# EAORA06
# Datasheet

## V 1.0.0

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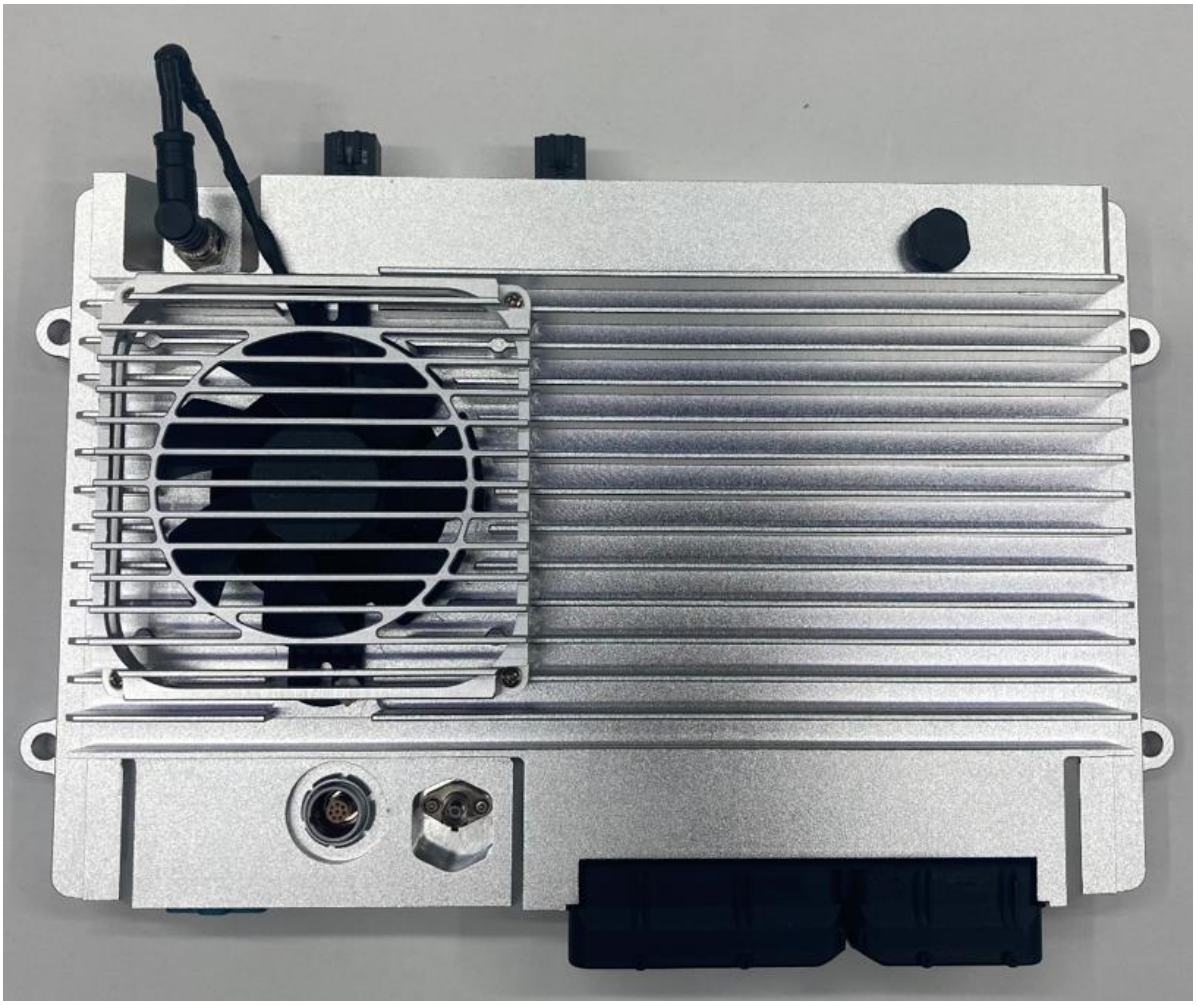
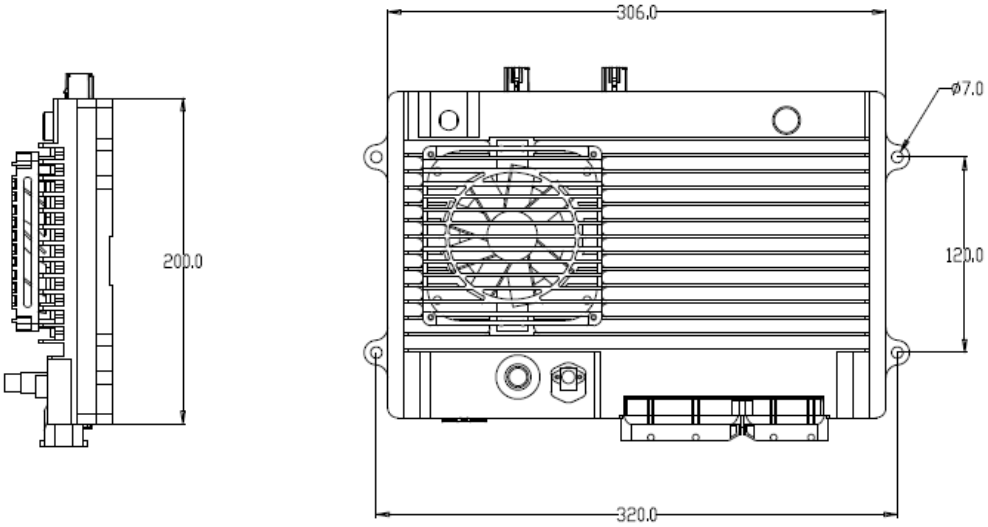
# 1. General Information

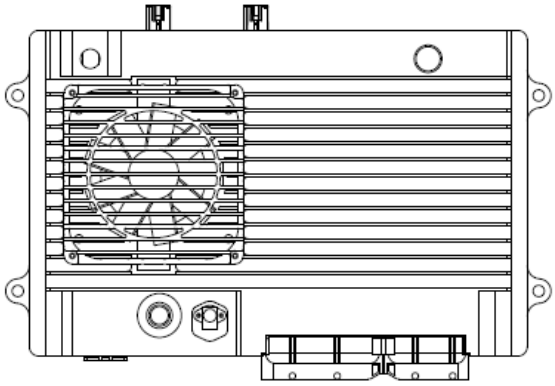
The EAORA06 product is an intelligent computing platform developed by Ecotron Corporation for automatic driving systems. Based on the Orin integrated solution for driving and parking, it is mainly targeting L3-L4 level driving and parking All-in-one solutions. It integrates one NVIDIA ORIN SoC and one Infineon TC397 MCU, combined with high-precision maps, localization, and navigation, it can achieve L3 functions of Highway Pilot HWP, Traffic Jam Pilot TJP, Navigate on Pilot NOP, and L4 functions of Home-Zone Parkin HPA, and Automated Valet Parking AVP.



# 2. Mechanical Properties

## 2.1 Dimensions



## 2.2 Connectors

The connectors used by EAORA06 are qualified automotive rated products. The connector types are summarized in table below:

| # | Connector | Name | Type | Supplier | Link |
|---|---|---|---|---|---|
| 1 | 121P | PCB Mount Header | 1746979-1 | TE | -- |
| 2 | | 81P Housing for Female Terminals | 1473244-1 | TE | http://www.digikey.com/products/en?keywords=1473244-1 |
| 3 | | 40P Housing for Female Terminals | 1473252-1 | TE | http://www.digikey.com/products/en?keywords=1473252-1 |
| 4 | | Automotive Big Terminal | 964273-2 | TE | http://www.digikey.com/products/en?keywords=964273-2%20 |
| 5 | | Automotive Small Terminal | 968220-1 | TE | http://www.digikey.com/products/en?keywords=968220-1 |
| 6 | | 81P Connector Caps & Covers | 1473247-1 | TE | http://www.digikey.com/products/en?keywords=1473247-1 |
| 7 | | 40P Connector Caps & Covers | 1473255-1 | TE | http://www.digikey.com/products/en?keywords=1473255-1 |
| 8 | | 81P Connector Accessories | 368382-1 | TE | http://www.digikey.com/products/en?keywords=368382-1 |
| 9 | | 40P Connector Accessories | 368388-1 | TE | http://www.digikey.com/products/en?keywords=368388-1 |
| 10 | 4-Cavity Waterproof Connector | Board Side | 2404815-1 | TE | |
| 11 | 4-Cavity Waterproof Connector | Board Side | E3SN6A-BMR131-S00 | Amphenol | |
| 12 | Aviation plug | Board-side | EEG.1K.308.CLN | JX | |
| 13 | | Harness-side | FGG.1K.308.CLAC | JX | |
| 14 | | Board-side | M8-F1-S8 | DAOSM | |
| 15 | | Harness-side | M8-D-P8 | DAOSM | |
| 16 | Antenna Port | Waterproof antenna interface | SMA-KKY-22.2MM | YINSAIGE | |

# 3. Quick Start

## 3.1 Preparation

Before using this device, please prepare the following items:

- Stable power supply, 12V DC/ 10A min or 24V DC/ 5A min
- USB to RS-232 adapter
- Laptop

## 3.2 Basic Knowledge

If you are a Linux beginner, it is helpful to learn how to use Linux command line tools. Here is a good Linux tutorial: tutorial.

## 3.3 Get Started

1. Connection

   Connect the positive and negative terminals of the ADCU to a DC power source, and then connect the RS232-3 of the ADCU to PC through the USB to RS-232 adapter. Please make sure that the PC can use the serial port normally.

2. Configuration

   Configure serial port:

   Baud rate: 115200

   8 data bits

   No parity checks

   1 stop bit

   Please use Putty or Minicom to open the serial port.

3. Power-on ADCU

Turn on the ADCU KeyOn switch first and switch on the power supply. The device first starts U-Boot, then runs the Linux system.

If you see the login dialog in the serial terminal window, it indicates that the system starts correctly. The default username and password are as follows:

**Username: *nvidia*  Password: *nvidia***

# 4. Hardware Description

The hardware circuit of the computing platform is designed according to the application requirements of the autonomous driving system. The electrical parameters meet Automotive-grade requirements and have a variety of data transmission interfaces that can meet the needs of sensor fusion for autonomous driving systems. The main chip contains a variety of high-performance computing units to adapt to the computation-intense characteristics of autonomous driving, including sequential and parallel computing.

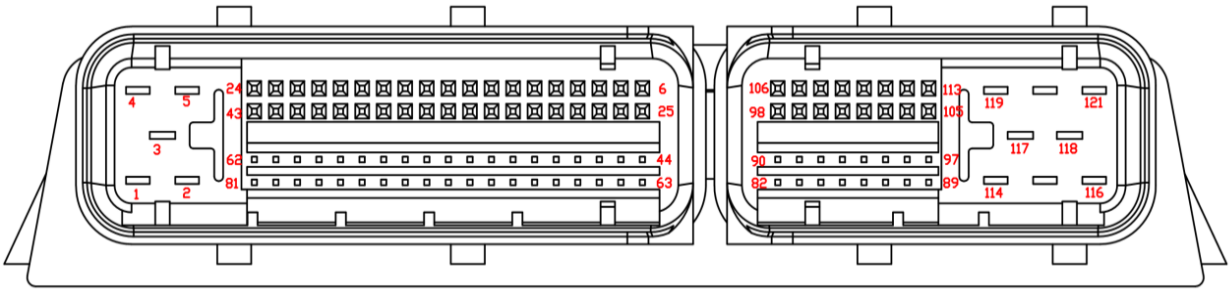
## 4.1 Specifications

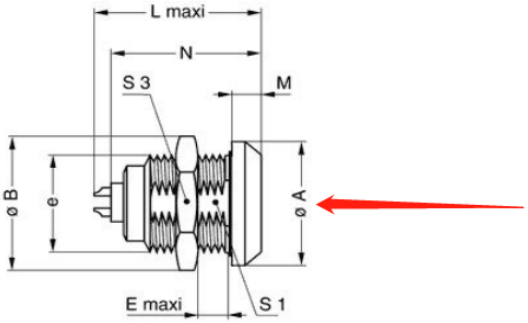
| Item | Parameter |
|---|---|
| Operating voltage | DC 9-32V |
| AI Computation performance | 200 Tops |
| Operation memory | 32GB |
| Storage memory | 64GB, optional expanded SSD |
| Operating temperature | -25 °C to 70 °C |
| Operating humidity | 0 - 95%, no condensation |
| Storage temperature | -40 to 85 °C |
| Dimensions | 335mm*214mm*60mm |
| Weight | ≤3000g |
| Protection level | IP5X |
| Cooling | Air cooling |

## 4.2 Device Ports

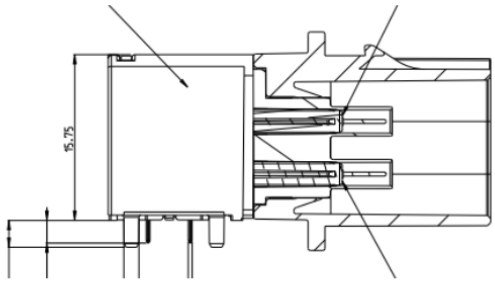
### 4.2.1 Port Distribution

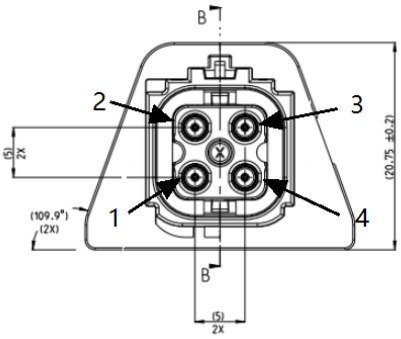
The distribution of input and output ports of the ADCU is shown in the figure below. All the figures are front view.

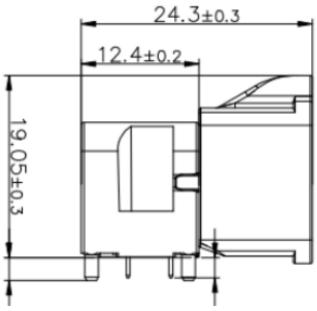


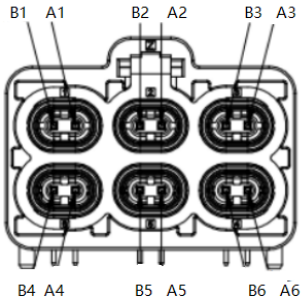





### 4.2.2 Pin Definitions

| Signal Name | PIN | Descriptions | Notes |
|---|---|---|---|
| **ESN1 Automotive Ethernet** | | | |
| P1_MDI_N | E3SN1-A1 | Automotive Ethernet 1 | 1000Base-T1 |
| P1_MDI_P | E3SN1-B1 | | |
| P2_MDI_N | E3SN1-A2 | Automotive Ethernet 2 | 1000Base-T1 |
| P2_MDI_P | E3SN1-B2 | | |
| P67_MDI_N | E3SN1-A3 | Automotive Ethernet 3 | 1000Base-T1 |
| P67_MDI_P | E3SN1-B3 | | |
| P8_MDI_P | E3SN1-A4 | Automotive Ethernet 4 | 1000Base-T1 |
| P8_MDI_N | E3SN1-B4 | | |
| P3_MDI_P | E3SN1-A5 | Automotive Ethernet 5 | 100Base-T1 |
| P3_MDI_N | E3SN1-B5 | | |
| P4_MDI_P | E3SN1-A6 | Automotive Ethernet 6 | 100Base-T1 |
| P4_MDI_N | E3SN1-B6 | | |
| **EEG Standard Ethernet** | | | |
| NPort7_BI_DD+ | EEG1-1 | Standard Ethernet | 100BASE-TX/1000BASE-T |
| NPort7_BI_DD- | EEG1-2 | | |
| NPort7_BI_DC+ | EEG1-3 | | |
| NPort7_BI_DC- | EEG1-4 | | |
| NPort7_BI_DB+ | EEG1-5 | | |
| NPort7_BI_DB- | EEG1-6 | | |
| NPort7_BI_DA+ | EEG1-7 | | |
| NPort7_BI_DA- | EEG1-8 | | |
| **Camera Port** | | | |
| Camera-1 | 2404815-4 | GMSL/GSML2 Serial Camera Port 1 | |
| Camera-2 | 2404815-3 | GMSL/GSML2 Serial Camera Port 2 | |
| Camera-3 | 2404815-2 | GMSL/GSML2 Serial Camera Port 3 | |
| Camera-4 | 2404815-1 | GMSL/GSML2 Serial Camera Port 4 | |
| Camera-5 | 2404815-4 | GMSL/GSML2 Serial Camera Port 5 | |
| Camera-6 | 2404815-3 | GMSL/GSML2 Serial Camera Port 6 | |
| Camera-7 | 2404815-2 | GMSL/GSML2 Serial Camera Port 7 | |
| Camera-8 | 2404815-1 | GMSL/GSML2 Serial Camera Port 8 | |
| **Display Port** | | | |
| HDMI | HDMI | HDMI Display Port | |
| **USB Port** | | | |
| USB Host | USB | USB Port | |
| **Power Positive** | | | |
| BATT | 121P-1 | BATTA Power Positive | BATTA is the main power supply.<br>BATTB is the backup power supply |
| | 121P-3 | | |
| | 121P-115 | | |
| | 121P-116 | BATTB Power Positive | |

| Signal Name | PIN | Descriptions | Notes |
|---|---|---|---|
| | 121P-118 | | |
| | 121P-121 | | |
| **Power Ground** | | | |
| PGND | 121P-2 | Power Negative | |
| | 121P-4 | | |
| | 121P-5 | | |
| | 121P-114 | | |
| | 121P-117 | | |
| | 121P-119 | | |
| | 121P-120 | | |
| **Signal Ground** | | | |
| GND | 121P-36 | Signal Ground | |
| | 121P-45 | | |
| | 121P-57 | | |
| | 121P-59 | | |
| | 121P-63 | | |
| | 121P-64 | | |
| | 121P-65 | | |
| | 121P-82 | | |
| | 121P-87 | | |
| **5V Sensor Power Outputs** | | | |
| 5V-1 | 121P-83 | 5V-1 Sensor power output | Maximum current 100mA |
| 5V-2 | 121P-86 | 5V-2 Sensor power output | Maximum current 100mA |
| **KEYONs** | | | |
| KEYON39 | 121P-39 | KEYON39 | Active-high, control TC397 to power on<br>Logic High trigger |
| KEYON44 | 121P-44 | KEYON44 | Active-high, control ORIN to power on<br>Logic High trigger |
| KEYON56 | 121P-56 | KEYON56 | Active-high, control TC397 to power on<br>Rising edge trigger |
| **Analog Inputs** | | | |
| AI01 | 121P-42 | Analog signal input 0~5V (voltage type) | 12 bits Accuracy |
| AI02 | 121P-60 | Analog signal input 0~5V (voltage type) | 12 bits Accuracy |
| AI03 | 121P-43 | Analog signal input (resistor type) | 12 bits Accuracy |
| AI04 | 121P-24 | Analog signal input (resistor type) | 12 bits Accuracy |
| AI13 | 121P-62 | Analog signal input 0~36V (resistor type) | 12 bits Accuracy |
| AI14 | 121P-40 | Analog signal input 0~36V (resistor type) | 12 bits Accuracy |

| Signal Name | PIN | Descriptions | Notes |
|---|---|---|---|
| **Digital Inputs** | | | |
| DI01 | 121P-20 | Digital Input 0~BATT | Active-High |
| DI02 | 121P-58 | Digital Input 0~BATT | Active-High |
| DI03 | 121P-77 | Digital Input 0~BATT | Active-Low |
| DI04 | 121P-38 | Digital Input 0~BATT | Active-Low |
| DI21 | 121P-74 | Digital Input 0~BATT | Active-High |
| DI22 | 121P-16 | Digital Input 0~BATT | Active-High |
| **Output Signals** | | | |
| HSO01 | 121P-88 | Rated 0.5A，Max 1A | |
| HSO02 | 121P-89 | Rated 0.5A，Max 1A | |
| HSO03 | 121P-97 | Rated 1A，Max1.5A | |
| HSO04 | 121P-96 | Rated 1A，Max1.5A | |
| LSO01 | 121P-101 | Rated 250mA | |
| LSO02 | 121P-94 | Rated 250mA | |
| LSO03 | 121P-90 | Rated 250mA | |
| LSO04 | 121P-92 | Rated 250mA | |
| LSO05 | 121P-110 | Rated 250mA | |
| LSO06 | 121P-103 | Rated 250mA | |
| LSO07 | 121P-109 | Rated 250mA | |
| LSO08 | 121P-107 | Rated 250mA | |
| **Serial Communication Ports** | | | |
| CAN_A_H | 121P-27 | Without 120 Ω terminal resistor | Support CANFD, Specific frame wake-up. Correspond to CANA in EcoCoder |
| CAN_A_L | 121P-28 | | |
| CAN_B_H | 121P-9 | Without 120 Ω terminal resistor | Support CANFD, Specific frame wake-up. Correspond to CANB in EcoCoder |
| CAN_B_L | 121P-10 | | |
| CAN_C_H | 121P-31 | With 120 Ω terminal resistor | Support CANFD. Correspond to CANC in EcoCoder |
| CAN_C_L | 121P-32 | | |
| CAN_D_H | 121P-11 | With 120 Ω terminal resistor | Support CANFD. Correspond to CAND in EcoCoder |
| CAN_D_L | 121P-12 | | |
| CAN_E_H | 121P-29 | With 120 Ω terminal resistor | Support CANFD. Correspond to CANE in EcoCoder |
| CAN_E_L | 121P-30 | | |
| CAN_F_H | 121P-13 | With 120 Ω terminal resistor | Support CANFD. Correspond to CANF in EcoCoder |
| CAN_F_L | 121P-14 | | |
| CAN_G_H | 121P-18 | With 120 Ω terminal resistor | Support CANFD. Correspond to CANG in EcoCoder |
| CAN_G_L | 121P-17 | | |

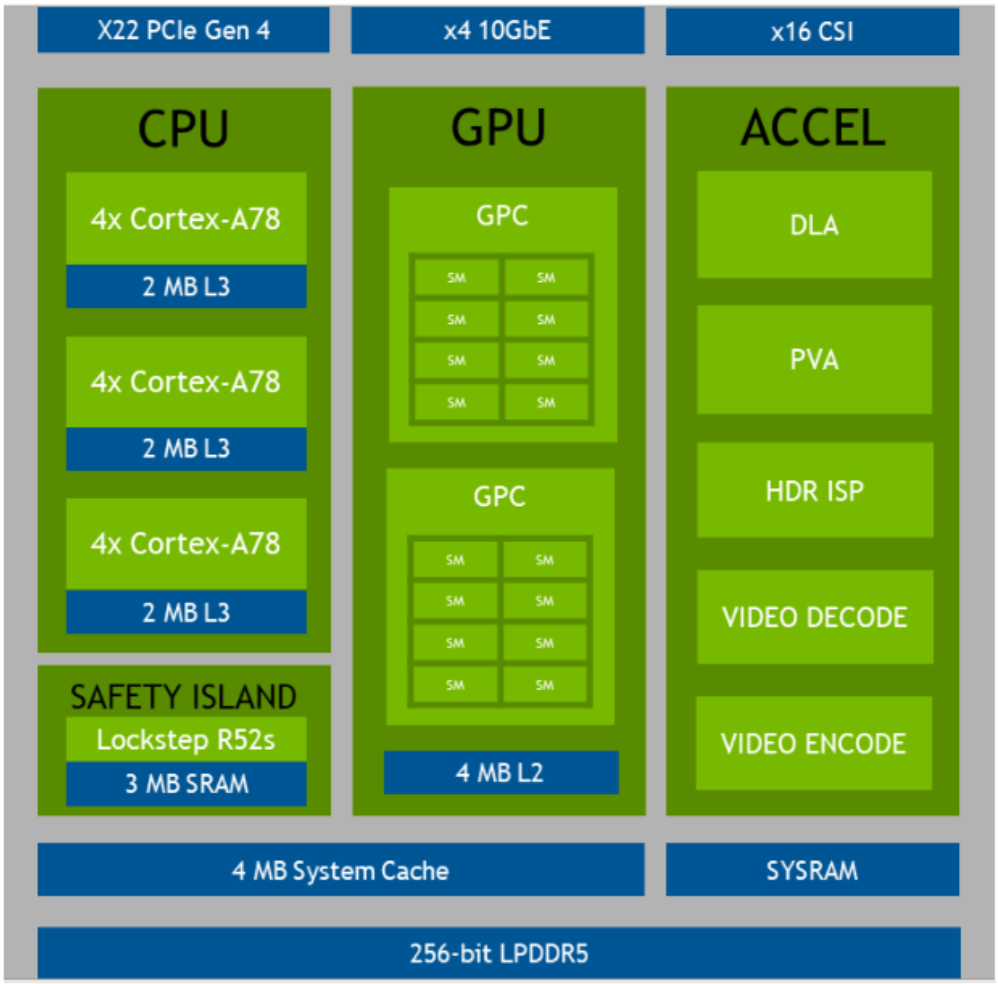
| Signal Name | PIN | Descriptions | Notes |
|---|---|---|---|
| CAN_H_H | 121P-22 | With 120 Ω terminal resistor | Support CANFD.<br>Correspond to CANH in EcoCoder |
| CAN_H_L | 121P-21 | | |
| SOC_CANB_H | 121P-48 | Without 120 Ω terminal resistor | Support CANFD.<br>Correspond to CAN0 of ORIN |
| SOC_CANB_L | 121P-67 | | |
| SOC_CANA_H | 121P-47 | Without 120 Ω terminal resistor | Support CANFD.<br>Correspond to CAN1 of ORIN |
| SOC_CANA_L | 121P-66 | | |
| CAN_H_LG69T | 121P-33 | With 120 Ω terminal resistor | Support CAN.<br>Used for GNSS interaction |
| CAN_L_LG69T | 121P-34 | | |
| CAN_SHILD-1 | 121P-46 | CAN Shield | |
| CAN_SHILD-2 | 121P-8 | CAN Shield | |
| LIN_BUS0 | 121P-6 | LIN0 Bus | |
| LIN_BUS1 | 121P-26 | LIN1 Bus | |
| LIN_BUS2 | 121P-7 | LIN2 Bus | |
| LIN_BUS3 | 121P-25 | LIN3 Bus | |
| LIN_BUS4 | 121P-61 | LIN4 Bus | |
| LIN_BUS5 | 121P-55 | LIN5 Bus | |
| RS232_1_TXD | 121P-52 | RS-232 serial port 1 | Orin ttyTHS0 |
| RS232_1_RXD | 121P-71 | | |
| RS232_2_TXD | 121P-69 | RS-232 serial port 2 | Orin ttyTHS4 |
| RS232_2_RXD | 121P-50 | | |
| RS232_3_TXD | 121P-51 | RS-232 serial port 3 | Orin ttyTCU0 used for Debug by default |
| RS232_3_RXD | 121P-70 | | |
| RS232_4_TXD | 121P-68 | RS-232 serial port 4 | Orin ttyTHS3 |
| RS232_4_RXD | 121P-49 | | |
| RS232_TXD_LG69T | 121P-72 | RS-232 serial port for GNSS | Used for GNSS interaction |
| RS232_RXD_LG69T | 121P-73 | | |
| **Ultrasonic Radar Ports** | | | |
| USS1 | 121P-108 | IO interface of radar 1 | |
| USS2 | 121P-100 | IO interface of radar 2 | |
| USS3 | 121P-99 | IO interface of radar 3 | |
| USS4 | 121P-112 | IO interface of radar 4 | |
| USS5 | 121P-105 | IO interface of radar 5 | |
| USS6 | 121P-113 | IO interface of radar 6 | |
| USS7 | 121P-106 | IO interface of radar 7 | |
| USS8 | 121P-98 | IO interface of radar 8 | |
| USS9 | 121P-91 | IO interface of radar 9 | |
| USS10 | 121P-102 | IO interface of radar 10 | |
| USS11 | 121P-111 | IO interface of radar 11 | |
| USS12 | 121P-104 | IO interface of radar 12 | |
| USS-POWER1 | 121P-37 | VCC interface of Group 1st radar | |
| USS-POWER2 | 121P-41 | VCC interface of Group 2nd radar | |
| USS-POWER3 | 121P-53 | VCC interface of Group 3rd radar | |

| Signal Name | PIN | Descriptions | Notes |
|---|---|---|---|
| USS-POWER4 | 121P-54 | VCC interface of Group 4th radar | |
| USS-GND | 121P-93 | The GND interface of the 1st and 2nd group radar | |
| USS-GND | 121P-95 | The GND interface of the 3rd and 4th group radar | |
| **Others** | | | |
| PPS_IN | 121P-23 | Second pulse synchronization input signal | ORIN-A, Support 5V-16V |
| PPS_OUT1 | 121P-81 | Second pulse synchronization input signal | ORIN, 5V Output |
| PPS_OUT2 | 121P-80 | Second pulse synchronization input signal | ORIN, 5V Output |
| PPS_OUT3 | 121P-79 | Second pulse synchronization input signal | ORIN, 5V Output |
| PPS_OUT4 | 121P-78 | Second pulse synchronization input signal | ORIN, 5V Output |

## 4.3 System Main Chip

The main chip of EAORA06 is NVIDIA Jetson AGX Orin, which is designed specifically for embedded autonomous driving control systems. The computing performance of different internal processors is listed below:

- AI performance: 200 INT8 Sparse TOPs
- CPU: 8 core Cortex A78 ARM 64-bit CPU, 2 clusters (4x 256KB L2 + 2MB L3) + 4MB L4
- Deep Learning Accelerator (DLA)： 2x NVDLA 2.0 Engines (48 TOPs each)
- GPU: NVIDIA Ampere Architecture with 2048 NVIDIA ® CUDA ® cores and 64 Tensor Cores. (108 Sparse INT8 TOPs)
- Vision accelerator： 1x PVA v2
- Image Signal Processor (ISP)： 1.85 Giga Pixels/s



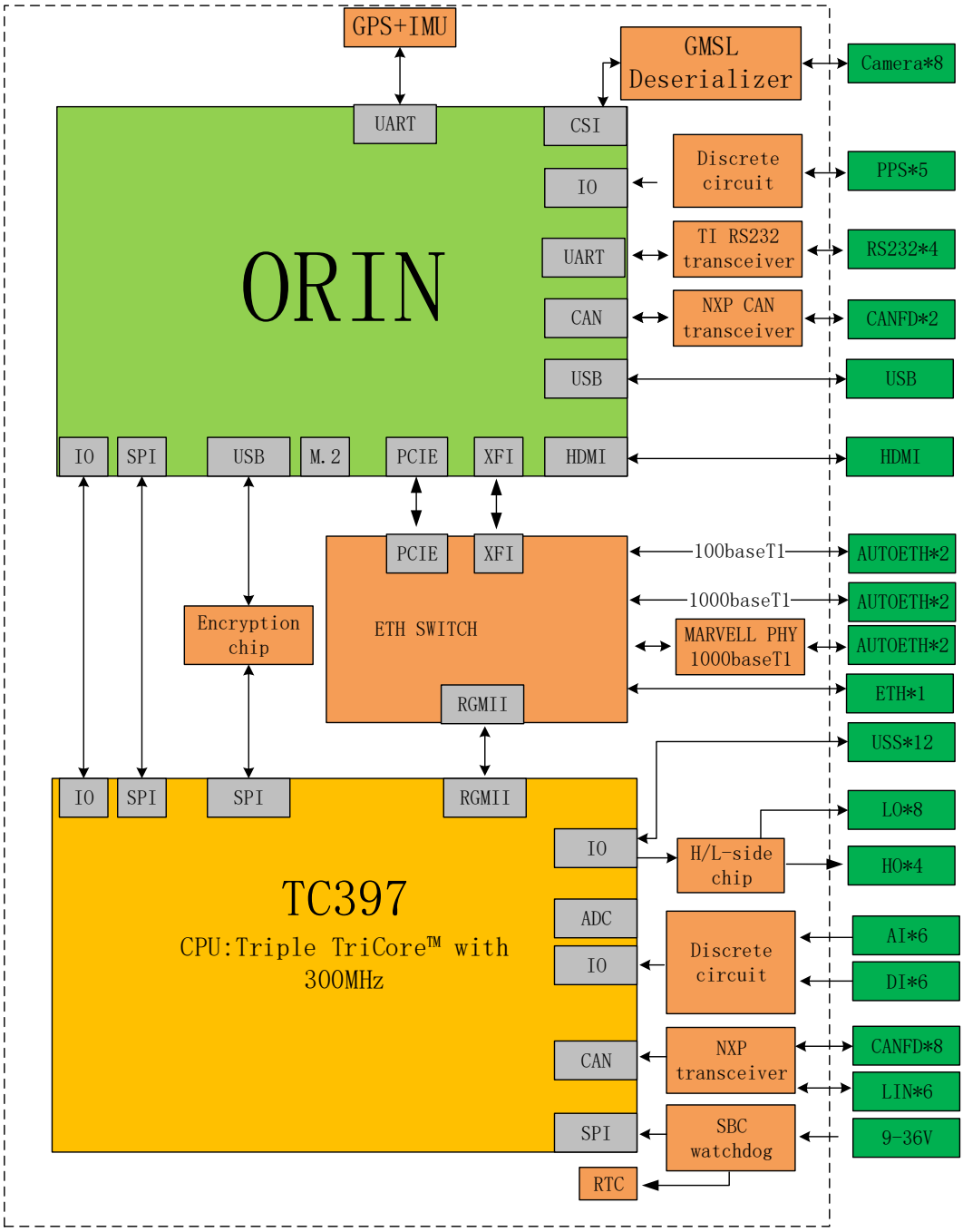

The microcontroller used in EAORA06 is Infineon TC397 which has a TriCore™ architecture, working at 300MHz and has an ECC (Error Correction Code) protected RAM with a capacity of up to 2.9MB + 16MB, designed based on ISO26262, supporting up to ASIL-D. By working with a system basic chip (SBC), it can achieve the hardware core safety architecture. The chip specs are shown below:

| **Feature** | **Detail** |
|---|---|
| Micro Control Core | 32-bit Infineon TC397XP |
| Maximum Frequency | 300MHz |
| Flash | 16M |
| SRAM | 2.9MB |

| | |
|---|---|
| EEPROM | 128K |
| Float Point Capability | Yes |
| SBC | TLF35584 |

## 4.4 Circuit Structure

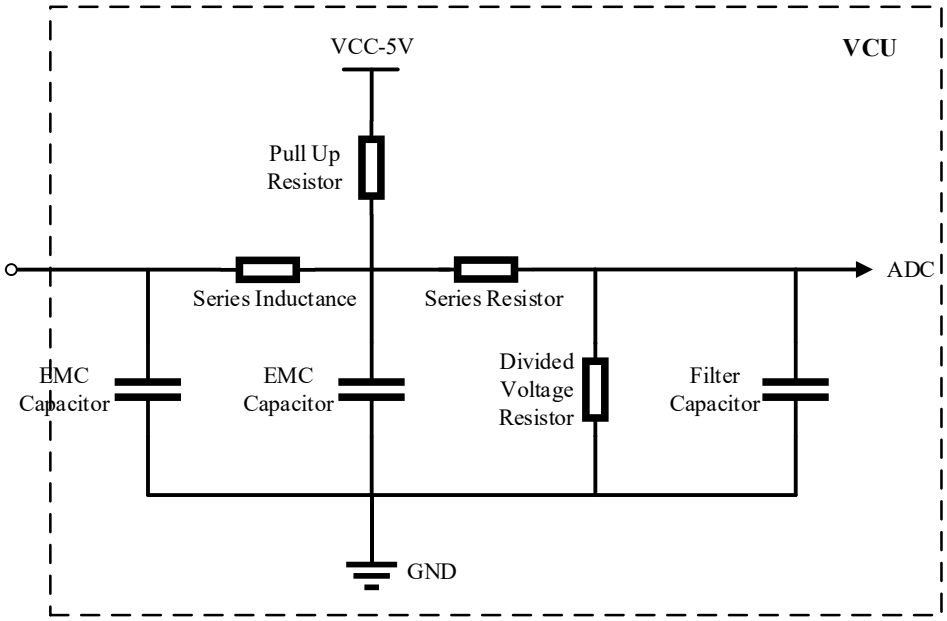
The internal circuit structure of EAORA06 is shown below:



## 4.5 Circuit Description

### 4.5.1 Analog Input

The analog input channel circuit has the same structure, the circuit schematic and circuit details are shown below:



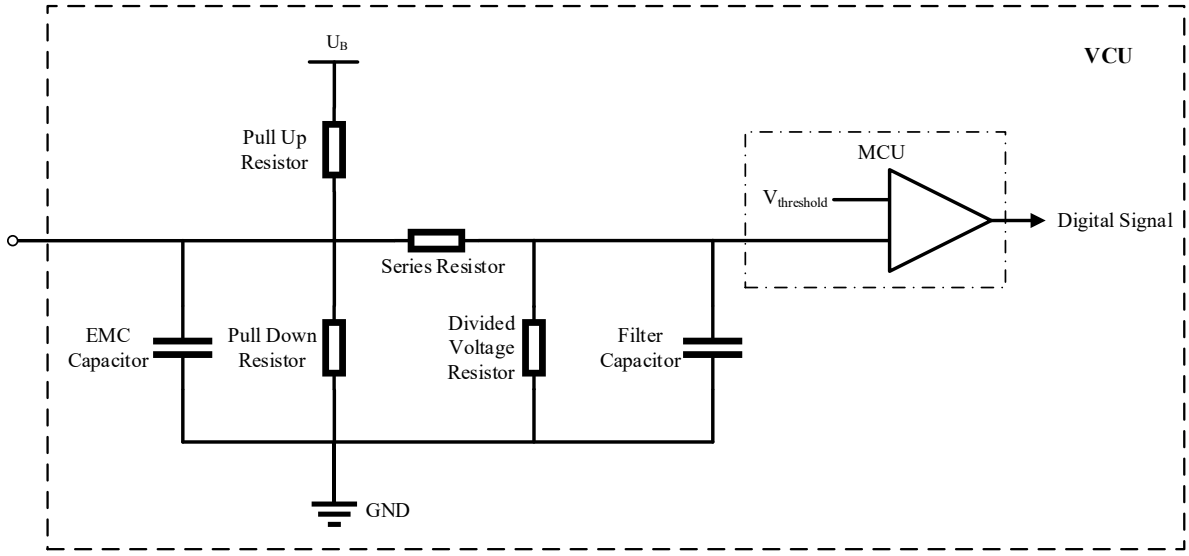

| Pin # | AI | EMC Capacitor | Pull Up Resistor | Series Resistor | Divided Voltage Resistor | Filter Capacitor | Input Range | | Conditions / Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | (F) | to 5V (Ohm) | (Ohm) | (Ohm) | (F) | Min | Max | |
| 42 | AI01 | 100n | -- | 22k | -- | 1n | 0V | 5V | |
| 60 | AI02 | 100n | -- | 22k | -- | 1n | 0V | 5V | |
| 43 | AI03 | 100n | 10k | 22k | -- | 1n | -- | -- | Resistance type |
| 24 | AI04 | 100n | 10k | 22k | -- | 1n | -- | -- | Resistance type |
| 62 | AI13 | 100n | -- | 22k | 3.48k | 1n | 0V | 32V | |
| 40 | AI14 | 100n | -- | 22k | 3.48k | 1n | 0V | 32V | |

Note:

1) "--" means not installed.
2) $U_B$ represents the BATT voltage of the power supply.
3) AI28 acquires BATT voltage signal.

### 4.5.2 Digital Input

The digital input channel circuit has the same structure, the circuit schematic and circuit details are shown below:




| Pin # | DI | Pull Up Resistor | Pull Down Resistor | Operation Threshold for Input Signal | | Input Range | | Conditions/ Remarks |
|---|---|---|---|---|---|---|---|---|
| | | to $U_B$(Ohm) | (Ohm) | $V_{low}$ | $V_{high}$ | Min | Max | |
| 20 | DI01 | -- | 10k | 3V | 8.5V | 0V | $U_B$ | Active High |
| 58 | DI02 | -- | 10k | 3V | 8.5V | 0V | $U_B$ | Active High |
| 77 | DI03 | 10k | -- | 3V | 8.5V | 0V | $U_B$ | Active Low |
| 38 | DI04 | 10k | -- | 3V | 8.5V | 0V | $U_B$ | Active Low |
| 74 | DI21 | -- | 10k | 3V | 8.5V | 0V | $U_B$ | Active High |
| 16 | DI22 | -- | 10k | 3V | 8.5V | 0V | $U_B$ | Active High |

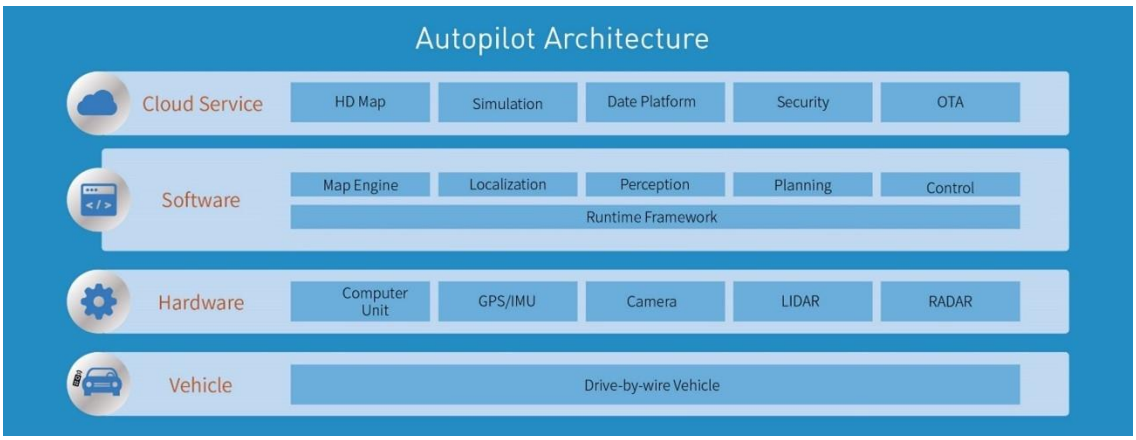
Note:

1) "--" means not installed.
2) $U_B$ represents the BATT voltage of the power supply.
3) KEYON and DC_WAKE only work as hardwired wake-up signal.

# 5. Soc Basic Software

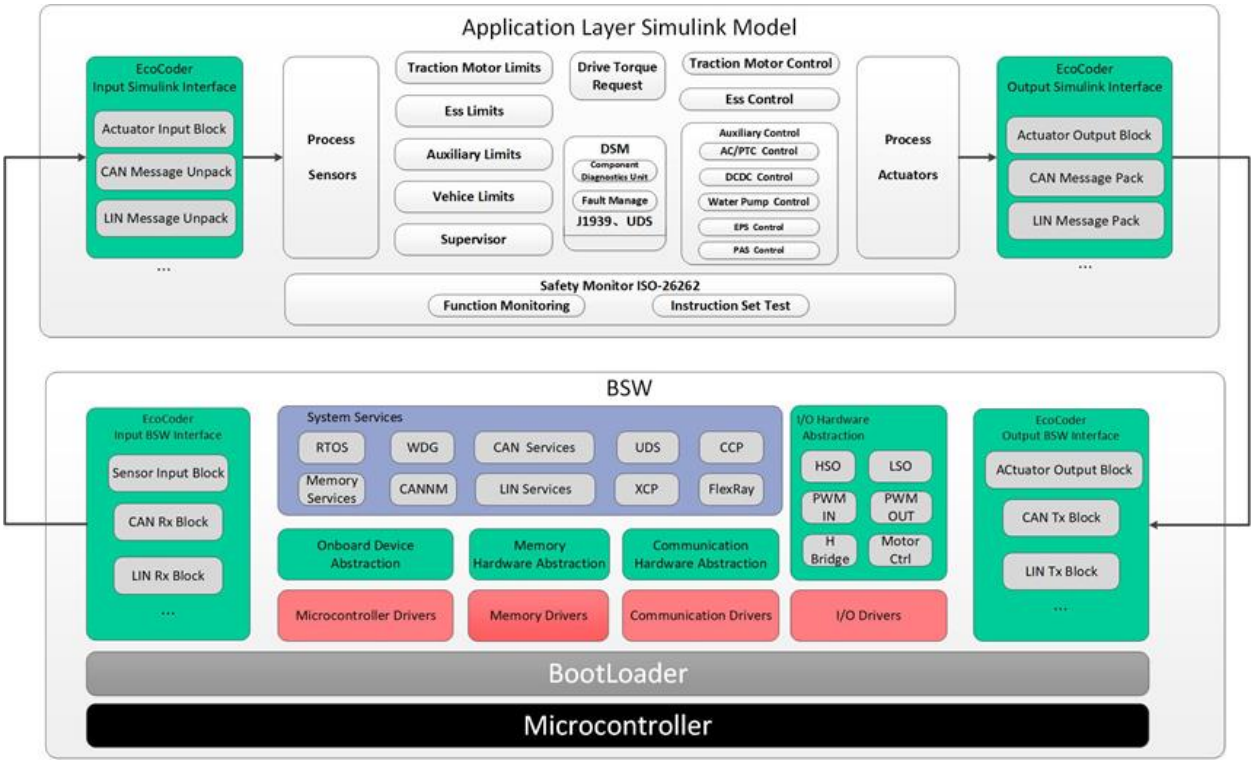
The SOC software system of the computing platform is customized for the autonomous driving system. A typical framework of an autonomous driving system is shown below. The SoC software system of EAORA06 consists of Runtime Framework and other components. The Runtime Framework is ROS (Robot Operating System) Melodic.

Linux is a bridge connecting the hardware and the users, providing functions such as Process Management, Memory Management, File System, Network, Security, User Interface, and Device Drivers. Users can enter commands through the user interface of the operating system. The operating system interprets the commands, drives the hardware devices, and implements user requirements. ROS provides some standard operating system services, such as Hardware Abstraction, Low-Level Device Control, Inter-Process Messaging, and Message Packet Management. ROS is built on a graph architecture, various nodes can publish, subscribe and aggregate all kinds of information, e.g. sensing, control, status, planning.



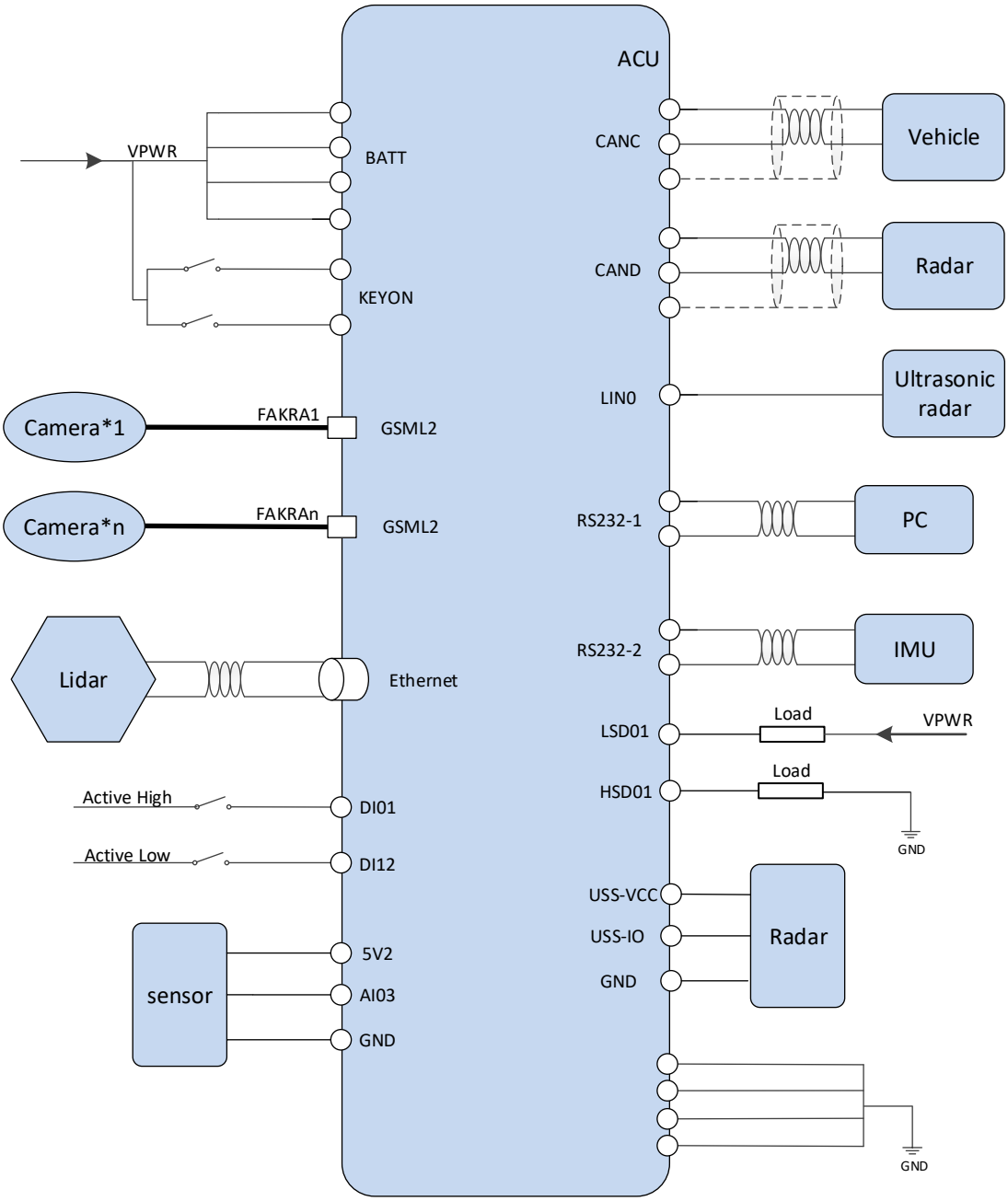

The software architecture of the MCU inside EAORA06 is designed according to AUTOSAR, which is divided into Application Software Layer and Basic Software Layer. Basic Software Layer consists of a microcontroller abstraction layer, an ECU abstraction layer, a service layer, and a complex driver. Application software and basic software are connected and integrated through EcoCoder. EcoCoder encapsulates the low-level software interfaces into the Simulink library via s-functions. Application developers can use Simulink to build the model and generate executable program files for TC397 via Simulink by just one click.

The basic software interfaces that EcoCoder encapsulates can read digital and analog input signals, control high and low side outputs, support .dbc file interpretation, implement CCP and UDS protocols, and define the measurement, calibration and NVM variables. MCU application development is implemented with the calibration software EcoCAL and the flashing software EcoFlash.



# 6. Demo Application

A demo for an autonomous driving hardware platform is shown below, which consists of EAORA06 and sensors.

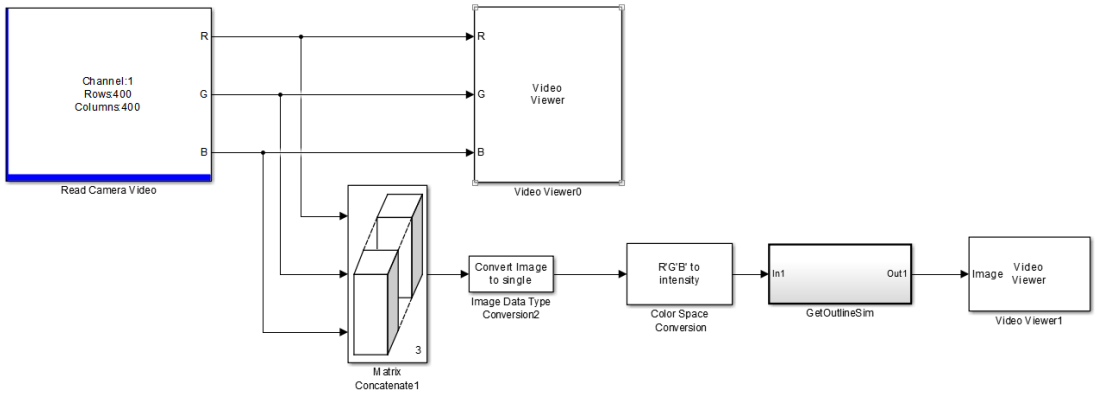


# 7. Development Tool

A combination of hardware, operating system stacks, and runtime environments are not capable enough to achieve autonomous driving, therefore, users need to develop software that can perform specific functionality and deploy them to EAORA06. For autonomous driving processor Orin, EcoCoder-AI is provided as a development tool. For MCU Infineon TC397, three development tools are provided: EcoCoder, EcoCAL, and EcoFlash. Developers can select the tools they need.

## 7.1 EcoCoder-AI

EcoCoder-AI is a powerful automatic code generation library based on Matlab / Simulink that links directly to the target controller. EcoCoder-AI integrates code generation, compilation and one-click generation of executable files. In addition, the control model based on Simulink can be directly converted into an ROS-based executable program suitable for the target controller and downloaded to the target controller. For details, please refer to EcoCoder-AI Manual for details.



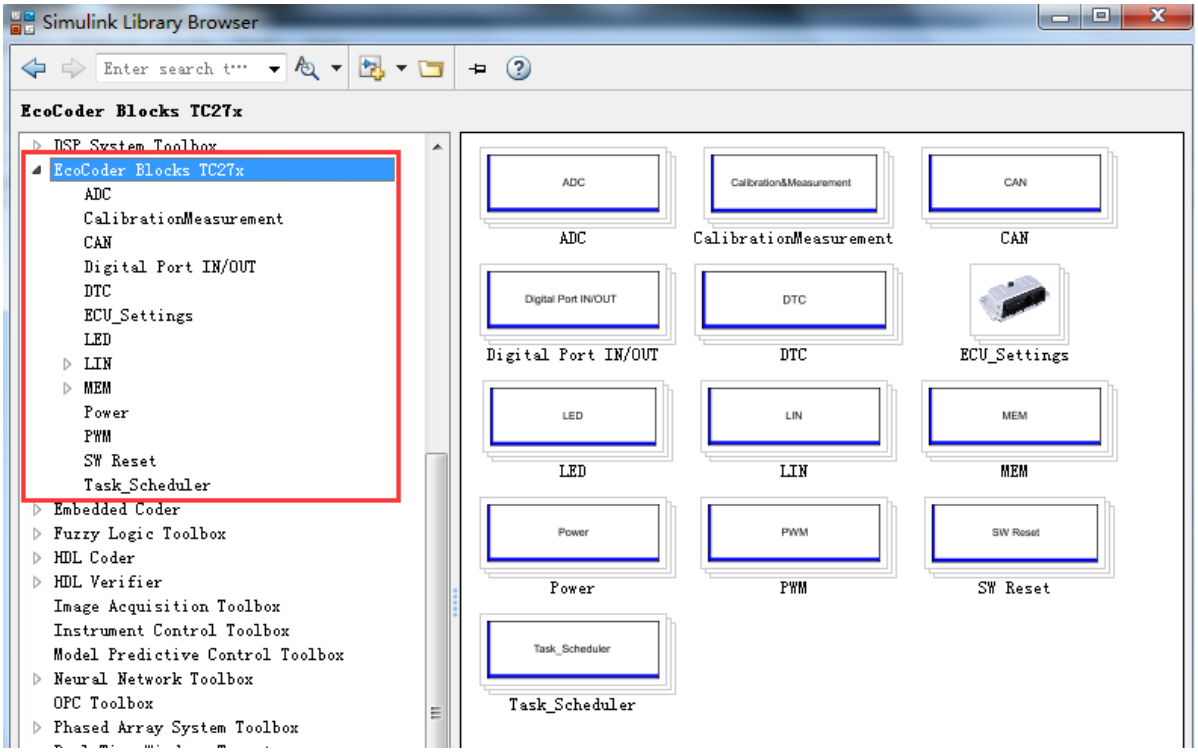

## 7.2 EcoCoder

EcoCoder is an application development tool for the control system, which makes it easier for users to develop embedded application software in the Simulink environment. It expands the resources of Simulink and Real-Time Workshop embedded encoders to generate the necessary code module and automatically configures and optimizes code generation. By encapsulating the

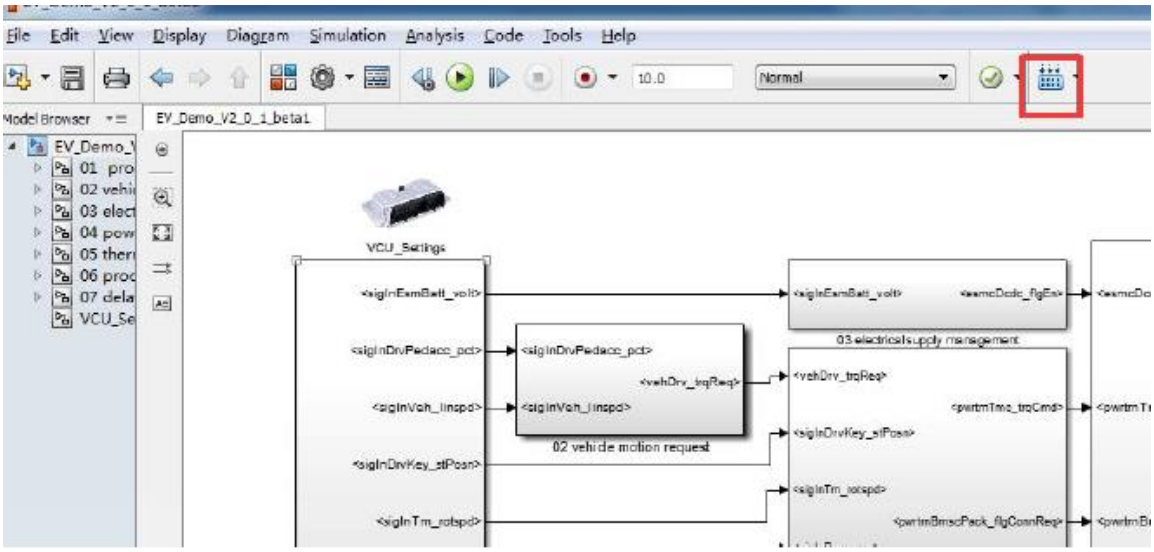
low-level software library to s-functions, EcoCoder allows developers to use low-level software interfaces by model-based-design method and configure basic parameters. It can generate executable files and data description files with one click and provide .a2l file address update tool.

**Features:**

- Users develop embedded application software in the Simulink environment.
- Application developers can focus on control strategy development without knowing all the information about hardware.
- By encapsulating the low-level software library to s-functions, EcoCoder enables developers to use the low-level software interfaces and configure parameters using the model-based-design method.
- Executable file and data description file can be generated by one click, and an .a2l file address update tool is provided. During the generation, the code generated by the model is integrated with the low-level software automatically in the background, then makefile is used to call the compiler to generate executables.



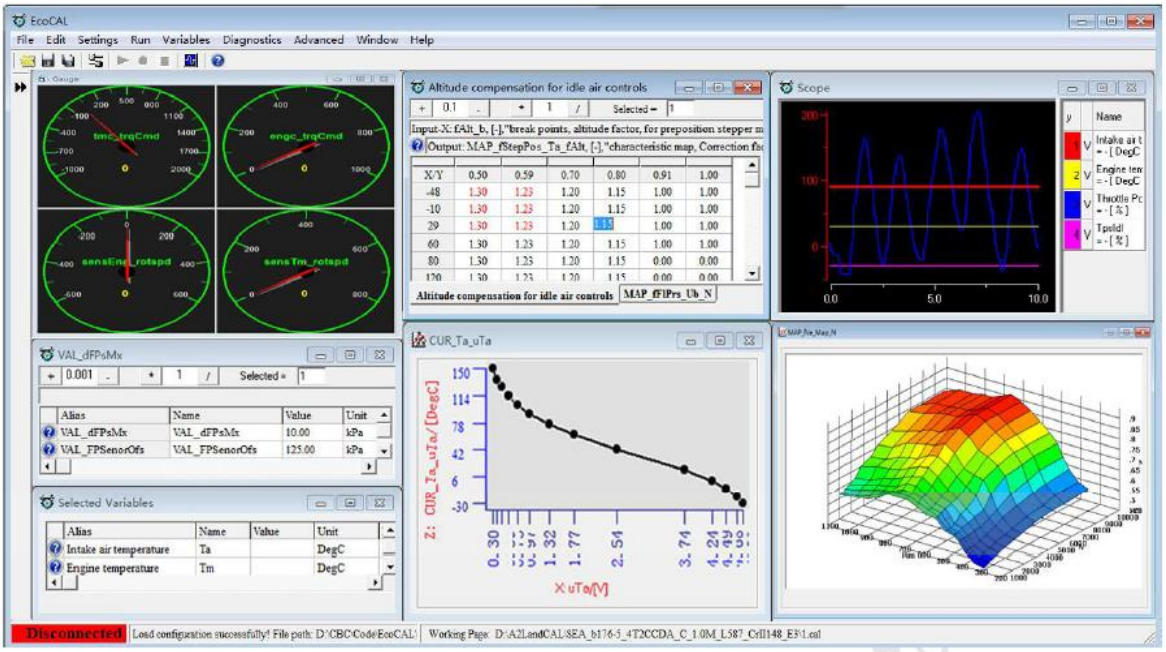
After compilation of the model, use the shortcut “Ctrl + B” or click the button shown below, the executable (ready-to-flash) files will be generated.




Developers can use EcoCoder to develop application software for MCU in EAORA06. Please refer to EcoCoder User Manual for details.

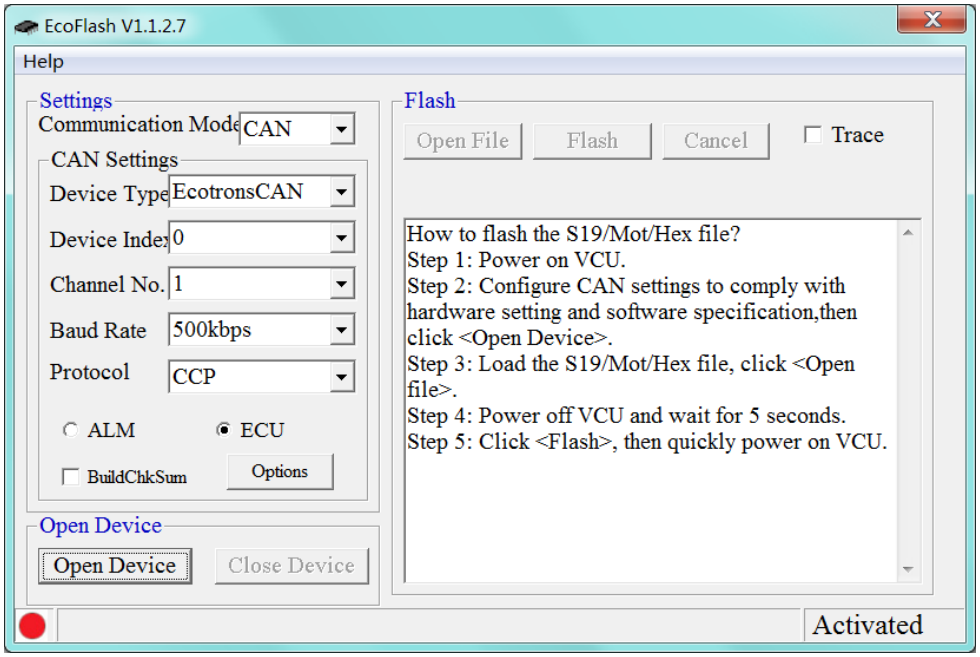
## 7.3 EcoCAL

EcoCAL is a PC-side calibration software based on the CCP protocol. By loading .a2l and .hex files, to achieve real-time observation and online calibration. It can assist control strategy development engineers to debug and calibrate application software. Please refer to EcoCAL User Manual for more details.




## 7.4 EcoFlash

EcoFlash is PC-side software working with BootLoader to flash target program files. It uses CAN communication protocol CCP/UDS, and support.s19, .mot and .hex files.

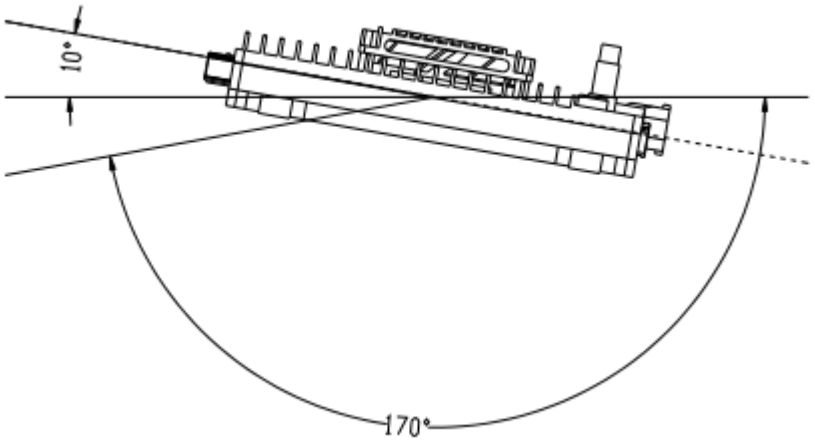


# 8. Installation Requirements

It is recommended to install the ADCU in the cockpit. If the OEM wants to assemble the ADCU in another location, the corresponding installation location should be evaluated by Ecotron's engineers and the OEM's engineers.

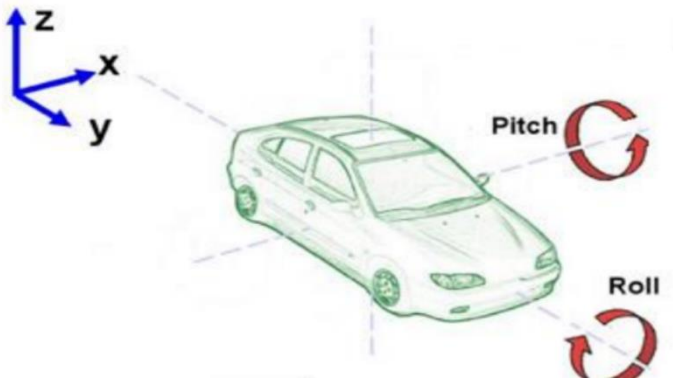
The precautions for ADCU installation are as follows：

1. The installation of ADCU and wiring harness should be firm and reliable, and there should be no looseness. Avoid supporting the wiring harness by ADCU. At the same time, the arrangement of ADCU wiring harness should prevent and protect all wires in the wiring harness from damage due to wear and overheating.
2. Try to avoid installing in places where dust is easy to gather, a large amount of dust accumulation will affect the reliability of ADCU work.
3. ADCU should keep away from the location where the temperature of the shell itself may exceed -15~70°C. At the same time, it is necessary to prevent the surrounding parts from releasing heat to the ADCU.




4. Avoid installing the ADCU in locations where oil, moisture, and water droplets are likely to splash on it.
5. Avoid the possibility of additional mechanical shock and external impact due to the installation position and fixing method of the ADCU and avoid installing the ADCU at the resonance point of the car body.

6. Avoid installing the ADCU where it may come into contact with the battery or other parts that are prone to seepage of acid and alkaline solutions, and near the ADCU power terminal.
7. Avoid installing the ADCU where it may come into contact with the positive terminal of Battery and the ignition power terminal.
8. ADCU should be installed in the horizontal and vertical position according to the connector downwards and maintain a certain angle to prevent water from entering the connector. In the horizontal direction, the recommended installation angle is -170° to -10°, as shown in Figure below. In the vertical direction, the recommended installation angle is -170°~ -10°, as shown in Figure below.




Z Axis: Vertical Direction

X Y Axes: Horizontal Direction

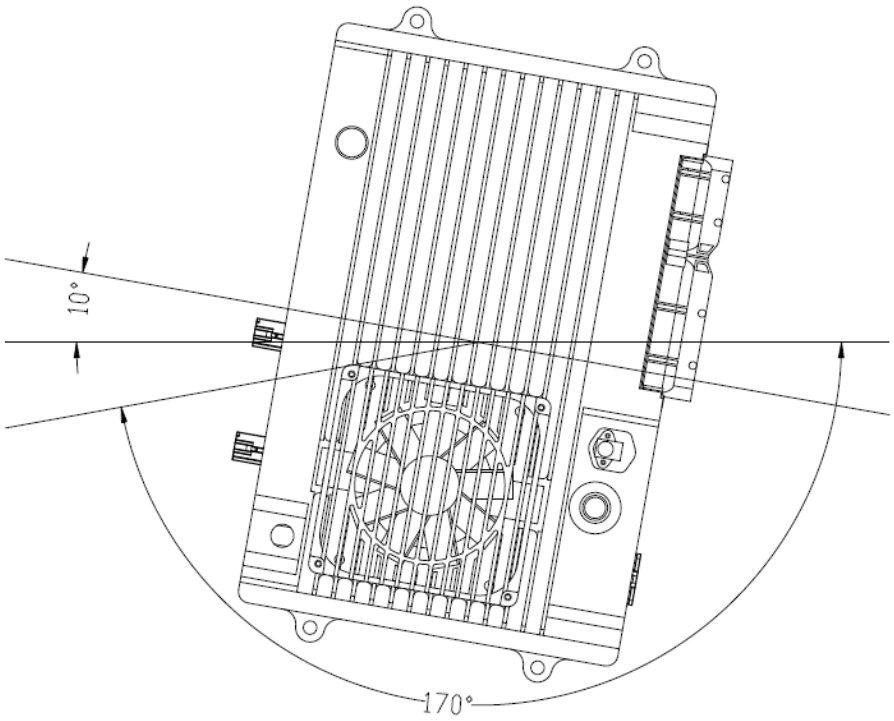



Figure: Vertical Installation Angle

Ecotron recommends using the 4 installation points on the ADCU for installation and fixation. It is recommended to use metal materials such as aluminum alloy for the mounting bracket, and the housing should have a reliable electrical connection with the vehicle body through the bracket. If other materials are used, the customer must ensure that it can meet the requirements of ADCU for vibration, heat dissipation, temperature, EMC, etc. If there is any deviation, it needs to be confirmed with Ecotron.

9. High-speed signal lines such as harness installation, network cables, video cables, etc. should keep away from areas of high voltage, radiation interference such as motors, battery packs, DCDCs as far as possible.