



Controllers for Electric and Autonomous Vehicles



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Technology Highlights

ISO26262-Oriented Design
High Performance Semiconductor
Model-Based Design
Complete Tool Chains
Production Quality



ECOTRON

Specialized in automotive electronics, Ecotron manufactures controllers for electric and autonomous vehicles. Ecotron brings high-tech and automotive grade controllers to small manufacturers at affordable prices. By using state-of-the-art technologies, such as scalable semiconductors from NVIDIA, Infineon or NXP and model-based design with Mathworks tools, Ecotron can dramatically speed up development and significantly reduce cost for customers. Ecotron controller offers a platform that frees the system engineers from worrying about hardware and basic software so they can focus on algorithms and applications.

ECOTRON PRODUCTS

- ADCU - Autonomous Driving Control Unit
- 5G-Telematic Box
- ADAS - Advanced Driver Assistance Systems
- EcoCoder-AI - Automatic code generation tool for AD Controllers
- AD Calibration - On-the-fly calibration for Autonomous Vehicles
- VCU - Vehicle Control Unit for Electric Vehicles
- ADAS - Advanced Driver Assistance Systems
- TCU - Transmission Control Unit for Electric Vehicles
- SCU - Supervisory Control Unit for general purpose controls
- EcoCoder - Automatic code generation tool for Electric Vehicles
- EcoCAL - Calibration tool

ECOTRON ADVANTAGES

- Scalable production Volume
- Competitive price for R&D
- Built-to-spec products
- ISO26262 compliance
- Quality processes

PRODUCTS

ADCU - Autonomous Driving Control Unit

EAORA04-D

Nvidia Jetson Orin

EAORA04-D is an intelligent computing platform developed by Ecotron, for autonomous driving systems using NVIDIA Jetson Orin chip and Infineon TC297. Using the supporting basic software and development tools, developers can build an L4 level low-speed autonomous driving system in a safe, convenient, and efficient manner.

NVIDIA Jetson Orin is designed for embedded intelligent systems including autonomous driving systems which can be used to implement autonomous driving function such as sensor fusion, environment perception, and path planning, etc. Infineon TC297 is based on TriCore™ architecture with a 300MHz operating frequency and an ECC (Error Correction Code) protected RAM with 728KB + 8MB capacity. It is designed based on the ISO26262 standard and supports ASIL-D safety level requirements. Developers can develop and deploy vehicle control and functional safety related strategies based on the MCU.



Interface type	Number	Function	Chip	Connector
M.2 KEY M	1	Extended storage	SOC	Internal
Camera interface	8	FPDlink III	SOC	Water-proof FAKRA
Gigabit Normal Ethernet	2	100BASE-T/1000BASE-T standard	Switch	2* Aviation plug
Gigabit Automotive Ethernet	3	100Base-T1/1000Base-T1,	Switch	1* Aviation plug
Video Output	1	1 channel HDMI	SOC	
USB	1	1 channel USBHost support USB2.0、US3.0、USB3.1	SOC	
RS232	4	1 channel used for Debugging	SOC	
RS485	1		SOC	
CAN	2		SOC	
PPS_IN	1	Support 3.3v-16v, hardware configuration	SOC	
PPS_OUT	4	2 channels 5V or 3.3V output, 2 channels 12V output	SOC	
CANFD	6	2 channels with specific frame wake-up	MCU	
LIN	4	No wake-up function is required	MCU	
KEYON	3	One channel is for SOC and two channels are for MCU		
Digital Input	6	Default configuration, 4 channels are active-high, 2 channels are active-low	MCU	121PIN-CMC
Analog Input	6	Default configuration: 2 channels are 5V voltage type, 2 channels are 36V voltage type and 2 channels are resistance type	MCU	
Digital Low-side output	8	8 channels @250mA	MCU	
Digital High-side output	4	4 channels @1A	MCU	
5V Sensor power	2	Maximum Current 100mA	MCU	
Power Positive	4			
Power Ground	4			
Signal Ground	8			

EAXVA05

Dual Nvidia Xavier Equipped

Ecotron's Autonomous Driving Control Unit (ADCU), EAXVA05, is an intelligent computing platform designed specifically for autonomous driving systems. EAXVA05 is equipped with 2 NVIDIA Xavier chips and 1 Infineon TC297 chip. With basic software and development tools, developers can safely, conveniently, and efficiently build low-speed L4-level autonomous driving systems in confined areas.

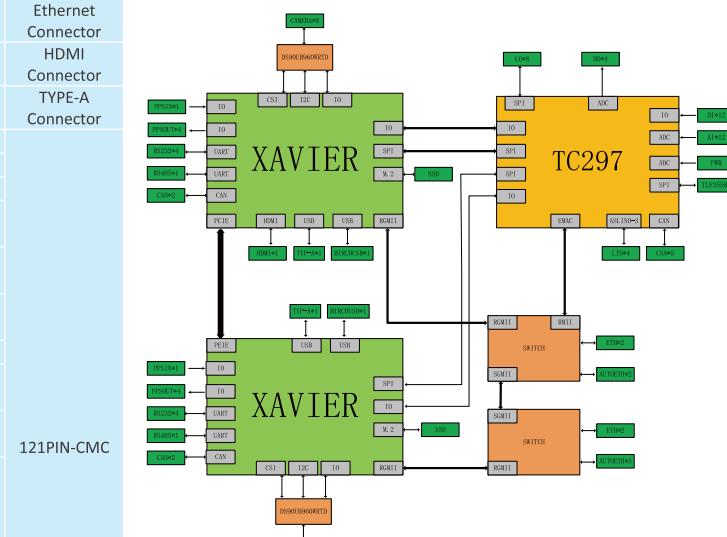


NVIDIA designs Xavier specifically for embedded intelligent systems. Xavier supports autonomous driving functions such as sensor fusion, environment perception, and path planning. Infineon TC297 has a TriCore™ architecture and has an operating frequency of 300MHz. Moreover, it has 728KB + 8MB capacity and ECC (error correction coding) RAM protection. Ecotron's ADCU is designed based on the ISO26262 standard and supports ASIL-D safety level requirements. Engineers can develop vehicle control and functional safety-related strategies based on this ADCU.

Specifications

Interface Type	Quantity	Function	Chip	Connector
M.2 KEY M	2	Extended storage	SOC	Internal
Camera Interface	12	FPDlink III	SOC	FAKRA
Gigabit Standard Ethernet	4	100BASE-T/1000BASE-T Standard	Switch	4*Aviation Connectors
Gigabit Automotive Ethernet	5	100Base-T1/1000Base-T1	Switch	1*Automotive Ethernet Connector
HDMI	2		SOC	HDMI Connector
USB	2	TYPE-A*2	SOC	TYPE-A Connector
RS232	8	One channel used for debug	SOC	
RS485	2		SOC	
CAN	4		SOC	
PPS_IN	2	Support 3.3V-16V Hardware configuration	SOC	
PPS_OUT	8	2 Channels 5V or 3.3V output 2 Channels 12V output	SOC	
CANFD	6	2 Channels with specific frame wake-up	MCU	
LIN	4	No wake-up needed	MCU	
KEYON	4	2 Channel for SOC 2 Channels for MCU		
Digital Input	6	Default configuration, 4 channels active high, 2 channels active low	MCU	
Analog Input	6	Default configuration, 2 channels 5V voltage type, 2 channels 36V voltage type, 2 channels resistance type	MCU	
Digital Low Side Output	8	8 Channels @250mA	MCU	
Digital High Side Output	4	4 Channels @1A	MCU	
5V Sensor Supply	2	Maximum current 100mA	MCU	
Positive Power Supply	4			
Power Ground	4			
Signal Ground	8			

Circuit structure diagram



PRODUCTS

ADCU - Autonomous Driving Control Unit

Overview

Ecotron's Autonomous Driving Control Unit (ADCU) is an intelligent computing platform for L3/L4 autonomous driving applications. It integrates intensive data processing, sensor fusion, and control strategies into a single control unit. With our ADCU, developers can effectively establish a structured and organized vehicle controller network. Its applications could be delivery robots, autonomous cleaning vehicles, and autonomous mining vehicles, etc.



EAXVA04

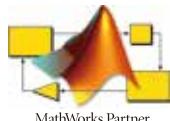
Nvidia Xavier+ Infineon TC297T

EAXVA04-based on NVIDIA Xavier + Infineon TC297T

Designed to Support L3/L4 Automation

EAXVA04 is designed and based on NVIDIA Xavier and Infineon TC297, with multiple I/O resources. It is designed for L3/L4 and above autonomous driving applications. Nvidia Xavier is used for environment perception, image fusion, path planning, etc. TC297 is used for safety monitoring, redundant controls, gateway communications, and vehicle control. It is a ASIL-C capable, high performance vehicle control unit.

EAXVA04 provide integrated solutions for ADAS, autonomous driving system design, vehicle control strategy design and implementation into a single unit, thereby greatly improving the system integrity. Our EAXVA04 provides various types of communication ports, compatible with the most of autonomous driving sensors on the market. With the FPDlinkIII/GMSL camera channel, Ecotron EAXVA04 is capable of running vision-based applications. It is also equipped with CAN transceivers and automotive ethernet, supports millimeter wave radar, LiDAR, and type of sensors.

**EAXVA04**

Interface Type	EAXVA04G-D	EAXVA04G-P	EAXVA04F-D	EAXVA04F-P
Video Input	8 channels, GMSL	8 channels, GMSL	8 channels, FPDLINK III	8 channels, FPDLINK III
Video Output	1 channel HDMI	/	1 channel HDMI	/
USB	1 channel USB Host supporting USB2.0, US3.0, USB3.1	/	1 channel USB Host supporting USB2.0, US3.0, USB3.1	/
RS232	4 channels, 1 channel for debug			
RS485	1 channel	1 channel	1 channel	1 channel
Automotive Ethernet	3 channels, 100Base-T1/1000Base-T1	3 channels, 100Base-T1/1000Base-T1	3 channels, 100Base-T1/1000Base-T1	3 channels, 100Base-T1/1000Base-T1
Standard Ethernet	2 channels, 100BASE-T/1000BASE-T	2 channels, 100BASE-T/1000BASE-T	2 channels, 100BASE-T/1000BASE-T	2 channels, 100BASE-T/1000BASE-T
CAN	2 channels connected to SOC			
CANFD	6 channels connected to MCU			
LIN	4 channels	4 channels	4 channels	4 channels
PPS_IN	1 channel, supporting 3.3V – 16V, Hardware Configuration	1 channel, supporting 3.3V – 16V, Hardware Configuration	1 channel, supporting 3.3V – 16V, Hardware Configuration	1 channel, supporting 3.3V – 16V, Hardware Configuration
PPS_OUT	4 channels. 2 channels support 5V/3.3V output, 2 channels support 12V output	4 channels. 2 channels support 5V/3.3V output, 2 channels support 12V output	4 channels. 2 channels support 5V/3.3V output, 2 channels support 12V output	4 channels. 2 channels support 5V/3.3V output, 2 channels support 12V output
Digital Input	6 channels. 4 channels active high, 2 channels active low	6 channels 4 channels active high, 2 channels active low	6 channels. 4 channels active high, 2 channels active low	6 channels. 4 channels active high, 2 channels active low
Analog Input	6 channels. 2 channels 5V voltage type, 2 channels 36V voltage type, 2 channels resistor type	6 channels. 2 channels 5V voltage type, 2 channels 36V voltage type, 2 channels resistor type	6 channels. 2 channels 5V voltage type, 2 channels 36V voltage type, 2 channels resistor type	6 channels. 2 channels 5V voltage type, 2 channels 36V voltage type, 2 channels resistor type
Digital Low-Side Output	8 channels@250mA	8 channels@250mA	8 channels@250mA	8 channels@250mA
Digital High-Side Output	4 channels@1A	4 channels@1A	4 channels@1A	4 channels@1A
5V Sensor Power Supply	2 channels, maximum current 100mA			

PRODUCTS

ADCU - Autonomous Driving Control Unit

Autonomous Vehicles Powered by Ecotron's ADCU



Autonomous Delivery Robot



Robotaxi



Autonomous Road Roller Fleet



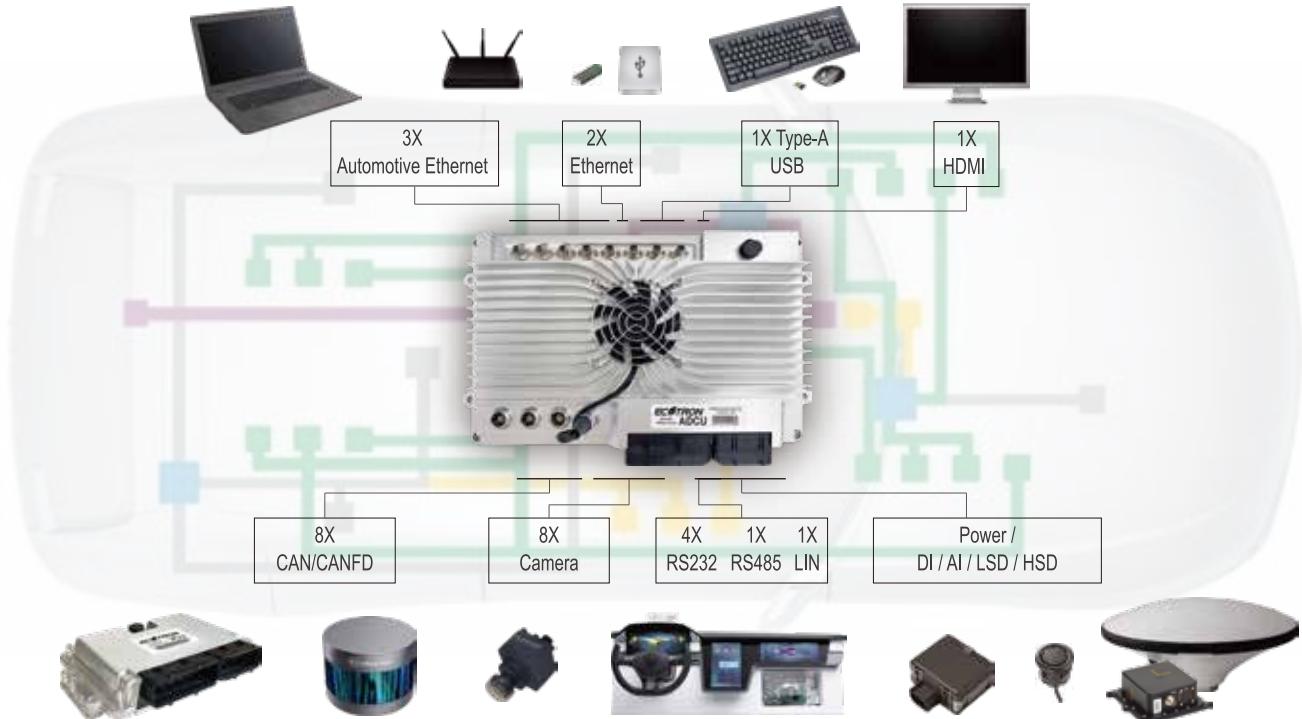
Autonomous Vending Vehicle



Autonomous Bus

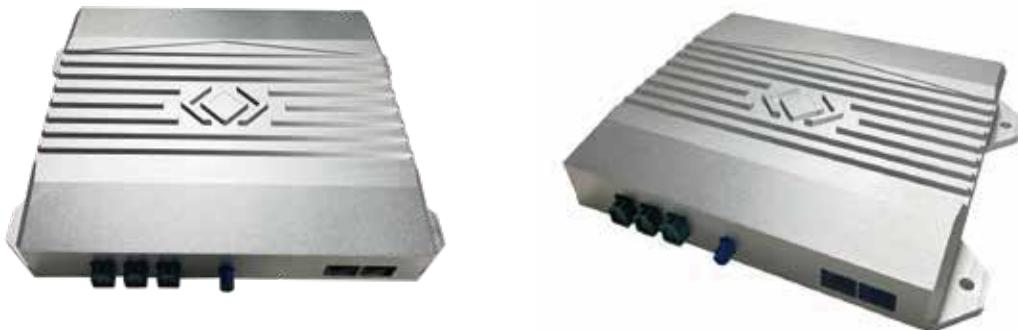


Autonomous Mining Vehicle



Autonomous Driving Control Systems

ETBOXG9550A01



Specifications

Item	Design Standard
Operating voltage	DC 12V
RAM	8GB
ROM	32GB
Operating temperature	-40 ~ 85°C
Operating humidity	0~95%, no dew
Storage temperature	-45 ~ 105°C
Size	260mm*209mm*41mm
Weight	1710g±10g
Proof level	IP50
Cooling	Passive

Product Introduction

ETBOXG9550A01 product is an automotive communication terminal developed and designed by Ecotron LLC. for autonomous vehicles, with 5G, C-V2X, automotive Ethernet, CAN, Wi-Fi, Bluetooth, high-precision localization, storage and other interfaces and functions. It is suitable for a variety of intelligent network vehicles, to achieve the functions such as uploading vehicle information and environmental data, sending commands from cloud scheduling system and interacting with road-end devices. It is designed to complete the vehicle-to-cloud, vehicle-to-road end, vehicle-to-vehicle data transmissions, eventually achieve the fleet driving, remote control, and other functions.

PRODUCTS

ADAS - Advanced Driver Assistance Systems

Advanced Driver Assistance Systems

Ecotron's ADAS is a complete system for Advanced Driver Assistance System applications. Equipped with computer vision and image processing algorithms, 77G forward millimeter wave radar, camera, and other sophisticated sensor systems, Ecotron ADAS can warn the driver on potential collision or even command emergency braking, to reduce the probability of accidents and improve driving experience.

Ecotron ADAS can acquire road information, and achieve ADAS functions such as lane departure warning, front collision warning, pedestrian collision warning, and automatic emergency braking. Visual warning can be sent to the dashboard or other in-vehicle display devices through the CAN at the same time.

Ecotron ADAS includes forward view camera, millimeter wave radar, warning display, related controllers and actuators.



Smart Camera

Radar

Display

Advanced Driver Assistance System Kit

Features



FCW:
Forward Collision Warning



ACC:
Adaptive Cruise Control



LDW:
Lane Departure Warning



AEB:
Automatic Emergency Braking



HMW:
Headway Monitoring Warning



PCW:
Pedestrian Collision Warning



ADAS Applications



Warning Information Display Example



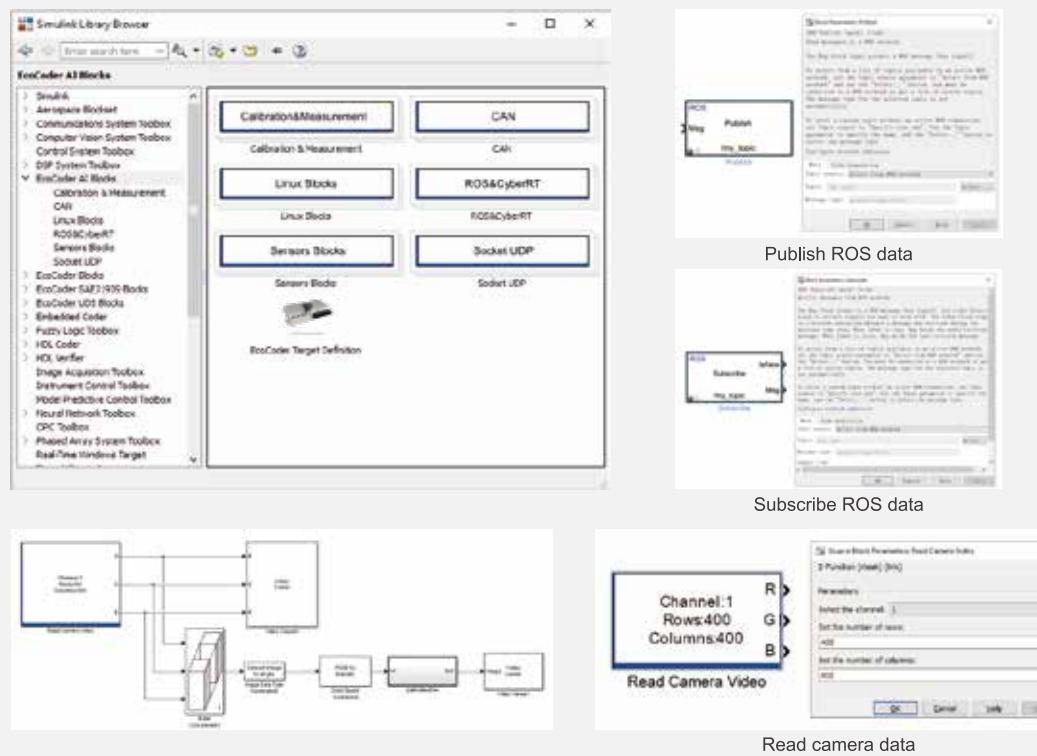
EcoCoder-AI Automatic Code Generation Tool for SOC

EcoCoder-AI is a powerful automatic code generation tool for AD controller, based on MATLAB /Simulink. It can be directly linked to the target controller.

EcoCoder-AI maximizes the usage of Simulink libraries, and it allows the application developers to use model-based design to develop applications from an autopilot system middleware.

Operating System
Windows XP and above
Supported MATLAB version:
Matlab2018b 64-bit and above

Other Requirements:
MATLAB/Simulink MATLAB compiler
Simulink embedded compiler
State Stream compiler



EcoCoder-AI Target definition

The EcoCoder-AI target definition is used to select the target controller. If you develop a ROS-based software, you can define ROS nodes through the Publish module or the Subscribe module. If your development is based on Simulink external mode, then you can set the username and root password for SSH login on the target controller.

Publish the data

The publish message block is based on ROS. It is used to publish messages to topics. The module can select the specified .m file according to the parameters specified by the developer. It determines the theme, and then determines the parameters of the message based on the name of the theme and the content of the .m file. Publish message block will then change the input interface of the module accordingly.

SOFTWARE & TOOLS

AD Calibration Tool

Publish Module

The Publish module receives ROS Message input and publishes it to the ROS network.

It uses the nodes of the Simulink model to create ROS publishers for specific topics. This node is created when the model is running and deleted when the model is terminated.

If the model has no nodes, the module will create one.

At each sample, the module converts the Msg input from the Simulink bus signal into a ROS message and publishes it.

The module does not distinguish whether the input is a new message or not. The module only publishes the message once it is sampled.

ROS Message Subscription Module

This module triggers a user-defined function when a message is received and pass the parameters in the message to the user-defined function for further processing. This block allows to select the m-file according to the parameters specified by the developer. It also allows developer to configure the name of the subscription topic, related message parameters, and the output parameters.

EcoCoder-AI External Mode

Simulink external mode provides communication between two discrete systems (host and target). The host computer is a computer running MATLAB and Simulink environment. The target machine refers to the ADCU hardware platform that runs the executable file generated by the host.

The host (Simulink environment) can request the target to receive changed parameters or upload signals by sending messages. External mode communication adopts a client/server structure, where the Simulink environment acts as a client and the target machine acts as a server.

The external mode allows the parameters of the EcoCoder-AI block to be modified in real time and Simulink automatically downloads the modified parameters to the target machine. Therefore, the external mode can be used for online calibration. This mode monitors the inputs and outputs of each block and subsystem in real-time without editing any interfaces. By connecting the oscilloscope module to the input and output ports, developers can check the signal on the target machine in real-time. Therefore, the external mode can be used for online monitoring and measurement.

In addition to Simulink's model-based development of autonomous driving algorithms, EcoCoder-AI implements external model-based calibration and measurement functions. It supports one-click code generation and automatic cross-compilation. After building the model, the compiled executable file will be automatically downloaded to the target machine and be executed.

Subscribe Module

The Subscribe module is used to subscribe a ROS message and it is triggered when a subscribed message is received.

This node is created when the model is running, and it is deleted when the model is terminated. If the model has no nodes, the module will create one.

At each simulation step, the module checks whether new messages are available on a specific topic.

If a new message is available, the module will retrieve the message and convert it into a Simulink bus signal.

Msg port output of the new message. If there is no new message, Msg outputs the last received ROS message.

If no message is received after the simulation starts, Msg will output a blank message.

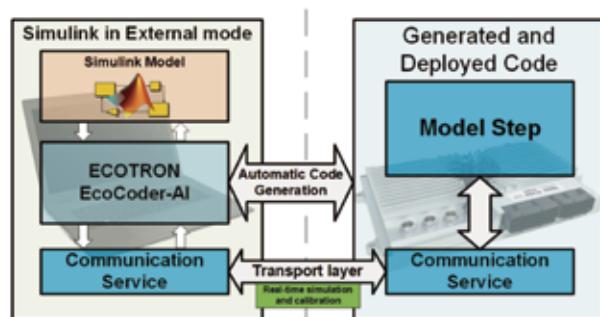
Linux Printing Block

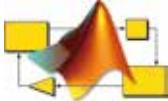
The Linux Printf block prints the information defined in this block to the Linux terminal.

ROS Information Block

The user can use the ROS Info block to print variables in the terminal.

Host Computer





Vehicle Control Unit

Vehicle Control Unit(VCU), is the main controller for the electric vehicle.

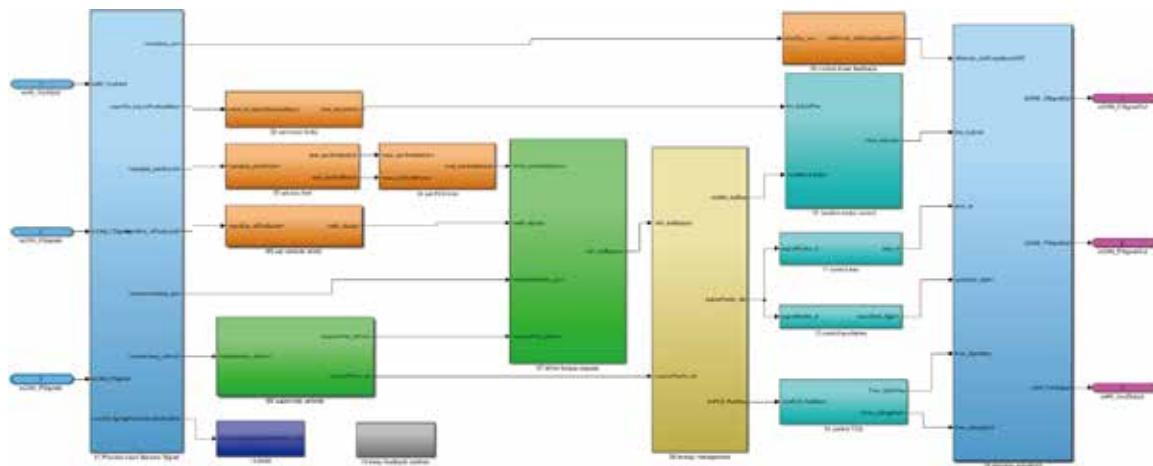
VCU receives the driver input signals, such as pedal inputs and vehicle speed, and uses these signals to manage the system energy, request the torque, and coordinate the motor, battery pack and on-board charging system. All of these factors determine the overall vehicle drivability.



Feature	EV22297A	EV22297A02	EV22377A	EV2274KAH
Main Chip	Infineon TC297TP: 300MHz, Flash 8MB, SRAM 728K	Infineon TC297TP: 300MHz, Flash 8MB, SRAM 728K	Infineon SAK-TC377TP- 96F300s: 300MHz, Flash 6M, SRAM 3M, floating point capable	ST SPC574K72E7; 160MHZ; Flash 2624KB; RAM 208KB;
Monitor Chip	SBC: TLF35584QVVS2	SBC: TLF35584QVVS2	/	SBC: NXP S9S08
Voltage Output	6 channels, 5V	9 channels, 5V	2 channels, 5V	3 channels, 5V
Peak Voltage	DC 36V	DC 36V	DC 36V	DC 36V
Interface Requirements	Bootloader, CCP protocols	Bootloader, UDS protocols	Bootloader, CCP protocols	Bootloader, CCP protocols
CAN bus	6 channels. All support CANFD, CANA and CANB supports specific frame wake-up	6 channels. CANE supports specific frame wake-up, CANF supports random frame wake-up, CANA, CANB, CANC, CAND support ISO CANFD	4 channels, CANA supports wakeup	3 channels, one supports wakeup
LIN bus	2 channels	1 channel	1 channel	1 channel
FlexRay	/	2 channels	/	/
Automotive Ethernet	1 channel, supporting wake-up	/	1 channel	/
EEPROM	512k	512K	64K	64K
Sensor Supply Output	6 channels, DC 5V	9 channels, DC 5V	4 channels, DC 5V	4 channels, DC 5V
Analog Input	22 channels. 10 channels 0V - 5V voltage type, 8 channels 0V - 32V voltage type, 4 channels 0V - 5V resistor type	22 channels. 8 channels 0V - 5V voltage type, 6 channels 0V - 5V resistor type, 8 channels 0V - 32V input	28 channels, 12-bit, 16 pull- ups, 12 pull-downs	23 channels, 12-bit, 17 channels 0V - 5V, 6 channels 0V - 32V
Digital Input	13 channels. 7 channels active high, 6 channels active low	13 channels. 2 channels active high, 11 channels active low	/	16 channels, 6 low effective, 10 high effective
Frequency Signal Input	4 channels	4 channels	6 channels, Hall-effect type	6 channels, Hall-effect type
Low-side Driver	18 channels, 4 channels can be configured to PWM output	26 channels. 7 channels can be configured to PWM output	20 channels, 8 configurable as PWM output	18 channels for 0.5A, 4 channels can be configured to PWM output
High-side Driver	10 channels. 2 channels can be configured to PWM output	10 channels	14 channels, 6 configurable as PWM output	6 channels, 4 channels can be configured to PWM output
Operating Temperature	-40 ~ 85 °C, refer to ISO 16750	-40 ~ 85 °C, refer to ISO 16750	-40 ~ 85 °C, refer to ISO 16750	-40 ~ 85 °C, refer to ISO 16750
Working Humidity	0~ 95%, non-condensing, refer to ISO 16750	0~ 95%, non-condensing, refer to ISO 16750	0~ 95%, non-condensing, refer to ISO 16750	0~ 95%, non-condensing, refer to ISO 16750
Protection Category	IP67	IP67	IP67	IP67
Pin Number	121 Pin	121 Pin	121 Pin	121 Pin
Dimensions	207 x 150 x 42mm	207 x 150 x 42mm	250x194x37mm	207x150x36mm
Housing Material	Die casting aluminum	Die casting aluminum	Die casting aluminum	Die casting aluminum
Weight	≤700g	≤700g	700g	600g
Mechanical Characteristics	Vibration, shock, drop tests passed according to ISO16750	Vibration, shock, drop tests passed according to ISO16750	Vibration, shock, drop tests passed according to ISO16750	Vibration, shock, drop tests passed according to ISO16750
Keyon	1 channel	1 channel	1 channel	1 channel
Wake-up Signal	2 channels active high wire wake-up signal (WAKE1, WAKE2), 1 channel active low wire wake-up signal (WAKE3)	1 channel wire wake-up signal (WAKEUP)	1 channel wire wake-up signal (WAKEUP)	1 channel wire wake-up signal (WAKEUP)

PRODUCTS

Vehicle Control Unit - VCU



VCU Application Layer Software Simulink Model

Features

Based on automotive grade 32-bit MCU Infineon AURIX TC377/297/275T or NXP SPC5744 hardware platform, with client-host chip architecture.

Designed according to ISO26262, and it has a built-in monitor chip for safety monitoring (meets ASIL-D standard requirement).

Comes with the basic software, or BSW, supporting all typical input / output drivers for vehicle control. The BSW is encapsulated in Matlab/Simulink environment, so users can develop their control system with 100% model-based-design methods.

The VCU hardware is abstracted from the application software and relieves the system engineer from the challenge of microprocessor configuration and embedded real-time software .

Ecotron VCU come with the bootloader, which supports reprogramming over CAN bus.

Supports CCP/XCP based CAN bus calibration tools, such as INCA and CANape, as well as EcoCAL, a cost effective calibration tool developed by Ecotron.

Applications



Electric Car



Hybrid / Electric SUV



Electric Truck



Electric Bus

Transmission Control Unit

Ecotron Transmission Control Unit (TCU) is the controller for 2-speed, 3-speed, or 4-speed transmission for electric vehicles. Transmissions work with the electric motor and maximize the efficiency. The transmission control unit can read the motor speed, vehicle speed, and other inputs, decides the best gear ratio for the operation conditions. Therefore can optimize the overall motor efficiency and increase the performance of the electric vehicles.

One version of our TCUs can control the automatic manual transmission. We have unique control strategies to achieve the fast gear shifting and to compensate the power interrupt during the shifting. Our TCU can be combined with the vehicle control unit and make a 2-in-1 controller to simplify the system and reduce cost. Similar to our VCUs, our TCUs come with the complete toolchain for model based design and auto code generation.



Features

Based on automotive grade 32-bit MCU Infineon AURIX TC377/297/275T or NXP SPC5744 hardware platform, with master-slave chip architecture.

Designed according to ISO26262, and it has a built-in monitor chip for safety monitoring (meets ASIL-D standard requirement).

Comes with the basic software, or BSW, supporting all typical input / output drivers for vehicle control. The BSW is encapsulated in Matlab/Simulink environment, so users can develop their control system with 100% model-based-design methods .

The VCU hardware is abstracted from the application software and relieves the system engineer from the challenge of microprocessor configuration and embedded real-time software .

Ecotron VCU come with the bootloader, which supports reprogramming over CAN bus .

Supports CCP/XCP based CAN bus calibration tools, such as INCA and CANape, as well as EcoCAL, a cost-effective calibration tool developed by Ecotron.

Feature	ET22377A
Master chip	Infineon SAK-TC377TP: 300MHz, Flash 6M, SRAM 1.1M, floating point capable
Monitor chip	Infineon SBC TLF35584
Supply voltage	DC 12V/24V (9-32V)
Peak voltage	DC 36V
Interface requirements	Bootloader, CCP protocols
CAN bus	3 channels, CANA supports wakeup
EEPROM	64K
Sensor supply output	8 channels, DC5V ±1%
Analog input	8 channels, 12-bit, supporting both 0-5V inputs
Frequency signal input	12 channels, Hall-effect type, 1Hz-30kHz
High-side driver	6 channels for 1A, MAX 2A, 2 channels can be multiplexed as PWM
H-bridge driver	2 channels, 10A, drive the brush motor, instantaneous current up to 40A
Operating temperature	-40 ~ 85 °C
Working humidity	0 ~ 95%, non-condensing, refer to ISO 16750
Protection category	IP67
Pin number	121 Pin
Dimensions	207×150×36mm
Weight	600g

PRODUCTS

SCU - Supervisory Control unit

Supervisory Control Unit

Features

- General purpose small foot-print controller
- Supervisory control for range extender
- Vehicle control for 2-wheeler or 3-wheeler
- Control system gateways
- Small size, light weight, 64-pin main connector
- IP rating, IP67
- Model-based design and automatic code generation
- ISO26262-oriented design
- OBD function supported
- 3+ CAN buses



Applications

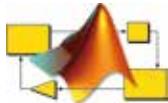
Range extended electric vehicle

Series hybrid electric vehicle

2/3-wheeler vehicle control



Feature	ES1274A
Main chip	NXP SPC5744P: 200MHz, Flash 2.5M, SRAM 192K, floating point capable
Monitor chip	NXP SBC MC33CFS6500, ASIL-D
Supply voltage	DC 12V/24V (9-32V)
Peak voltage	DC 36V
Interface requirements	Bootloader, CCP protocols
CAN bus	3 channels, one supports wakeup
EEPROM	64K
Sensor supply output	2 channels, 5V
Analog input	8 channels, 12-bit, supporting both 0-5v inputs and 0-12v inputs
Digital Input	9 channels, 4 low effective, 5 high effective
Frequency signal input	2 channels, Hall-effect type
Low power low-side driver	8 channels for 250mA
Low-side driver	2 channels for 3A
High-side driver	2 channels for 2.5A, 2 channels for 0.8A
Operating temperature	-40 ~ 85 °C
Working humidity	0 ~ 95%, non-condensing, refer to ISO 16750
Protection category	IP67



EcoCoder

EcoCoder is an enhanced auto-code generation library resides on top of the generic Matlab/Simulink. It links directly to the target controller. It integrates code generation, and executable file generation in one click.

Operating System

Windows 10 & Windows 7 & Windows XP

Supported Versions of MATLAB

MATLAB2010b and above

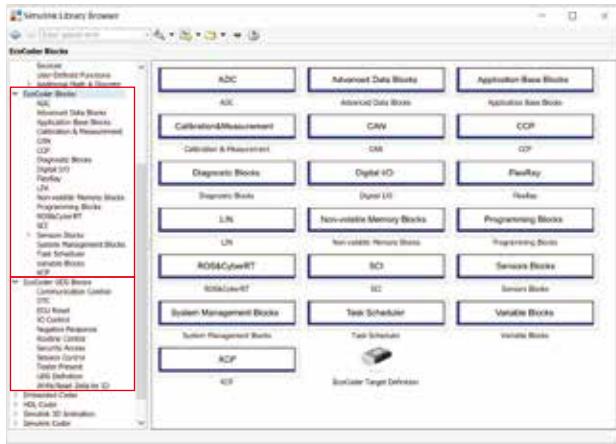
MATLAB Component Requirements

MATLAB Simulink

Simulink Coder Embedded Coder

Stateflow Stateflow Coder

Basic EcoCoder Library and S-Function



When you install EcoCoder, the installation process will automatically add all EcoCoder's library blocks and S-functions to Simulink.

It encapsulates all the hardware drivers with EcoCoder S-functions, including ADC drivers, CAN drivers, digital IO drivers, PWM drivers etc. It also encapsulate the real-time operating systems with EcoCoder task scheduler S-function.

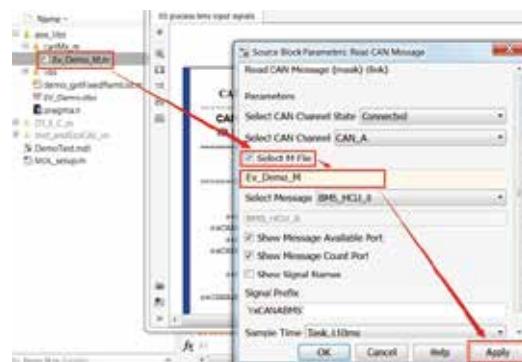
It links the application software, i.e., Simulink model, to the hardware drivers via EcoCoder library blocks and S-functions in Simulink environment.

When you run simulation with EcoCoder, it verifies model and software integrity.

After you click "code generation" button, EcoCoder will generate the microprocessor compatible codes automatically, which will invoke compiling and linking process, running in the background using a compiler, e.g. CodeWarrior, to compile the application code and hardware driver code together.

CAN Protocol Implementation

You can convert DBC file to .m file through EcoCAN, then select the .m file and the CAN message in the .m file in the CAN block in EcoCoder. CAN signals will be displayed when selecting and it will be connected to the signal in the model after selected.

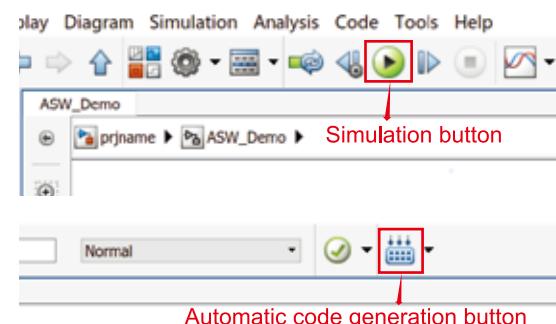


User Defined Variable

User Defined Variables can be defined either by EcoObj in .m file, or by Model Explorer in MATLAB. You can click "Simulink NumericType" in Model Explorer->Base Workspace to define User Defined Variables.

Auto-Code Generation

After the model simulation passes, you can generate executable files by using shortcut "Ctrl+B" or clicking the button below.



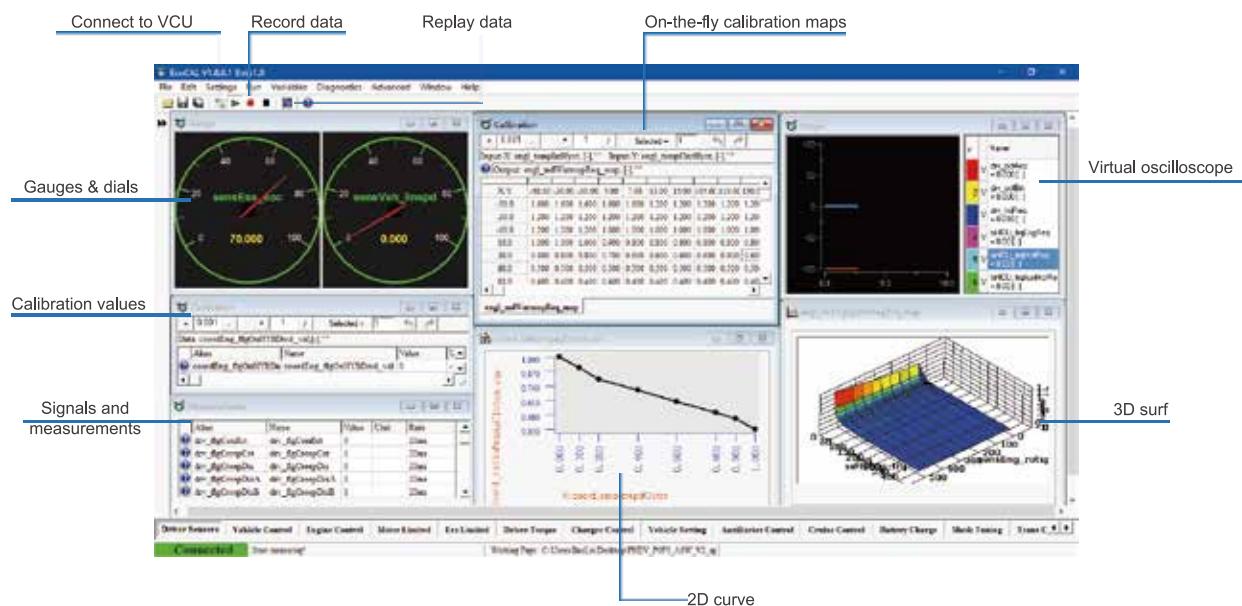
SOFTWARE & TOOLS

Calibration Software - EcoCAL

EcoCAL

Professional Calibration Software

EcoCAL is a professional real-time online calibration measurement tool. EcoCAL is capable of real-time measurement, real-time recording, real-time online calibration, data playback, OBD online fault diagnosis, real-time fault code reading, fault localization offline writing and other functions. EcoCAL supports communication protocols such as XCP/CCP/KWP200 and multiple communication interfaces, including CAN bus, USB, SCI (COM) and Ethernet, etc.



Follows CCP / XCP standard communication protocols

Uses .A2L file, which is compatible with ASAP2 format

Supports various communication media, including CAN, Ethernet, USB and RS232/SCI

Defines various calibration interfaces, such as gauges, dials, plots, surfs, forms, sheets and so on

Supports values, curves, maps calibration and bit-wise manipulating

Capable of real-time online calibration

Capable of flashing data to VCU and fetching data from VCU

Saves calibration data to files, and manages the versions of calibration data sets

Supports calibration data management, including copy, compare and view (data difference)

Records data in CSV/dat format which can be replayed in Data Analyzer

Supports OBD standard: reading Diagnostic Trouble Code (DTC), clearing code and reporting failure



TECHNOLOGY HIGHLIGHTS

ISO26262-Oriented Design

Ecotron controller meets the latest and the most stringent automotive safety requirement, which is ASIL-D level in ISO26262 standard. As a road vehicle functional safety standard, ISO26262 is designed to improve the automotive safety performance. Ecotron has controller design, development and quality management processes that comply with ISO26262 standard. The hardware and software are systematically validated and tested to ensure that the vehicle controller works in a variety of harsh conditions for safety purposes. For automotive manufacturers, the implementation of ISO26262 standard not only improves the safety performance, but also builds the strong image of product quality and engineering capability.



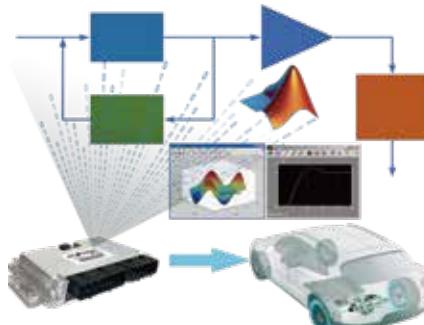
High Performance Semiconductor

Ecotron ADCU uses NVIDIA Orin/Xavier as the core computation processor, and uses NXP's latest generation of SPC5744P microcontroller and related automotive grade chips to achieve outstanding performance. Ecotron VCU also uses Infineon TC397T/377T/297T/275T TriCore microcontroller. These advanced powerful controllers are the core of the control systems.



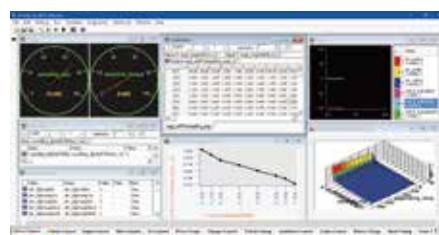
Advanced Software Development Process

The software development is based on model-based design technology. All the software control strategies are modeled and simulated in MATLAB / Simulink, and built-in automatic code generation function. The entire development process is in line with CMMI development process, thus ensuring the quality of software to meet the ASIL standard requirements. Ecotron enables four steps in the design of a model-based control system: analysis, modeling, simulation, and integration. MIL, SIL and HIL tests can be run on the same control system platform.



Powerful Calibration Tools

Ecotron ADCU supports calibration tools based on Simulink External mode. The Ecotron VCU calibration tool EcoCAL is developed in-house. It is based on the CCP/XCP standard protocols and is compatible with the ASAP2 files. EcoCAL is also compatible with CANape, INCA and ATI VISION files. Compared to other calibration tools, EcoCAL is a convenient, simple and low-cost tool. It has all the functions of a calibration tool and it is easier to master in a short time.



Production Quality

Ecotron manufacturing facility has been certified with IATF16949 and ISO9001. All Ecotron products are designed and developed according to automotive standard quality processes, including APQP, DFMEA, PFMEA, PPAP, SPC, MSA, etc. Also, the products are tested against the automotive DVP standards, including ISO16750, ISO7637, ISO11452, CISPR25, etc.. Our products pass the tests, including EMC, ESD, water & dust protection, environmental temperatures, salt fog tests, etc.





***CUSTOMER SATISFACTION THROUGH
QUALITY PRODUCTS AND SERVICES***

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