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Hardware Interface Guidelines for the Vehicle Control Unit

整车控制器接口规范

(English Translation)

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Foreword

The "Car Controller Interface Specification" stipulates the basic specifications of the hardware interface of the pure electric passenger vehicle controller.

The pure electric passenger vehicle controller provides a basis for the formation of a unified diagnosis and maintenance of the pure electric passenger vehicle industry in China.

standard.

This specification was proposed by the Strategic Alliance for Technology Innovation of the Electric Vehicle Industry.

This specification is under the jurisdiction of the China Automotive Engineering Society.

3.4 SOC

SOC. Fully referred to as the state of charge state of charge.

The SOC is used to reflect the remaining capacity of the battery energy, and its value is defined as the ratio of the remaining battery to the battery capacity.

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3.5 EMC

EMC. Fully known as Electromagnetic Compatibility.

EMC is defined as "equipment and systems that function properly in their electromagnetic environment and do not constitute anything unbearable in the environment.

The ability of electromagnetic disturbance" This definition contains two aspects. First, the equipment should be able to work properly in a certain electromagnetic environment.

That is, the device should have a certain electromagnetic immunity; secondly, the electromagnetic disturbance generated by the device itself cannot be generated for other electronic products.

The big impact is electromagnetic disturbance.

3.6 EFT

EFT. Fully called electric fast transient, Electrical Fast Transient EFT technology is a hardware anti-interference technology, mainly for electrical fast transient burst interference signals.

3.7 PWM

PWM. full name pulse width modulation, Pulse-Width Modulation PWM is a pulse width variable signal that is a way to pass data signals.

3.8 RS232

RS232. Fully referred to as Recommendation No. 232, Recommended Standard RS232 is a serial communication protocol used in industrial control sites.

3.9 K_Line

K_Line. The K line is generally used in car detection systems and is a single-wire mode that connects to the controller and enables data transfer.

3.10 MOST

MOST. Media Oriented System Transport for Media

3.11 FlexRay

FlexRay. FlexRay is a high-speed, deterministic, fault-tolerant bus technology for automotive applications.

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4 Hardware interface division

The electric vehicle controller collects driver driving instructions through the hardware interface, and obtains the motor and battery pack through the vehicle communication network.

Relevant information of components, analysis and calculation, sending management instructions to achieve vehicle drive control, energy optimization control, safety protection Protection and other functions. Based on the control function of the vehicle controller, the hardware interface of the vehicle controller can be divided into a power interface, a ground interface, and a drive.

Dynamic interface, digital signal interface, analog interface and communication interface.

5.1.1 Input Power

The vehicle controller takes power from the low-voltage battery of the whole vehicle. The design specifications of the input power interface can refer to the parameter requirements of Table 1.

Table 1 Input power interface requirements

Interface name standby current support function Input power interface 9 v-16 v; leakage current less than 4 mA Monitoring low voltage battery voltage can support implementation Battery aging status detection function, prompt replacement low Press the battery, or control the DCDC relay the function provides an input signal.

5.1.2 Output Power

The vehicle controller can provide DC power output capability for vehicle sensor power supply. The specific solution is determined according to the system design.

The port design can refer to the requirements of Table 2.

Table 2 Output power interface design recommendations

Interface name parameter indicator support function Output power interface Provide 2 power output; each power channel Stream output capability >100 mA; voltage accuracy is higher than 2%; output power and controller chip power supply independent Power is supplied to an external sensor such as an accelerator/brake pedal.

5.2 Activating the interface

The vehicle controller can have an activation interface such as a key signal, a charging signal, a CAN signal, and a remote activation signal.

The system design determines that the interface design indicators can refer to the

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requirements of Table 3.

Table 3 Activation interface design recommendations

Interface name parameter indicator support function Key interface 9 v-16 v; can access 2 key signals Vehicle low-voltage electrical appliances up and down control; vehicle high Pressure system up and down control; motor system power on and off Control; after the key is powered off, such as motor /the battery is cooled down and the fault code is stored.

Charging interface

Slow charge and fast charge signal Two signals are activated separately Charging protection function to prevent vehicle error during charging process Action; vehicle charging power statistics function; charging the process lights up the necessary equipment such as the meter.

Table 6 High-side drive interface design recommendations

Interface name parameter indicator support function High-side relay drive interface Short circuit protection for power supply; short circuit protection for ground; over current Over temperature protection; can work under 16 V power Vehicle high voltage relay control.

5.4.3 LED driver

The vehicle controller can be equipped with LED lamp driving capability for fault prompting, etc. Figure 3 is a schematic diagram of the LED lamp driving interface.

The maximum drive capability depends on the load.

Drive and

Troubleshooting

led

Figure 3 LED light drive interface schematic

5.5 Digital Signal Interface

The vehicle controller should have a digital I/O interface that responds to the vehicle's switching signals. Switching signals can be divided into active high and low levels Effective two.

5.5.1 Digital Input

A schematic diagram of an active high digital input interface is shown in Figure 4. The Rpd high potential terminal should have overvoltage protection measures.

Rpd

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