

ADLINK ROScube and ADM Family

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Redefining AI Performance The RQX-59 Series

Elevate Your Robotics And Autonomous Driving Solutions



ADLINK's ROS 2 Solution

ROScube-X RQX-59 Series

- **6 SKU** models available: RQX-590, RQX-59G/F, RQX-590/G/F-E (with expansion box)
- Powered by **NVIDIA Jetson AGX Orin** module with robust AI computing for intelligent robotics development
- **GMSL2** and **FPD-Link III** cameras can achieve **Frame Sync** using RQX-59
- Turnkey solution with **customized BSP** and **drivers** for top 4 camera brands
- Secure **locking USB ports** and **fanless** design



Key Features

RQX-590

Module

- Powered by Jetson AGX Orin module
- 32 GB 256-bit LPDDR5
- 200 TOPS in AI performance
- 64 GB eMMC

I/O

- Extensive I/O for external PPS / GPS Signals
- M.2 Key B 5G/LTE module
- 6 SMA (4 for 5G/LTE; 2 for Wi-Fi 6)

OS

- Ubuntu 20.04 LTS, Jetpack 5.0.2 or above

RQX-59G/F

Cameras

- GMSL2 and FPD-Link III
- Up to 8 cameras at the same time
- Supports top car camera brands

RQX-590/G/F-E

Expansion Box

- 1x PCIe gen4 x16
- 1x PCIe gen3 x4 for 10 GbE
- M.2 adaptor
- Motion control cards expansion

optional



Environments

- IEC 60068-2-64 Vibration
- IEC 60068-2-27 Shock
- 0 to 50°C at full CPU frequency with 0.6m/s airflow

Software

- ROS 1/ ROS 2
- Neuron SDK (for quick start only)

Front Panel I/O Interface

LAN Ports

- IEEE-1588 (PTP) supports synchronization with LiDAR and RQX-59 series

Module

- COM1: RS-232/485
- COM2: RS-232

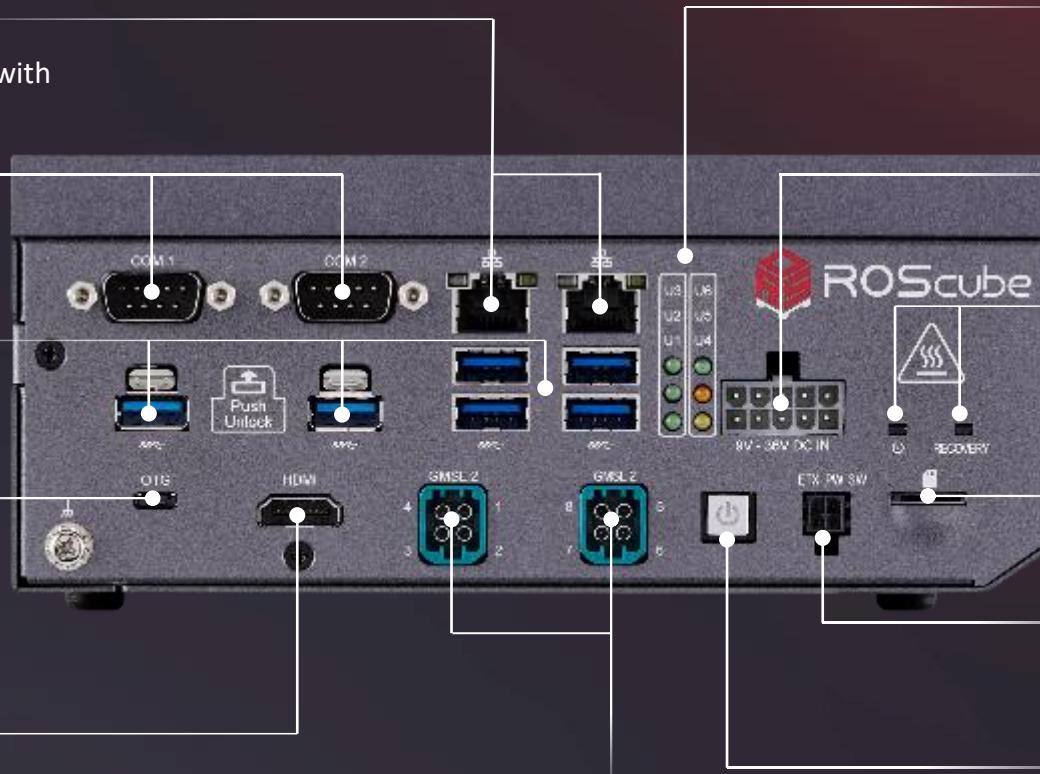
Ruggedized USB 3.0

- 6x USB Type A, includes 2x lockable USB 3.0

On The Go (OTG) Port

- Extra USB Type C
- Modify environment variables
- Transfer data
- Connect to peripherals

HDMI 2.0



Mini FAKRA connectors

- Support maximum 8 GMSL2 or FPD-Link III cameras
- Advanced frame sync technology

LED lights

- 5 user-defined LEDs
- 1 power-on LED

Wide Range DC Input

- From 9 to 36 V

Recovery & Reset Buttons

- 1 Recovery
- 1 Hardware Reset

MicroSD Card Slot

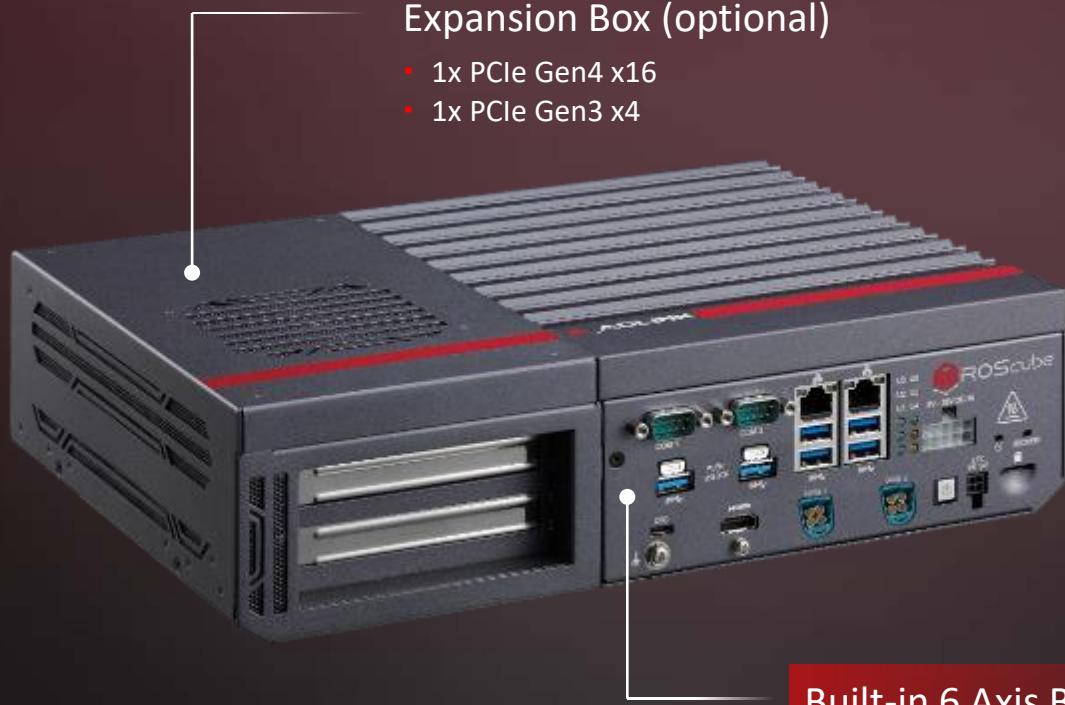
- Extra storage support

Remote Power Button

- Make it easy to turn on/off once installed in the vehicle

Power Switch

Side Panel & Internal I/O Interface



Expansion Box (optional)

- 1x PCIe Gen4 x16
- 1x PCIe Gen3 x4

Built-in 6 Axis BMI 270 IMU

- More accurate and reliable data
- Better stabilization
- Enhanced navigation
- More efficient power usage

Multi I/O

- | | |
|--------------|---------------|
| ▪ UART | ▪ I2C |
| ▪ SPI | ▪ PWM |
| ▪ 1x CAN bus | ▪ 20-bit GPIO |



Audio In/Out

Internal I/O

- M.2 Key M for NVMe SSD Storage
- M.2 Key E for Wi-Fi 6
- M.2 Key B for 5G LTE module
- 1x USIM socket
- 3V 550mAh RTC

Special Offer – ESK with TIER IV

Edge Perception Development Kit

ADLINK and TIER IV have partnered to bring you the [ESK-Edge Perception Development Kit](#), a comprehensive turnkey solution for the seamless development of autonomous driving applications. This kit combines the ADLINK RQX-58G robotic controller with the TIER IV Automotive HDR cameras C1/C2, offering exceptional camera perception capabilities. Designed specifically for high AI computing workloads with minimal power consumption, the Edge Perception Development Kit is the ideal choice for autonomous driving applications. By incorporating TIER IV's C1/C2 cameras, developers can take advantage of a durable GMSL2 controller package that streamlines the establishment of R&D settings. This results in faster and more cost-effective innovation development for businesses across all sectors.

-
- | | |
|----------|---|
| ADLINK | ▶ ROScube-X RQX-58G |
| TIER IV | ▶ C1/C2 cameras |
| Software | ▶ ▪ Ubuntu Linux Kernel with ROS1/ROS2
▪ Autoware
▪ ADLINK Neuron SDK |
-



RQX-59 Series

Validated Cameras and LiDAR for RQX-59 Series

Brands Sensors	GMSL2 Camera (drivers ready)	FPD-Link III Camera (drivers ready)	LiDAR
TIER IV	Automotive HDR camera C1/C2	-	-
StereoLabs	ZED-X/ ZED-X mini	-	-
oToBrite	oToCAM264ISP oToCAM260ISP	oToCAM264ISP oToCAM222	-
Leopard	LI-AR0233-GMSL2(non ISP)	-	-
Outser	-	-	OS1-32

ADLINK ADM Family



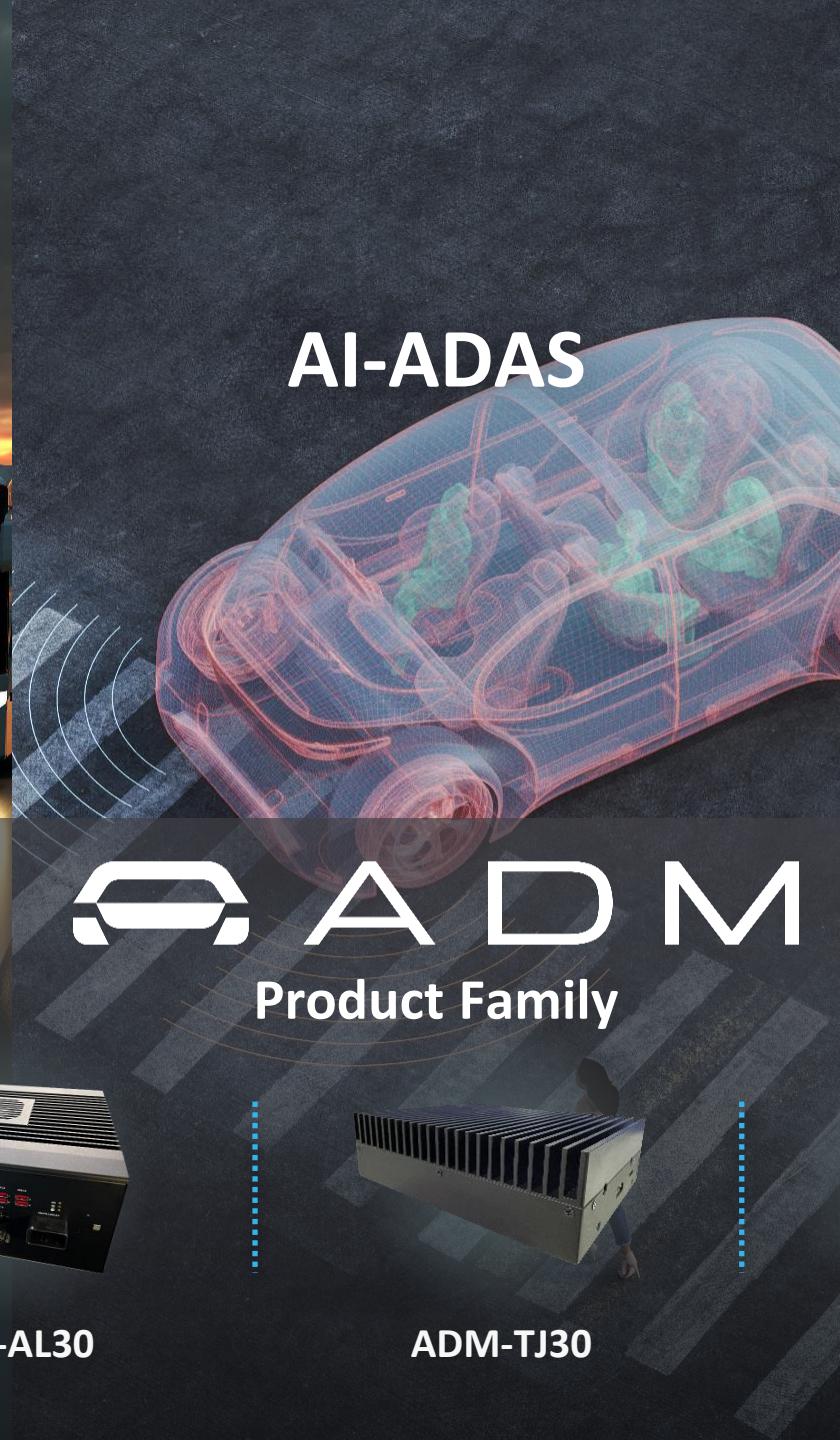
Value Proposition

Σ (AI + Automotive)

Elevate your **fleet** performance with **AI** computing devices,
built for **automotive-grade quality**.



Autonomous



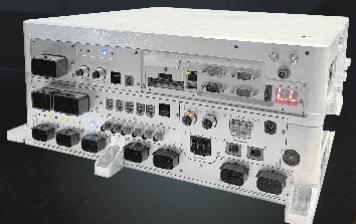
AI-ADAS



Smart Cockpit



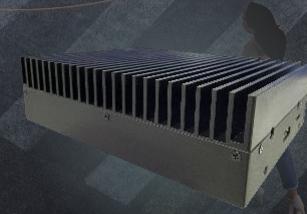
ADM
Product Family



ADM-SR70



ADM-AL30



ADM-TJ30



ADM-IM10



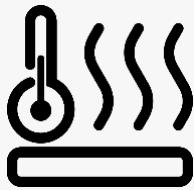
ADM-Q55

Comprehensive Design Capabilities



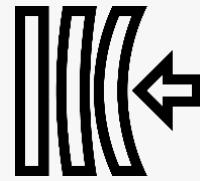
Power Supply

- 2000W+
- 9-36 VDC
- Ignition Control
- Redundant Power



Liquid Cooling

- Liquid Cooled Cold Plate
- Thermal Simulation



Anti-shock and Vibration

- Memory Solder Down
- Automotive Connectors



Certifications

- ISO 16750
- ISO 7637
- ISO 26262
- IATF 16949

Automotive-grade Production Line

Our Taipei Manufactory site hosts a specialized production line meticulously designed for automotive products, following the rigorous standards of **IATF-16949 certification**, ensuring exceptional quality control.

Highlight:

- IATF-16949 certified
- No touch process (transported by P5G AMR)
- Fully manufactured in class 100,000 cleanroom
- Latest equipment that meets Tier 1 requirements:
 - Ersa SMT Reflow: Δt 1°C , Void <20%
 - Ersa Selective Soldering: 100% (Filled %)
 - In Line 3D X-Ray: 100% (Inspection)



ISO 26262 Certified

ISO 26262 is a global standard that specifically addresses the safety of Electronic Control Units (ECUs) in automotive applications, which is widely complied with global automakers.

Our commitment to ISO 26262 means our automotive hardware solutions are built with the highest safety standards, guaranteeing reliability for customers' critical vehicle systems.



Safety Requirements

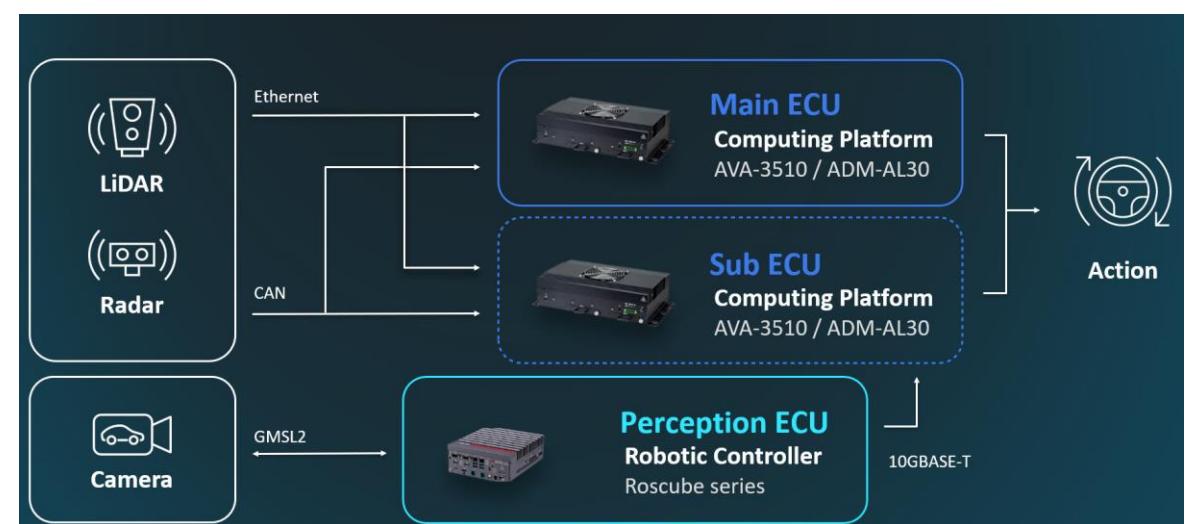
Automotive OEM :

- Companies : GM, Ford, Toyota, BMW ..
- Safety requirements : ISO 26262
- Project type : ODM, Automotive OEM's specific needs
- Cost : higher
- Schedule : longer



After market :

- Companies : most autonomous startups / unicorns
- Safety mechanism : ISO 26262 not mandatory, and depends on architecture e.g. two Main ECU for redundancy, remote monitor and remote driving
- Project type : standard products or ODM



ISO 26262 V-Model Overview

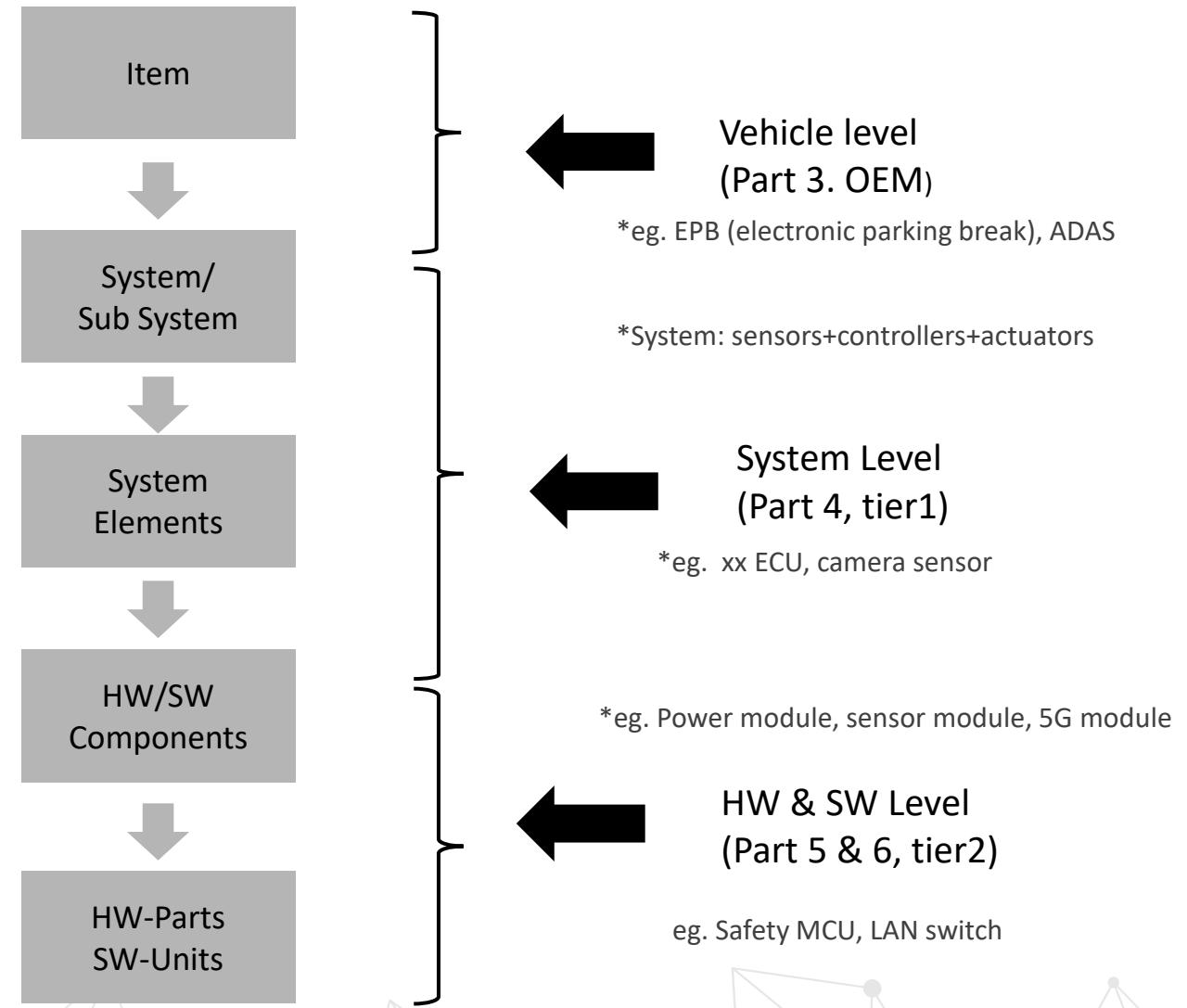
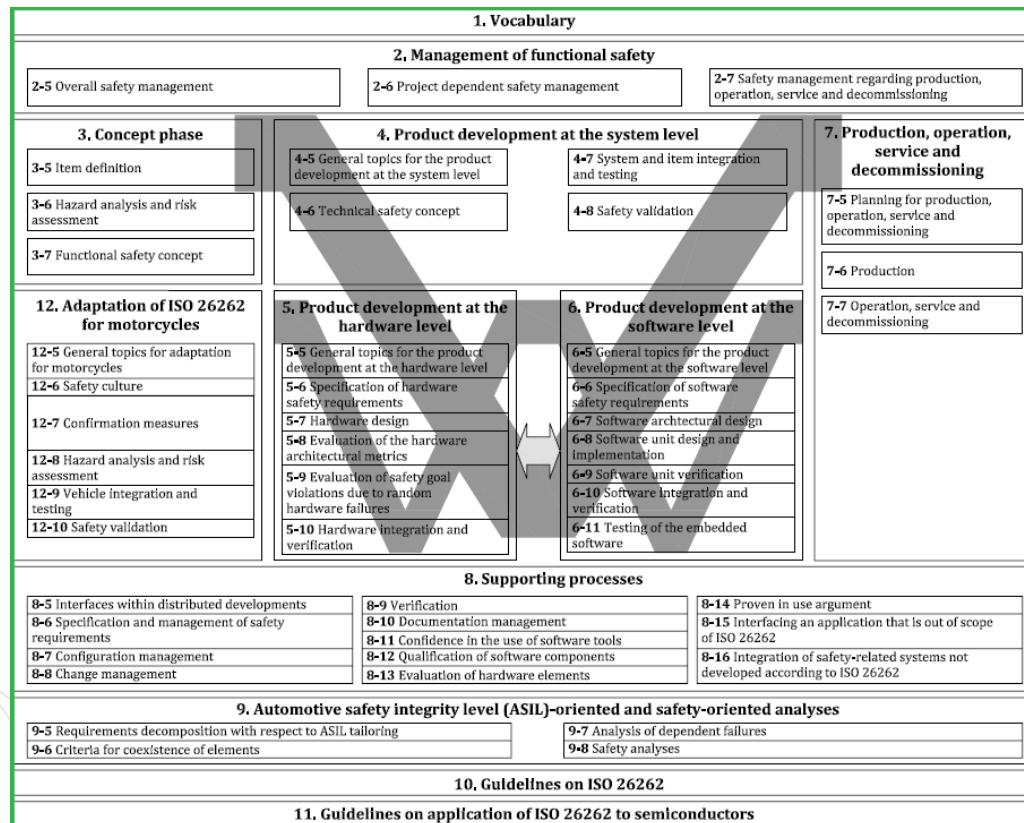
V-Model

Customer: provide safety goal

-Item 3

ADLINK : discuss with customers, break down SW, HW needs and design according to safety goal

-Item 4~10



Autonomous Shuttle Bus

Customers' Requirements

- Targeted scenario: limited area like airports
- Object recognition and perception
- Safety and redundancy
- Anti-shock and vibration design

Why ADLINK

Provides powerful hardware solutions:

- Sensor box: RQX-58G/59G
- CPU box: AVA-3510/ADM-AL30

System designs:

- Anti-shock and vibration



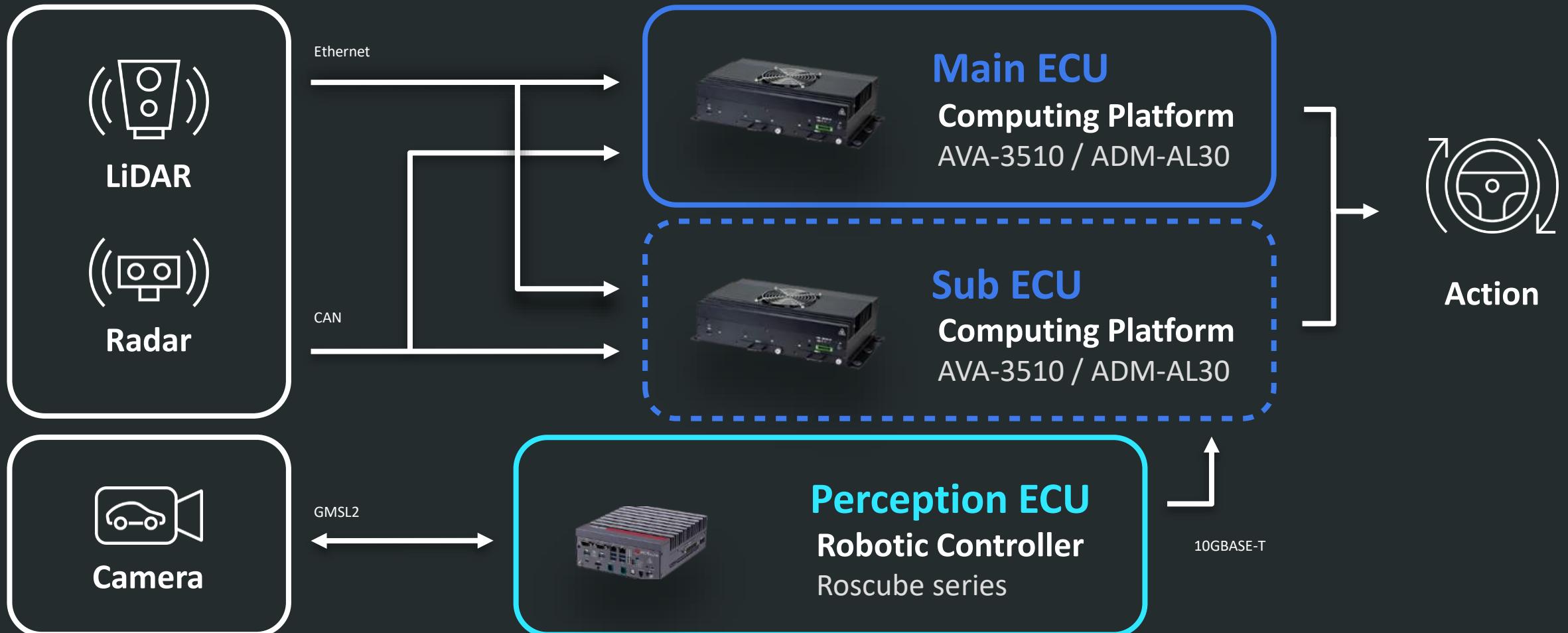
AVA-3510
/ADM-AL30



RQX-58G
RQX-59G



ADLINK Autonomous Driving Architecture

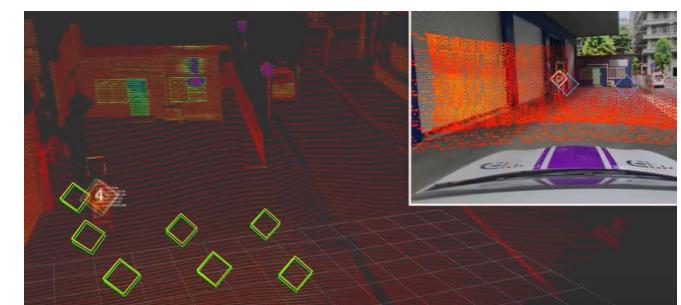
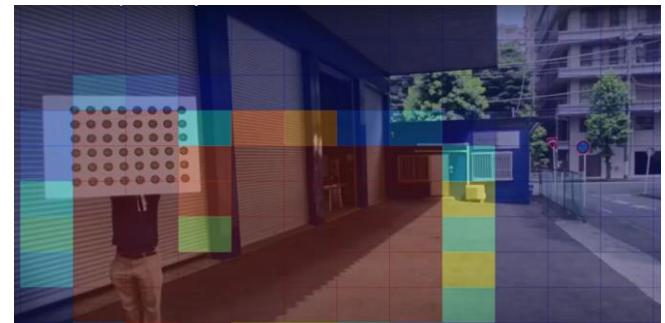


TIER IV and ADLINK : Sensor Fusion Development Kit

Cameras : TIER IV Automotive HDR Camera C1 x2

LiDAR : HESAI XT32 or AT128 x1

ECU : ADLINK RQX-58G and AVA-3510



AVA-3510

Standard Product | Now Available

NVIDIA GPU & Intel® XEON® AI Computing Platform



CPU

Intel® Xeon® E processor



GPU

NVIDIA MXM RTX5000 GPU module



Storage

1x M.2 NVMe 2242 B+M, 2280 M (PCIe)
Option: 2x 2.5" HDD tray



Interfaces

2x 10GbE, 5x GbE
2x USB 3.0 lockable, 2x USB 2.0
2x DB9: COM1/2: RS-232/422/485



Power

9-36 VDC input
Ignition control



Environmental

Standard: -10°C to 55°C



Automotive

2x CAN



NVIDIA GPU and Intel® 12th Gen Core i9/i7 AI Computing Platform



CPU

12th Gen Core i9/i7
Memory: 4x 32G DDR5 ECC



System Support

OS: Ubuntu 22.04
TPM 2.0/ WDT



GPU

RTX 4000 SFF



Automotive

8x CAN FD (by M.2 CAN module)
4x CAN 2.0
Automotive connectors (TE MATEnet, Molex CMC,)



Power

9 - 36 VDC
Ignition control



Environmental

Operating Temperature
W/o GPGPU: -20°C to 60°C
With GPGPU: 0°C to 45°C



Storage

OS: 1x 256G
Logging: 2x 2.5" SATA 256G SSD



Interfaces

2x 10G base-T, 8x 1G base-T1
4x USB 3.2 Gen 2
3x M.2
1x HDMI and 1 X DP



Design Compliance

ISO 16750-2
ISO 7637-2

RQX-59 Series

Standard Product | Now Available

Performance Expandable Robotic Controller



GPU

Jetson AGX Orin



PCIe Slot

1x PCIe Gen 3x 16
1x PCIe Gen 3x 4



Rugged USB ports

Rugged USB ports



Camera

GMSL2 cameras with FAKRA connectors x 8



SD Card Storage

1x SD card storage



Ethernet – IEEE-1588

Standalone LANx 2
IEEE-1588 (PTP)
time synchronized



Rich I/O

1x CANbus w/ isolation
8x DI/DO
2x I2C



Wide range DC input

9 - 36 V



Environmental

IEC 60068-2-64 Vibration
IEC 60068-2-27 Shock
-20 °C to 70 °C wide temperature



Autonomous Truck

Customers' Requirements

- Targeted scenario: Highway
- Integrate with huge amount of sensors
- High performance AI platform for real-time decision making
- Safety and redundancy
- Anti-shock and vibration design

Why ADLINK

Provides powerful hardware solutions:

- Integrated System: ADM-SR70

System designs:

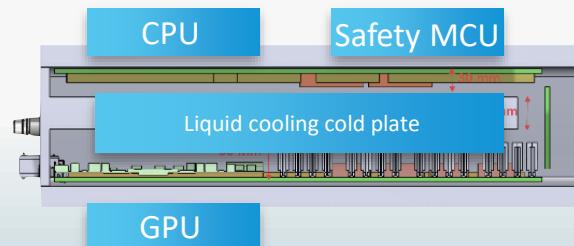
- Anti-shock and vibration
- Liquid cooling solution



ADM-SR70



Integrated Autonomous Driving System with Liquid Cooling



intel. **NVIDIA.**



CPU

Intel Sapphire Rapids
Memory: 128G DDR5 RDIMM



Network

2x 10G BASE-T
10x 1G BASE-T1
6x 100M BASE-T1



GPU

NVIDIA Jetson AGX Orin
RTX 4080x 2



Automotive

CAN: 13x CAN_FD
Camera: 12x GMSL2 cameras
Automotive Connectors



Safety MCU

Infineon TC397



Power

2000W+



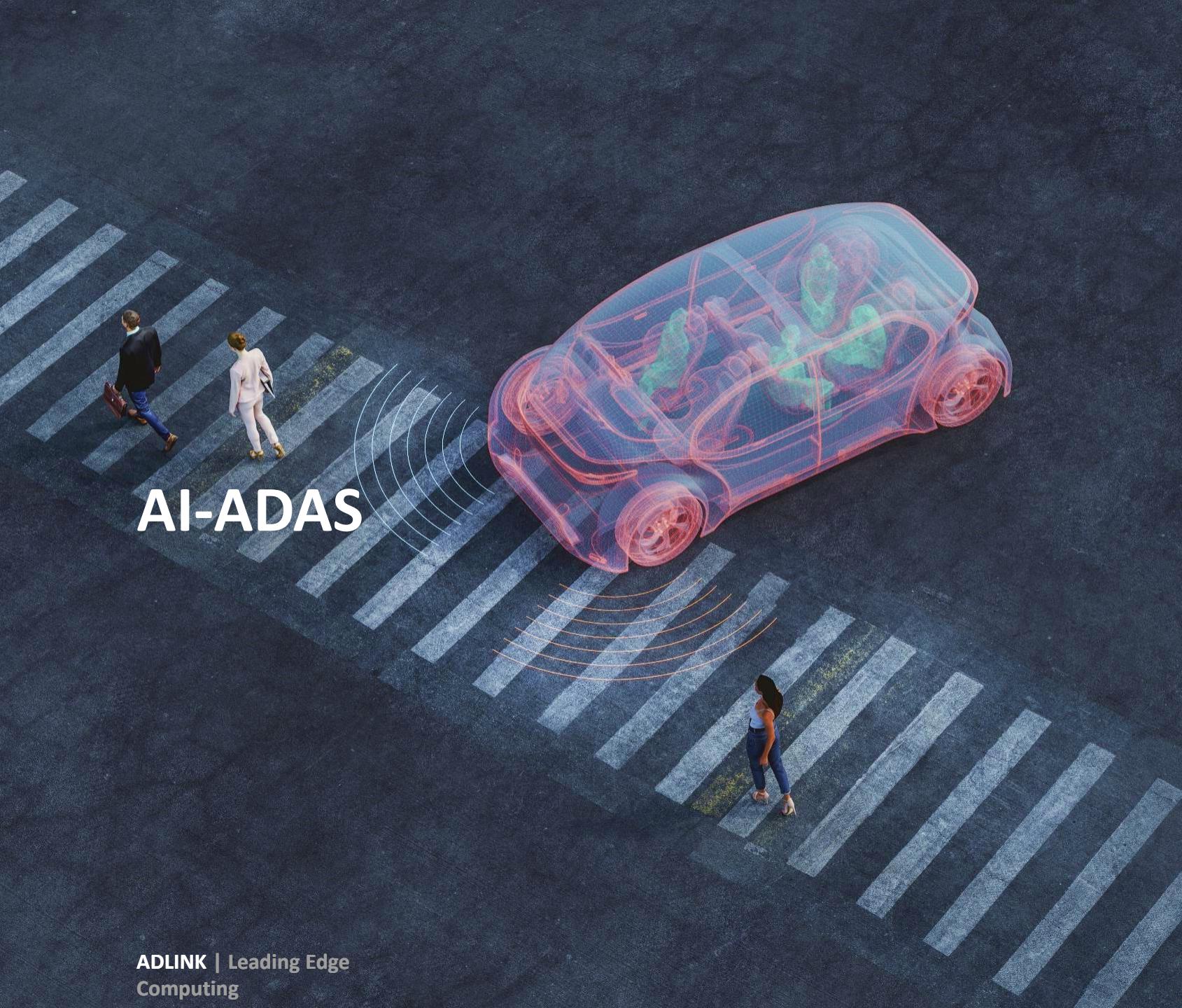
Design Compliance

ISO 16750-2
ISO 7637-2



Thermal

Liquid cooling design



AI-ADAS



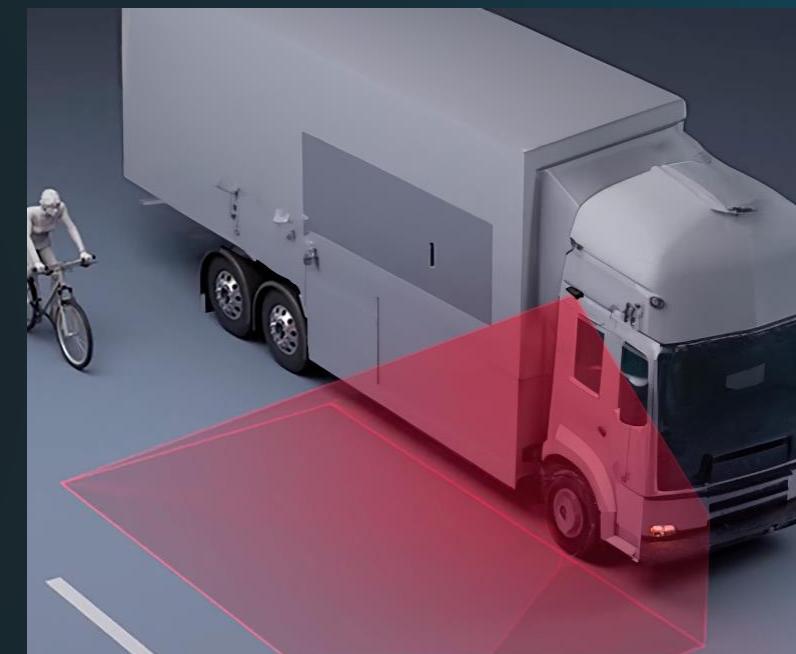
Focus Applications



Fleet Management



Driver Monitoring System



Blind Spot Detection

Fleet Management

Helps fleet operators optimize routes, monitor vehicle performance, ensure driver safety, and improve overall operational efficiency.

Value

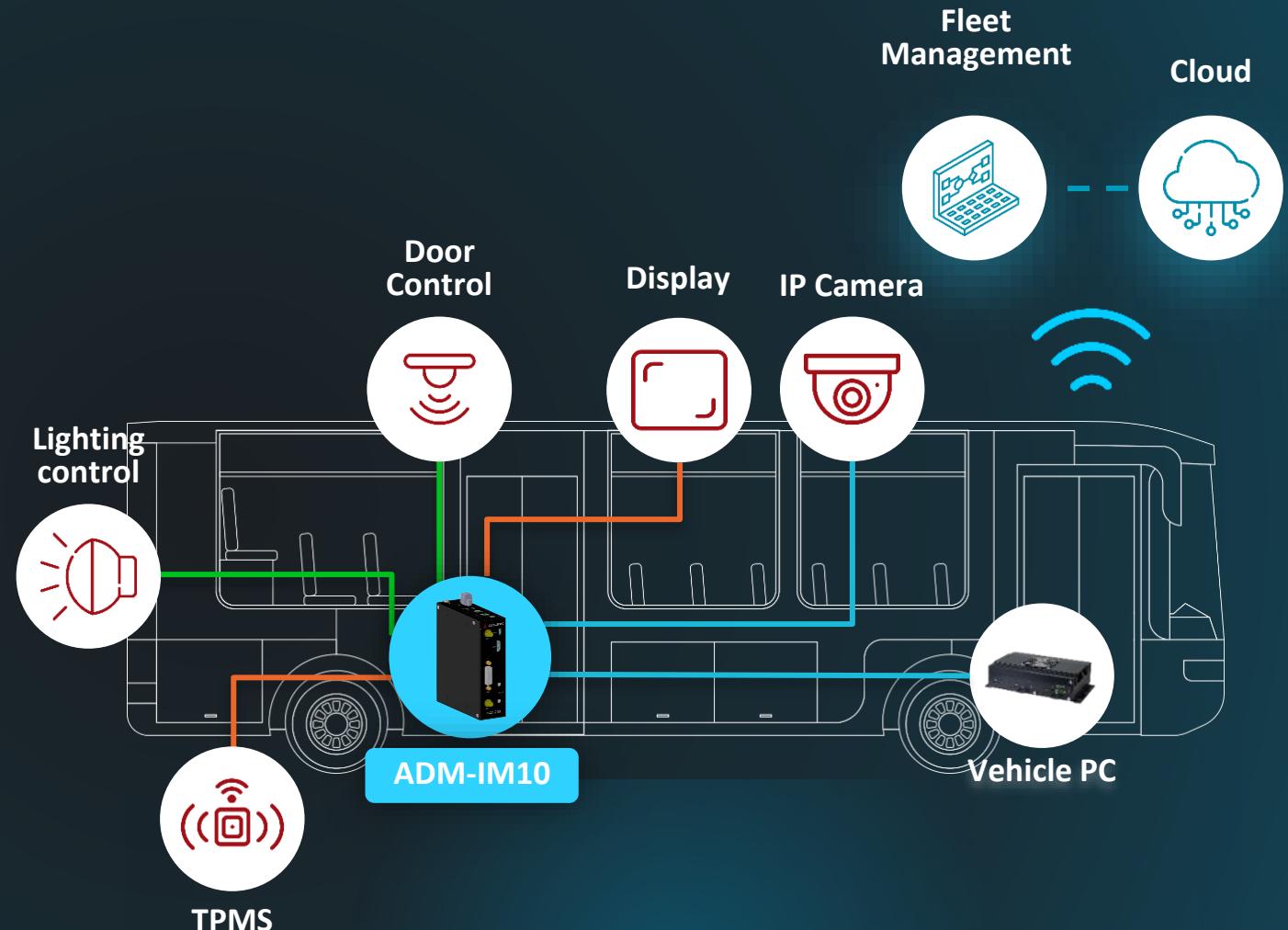
- Enhance dispatching system
- Optimize routes to minimize CO2 emission
- Improve driver safety
- Schedule preventative maintenance to minimize downtime



Fleet Management for public transportation

In public transportation systems, vehicle gateways with sensors can monitor the status of buses. They can provide real-time information on

- Vehicle location
- Passenger occupancy
- Maintenance issues
- Tire-pressure monitoring system
- Payment
- Driver behavior monitoring (acceleration & brake)



Helping improve public transit efficiency and user experience.

Cost Effective i.MX8M Plus ARM Cortex A53 Vehicle Gateway



CPU



i.MX8M Plus ARM Cortex A53 Quad
Core 1.6GHz
Memory : 2GB DDR4 onboard
OS storage: 32GB eMMC onboard

Mechanical Design



Compact size: 130mm(W)x 110mm(D)x 40mm(H)
Weight: 0.4kg

Interfaces



2x 10/100/1000 Mbps Ethernet ports
2x CAN bus, 4x RS232
1x HDMI, 1x Micro-B USB for download
[1x M.2 B Key \(for 4G LTE/5G Module or GNSS\)](#)
1x M.2 E Key (for WiFi/ BT)

Power



9 - 36 VDC, 3-pin terminal block
Support ignition sense
Standby power consumption: @24V consume current under 5mA



Design Compliance

ISO 7637-2

E-mark

Environmental



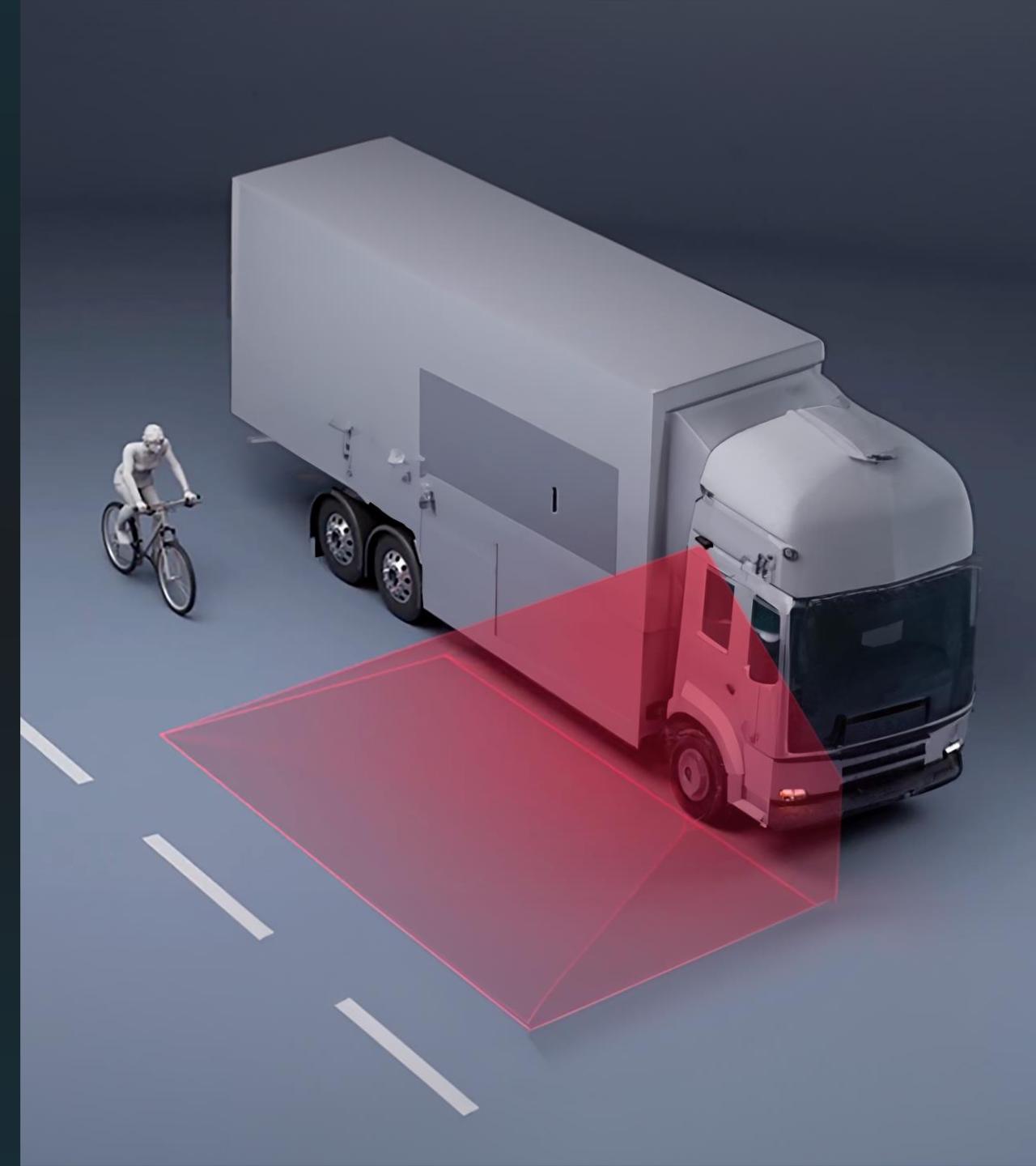
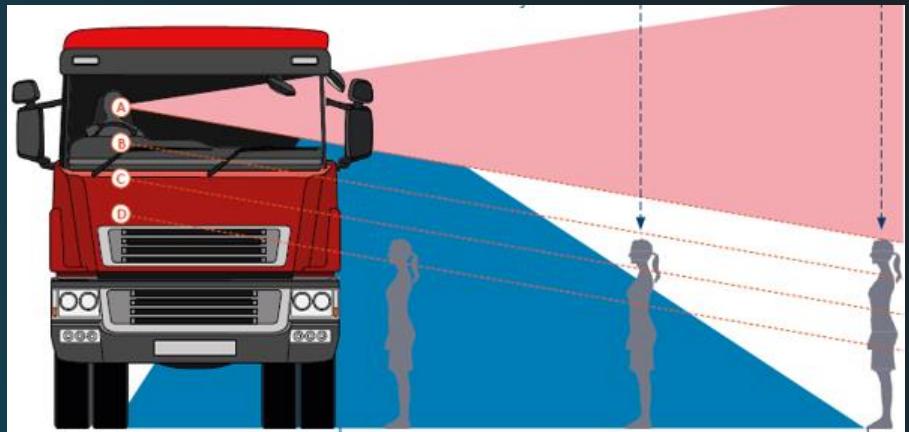
-40°C - 85°C operating temperature
-20°C - 65°C depending on Wi-Fi/ LTE module

Blind Spot Detection

Uses camera sensors installed at the side of the cabin to keep an eye on the detecting zone. By alerting them to potentially hazardous situations, it could assist the driver in changing lanes safely.

Value

- Reduces the risk of accidents when changing lanes by monitoring the dangerous blind spot.



Other ADAS Requirements

ADAS

- AVM: 360 degree surround view
- **BSIS/BSD (UN R151, Direct Vison Standard)**: blind spot system
- **FCW (UN R131)**: forward collision warning
- **LDW (UN R130)**: lane departure warning
- **DMS (GSR, general safety regulation)**: driver monitoring system



AVM: 360 degree surround view



BSIS/BSD: Blind Spot Detection



DMS: Driver Monitoring System



Driver Monitoring System

FCW: Forward Collision Warning



LDW: Lane Departure Warning



AI-ADAS Total Solution

	Existing solution	ADM-TJ30
Solution	<p>Different system from different vendors</p> 	<p>Highly integrated solution</p> 
Number of system	<p>6 (AVM, BSD, BSIS, DMS, FCW/LDW, fleet management)</p>	 1
Supply chain management	Complex with multiple vendors to manage	 Simple
Overall cost	High (product, installation complexity, quality, etc.)	 Low
Quality	Mostly aftermarket or commercial grade	 Automotive grade from domain controller SoC, manufacturing, testing, etc.
Image resolution	<=1M pixels	 1~2M pixels
Time-synced video recording	Not easy to achieve	 <1ms time-synced event triggered video recording
Extension	None	 OTA, Level 2 ADAS functions

Blind Spot Detection and ADAS

for commercial vehicles

HGV Safety Regulation

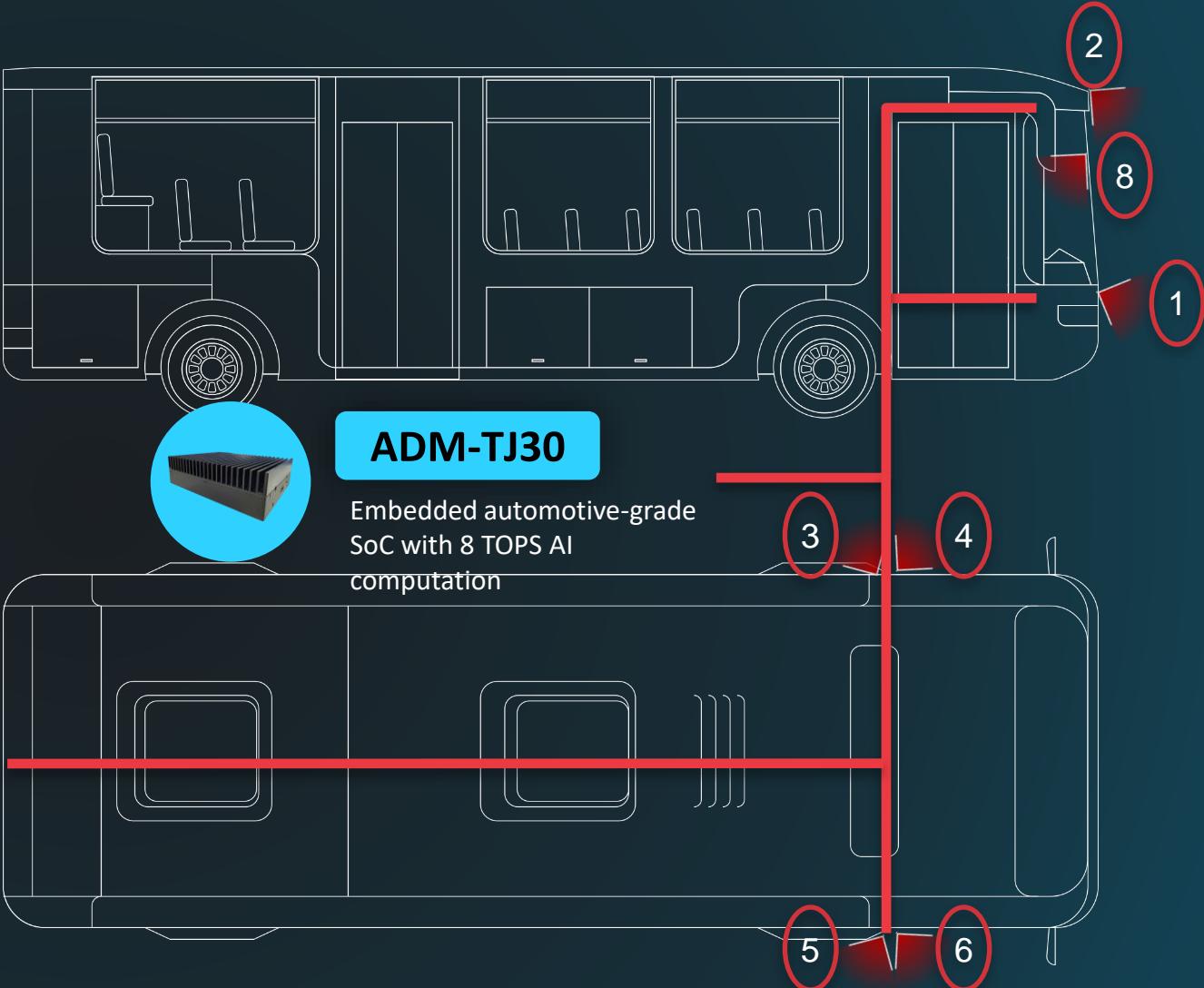
- UK, EU, USA

Solution Ready (HW ECU + Camera + SW)

- BSIS / BSD
- FCW, LDW
- AVM Surround view
- DMS

Why ADLINK

- Reduce TCO : from several ECUs to All-on-one system
- 360-degree and in-cabin ADAS solution with automotive-grade camera & ECU
- Support multiple ADAS functions
- Compact design and fanless for easy deployment



Highly Integrated ADAS Computing Platform



SoC

TI: TDA4 MidEco



Automotive

4x CAN/ CAN-FD
Automotive connectors



Storage

Micro SD card slot



Camera

8x FPD Link cameras



Power

9~32 VDC

Power consumption : 15W



Display

1x Display Port



System Support

OS: TI-RTOS



Environmental

ECU: IP51

Camera: IP67/ 69k

Operating Temperature: -40°~85°C



Interfaces

1x 1G Base-T

1x 100M Base-T1

1x USB 3.0 Type A

3x GPIO



Design Compliance

EMC: ISO 16750-2 / ISO 10605 / VSCC 56-3

Reliability: ISO 16750-4 / IEC 60068



SMART COCKPIT

Smart Cockpit

for HMI experience

It incorporates various digital, electronic, and connectivity features to enhance the driving experience, safety, convenience, and entertainment.

Customers' Requirements

- Needs to support multiple function integration
- Minimize wiring and weight

Why ADLINK

- Enables an extensive domain and function integration for cluster, infotainment, and Advanced Driver Assistance Systems (ADAS)
- Reduces the number of installed control units and extensive wiring harnesses, as it combines all functions in a single box



ADM-Q55



Qualcomm

AUO

ADLINK
LEADING EDGE COMPUTING

ADM-Q55

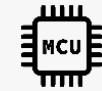
Standard Product | Sample Q4 2024

Smart Cockpit Domain Controller



SoC

SA7255P SoC
QNX OS/Hypervisor + Android Auto



Safety MCU

NXP S32K



Network

Wi-Fi 6
BT 5.2
1000 Base T
[1000 Base T1](#)



Camera

Mini FAKRA- SerDes



Interfaces

USB 3.0/2.0
USB2.0 Type C
[CAN](#)
LIN
RS232



Display

Fakra- SerDes



Audio

A2B
Line out
Mic
AM/FM/DAB



Autonomous



AI-ADAS



Smart Cockpit



ADM
Product Family



ADM-SR70



ADM-AL30



ADM-TJ30



ADM-IM10



ADM-Q55