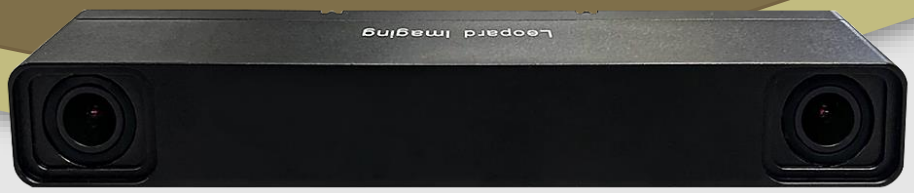
LEOPARD IMAGING

LI-AR0234CS-STEREO-GMSL2-30



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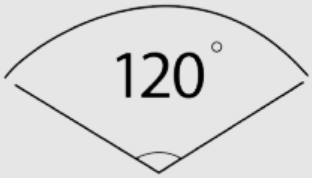
INTRODUCTION

HAWK, the LI-AR0234CS-STEREO-GMSL2-30 is the professional 3D depth camera where cutting-edge technology meets effortless usability. Equipped with ON Semiconductor 2.3MP CMOS digital image sensor AR0234CS, our HAWK provides unparalleled depth sensing capabilities, allowing ease while teams or enthusiasts work at the edge of ADAS, autonomous driving, robotics and immersive enjoyments. Dive into a world of limitless possibilities with HAWK, where every detail is captured with precision and every interaction is taken to new heights.

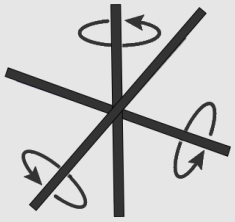
FEATURES & HIGHLIGHTS



With 121.5˚ horizontal and 147.5˚ diagonal field of view, HAWK helps to perceive the world in 3D with greater depth and dimension of field, sharper image quality and more details.

2 x Global shutters capture the entire frame at the same time, freeze the motion at a specific point in time, offering an accurate representation of moving subjects without distortion.

IP65 level resistance to water, dust and humidity ensures remarkable performance for outdoor and indoor applications in different fields like robotics, industrial, medical, agricultural, etc.



Built-in 6-axis IMU for enhanced spatial and positional awareness.

CE and FCC certifications render assurance about safety, protection and product quality.

It is easy to deploy Hawk in different systems and environments thanks to its flat bottom and flexible mounting options.

TECHNICAL SPECIFICATIONS

General	
Use environment	Indoor / Outdoor
Baseline	150 mm
IP Rating	IP65
Video Output	1200P @ 60 fps with output resolution side-by-side 2 × (1920 ×1200) 1200P @ 30 fps with output resolution side-by-side 2 × (1920 ×1200)
Power Supply Range	9 ~ 19 VDC
Power Consumption (NVIDIA® AGX Xavier™)	118 mA @ 12 VDC (2 * 1920 × 1200 @ 60 fps)
IMU (Inertial Measurement Unit)	BMI088
Serializer	Maxim GMSL2
Part#	LI-AR0234CS-STEREO-GMSL2-30
MPN (Manufacturer Part Number)	LI-AR0234CS-STEREO-GMSL2-30-V1.0
Depth	
Depth Frame Rate	30 Hz
Depth Range	1.0 ~ 8.0 m **NOTE**: For high Z-accuracy, the depth range can be 0.5 m to 8.0 m. However, the depth range can be up to 20 m with reduced Z-accuracy.
Depth Technology	Neural Stereo Depth Sensing
Object Detection	
Object Types	Vehicles, persons, custom objects
Object Tracking	Supported
Detection Outputs	Location, unique ID, bounding boxes 2D, segmentation masks
Image Sensor	
Sensor	ON Semiconductor 2.3MP CMOS Image Sensor AR0234CS (QTY: 2)
Optical Format	1/2.6"
Resolution	1920 (H) × 1200 (V) (active pixels)
Pixel Size	3.0 × 3.0 µm
Output Format	10-bit RAW
Color / Mono	Color
Shutter	Global shutter

LENS SPECIFICATIONS

Focal Length	2.8 mm
Aperture, F/#	2.0
Field of View (FOV)	147.5˚ (diagonal) / 121.5˚ (horizontal) / 73.5˚ vertical
Optical Distortion	< -65.3%
Relative Illumination	> 30%
Glass Cover	No
IR Filter	650 nm IR cut filter
Lens Mount	Active Alignment (AA)

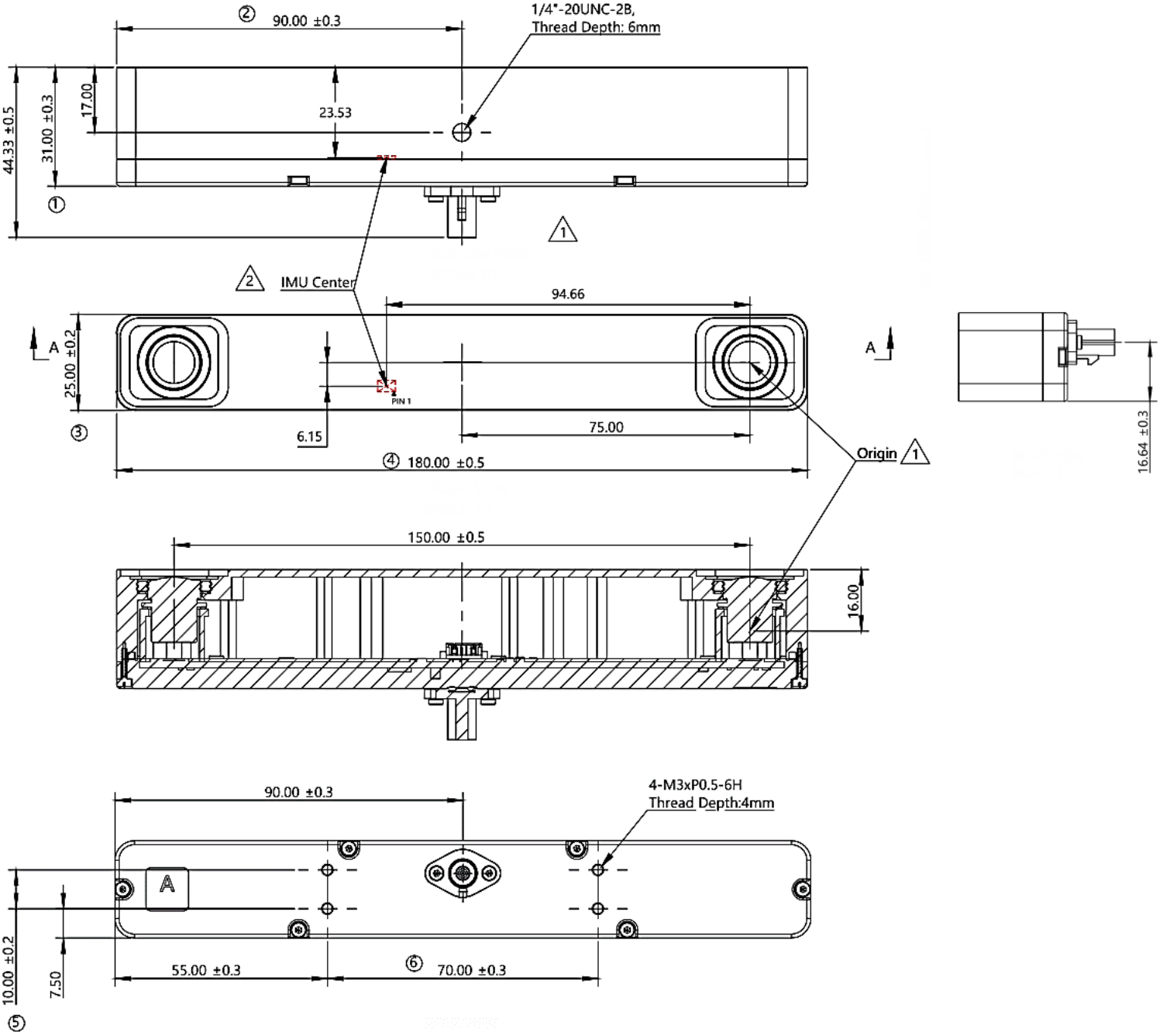
PHYSICAL, ENVIRONMENTAL, & CERTIFICATION

Physical Features	
Weight	~ 204 g
Size	180.0 (L) × 25.0 (W) × 44.33 (D) mm
Connector	Fakra Z type connector
Mounting Mechanism	• One 1/4"-20 UNC-2B thread mounting point. Thread depth: 6 mm • Four M3 × P0.5-6H thread mounting points. Thread depth: 4 mm • Tripod 
Environmental Features	
Operating Temp	-20°C ~ +50°C
Storage Temp	-40°C ~ +70°C
CERTIFICATION	
FCC, CE	Yes

APPLICATIONS

- Bar Code Scanner
- 3D Scanning
- Positional Tracking
- Iris Scanning
- Machine Vision
- Augmented Reality
- Virtual Reality
- Biometrics
- Gesture Recognition
- Depth Sensing

DIMENSIONS



NOTE:

- Other unmarked tolerances are ±0.3 mm.
- ⊗ marked are important sizes.
- ⚠ marked is revision version.
- For unmarked sizes, refer to 3D model.
- All materials are compliant with RoHS requirements.
- IMU location is shown in the drawing.
- Unit: mm

DEPTH PERFORMANCE

SPEC LIMIT (6-Meter Distance)

Metric	Spec Limit(s)
Z-Accuracy	±2% at 6 m distance at 80% depth FOV
Z-STD	±2% at 6 m distance at 80% depth FOV
Z-Distortion	±2% at 6 m distance at 80% depth FOV
Z-Fill-Rate	±0.1% at 6 m distance at 80% depth FOV

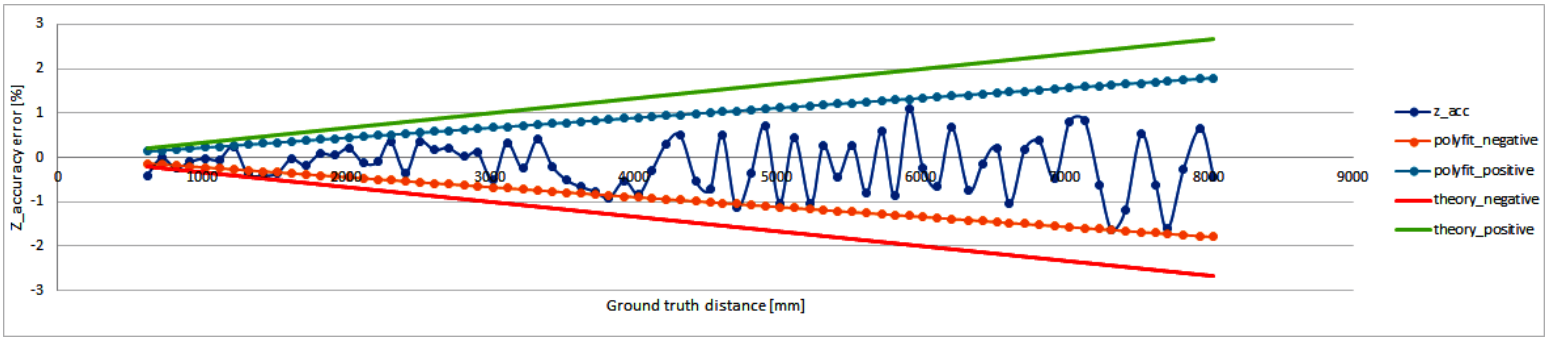
DISTANCE & Z-ACCURACY

NOTE:

Z-STD, Z-DISTORTION, Z-Fill-Rate has little difference for the distance from 1.0 m to 8.0 m.

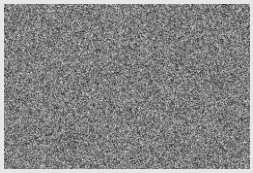
Distance	Z-Accuracy
1 meter	< 0.33%
2 meters	< 0.66%
3 meters	< 0.99%
4 meters	< 1.32%
5 meters	< 1.65%
6 meters	< 2.00%
7 meters	< 2.31%
8 meters	< 2.64%

MEASURED DATA GRAPH



Test Condition:

1. Target to generate depth image: random_target.bmp (image on the right)
2. The same ROI is selected under all measured distances.
3. ROI size: 100 (W) x 50 (H) pixels



random_target.bmp

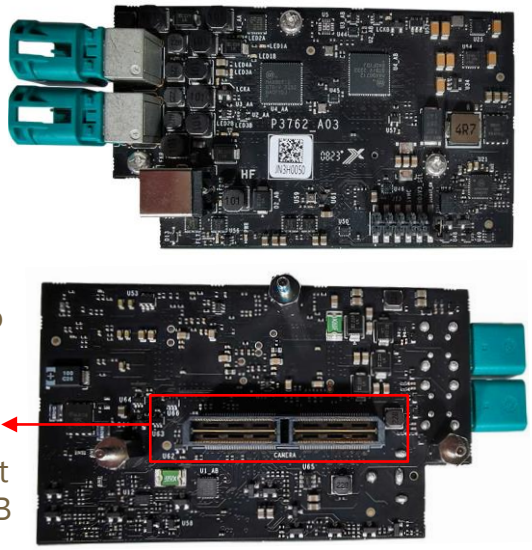
IMAGE ORIENTATION

RECOMMENDED ADAPTER BOARDS

LI-JAG-ADP-GMSL2-8CH:

- Nvidia Part#: P3762_A03
- Supports up to 8 cameras
- DeSerializer: Maxim MAX96712
- Compatible with NVIDIA® Jetson AGX Orin™ Developer Kit and LI-AGO-CB carrier board

For more info, refer to:
https://leopardimaging.com/product/platform-partners/nvidia/nvidia-jetson-orin/agx-orin-cammera-kits/li-jag-adp-gmsl2-8ch/

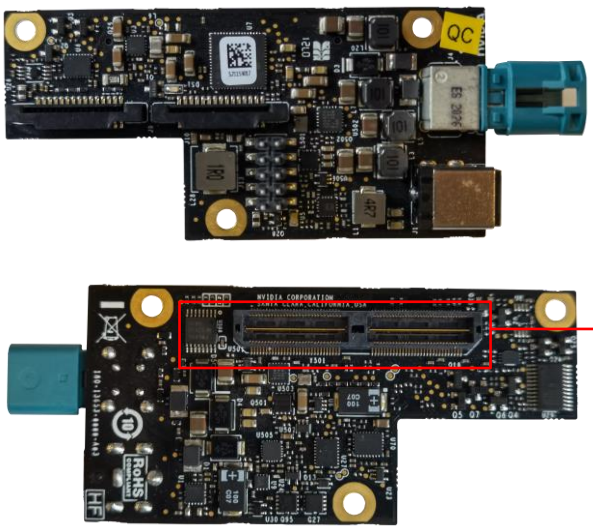


Connector to NVIDIA® Jetson AGX Orin™ Developer Kit or LI-AGO-CB

E3653_A03:

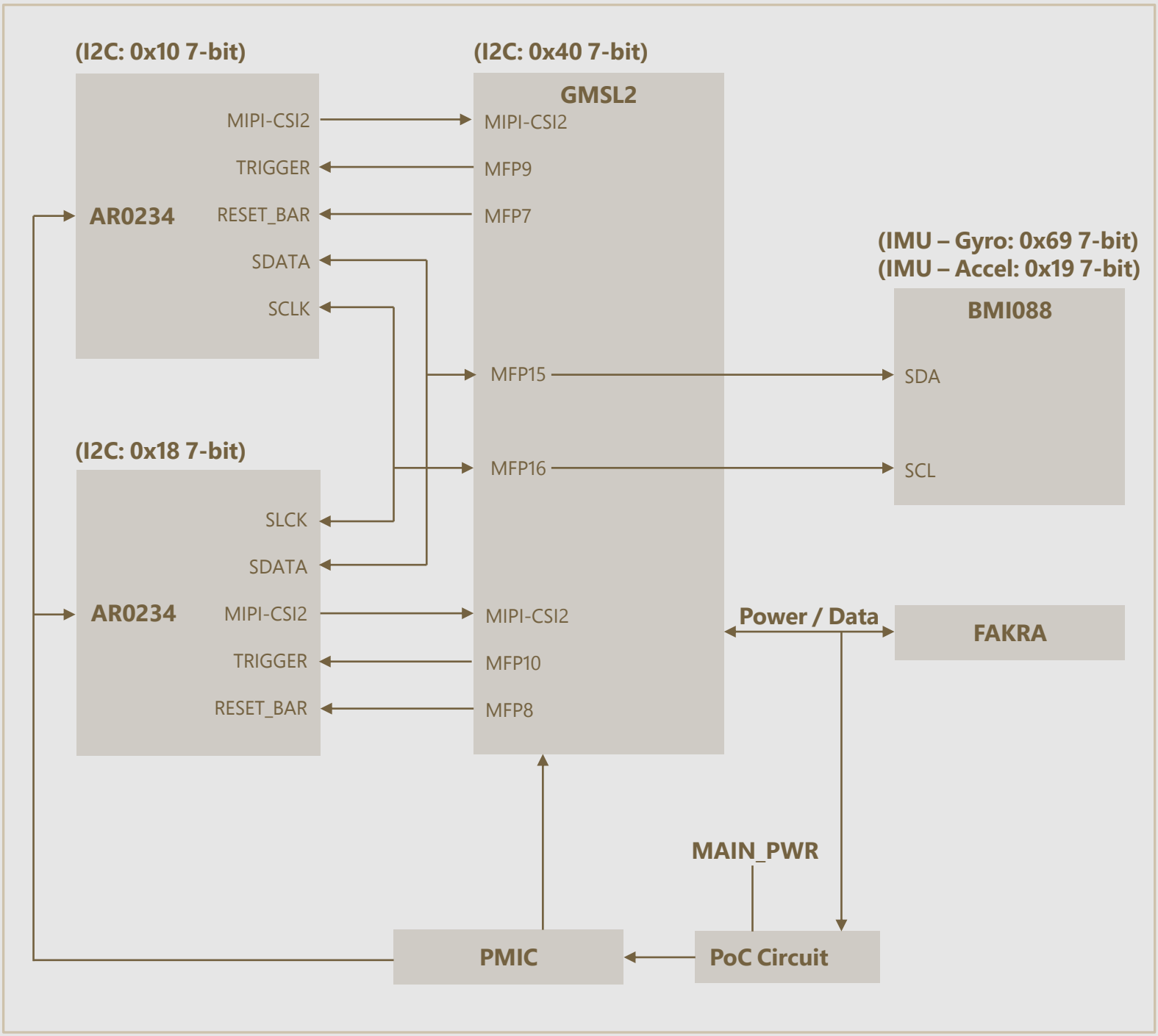
- Supports up to 4 cameras
- DeSerializer: Maxim MAX96712
- Compatible with NVIDIA® Jetson AGX Xavier™ and AGX Orin™ Developer Kit.

For more info, refer to:
https://leopardimaging.com/product/accessories/adapters-carrier-boards/for-nvidia-jetson/e3653-a03/



Connector to NVIDIA® Jetson AGX Xavier™ and AGX Orin™ Developer Kit

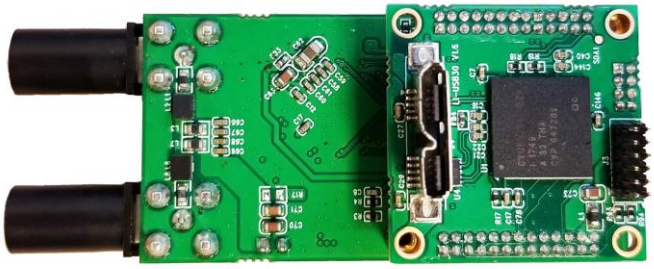
SYSTEM BLOCK DIAGRAM



USB3.0 CAMERA KIT

LI-GMSL2-USB

Top View



Bottom View

LI-AR0234CS-STEREO-GMSL2-30 can connect to LI-GMSL2-USB as a USB 3.0 camera.

Part#: **LI-USB30-AR0234CS-STEREO-GMSL2-30**

SPECIFICATIONS

- USB 3.0 Super Speed support
- UVC compliant
- Global shutter
- Allows customization
- 12 VDC power supply for camera
- Weight: ~ 299 g
- Single Coax Cable transmits up to 12 meters PoC (Power over Cable)
- Power consumption: 86 mA @ 12 VDC
- Resolution: 2 * (1920 × 1200) @ 7.9 fps
- Compatible with Windows, Linux OS and other OS which have UVC drivers

NOTE: LI-USB30-AR0234CS-STEREO-GMSL2-30 syncs RAW images output side by side (no depth processing function)

BOM

#	Items	QTY
1	LI-AR0234CS-STEREO-GMSL2-30	1
2	LI-GMSL2-USB	1
3	3-Meter Fakra Cable	1
4	12 VDC Power Supply	1
5	USB3.0 Cable	1

SDK SUPPORTED

- Camera Tool Source Code in C#
- Capture & Display
- Register Access Function

REVISION HISTORY

Revision	Description	Release Date
1.0	First release.	08 Sep 2022
1.1	Updated power consumption.	21 Nov 2022
1.2	Added the following note on the USB30 page: LI-USB30-AR0234CS-STEREO-GMSL2-30 syncs RAW images output side by side (no depth processing function)	26 Apr 2023
1.3	1. Added section "Recommended Adapter Boards". 2. Replaced block diagram with Pinout Connections.	10 Oct 2023
1.4	Added "Certification" section.	26 Oct 2023
1.5	1. Updated introduction. 2. Added Features & Highlights section and Mounting Mechanism description. 3. Updated Technical Specifications, System Block Diagram and Image Orientation.	26 Feb 2024
1.6	Updated 2D dimensions.	09 Apr 2024
1.7	Updated 2D dimensions.	17 Jul 2024

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