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Automotive Electronics and Charging Spot Application

With the increasing of consumption of non-renewable energy like petroleum, energy crisis is affecting the development of global economy.

Vehicle exhaust and other toxic gases are bring bad effect to the world wide environment.

Countries around the world are investing a lot to research new energy vehicles in order to reduce energy consumption and improve natural environment.



Energy vehicles have a sales volume up to **500** thousand.

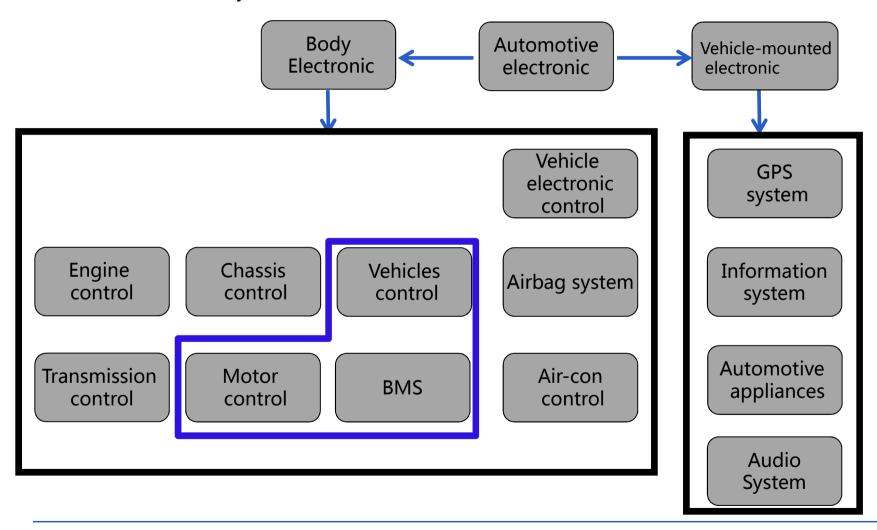
Sales volume of new energy vehicles will reach a number of **1.7 million** in 2020.

Content



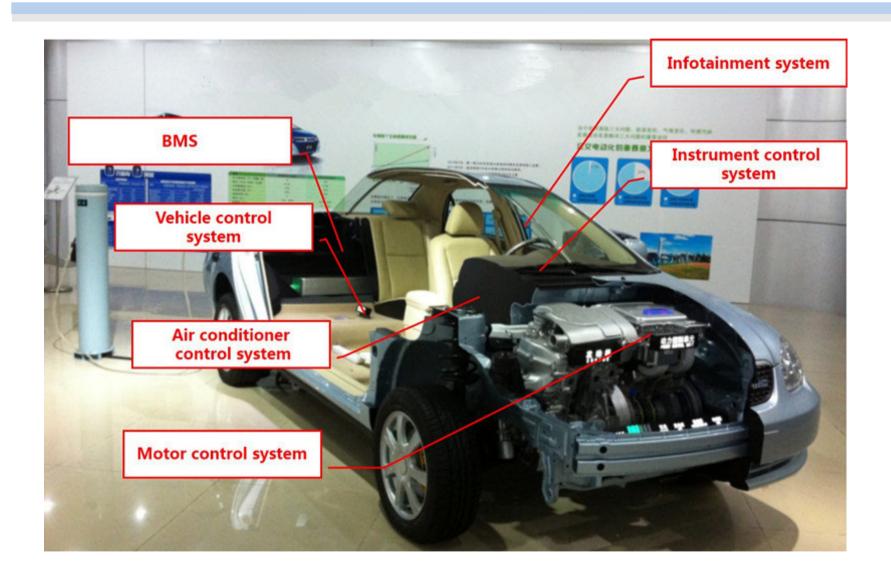
- Automotive electronics industry applications
 - 1. Introduction of automotive electronics industry
 - 2. Automotive electronics power solutions
- Automotive charging spot industry applications
 - 1. Basic knowledge of charging pile
 - 2. charging spot power solutions

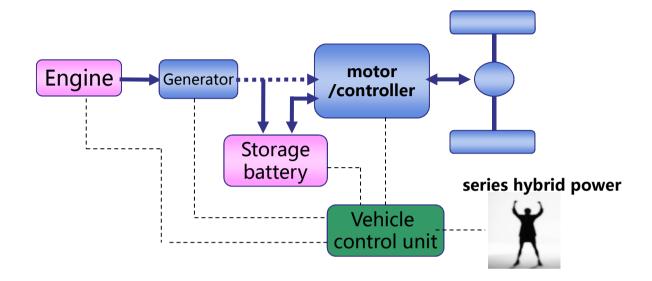
Automotive electronics is a mean to improve the vehicle safety, comfort and infotainment. It is a collective term for car body control device and vehicle control unit.



Basic structure of automotive electronics

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Extended range for electricity

Technolog)
source	

Based on pure electric drive, if necessary, use of internal combustion engine power travel distance increased, pure electric technology based.

Core technology Internal combustion engine work only in limited power, internal combustion engine control technology is relatively simple, can independent breakthrough technology, higher requirements of power battery charge and discharge capacity at the same time, the core technology rely on pure electric.

System

Required power battery has a certain capacity, repair electrical **requirement** power requirement of internal combustion engine is not high

To improve the efficiency of internal combustion engine, through the internal combustion engine power generation to ensure internal combustion engine is always working in high efficient area, power battery as spare energy storage unit, based on the internal combustion engine technology.

Maintain internal combustion engine working in high efficient area, control strategy of EMS is relatively complex, slightly below the requirements for power battery electric extended range, the core technology relies on the internal combustion engine control technology

For internal combustion engine repair electrical power to meet any conditions motor driven power requirements, requirements for battery capacity is not high

Core technology of new energy vehicles



Mainly solves the problem of power battery monitoring and management, and improves the key technology such as battery charging speed

Mainly carry out research of motor system and establish an experiment platform of motor system

> 2.Motor and control technology

3. Vehicle control technology

Mainly reduces fuel consumption and emission, and improves power performance

4. Power system integration technology

Mainly achieve the integration of power system. These 4 technologies are the most important technologies for new energy vehicles.

management technology

EV

To improve engineering application of 1.Power battery group and CAN bus control technology such as logical control and vehicle power-on, process including upgrade maintenance operability, off-line fault diagnosis, failure safety alarm, driving, etc. of each ECU

> 7.Based on CAN bus network communication and control technology

6.Heat management technology

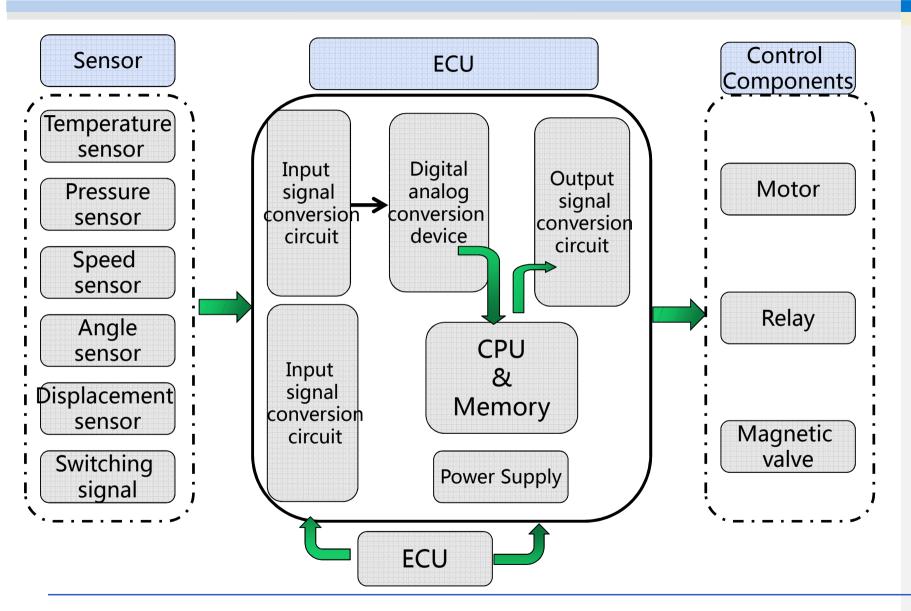
To solve code technology of thermal management in engine, motor, controller, battery and other components

technology To find out ways and laws of the correction of parameter control and control strategy to obtain the corrected mathematical model

5. Vehicle matching test and calibration

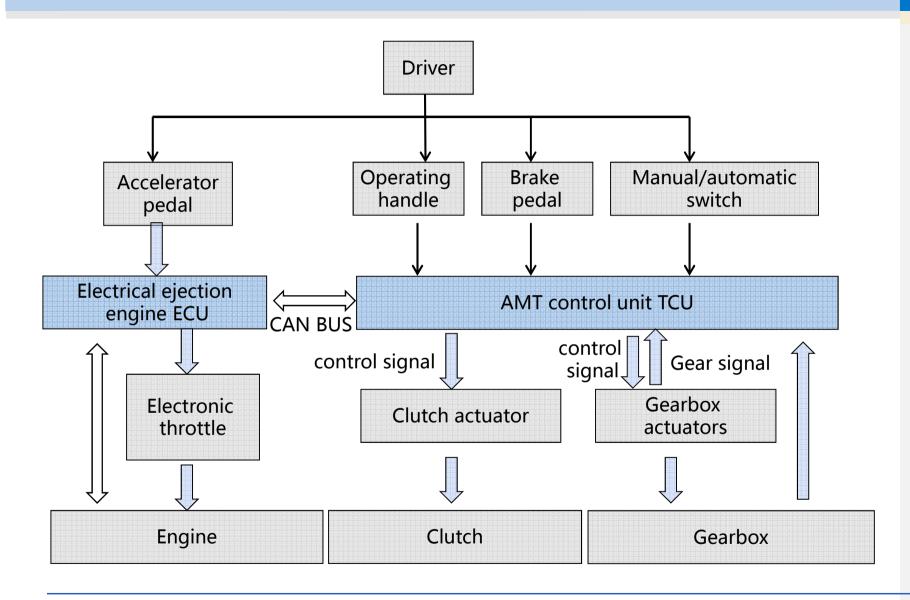




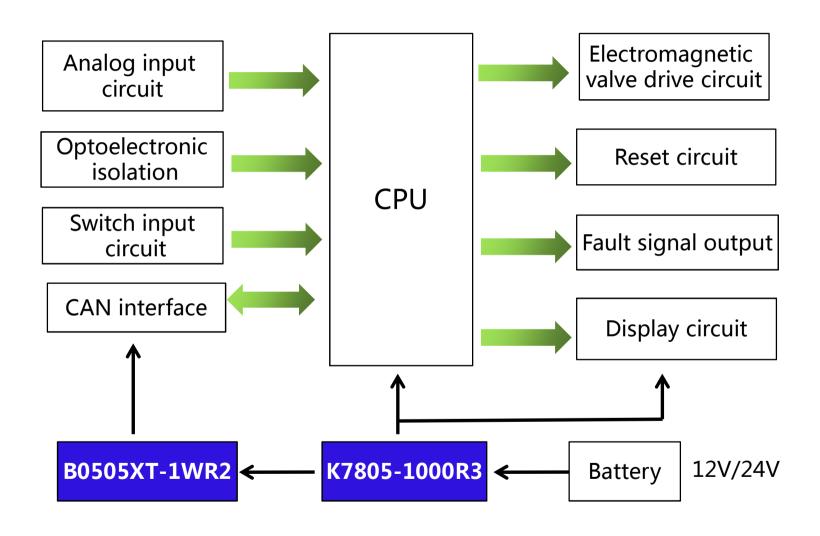


Automated transmission control system



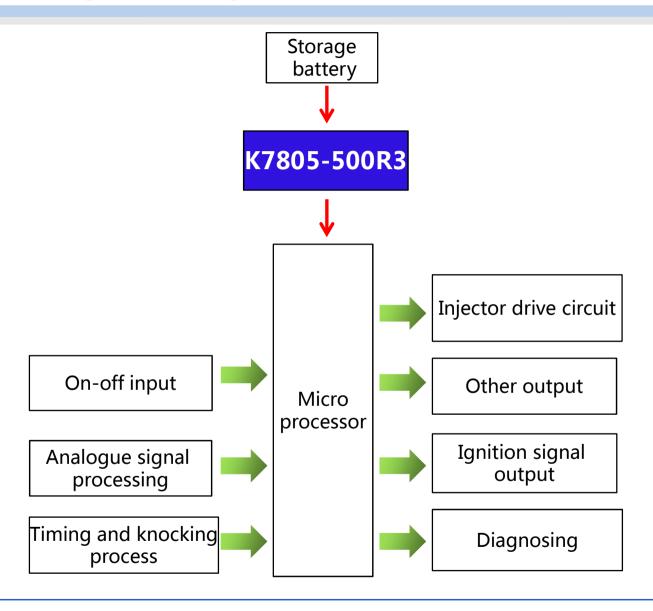


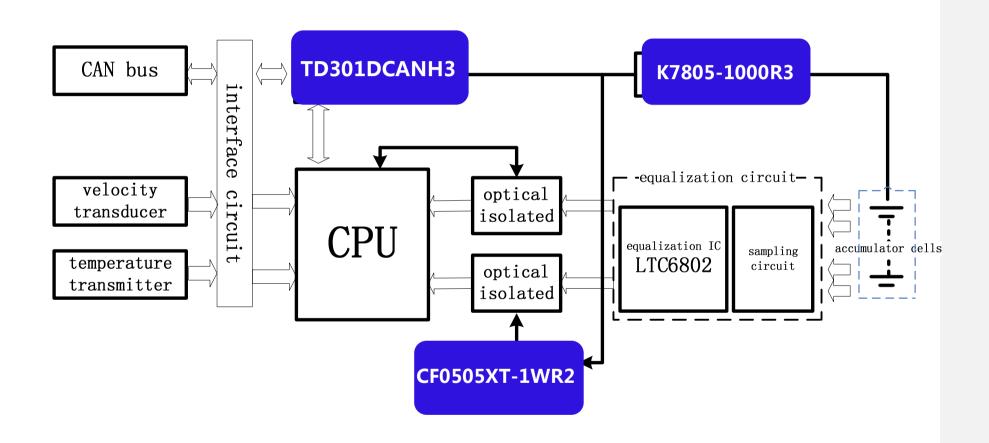
Control process of automated transmission control system MORNSUN®



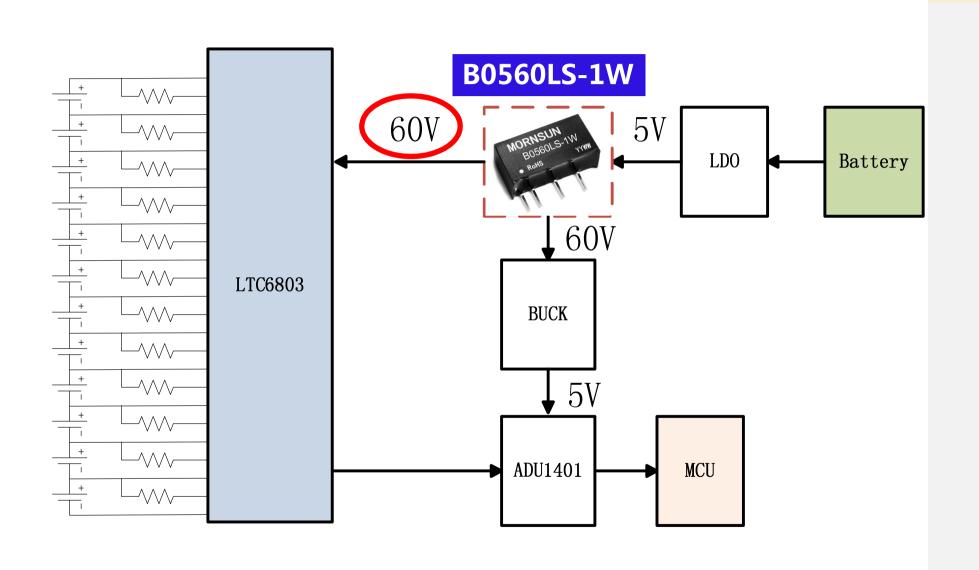
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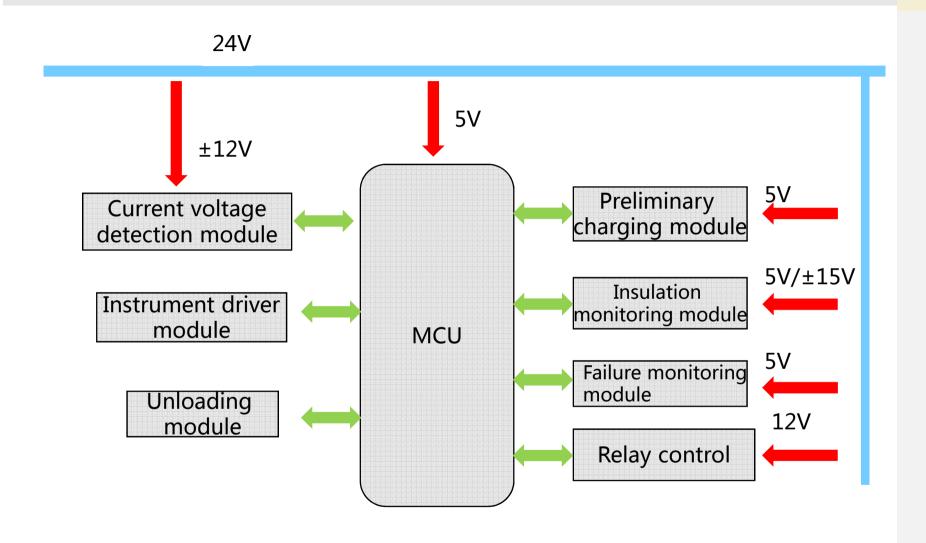












1. Energy conversion unit

Battery needed to convert the direct current of motor power, drive motor running.

6.Safe, reliable and durable

Should be able to adapt to various vehicle driving environment, and durable, security.

motor drive electric vehicle

2.Rated power

To match the driven motor rated power, The best is big.

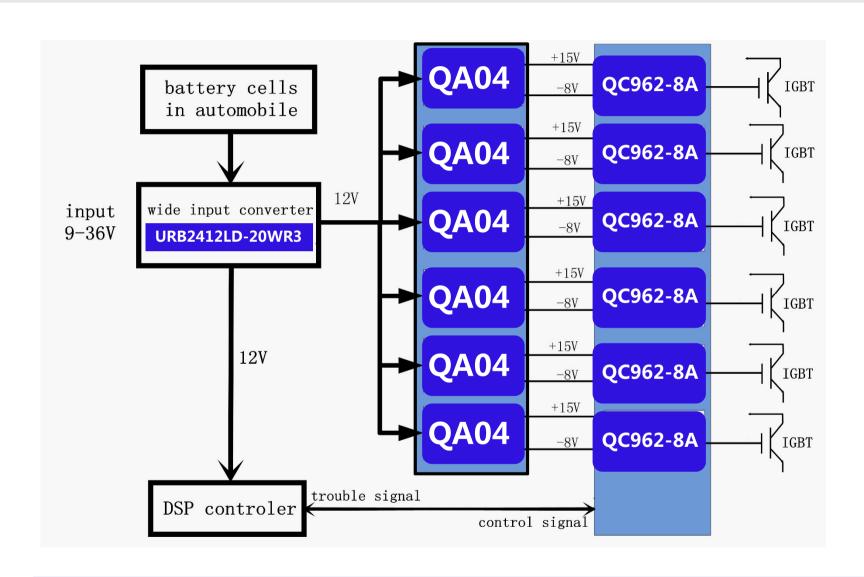
5.Energy conversion efficiency

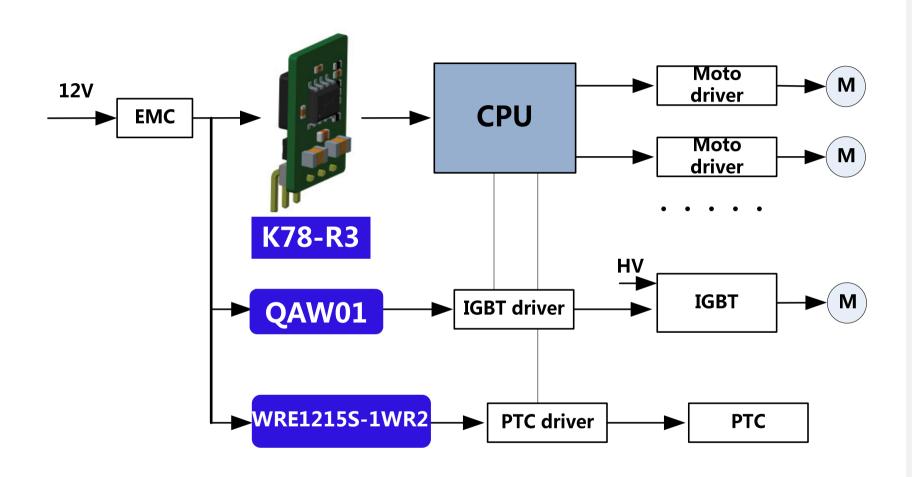
Generally should be above 97%. Must have good ventilation cooling performance.

4.With functions of reverse charge

Vehicle brake, the motor is in a state power.
Should be able to see this reverse filling to the battery of electric power

3.Maximum overload current With the maximum overload ratio matching of the machine. The motor can exert its maximum torque









- ➤ Automated transmission control system→B0505XT-1WR2, K7805-1000R3
- ➤ Engine management system→K7805-500R3
- ➤ Battery management system→CF0505XT-1WR2,TD301CANH3,K7805-1000R3, B0560LS-1W
- ➤ Vehicle control system → Several kinds of isolated DC-DC converter
- ➤ Motor controller→QA04
- ➤ Air conditioner controller → K78-R3, QAW01, WRE1215S-1WR2

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AC charging spot



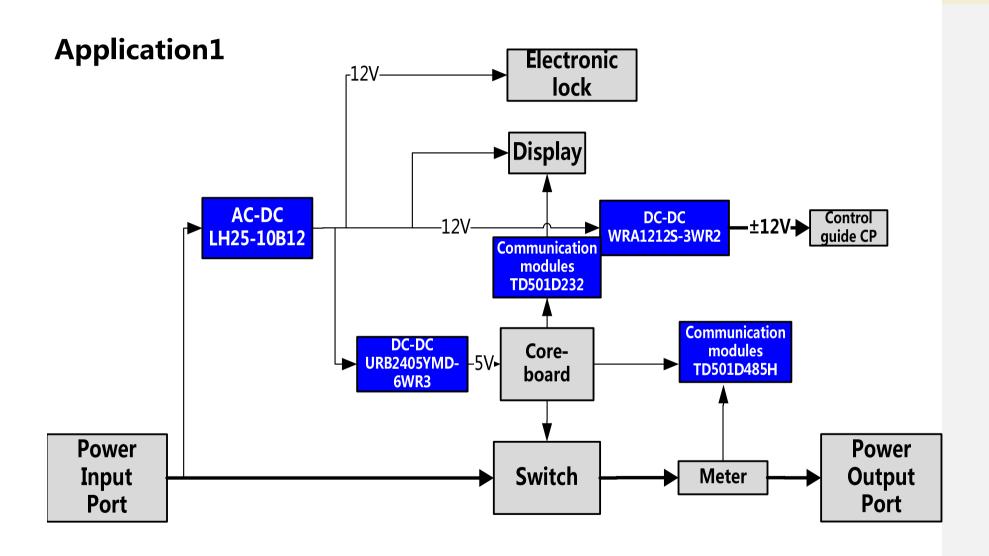
- > Fixed on the ground
- ➤ Uses conduction ways to provide AC power for electric vehicles which with on-board charger
- > Offers man-machine interface and AC charging port
- > With measurement and control protection function



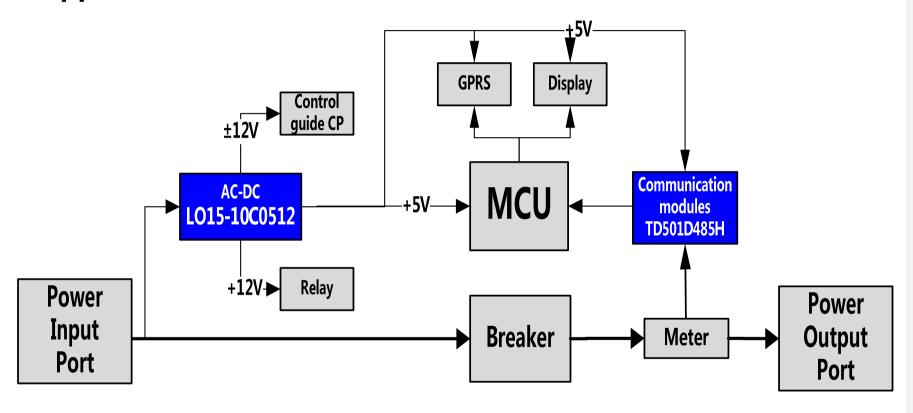
AC charging spot



LCD(5V, 12V, 24V power supply)power based on screen size Display module Communication 232/485/CAN/wifi/GPRS/ethernet module /swiping card 3.3V, 5V Control → ±12V/1W, ground Power guide requirements for internal Relay → 12V, 24V, control contactor components Electronic → 12V, 24V, about 5W, ground lock Main → 5V/1A control unit



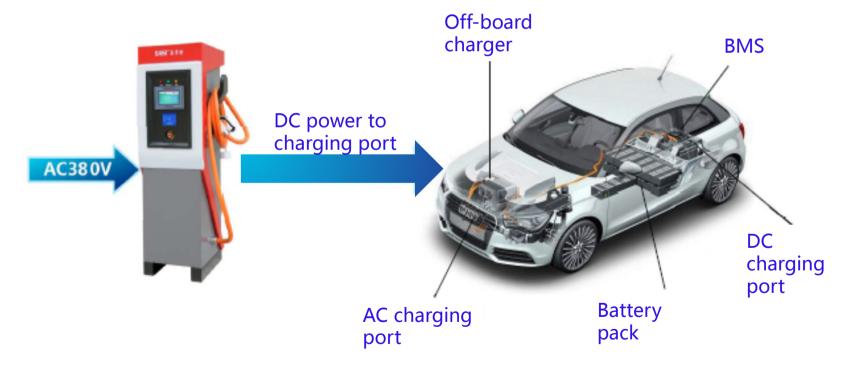
Application2



DC charging spot(off-board charger)



- > Uses conduction ways to converter AC energy of power grid to DC energy to charge battery of electric vehicles.
- > Provide man-machine interface and DC charging port.
- > With measurement and control protection function.
- ➤ Mainly contains 2 parts: AC/DC conversion and DC output control.
- > Integral DC charging spot and split DC charging spot.



Integrate AC/DC conversion and DC output control unit.

Features: is installed outdoors, high protection level requirements, up to 150KW

Advantages: easy installation, layout, construction simple and quick charging machine.



Has separate AC-DC conversion part and DC output control part. These 2 separate parts are combined by cable.

Features:

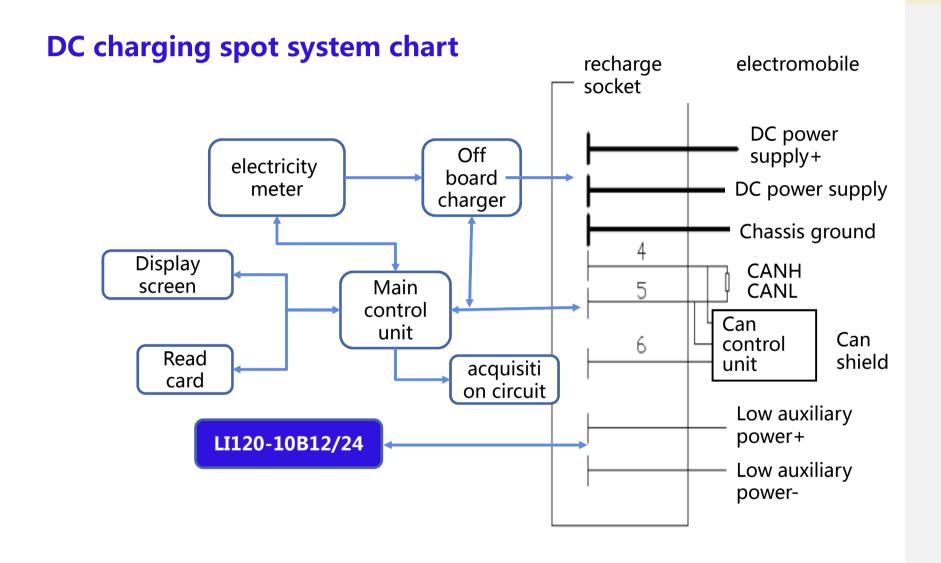
- 1. Charging machine installed indoors, low protection level requirement.
- 2. Outdoor parking charging pile installation, protection level IP54.



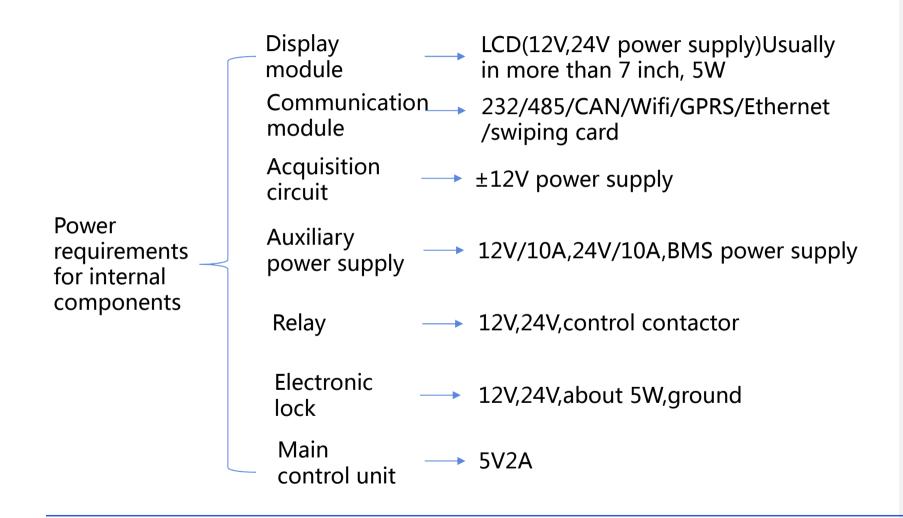
Advantages: good charging machine running environment, no need for special handling of ventilation and heat dispersion.

Weaknesses: charging machine room cost is high, long construction period.



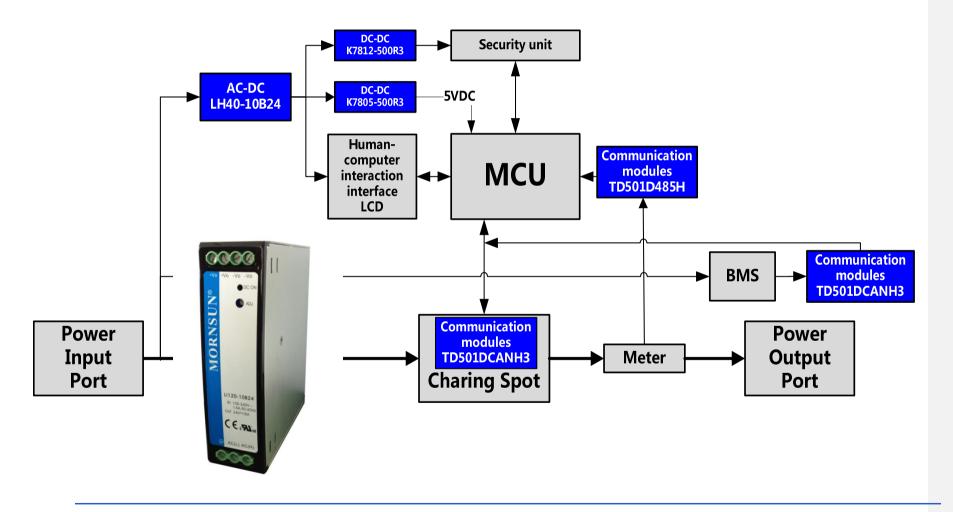








Application





AC charging spot

Charging spot





AC charging spot

LH25-10B12 URB2405YMD-6WR3 TD501D232 TD501D485H WRA1212S-3WR2

DC charging spot

LI120-10B12 LH40-10B24 K7812-500R3 K7805-500R3 TD series

Thank You!