkerhed

Læs sikkerhedsanvisningerne, før produkt bruges. Overhold alle advarsler. Brug kun produkt som anført i [Intended use](#) på side 24.



FORSIGTIG

Forbrændingsfare

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



FORSIGTIG

Fare for skarpe kanter

Produktet kan have skarpe kanter.

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 24.



VORSICHT

Gefahr von Verbrennungen

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



VORSICHT

Schnitte durch scharfe Kanten

Das Produkt kann scharfe Kanten haben.

Bestimmungsgemäßer Gebrauch

Allied Vision Produkte sind bestimmt für die Integration in Bildverarbeitungssysteme 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 24.



ATENCIÓN

Riesgo de quemaduras

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



ATENCIÓN

Riesgo de cortes por bordes afilados

El producto puede tener bordes afilados.

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 24 kuvatulla tavalla.



HUOMIO

Palovammojen vaara

Käytössä olevan tuotteen saavuttamat lämpötilatasot voivat aiheuttaa palovammoja.



HUOMIO

Terävien reunojen aiheuttama viiltovaara

Tuotteessa voi olla teräviä reunoja.

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 24.



ATTENTION

Risque de brûlures

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



ATTENTION

Risque de coupures sur des bords tranchants

Le produit peut présenter des bords tranchants.

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.

עברית - HE

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 24).

זהירות

סכנת כווייה

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



זהירות

סכנת חתכים על ידי קצוות חדים

למוצר יכולים להיות קצוות חדים.



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 24.



ATTENZIONE

Pericolo di ustioni

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



ATTENZIONE

Pericolo di tagliarsi sui bordi affilati

I bordi del prodotto lente possono essere affilati.

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](#) 24 ページに従って使用してください。



注意

やけどの危険性

作動中のカメラは、やけどを引き起こす温度まで熱くなる恐れがあります。



注意

な端部で切り傷の危険性

本製品には鋭利な部分がある場合があります。

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 24.



VOORZICHTIG

Risico van verbranding

Het gebruikte product, kan temperatuurwaarden bereiken die brandwonden kunnen veroorzaken.



VOORZICHTIG

Risico van snijwonden door scherpe randen

Het product kan scherpe randen hebben.

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 24.



FORSIKTIG

Risiko for brannskader

Produktet i bruk kan nå temperaturnivåer som kan forårsake brannskader.



FORSIKTIG

Risiko for kutt fra skarpe kanter

Produktet kan ha skarpe kanter.

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 24.



VARNING

Risk för brännskada

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



VARNING

Risk för skärsår från vassa kanter

Produkten kan ha vassa kanter.

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](#) 于第 24 页。



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。



注意事项

锋利边缘割伤的风险

产品可能有锋利的边缘。

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



Get an overview of documentation for the 25GigE interface cards:

Note.....	16
Shipping contents.....	16
What else do you need?	16

Note



Read this document carefully

Learn to use 25GigE interface cards in the most safe and efficient way and avoid damage to your imaging system.

About 25GigE interface card

25GigE interface cards in this user guide fully support the requirements for 25GigE cameras. RDMA (Remote Direct Memory Access) technology offloads the host's CPU and RAM from tasks, ensuring stable and efficient data delivery, even with demanding workloads. See [RDMA for high performance at low costs](#) on page 34.

For a smooth installation and operation, see [Hardware components](#) on page 32 and [Cooling interface cards](#) on page 33.

Shipping contents

Interface cards shipping contents

- 1 × 25GigE interface card
- 1 × Bracket Standard Profile
- 1 × Bracket Low Profile

Table 1: 25GigE interface card shipping contents



Required components

Fiber optic cables and transceivers to connect between interface cards and cameras are not included.

Please observe that 25GigE connections require **2 transceivers**: 1 transceiver on the camera and 1 transceiver on the interface card.

What else do you need?

Download	Link
Allied Vision cameras and accessories	www.alliedvision.com/en/products
Downloads ¹	https://network.nvidia.com/products/adapter-software/ethernet/windows/winof-2

¹ For best performance, use the latest **Win-OF2 Driver** and the suitable **Networkcard Firmware** that can be updated with the **mlxup Tool**. Please understand that third-party links may change.

Table 2: Downloads for 25GigE interface card

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

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Document history and conventions



This chapter includes:

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Document history

Version	Date	Remarks
V1.0.0	2026-Jun-15	Release version

Table 3: Document history

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



CAUTION

Risk of cuts

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.

Compliance, safety, and intended use



This chapter includes:

Model ID covered by this user guide	23
Compliance notifications	23
Intended use	24
Liability, trademarks, and copyright.....	25
Your safety	25
How to avoid product damage	26

Model ID covered by this user guide

The DoC (EU declaration of conformity) document refers to:
25GigE interface cards have the Model ID: AEF.

Compliance notifications



National regulations on disposal must be followed.

For customers in the USA



Integrated into PC chassis or suitable housings to ensure EMC shielding: FCC Class B digital device

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

United States of America: Supplier Declaration of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Note: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For customers in Canada

This apparatus complies with the Class B limits for radio noise emissions set out in the Radio Interference Regulations.

CAN ICES-3 (B) / NMB-3 (B)

Pour utilisateurs au Canada

Cet appareil est conforme aux normes classe B pour bruits radioélectriques, spécifiées dans le Règlement sur le brouillage radioélectrique.

CAN ICES-3 (B) / NMB-3 (B)

Manufacturer

Allied Vision Technologies GmbH
Taschenweg 2a
07646 Stadtroda, Germany

Tel// +49 36428 677-0

Fax// +49 36428 677-28

Responsible Party**U.S. Contact Information**

Allied Vision Technologies, Inc.
102 Pickering Way – Suite 502
Exton, PA 19341, USA

Responsible Party**Canada Contact Information**

Allied Vision Technologies Canada Inc.
300 – 4621 Canada Way
Burnaby, BC V5G 4X8, Canada

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.

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Your safety

This section informs about issues related to your personal safety. Descriptions explain how to avoid hazards and use Network cards safely.

Handling hot Network cards

Electrical components of Network cards get hot during operation.

Avoid touching Network cards during operation. After operation wait for cards to cool down before you touch them.

Sharp edges

The edges of Network cards can be sharp. Be careful these edges do not cut your skin when handling Network cards.

How to avoid product damage

To prevent material damage, read the following to understand risks in using Network cards.

ESD

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 Network card 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 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.

No hot-plugging for Network cards

Network cards do not support hot-plugging. Hot-plugging can destroy the camera and connected hardware by high inrush current.

Disconnect power supplies before connecting or disconnecting devices from each other.

Ground loops

Unsuitable connections can lead to different potentials between the camera system GND and the environmental shield/chassis GND caused by ground loops. This can damage the camera and the connected devices or cause malfunctions.

- Avoid potential differences between the camera housing and GND.
- All wiring must be done by authorized personnel, according to the corresponding technical standards.
- You may mount the camera electrically isolated.
- Read the Avoiding Ground Loops in Vision Systems application note.



More information

See the Avoiding Ground Loops in Vision Systems application note at https://www.alliedvision.com/assets/support/Camera-Documentation/Allied-Vision/FAQs-Application-Notes/GND-Loops_in_Vision-Systems.pdf.

Specifications



This chapter includes:

Interface Card 25GigE 2-Port SFP28 28

Interface Card 25GigE 2-Port SFP28

Specifications

Parameter	Value	
Official product name	AV-IC-A-25GE-2CH	
Order code	30220	
PCI specification	PCIe v3.0 x 8	
Bandwidth by port	25GigE, 10GigE, 1GigE	
Max. number of cameras	2	
Controller	NVIDIA ConnectX-5	
Software properties		
OS support	This interface card is recommended for systems with Allied Vision 25GigE cameras using Vimba X . Vimba X documentation: https://docs.alliedvision.com/ Vimba X downloads: https://www.alliedvision.com/en/support/software-downloads/vimba-x-sdk/vimba-x .	
Protocol support	IEEE 802.1AX IEEE 802.1P IEEE 802.1Q IEEE 802.1Qau IEEE 802.1Qaz IEEE 802.1Qbb	IEEE 802.1Qbg IEEE 802.3ad IEEE 802.3ae IEEE 802.3ap IEEE 802.3az IEEE 802.3by
RDMA version	RoCE v2 (See RDMA for high performance at low costs on page 34.)	
Jumbo frames	9.5 KByte (Set to ≥9 KByte for proper operation.)	
Cable connections		
Cable type support	Optical fiber	
Cable connector	2 × SFP28 For transceivers, see Transceiver modules on page 32.	
Standards for supported fiber optic cables	25G BASE-SR 25GBASE-LR 10G BASE-SR 10GBASE-LR	10GBASE-ER 1000 BASE-SX 1000BASE-LX
LED signals	No light = No link Solid amber = Connected Amber flashing = Data transfer	

Table 5: Interface Card 25GigE 2-Port SFP28 > Specifications (Sheet 1 of 2)

Parameter	Value
Power and ESD	
Power supply	PCIe
Max. power consumption (Interface card)	13.7 W For camera power, see Power supply on page 33.
ESD protection	±8,000 V (contact discharge)
Mechanical properties	
Dimensions	68.6 × 163 mm
Bracket profiles ¹	Low Profile = half-height Standard Profile = full-height
Weight	Tbd
Conditions for operation and storage	
Operating temperature	0 °C to +50 °C
Storage temperature	-40 °C to +85 °C
Storage relative humidity	90% non condensing (at +35 °C)
Compliance	
Compliance	CE, FCC, RoHS
¹ Both brackets are included in the delivery.	

Table 5: Interface Card 25GigE 2-Port SFP28 > Specifications (Sheet 2 of 2)

Requirements for host PCs

[Table 6](#) shows two setups for low or maximum performance. According to our tests, the interface card can be operated in both cases, but the camera performance is affected. Please check the individual requirements of your application:

	Low performance	Maximum performance
Camera performance	Low resolution images at low frame rates.	Full resolution images at maximum frame rates, using pixel formats with high bit depths.
CPU	Intel i7-11700	Intel U7 265K
Mainboard chipset	Z590	Z890
Mainboard extension slot	PCIe 4.0 x16	PCIe 5.0 x16
RAM	16 GByte DDR4 - 3200 MHz	32 GByte DDR5 - 5600 MHz

Table 6: Interface Card 25GigE 2-Port SFP28 > Requirements for host PCs

Dimension schematics

This is an example image, actual proportions may be different.



Figure 1: Interface Card 25GigE 2-Port SFP28 > Dimension schematics

Efficient technology



This chapter includes basic instructions on cable connectors:

Hardware components	32
Cooling interface cards	33
RDMA for high performance at low costs	34

Hardware components

25GigE cameras do not use typical Cat 6a GigE cables with RJ45 connectors for connections to the NIC (Network interface card). Instead, fiber optic cables are used to transfer the full bandwidth of 100 GBit/s with optimum signal quality.

Transceiver are used on both sides of the connection to change electrical into optical signals and back again. See [Figure 2](#):

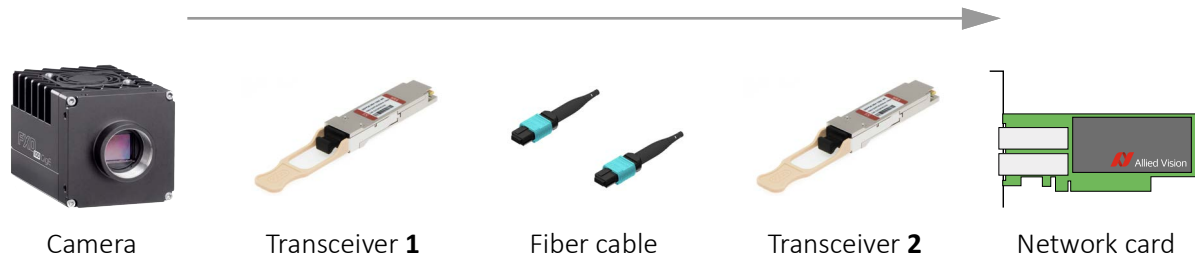


Figure 2: Connection between 25GigE cameras and the host

Transceiver modules

Various transceiver types are offered to support the requirements for different cable lengths. [Table 7](#) shows tested transceivers:

Transceiver type ¹	Connector type	Core material	Max. bandwidth	Max. cable length	Price-to-performance ratio
QSFP28 (Short-Reach)	Depending on the transceiver ²	Glass fiber	100 Gbit/s	< 100 m	Cost effective
QSFP28 (Long-Reach)				< 60 km	Expensive
QSFP56 (Short-Reach)			200 Gbit/s	< 100 m	Cost effective
QSFP56 (Long-Reach)				< 2 km	Expensive

¹ QSFP28 and QSFP56 modules have the same form factor. QSFP28 connectors can be used with QSFP56 port, and vice versa.

² Many options are available, please check the compatibility between transceivers and cables.

Table 7: Transceiver tested for connections with 25GigE cameras



Suitable transceivers

For smooth operation, we recommend using:
Allied Vision **order code**: V000005589-01001

If you have further questions, please contact our Support team at
www.alliedvision.com/en/company/contact-us/technical-support-and-repair-rma.

Fiber optic cables

The matching connector types for fiber optic cables depend on the transceivers' ports. For example, MTP MPO-12/UPC transceivers require cables with MTP-12/UPC connectors.



Suitable fiber optic cables

For smooth operation, we recommend using this setup:

5 m (16 ft) MTP®-Jumper, MTP®-12 UPC to MTP®-12 UPC, 12 Cores, Multimode (OM4), Plenum (OFNP), 0.35 dB max., Type B

Allied Vision **order code**: V000005637

If you have further questions, please contact our Support team at www.alliedvision.com/en/company/contact-us/technical-support-and-repair-rma.

Power supply

25GigE cameras by Allied Vision do not support PoE. They must be powered externally with 24 VDC, power supplies must support minimum 30 W.



Suitable camera power supplies

For smooth operation, we recommend using:

SVS-PS-12S-24V-30W-XX

(Where XX represents country code: EU, US, or UK)

Allied Vision **order codes**: EU: F009499, UK: F009500, US: F009501

If you have further questions, please contact our Support team at www.alliedvision.com/en/company/contact-us/technical-support-and-repair-rma.

Cooling interface cards

25GigE 2-Port SFP28 interface cards are dedicated for large server farms where the architecture provides a strong cooling by design. These cards can be operated on ATX PCs as well, but with additional cooling.



Operation with insufficient cooling

25GigE 2-Port SFP28 interface cards can be operated without cooling.

If the card heats up above the maximum operating temperature specified:

- The system is protected from damage.
- But the card is throttled below maximum bandwidth to cool down again.

ATX housing fans

On our tests systems, we use 140 × 140 mm (or 120 × 120 mm) industrial fans that support 3000 rounds per minute. The cooling effect proved to be sufficient when BIOS is set to 2000 rpm.



Suitable housing fans

For smooth operation, we recommend using:

- **140 × 140 mm:** Noctua Industrial fan (NF-A14 industrialPPC-3000PWM)
- **120 × 120 mm:** Noctua Industrial fan (NF-F12 industrialPPC-3000PWM)

You can find these products at www.noctua.at.

Fans mounted to interface cards

Fans can be mounted to interface cards if technical requirements do not allow using housing fans. For this setup, we found the following 40 × 20 mm fans a proper solution:



Suitable fans mounted to the interface card

For smooth operation, we recommend using:

- **40 × 20 mm:** Noctua High-Efficiency Quiet fan NF-A4x20 PWM
- **40 × 10 mm:** Noctua High-Efficiency Quiet fan NF-A4x10 PWM

You can find these products at www.noctua.at.

RDMA for high performance at low costs

25GigE cameras by Allied Vision support RDMA (Remote Direct Memory Access) for data transmission, using RoCEv2 (RDMA over Converged Ethernet) protocol. Because this technology is highly efficient, it is widely adopted in data centers. Bringing this functionality down to the field of machine vision, we leverage the performance of your application.

Figure 3 on page 34 shows how RDMA offloads host PCs.



Figure 3: Traditional data transfer versus data transfer using RDMA (RoCEv2)

Built on top of the internet protocol stack, RoCEv2 enables:

- CPU and TCP/IP bypass: Data is transferred bypassing the CPU or TCP/IP stack, eliminating intermediate copying and buffering.
- Direct Memory Access: Image data is written directly into the host system's RAM.
- Low latency, high throughput transfer: Stable and efficient data delivery is ensured, even for demanding workloads.
- Reduced CPU load: Processor usage for packet handling and data stream writing is minimized, freeing resources for analysis or inference tasks.

Benefits of RDMA

- High throughput for multi-camera setups supports parallel readout and data streams with ultra-high bandwidths.
- Enhanced stability prevents frame loss for image acquisition without interruptions.
- Lower CPU usage frees computing power for other tasks such image processing.
- Lower latency enables faster real-time detection and feedback, low jitter and precise multi-camera synchronization.
- Fiber optical cables enable transmission distances of kilometers.
- Rapidly evolving RDMA provides a future-proof scalability for Allied Vision cameras with 25GigE and 100GigE. At the time this document is being created, RDMA Network adapters support up to 400GigE. The broad industry is rapidly adopting RDMA, an ecosystem with long-term perspective.
- Reduced system costs through the use of proven components (such as interface cards, cables, and transceivers) that can be purchased in large quantities.