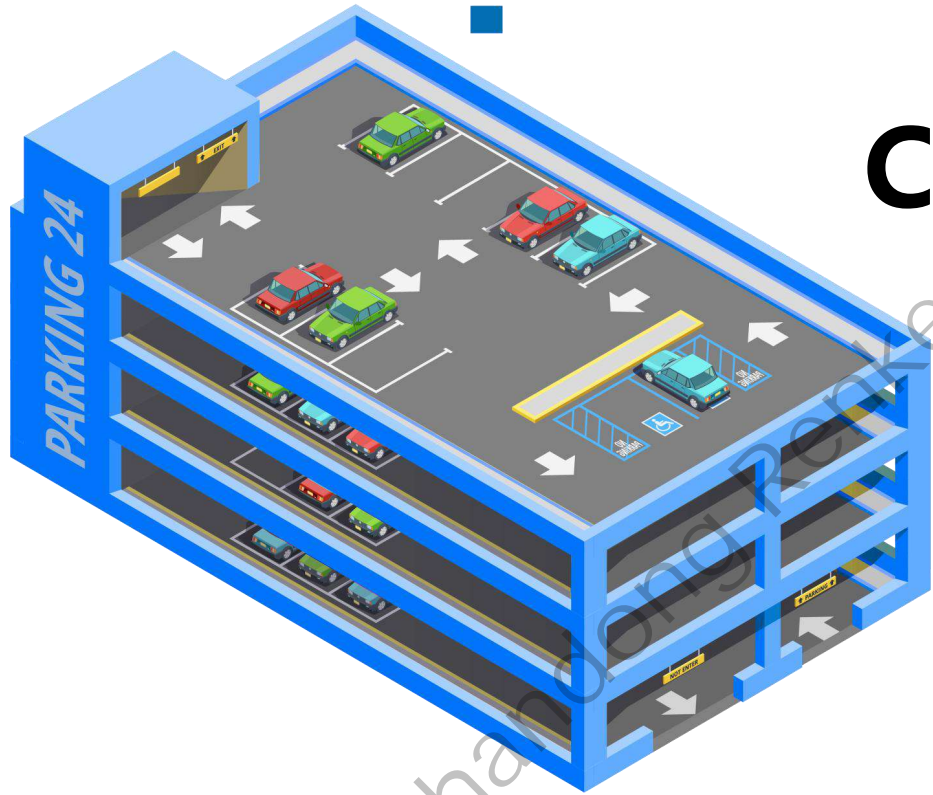
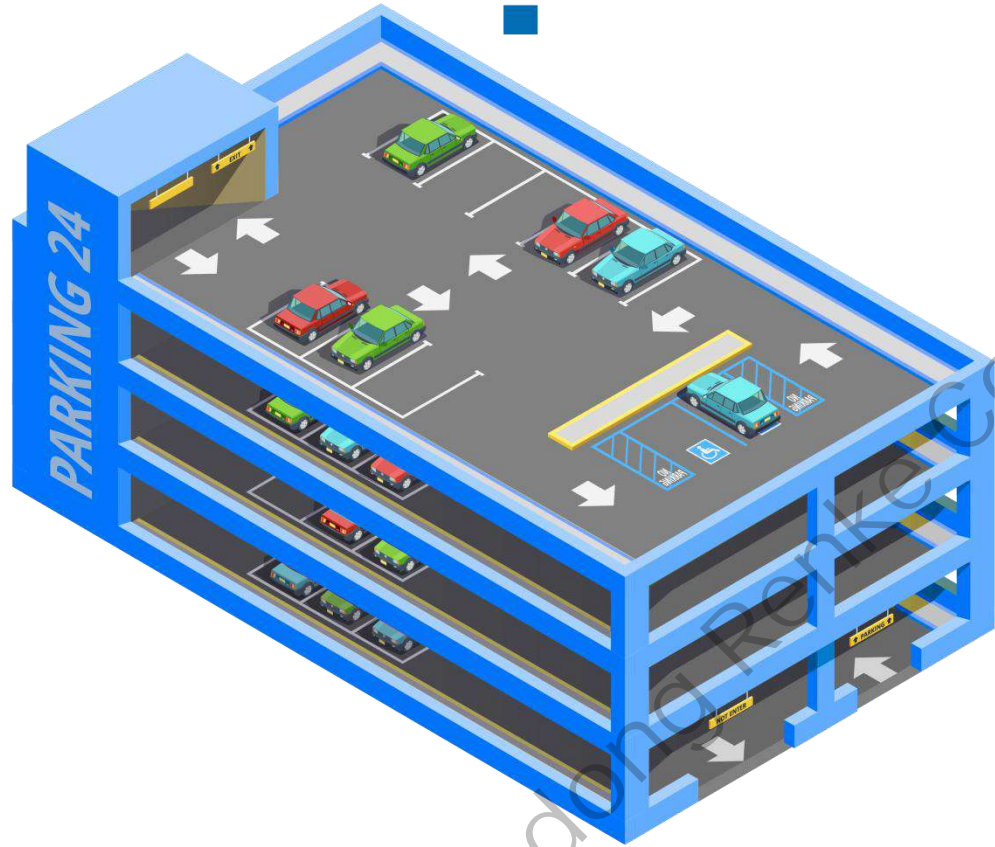


Underground Garage CO Monitoring Solutions





01

**PROGRAMME
BACKGROUND**

Shandong Prentice Control Technology

<<Programme Background>>



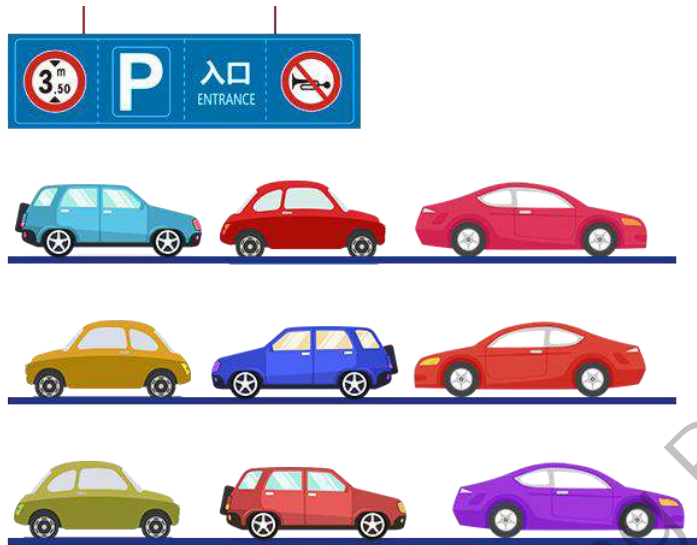
Hazards of carbon monoxide

Carbon monoxide (CO) is the product of incomplete combustion of coal, petroleum and other carbon-containing substances, and is a colorless, odorless, non-irritating and toxic gas.

Due to the continuous development of transportation and industrial and mining enterprises around the world, the consumption of fuels such as coal and oil continues to grow, and the emission of CO

When a person inhales CO, it binds to hemoglobin to produce carboxyhemoglobin causing the person to become hypoxic. The most common symptoms of CO poisoning, such as headache, nausea, vomiting, dizziness, fatigue and a feeling of weakness, can have sequelae as exposure to CO may severely damage the heart and central nervous system.

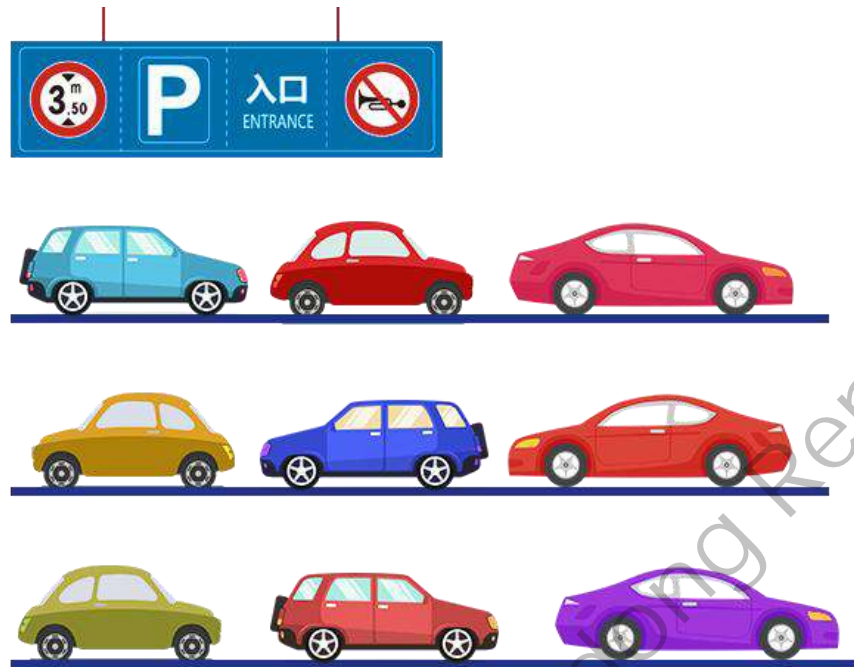
<<Programme Background>>



Code of conduct

In recent years, the national and local CO detection system for underground garages also pay attention to. It is understood that the national standard "Green Building Evaluation Standard" GB/T50378-2014 version of the provisions of 8.2.13: "underground garage set up with exhaust equipment linked CO monitoring device"; "Beijing Green Building Evaluation Standard" DB11 /T825-2015 version of the provisions of Section 4 residential buildings Section 4, 4.5.15 and Section 5, 5.5.13 of Public Buildings, both stipulate that "underground garages are equipped with CO monitoring devices linked with exhaust equipment"; 8.6.3 of Jiangsu Green Building Design Standards, DGJ32TJ76-2009, stipulates that "underground garages with underground garage with mechanical ventilation should be monitored and controlled in real time". In addition, Shenzhen and other cities have also mentioned the relevant content. The above standards are applicable to new construction, alteration and expansion of residential buildings, offices, shopping malls and hotels in public buildings.

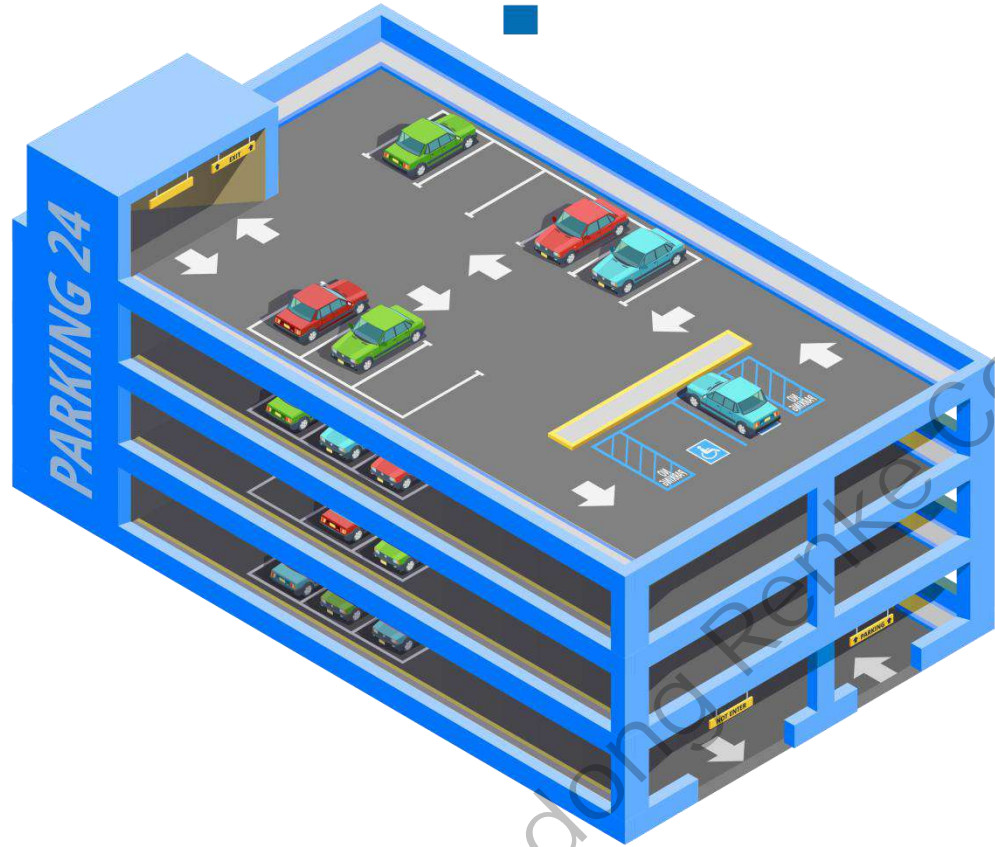
<<Programme Background>>



Underground Garage CO

With the popularity of private vehicles and underground garages, indoor vehicle exhaust emissions seriously affect indoor air quality, and one of the main components of exhaust is carbon monoxide (CO).

Underground garage carbon monoxide is mainly generated from the car engine. When the engine is idle, due to inadequate combustion of gasoline, it will produce a large variety. Underground garage is a closed environment, the vehicle is more frequent in and out, the exhaust gas is not easy to discharge, it is easy to accumulate a large amount of CO gas, resulting in the underground garage filled with choking odor, damage to human health. Therefore, the underground garage should be equipped with air supply and exhaust system, with fresh air for replacement, the installation of underground garage carbon monoxide concentration monitoring system.



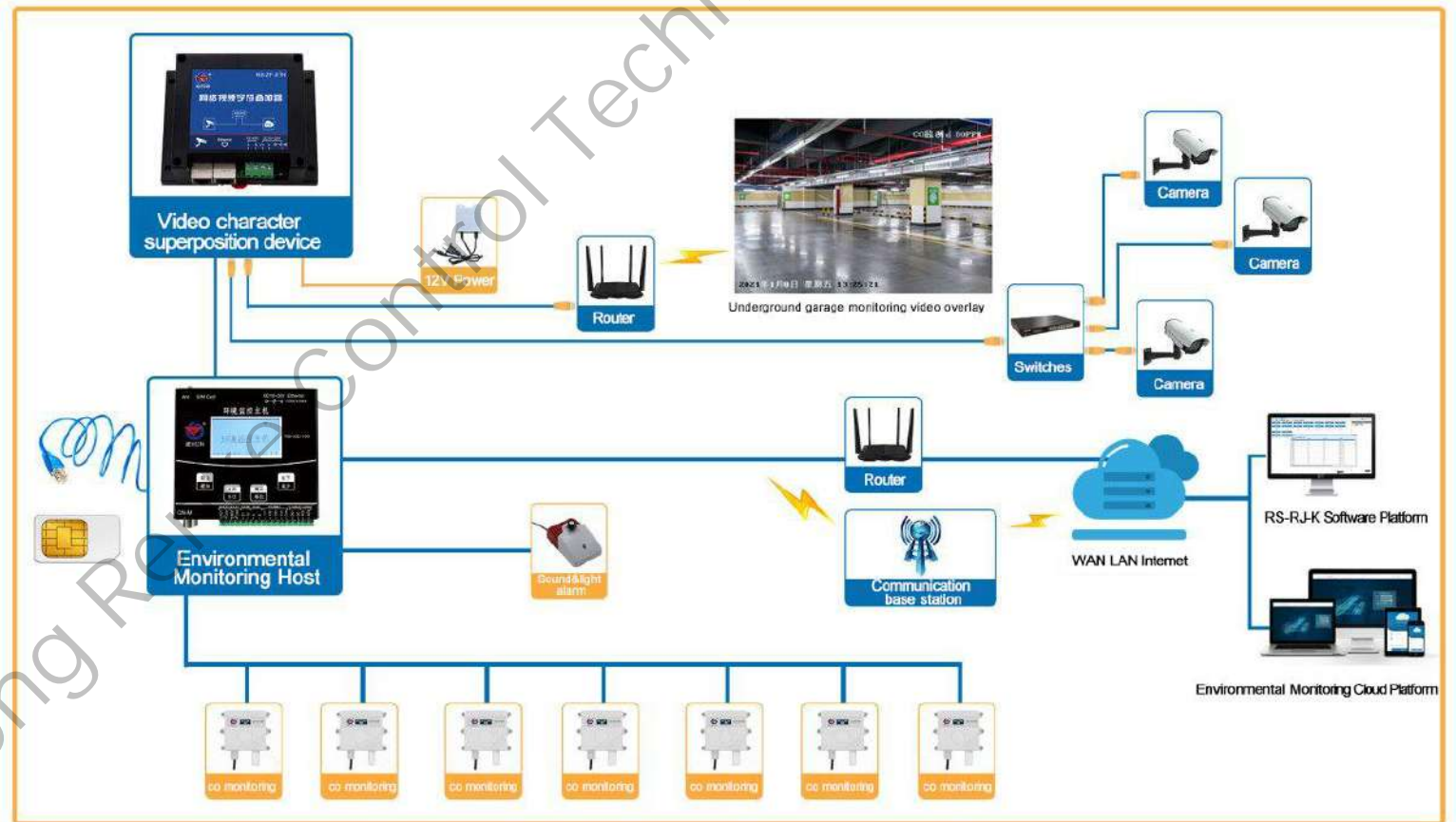
02

**PROGRAMME
INTRODUCTION**

Shandong Prentice Control Technology

<< Programme Introduction >>

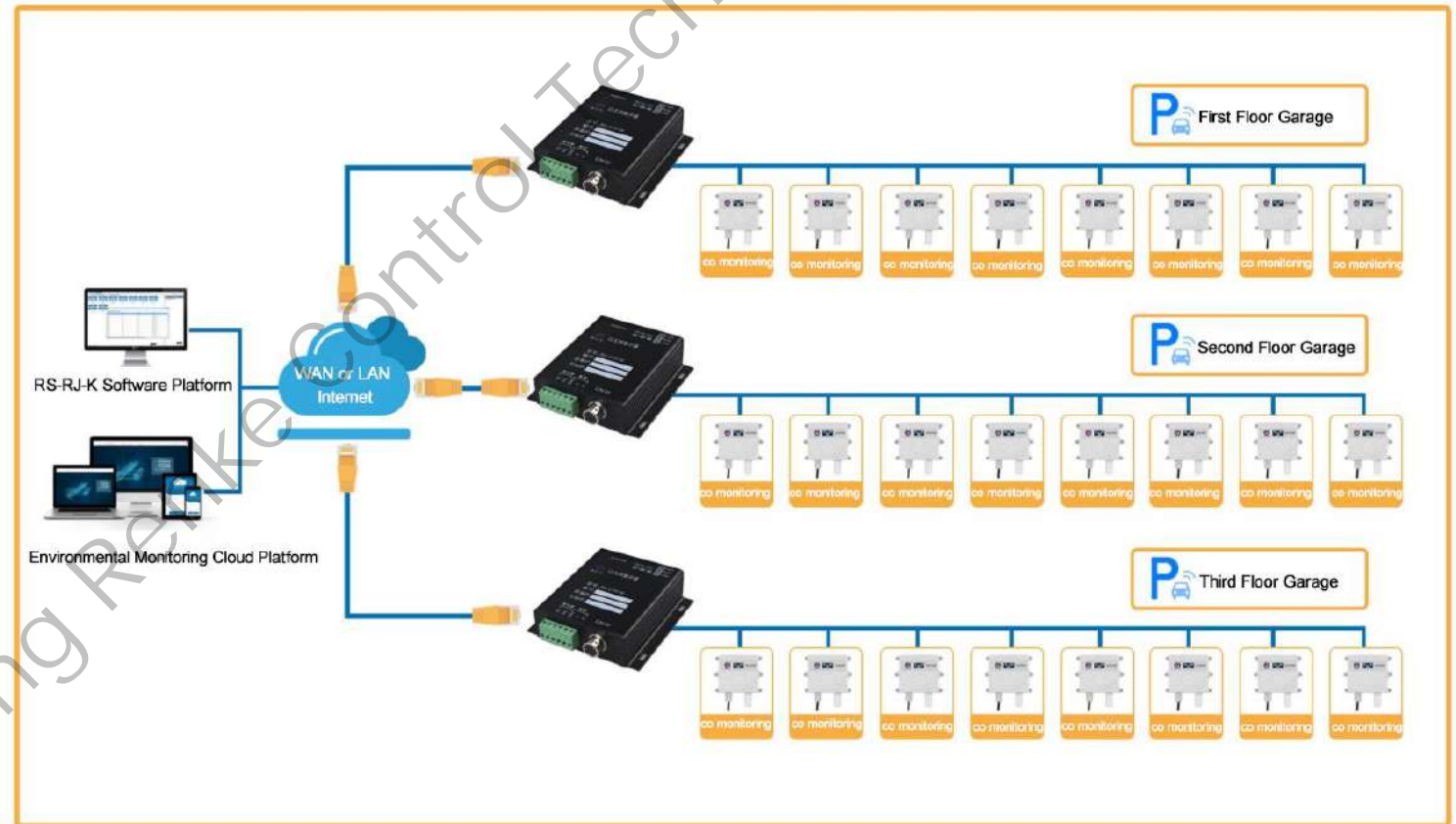
The underground garage CO monitoring system consists of co data collection equipment, environmental monitoring host or Ethernet concentrator (for multiple areas), video monitoring system (video character overlay + camera), environmental monitoring platform, and fan control system (linked fan exhaust start).



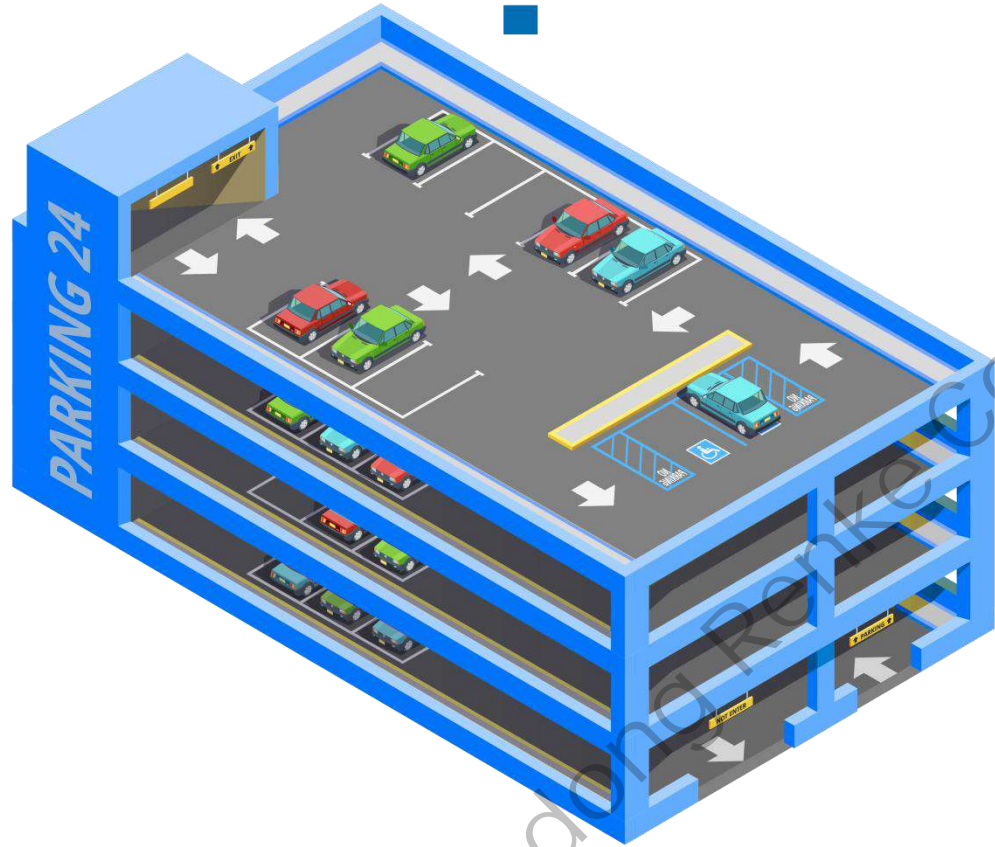
Solution Topology Diagram

<< Programme Introduction >>

For a variety of small area co monitoring and considering the weak wifi signal and GPRS signal in the underground garage, our **Ethernet concentrator** can be used to transmit the collected data to the platform through the network port wiring. This solution can effectively monitor data in different areas and save economic cost.



CO multi-area monitoring topology diagram



03

**PROGRAMME
COMPOSITION**

Shandong University of Control Technology

<< Program Composition >>

CO Sensor



Our design of CO sensor, unique compensation algorithm, multi-segment gas calibration, suitable for underground parking, garage, workshop, confined places and other occasions that need to detect the concentration of carbon monoxide. Adopt imported brand electrochemical sensor, stable and durable.

Functional characteristics are as follows:

- Range 0-1000ppm (default), 0-2000ppm can be selected, other ranges can be customized.
- High measurement accuracy within $\pm 3\%FS$ and repeatability within 2%.
- 485 communication interface, standard ModBus-RTU communication protocol, communication distance up to 2000 meters.
- Optional high-quality OLED display for direct viewing of values in the field and clear display at night.
- Field power supply adopts 10~30V DC wide voltage power supply, which can adapt to a variety of DC power sources on site.
- The product adopts wall-mounted waterproof case, easy to install, high protection level can be applied to the harsh field environment.

<<Program Composition>>

Environmental Monitoring Host



To ensure the safe, stable and efficient operation of the underground garage, it is necessary to carry out 24-hour real-time monitoring and intelligent regulation and control of the underground garage. This device can monitor the specific parameters of various sensors conveniently and uniformly. It is a simple and practical intelligent monitoring host, which only needs to be connected to the network and configured simply according to the wizard. It can timely find out the hidden safety problems in the underground garage monitoring system and intelligent alarm. Functional features are as follows:

- Built-in data storage for 520,000 records
- 1 RJ45 network port for uploading monitoring data to remote monitoring software platform.
- With 1 channel water leak detection function can be connected to external leak electrode or external leak rope, up to 30 meters.
- 1 multi-functional GPRS communication interface, simply insert a mobile phone card to upload data to the monitoring software platform.
- 1 ModBus-RTU master interface to access all types of our 485 sensor.

<<Program Composition>>

Network video character superimposer



Network video character superimposer is a device developed by our company for the common standard Modbus-RTU communication mode 485 devices in the market, which is suitable for HD network cameras. Users can connect this product to 485 devices according to the actual demand, and after simple configuration of the superimposer, the corresponding character information will be superimposed on the HD network camera video screen. Functional features are as follows:

- Support DC10~30V wide voltage input, character display position adjustable in full display.
- Match all standard Modbus-RTU communication devices and support up to 4 cameras stacked at the same time.
- Independent software configuration, powerful, simple interface, easy operation, up to 16 485 devices can be accessed.
- Camera underlying protocol docking, does not affect the original video signal, real-time display of data changes in the monitoring site.
- Support any Chinese, English, punctuation display, up to 22 Chinese characters or 44 characters per line.

<<Program Composition>>

Ethernet Concentrator



The concentrator that transmits data via Ethernet can access 1-8 transmitters of all types of our RS485 type, which is suitable for collecting data from multiple points in one space and uploading them to the network through one concentrator, and the overall equipment cost of this solution is low. Functional features are as follows:

- Equipment 10~30V power supply, it can set the temperature and humidity upper and lower limits, and associated with the relay.
- The collector can provide centralized power supply for hooked up RS485 devices.
- With 1 switch signal input, 1 relay contact or active contact output (specified when ordering) .
- Access to our RS-RJ-K software platform and cloud platform.

<<Program Composition>>

Environmental Monitoring Cloud Platform



Environmental monitoring cloud platform is designed to provide users with convenient services and specially developed web login platform, the cloud platform is deployed in the public network server, can easily access our company a variety of products. Customers do not need to have a public network IP or domain name resolution services, and do not need to set up their own server, eliminating the server maintenance costs.

Environmental monitoring cloud platform can monitor **real-time data** and monitoring screen of underground garage CO, support analysis, view and export historical data, remote setting of weather station data parameters and other functions, support multiple login methods, such as **computer web terminal**, **mobile phone APP** and **WeChat public** ect.

<<Program Composition>>

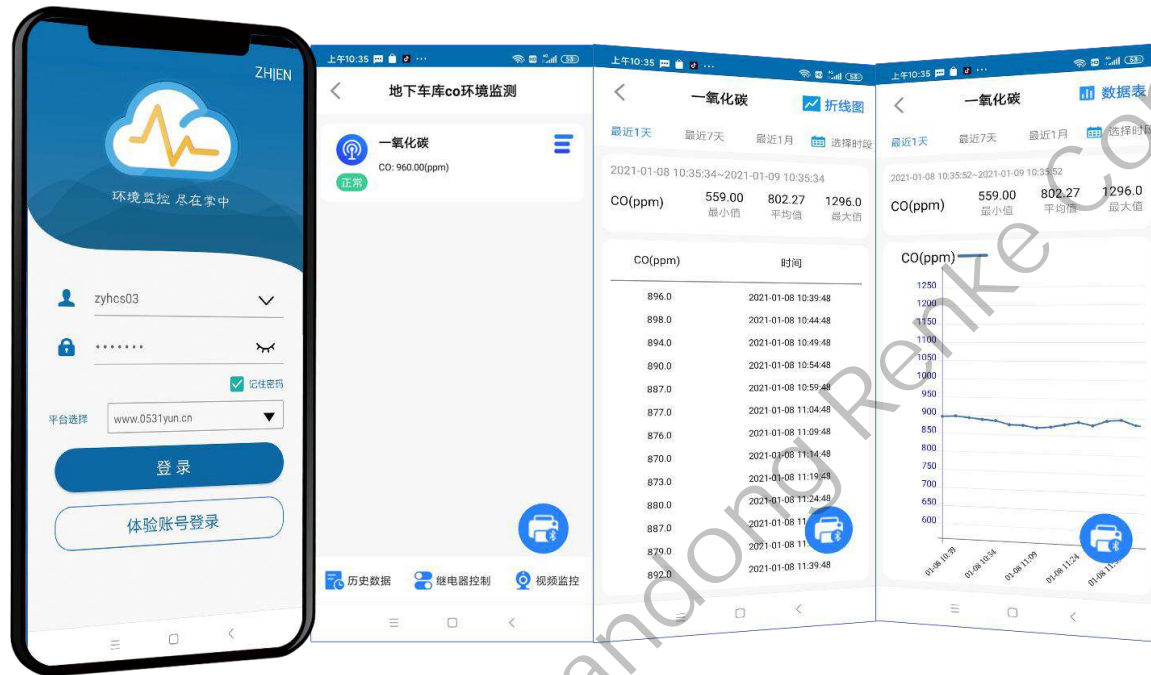
Environmental Monitoring Cloud Platform Web Interface Display



Open your computer's browser and enter "www.0531yun.cn" to enter the login interface of the cloud platform. Enter the user name, password and verification code, generally the initialized password is the same as the user name.

<<Program Composition>>

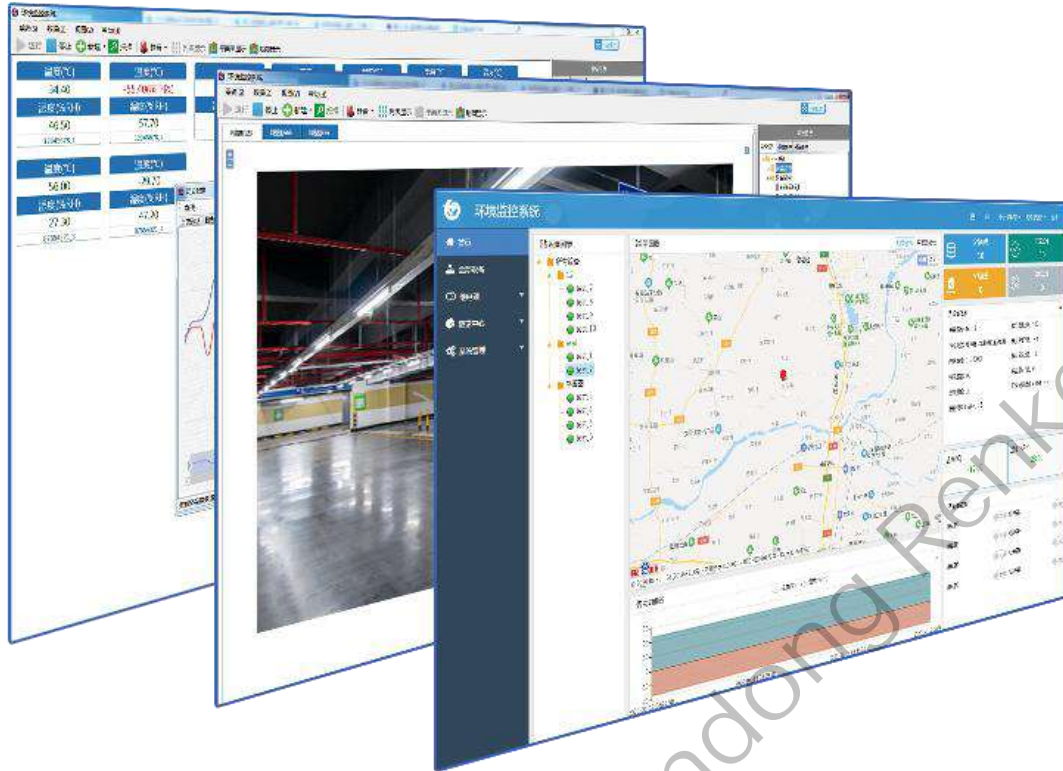
Environmental Monitoring Cloud Platform APP Interface Display



To facilitate the monitoring of data by mobile users, the company developed and launched the "Cloud Control" mobile APP. It is convenient for users to monitor 24 hours in real time. The mobile APP "Cloud Control" can control thousands of devices with one click, support video view, equipment failure / abnormal alarm, offline alarm function, real-time data view, historical data view, it also can connect bluetooth printer for data printing, powerful.

<<Program Composition>>

Local Software Platform RS-RJ-K



RS-RJ-K monitoring platform is an environmental monitoring platform software, the software can run on WIN Server 2008, WIN7, WIN8, WIN10 and other operating systems, with support for voice alarm, e-mail alarm, SMS alarm. It supports device name customization, data unit and conversion function customization, remote Web access, and device management by authority.