

AI Edge Computing Application Stories



Urban development is inseparable from intelligence and intelligence. For more than 20 years, JHCTECH has always stood at the forefront of industry development. Many star products have penetrated deeply into various industries and responded to global development trends with extraordinary R&D capabilities.



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JHCTECH & Tencent Driverless Car Project

In order to hold on to the development opportunities and explore future urban Intelligent transportation system. In March 2021, Tencent's driverless car officially landed in Shenzhen Intelligent transportation system demonstration zone. The project will be based on the test of IoT, and will be oriented to build an autonomous driving ecosystem and future transportation system with the five major elements as "vehicle, road, cloud, network and map". Combining new-generation technologies such as 5G, autonomous driving, and AI, we will build a full ecosystem for the R&D and testing of future Intelligent Connected Vehicle(ICV), as well as building a world-leading test base for Intelligent transportation system. This is a demonstration area unmanned driving project jointly built by Shenzhen Pingshan Government, Shenzhen Stock Exchange and Tencent.



Customer application requirements

In the era of vigorous development of driverless technology, the efficient coordination of smart transportation and the Internet of Vehicles is the foundation of safe driverless driving. Traditional driving uses the human brain and human eyes to drive on the road, and driverless cars perceive the traffic environment around the vehicle through sensors. And by sensing the road, vehicle position and obstacle information, to judge and execute the vehicle steering, speed and formal route. In order to meet its harsh driving conditions, this project requires an industrial-grade edge computing product to achieve rapid processing of sensing unit data, so as to well achieve the purpose of safe unmanned driving. The required equipment must meet the following conditions:

- It adopts seismic design, high reliability, high precision and high timeliness to adapt to the vehicle environment.
- Adopt high-performance processor, support AI/GPU card, can quickly process the data information of the vehicle perception unit
- Wide voltage DC power supply, which can effectively supply power to the vehicle battery
- Abundant I/O interface for connecting multiple peripheral devices
- CAN bus, realizes the connection between the system and the vehicle wire control system

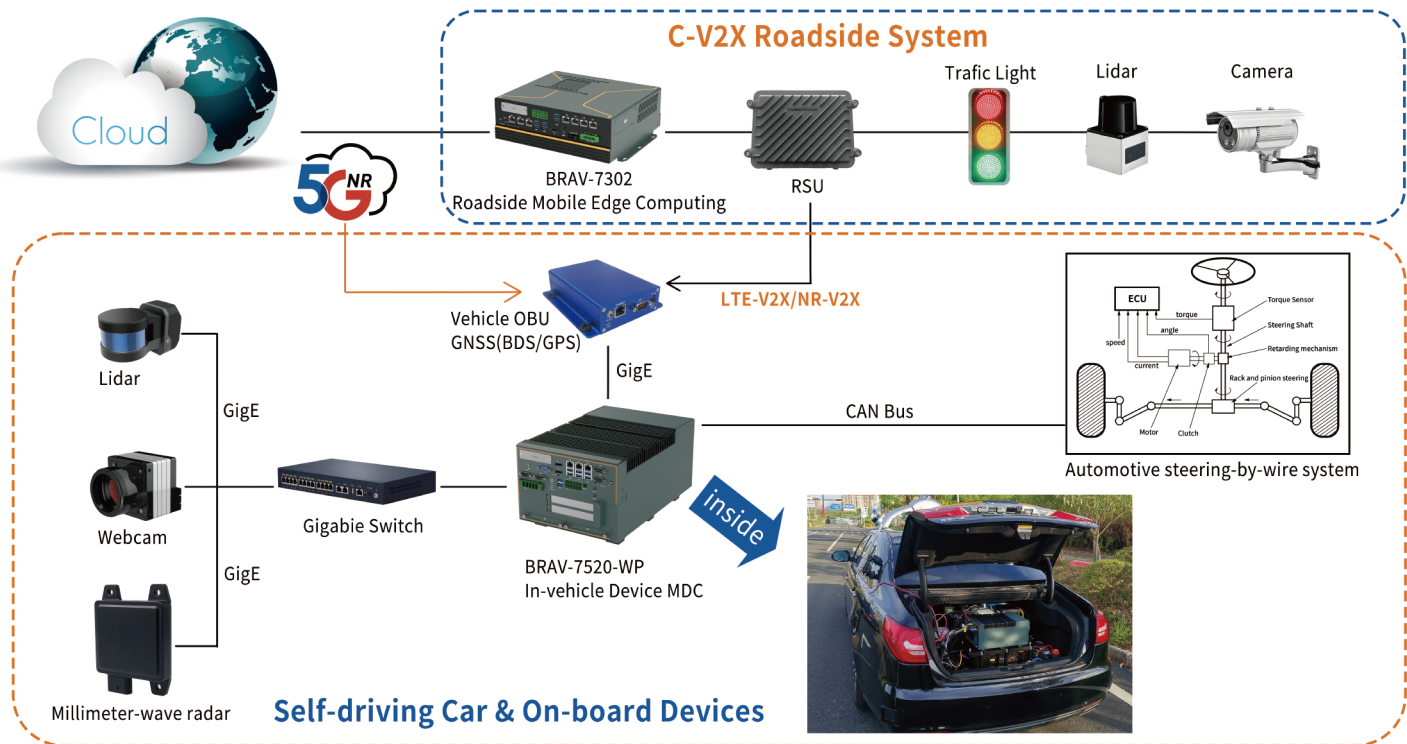
Application products



BRAV-7520-WP



BRAV-7302(Roadside)



Related applications

As one of Tencent's important suppliers in the field of edge computing, JHCTECH has provided leading edge computing product support for the Shenzhen Intelligent Networked Transportation Test Project. BRAV-7520-WP finally serves as computing unit MDC, providing strong support for unmanned driving. The structure and installation of BRAV-7520-WP are designed according to the shock absorption design, which is suitable for the vehicle environment. It is equipped with Intel™ Xeon RE or 9th/8th Gen Core™ processor, WP model supports RTX-3080 high computing power GPU for deep learning to realize Laser fusion data structure, DC 9-55V wide voltage DC power supply is suitable for vehicle battery power supply. At the same time, the BRAV-7520-WP edge computing device is equipped with rich I/O interfaces, which can satisfy the connection with multiple peripheral devices.

At present, the computing unit MDC of L4 and L5 autonomous driving adopts a dual architecture solution of CPU+GPU, and the OBU communicator adopts FPGA architecture. MDC (BRAV-7520-WP) connects sensors such as vehicular radar, millimeter-wave radar, and camera through switches, and performs data structure fusion through deep learning inference calculation. At the same time, after the OBU communicator is directly connected, the C-V2X network connected upward can sense roadside and cloud information, and the CAN connected downward. Connect the vehicle-mounted wire-controlled system through CAN bus, it realizes the vehicle's braking, steering, engine start-stop, transmission and door and window control, as well as the automatic control of the warning system with sounds, images and vibrations.

Summary

JHCTECH BRAV-7520-WP is a product specially designed for intelligent AI edge computing, which can meet the harsh environment of unmanned driving applications, and assist in the realization of safe unmanned driving through fast processing of sensing unit data. This project is another benchmark application of JHCTECH's edge computing products in the field of unmanned driving after projects such as Guangzhou Biological Island, Tianjin Xiqing Pilot Area, and Jingyizhuang Autonomous Driving.

Winter Olympics Driverless Minibus

On February 4, 2022, a world-renowned sports event - the Winter Olympics will kick off in Beijing!

The "Technology Winter Olympics" is a highlight of the Beijing Winter Olympics. Unmanned driving is an important part of the "Technology Winter Olympics". L4-level unmanned shuttles, autonomous parking, unmanned distribution and other Intelligent Internet of Vehicle services are the first time applied to the Olympic.



Customer application requirements

A few days ago, JHCTECH provided leading edge computing product support for the Winter Olympics E-Techzhixing autonomous driving cabin, helping it to carry out the tasks of personnel ferrying and material delivery in the Chongli competition area of Zhangjiakou of the Winter Olympics. Faced with the high flow of people during the Winter Olympics, and considering reducing the frequency of people's contact during the COVID-19 epidemic, the low-speed driverless minibus highlights its substitutability for human resources under special circumstances. By adopting a multi-sensor fusion solution, functions such as autonomous positioning, destination navigation, optimal path planning, pedestrian recognition, obstacle avoidance, and detours in indoor/semi-indoor scenarios can be realized. The car computing unit MDC needs to be able to operate stably in the harsh environment of high-vibration. It is equipped with rich I/O interfaces, multiple network ports and multiple displays, and can be connected to not only car sensors such as radar, cameras but also other equipment. Support CPU+GPU dual processor, realize fast analysis and processing of sensing unit data, wide voltage power supply, support vehicle power supply. In addition, wireless functions such as 4G/Wifi/BT and GPS/BDS navigation are required.

Related applications

KMDA-3602 is equipped with Intel Kabylake-S/Sky lake-S processor, supports up to 120W power consumption GPU, can perform deep learning inference calculation with stable performance. The shock absorption design of the whole machine can meet the stable operation of the vehicle in the harsh environment of high vibration. It's with multiple network ports and multiple displays, supports 3 LANs, 4 POEs or 7 LANs, which can effectively connect a variety of external devices. It adopts DC 6-48V wide voltage power supply, suitable for vehicle battery power supply, and has ITPS vehicle management function. It has strong expansion ability and meets the needs of wireless data transmission through 4G/Wifi/BT.



KMDA-3602

Summary

KMDA-3602 is a high-performance on-board computer that adopts active and passive current combined with heat dissipation design. The whole machine structure and installation method are carried out according to the shock absorption design scheme, which is suitable for the on-board environment and can be used as one of the reliable solutions for the on-board computing unit of unmanned vehicles.

Outdoor Unmanned Disinfection Sweeper



The sanitation service industry has always been a labor-intensive industry, relying on a large number of manpower. The high cost, long process and low efficiency of manual cleaning have always been the pain points of the sanitation industry. With the development of urban modernization, the demand for sanitation continues to increase. The sanitation scenario is one of the key low-speed application scenarios for the application of low-speed driverless technology. Autonomous driving enables sanitation and automatically completes cleaning tasks, which is an ideal labor replacement solution in the future.

Customer application requirements

The unmanned disinfection and cleaning vehicle built by a large domestic bus group is supported by JHCTECH and its partners. The unmanned disinfection vehicle integrates various AI technologies such as artificial intelligence, machine vision, image recognition, and precise positioning. It can automatically identify the environment, plan the route and automatically clean it, and give full play to the role of the Internet of Things, cloud computing, big data and other information network platforms to achieve fully automatic, full working conditions, refined and efficient cleaning operations. For outdoor unmanned sweepers, the outdoor environment is relatively complex and unpredictable. Weather and lighting test the robot's visual positioning and object detection capabilities. The more open and complex unstructured environment requires robots to have stronger mapping capabilities. In addition, in the outdoor environment, the moving speed of dynamic obstacles and robots is higher, and the robot needs to have more sensitive obstacle avoidance ability.

Related applications

This project uses JHCTECH BRAV-7302 equipped with intel core i7-7700K, GTX-1060 GPU, and the application system developed by the joint partners. Through the front-end GNSS inertial measurement unit, lidar, millimeter-wave radar, industrial cameras and alarms, etc., real-time ranging, satellite navigation, automatic detection and sensing of the surrounding environment, video streams and data are aggregated to the BRAV-7302 for processing, making the unmanned disinfection sweeper can realize fully automatic unmanned driving, automatic steering, obstacle avoidance, turning, and going up and downhill. At the same time, it can realize real-time warnings, work 24/7, and communicate with the cloud platform through 4G/5G to achieve one-key recall, remote control of multiple unmanned disinfection and cleaning vehicles at the same time, integrate high-efficiency intelligence under multiple systems.



BRAV-7302

Summary

In this unmanned disinfection and cleaning vehicle, JHCTECH BRAV-7302 edge computing product has the advantages of reliable high-performance platform, rugged industrial design, strong I/O flexibility, etc., can sense the data of the unit in real time processing, to provide positioning and navigation, visual computing, motion control and other application control for the robot.

Changqi Expressway ETC Free Flow System

Electronic toll collection system (ETC), as an important part of intelligent highway transportation, is currently playing an important role in scenarios such as road and bridge and parking lot, also plays an important role in improving traffic efficiency and mining the value of traffic data. In the ETC system, the industrial control computer plays a vital role. It is not only connected with the RSU, the high-definition license plate recognition system and other lane equipment, but also with the Toll Station Server to complete the calculation, storage and forwarding of ETC-related data, and control of various lane equipment.



Customer application requirements

In the ETC free flow system, it automatically completes the collection, processing, analysis and transmission of ETC vehicle information in high-speed traffic through external equipment such as license plate recognition and RSU. After these information data are uploaded to the ETC backsystem software, the identification and marking of all ETC vehicles can be done. Meet the purpose of free flow path identification, billing, and fast release. The ETC gantry site is an important carrier for segmented billing functions, and the ETC industrial computing controller is a key part of the ETC gate. In this highway project, the customer put forward the following requirements for the ETC free flow system hardware equipment:

- Adapt to the harsh road environment with variable temperature, humidity, dust, corrosion, vibration, etc. The product is sturdy and durable;
- With electromagnetic compatibility and anti-interference ability, stable performance, support 24/7 uninterrupted continuous normal work;
- The anti-vibration design of the chassis ensures the stability and safety of the data;
- Abundant IO interface, enough expandability to connect a variety of different lane devices



KMDA-3610

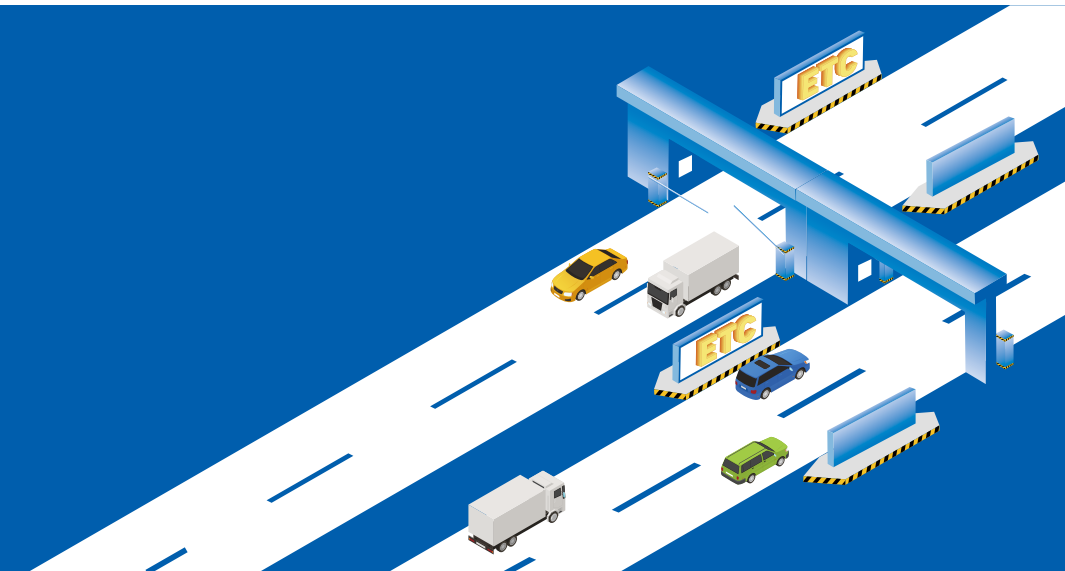
Related applications

After testing different products, finally the whole ETC gate system choosed JHCTECH KMDA-3610/S001. KMDA-3610/S001 is a high-performance computer with expansion box, equipped with Intel® Skylake S/Kabylake-S series processors, H110 chipset, 2*DDR4 2133/2400MHz, 32GB maximum support and other high-performance configurations, stable performance. It can realize information collection, calculation, storage and forwarding.

The structure of the whole machine uses a fanless heat dissipation design, which can overcome the influence of harsh environments, can adapt to changes in temperature and humidity, and has the capabilities of waterproof, dustproof, anti-corrosion, anti-vibration and shock, and can adapt to wide temperature and wide pressure work. It has good electromagnetic compatibility and anti-interference performance to ensure stable operation of the device.

Diversified communication connections, support 4G / Wifi / BT wireless communication. All equipped with COM (RS-232 / 422/485) interface, VGA / HDMI / DP interface, USB3.0 and miniPCIe expansion port, Gigabit LAN, support general industrial protocol, which can fully meet various network requirements.

Malaysia Electronic Toll Collection System



The Electronic Toll Collection System has been popularized all over the world. ETC is more convenient and faster than manual toll collection. ETC is the use of automatic vehicle identification technology to complete wireless data communication between vehicles and toll booths, automatic vehicle identification and exchange of related charging data, processing of charging data through computer networks. It realizes automatic fare collection without car stopping. As the core component of the lane control system, the industrial control computer, its reliability and stability are the key to ensure the smooth and normal operation of the toll collection system, play the role of the system in the management of expressway toll collection, and improve the traffic efficiency.

Customer application requirements

A customer from Malaysia put forward a demand for an industrial control computer applied to an electronic toll collection system for expressways. The industrial control computer is applied to the lane controller of the ETC system. The host communicates with the roadside antenna (RSU), traffic light, alarm, character stacker, fee display, automatic barrier machine, canopy signal light, vehicle detector, ground sense coil, integrated control of cameras, card readers, etc., Realize charging, and control the lift bar, so as to achieve the purpose of vehicle traffic. The project has the following requirements for hardware equipment:

- Environmental requirements: strong and durable, dustproof, shockproof, moistureproof, suitable for harsh road environment
- Reliability requirements: meet high performance, high reliability requirements, adopt Intel 8th/9th Core I3 CPU, support continuous 24-hour stable operation
- Stable performance and easy maintenance
- Rich interface and expansion performance requirements: must have several serial ports and 2 PCI expansions to connect other external devices



KMDA-5921/S002

Related applications

After communication and discussion with the customer, the customer chose JHCTECH's KMDA-5921/S002 to provide reliable control hardware for the ETC system. KMDA-5921 box computer has a wealth of expansion interfaces such as M.2, PCIe, Mini PCIe, to support multiple serial cards and DIO cards, with strong expansion capabilities. At the same time, it has a wide temperature and wide pressure design, using Intel® Gen 8th /9th Coffee Lake G5 processor with Q370 chipset, providing a reliable and stable processing platform for this project. 4 DDR4 memory slots, up to 128G memory, for uninterrupted and stable operation. Professionally customize 2 PCIs for customers to connect machines and equipment, with rich I/O interfaces, 3 LANs, 8 USBs, multiple serial ports, and can be connected to external devices such as cameras and automatic railing machines. With a compact design, it's rugged and durable, it has the characteristics of dust resistance, corrosion resistance, shock resistance and electromagnetic interference resistance.

It solves the poor contact caused by the contact surface of the connector when working in various harsh environments such as dust, humidity, high/low temperature, corrosion, etc., and effectively reduces the maintenance and repair risks caused by mechanical failures. Real-time online monitoring and control, and rapid response to changes in operating conditions, automatic reset in case of distress, to ensure the normal operation of the system.

Medellin Metro Station (Automatic Ticketing System)

Travel is an important part of people's lives, and the subway has become the popular choice for many people. Facing a huge number of passengers, manual ticketing management is far from satisfactory. Subway stations urgently need an efficient, fast and reliable ticketing system to achieve fast ticket processing and ensure the passengers travel well. Therefore, the subway management wanted to find new ways to help automate the ticketing process and improve ticketing efficiency. JHCTECH is able to meet this need.



Customer application requirements

As a self-service intelligent terminal for passengers to purchase and collect tickets, the automatic ticket vending machine in the subway station needs to rely on the support of powerful intelligent control hardware. To meet the customer's specific needs for a hardware device, the device needs to be able to connect multiple peripherals. At the same time, due to the high frequency of use of ticket vending machines, the equipment needs to be reliable and safe to withstand continuous use by passengers. The device needs to have the following characteristics:

- Use intel 8th/9th generation CPU
- 6-8 serial ports
- 4-6 USB ports



KMDA-5920

Related applications

The customer selected JHCTECH's KMDA-5920 to provide a rugged platform for its application. KMDA-5920 Box PC adopts Intel® Gen 8th /9th Coffee Lake processor, which improves the system's 24-hour uninterrupted stable operation in harsh environments. With abundant I/O interfaces, major peripheral devices such as card readers, coin machines, receipt printers, cameras, touch screens, etc. can be connected to the system through the KMDA-5920's I/O interfaces. At the same time, it provides 4-6 USB ports, and the PCIe slot can support expansion cards. The PCIe slot of the KMDA-5920 provides more serial port expansion for this application. This device is specially designed for industrial use, can operate in the temperature range of -20 ~ 65°C, SSD/10 ~ 55°C, HDD, anti-vibration and shock design, can guarantee stable operation.

Indian Traffic Light Intersection Illegal Capture System



Urban traffic is an important part of urban construction. At the intersections with heavy traffic, traffic violations such as incorrect turns, speeding, and running red lights occur every day. In order to ensure smooth and orderly urban traffic, the illegal capture system plays an important role at traffic lights, which can effectively alleviate traffic congestion and prevent traffic accidents.

Customer application requirements

Customers in India hope to find a hardware solution to standardize public driving awareness and curb violations such as red light running and speeding by capturing images of vehicles running red lights or speeding, and identifying the license plate numbers of passing vehicles. Considering the special road environment and related to traffic safety, Indian customers require hardware equipment to be robust, reliable, stable in performance and high safety as following requirements:

- Equipped with a high-performance processor to handle multiple video streams
- Must support operation in harsh environments, low power consumption, fanless design, wide temperature range
- Equipped with 7 LAN ports to connect cameras, ground coils, traffic light controllers, etc.



KMDA-3601

Related applications

According to the needs of Indian customers, JHCTECH selected KMDA-3601/S002 solution for customers. At the red light signal, the video signal of the forbidden lane is sent to the video vehicle detection unit. When the vehicle detection unit detects that a vehicle passes under the red light, the industrial computer controls the red light violation capture unit to take pictures of the violation information of the vehicle.

Such as pictures of illegal vehicle license plates and pictures of the process of running a red light, etc., as the basis for traffic police law enforcement. All processing results are stored in the storage unit of the industrial computer, and the stored information can be downloaded to the relevant storage medium by manual control through the transmission system.

KMDA- KMDA-3601/S002 is based on Intel Q170 chip, using 6th Gen Intel® Skylake-S/ 7th Gen Intel® Kabylake-S Celeron/Pentium/Core I3/I5/I7 CPU, stable performance, can efficiently process large amounts of data and control tasks. As a roadside system, since the hardware equipment needs to be deployed in the control cabinet, KMDA-3601 has low power consumption, wide operating temperature, fanless design heat dissipation structure, anti-vibration and anti-shock, which can effectively match the hardware requirements of the illegal capture system, resist various harsh working environments and ensure long-term stable operation. In addition, KMDA-3601 has a wealth of I/O interfaces, 4 serial ports, 9 USB, supports dual 4K display, external keyboard, mouse and monitor for debugging and maintenance; it is also equipped with 7 LAN ports, 4 of which have PoE Support, meet the requirements of connecting cameras, perform license plate recognition, as well as store and forward data.

Mec Equipment Accelerates Vehicle-road Collaboration

As a new industrial form with deep integration of semiconductor, intelligent computing, wireless communication, automobile manufacturing, and transportation industries, the Internet of Vehicles has great potential to improve traffic safety and traffic efficiency. We highly value the development of the Internet of Vehicles industry. China industry has been actively promoting the route of vehicle-road collaboration built with C-V2X technology. The roadside infrastructure is an important part of the new infrastructure of the Internet of Vehicles, and its technology and standard system are being continuously improved, and the related industrial chain (including roadside perception, roadside edge computing, and roadside communication, etc.) is also developing rapidly.



Hardware solution

In the application of vehicle-road coordination, MEC plays an irreplaceable role. Depending on the deployment location and specific requirements for latency and computing power, MEC has many forms, including roadside MEC and network edge MEC.

Based on two 11th generation Intel® Core™ processors: Intel® Core™ TMI7-1185GRE processor, Intel® Core™ TMI7-1185G7 processor, JHCTECH has developed a brand new KMDA-3301 roadside MEC device. Its main features include: no fan cooling, rich I/O interfaces, aluminum material, slim body, shock absorption design, etc., it is very suitable for deployment in harsh environments such as roadside, and provides stable and reliable high computing for road applications.



KMDA-3301

Related applications

Various MEC devices based on Intel® architecture provide powerful and reliable general-purpose and AI computing power support for various use cases of vehicle-road collaboration, enabling us to efficiently analyze information from different types of sensors in real time and generate results. The integration significantly improves the safety and efficiency of the intelligent transportation system.

The in-depth cooperation between JHCTECH, Intel and Leishen Intelligence has combined powerful hardware and software products with complete functions, laying a solid foundation for the development of the global Internet of Vehicles industry!

Beijing Subway CCTV Integrated Monitoring System



In recent years, with the continuous growth of urban transportation rail routes and urban pedestrian flow, the problem of rail monitoring has become increasingly. The Urban Rail Transit Comprehensive Monitoring System (CCTV) ensures the normal operation of the subway, plays an important role in ensuring the safety of trains, passengers and staff, and improves the quality of transportation services and overall operational efficiency.

Customer application requirements

Video surveillance system (CCTV) is the most core system in the field of subway security. The subway video surveillance system requires higher reliability and stability, so as to carry out multi-dimensional construction and protection. In order to actively respond to various demands of subway traffic and follow the basic design guidelines of safety, reliability, reasonable functions, advanced technology, simple implementation, economical and practical, and convenient maintenance, the equipment should have the following characteristics:

- Supports 6th/7th generation Core I7 series processors to handle multiple video streams
- Onboard Cambrian MLU220 AI acceleration chip, AI acceleration computing power 8TOPS (INT8)
- The system adopts on-board memory, shock-absorbing design, strong shock and vibration resistance, and the operating temperature range meets the TX standard (-40~70°C)
- EN50155 certification, supports TPM2.0 security encryption



SIGM-3251

Related applications

As an application solution provider in the field of rail transit, JHCTECH has designed a set of product application solution SIGM-3251 according to the customer's needs. This product solution adopts Intel® Skylake/Kabylake-U CPU, and uses Cambrian MLU220 AI as the acceleration chip to meet high-performance requirements. The All-In-One reinforced structure design has strong shock and vibration resistance; 40°C~85°C). In addition, the SIGM-3251 supports rich I/O, including 6 USB, 4 isolated COM, 4 Gigabit Ethernet ports, and a high-reliability isolated power supply design to meet the ability to process multiple video streams.

MEC devices based on Intel® architecture provide powerful and reliable general-purpose and AI computing power support for various use cases of vehicle-road collaboration, enabling us to efficiently analyze information from different types of sensors in real time and fuse the results, significantly improving the safety and efficiency of the intelligent transportation system. It provides an extremely safe and stable CCTV system for the Beijing Subway.

Shanghai Metro Video Surveillance Project

As the artery of urban traffic, the subway shortens the distance between time and space, and has become an important transportation in many large cities to relieve traffic congestion. The video surveillance system (CCTV), as an important part of ensuring the organization and safety of urban rail transit, can monitor train operation, passenger flow, parking lot conditions, and even discover public security incidents, judge the scale and time to implement rapid and efficient response.



Customer application requirements

Video surveillance system (CCTV) is the most core system in the field of subway security. The subway video surveillance system requires higher reliability and stability, and requires multi-dimensional construction and protection. The relevant departments of Shanghai Metro want to find an industrial tablet computer for their subway CCTV video surveillance system. The equipment must meet the following conditions:

- Sturdy and durable, high resistance, to meet the high vibration and continuous long-term operation requirements of the subway during operation
- Fanless design, small form factor, suitable for installation in limited space
- Provides a LAN with M12 design



ALAD-A1001T

Related applications

ALAD-A1001T is a compact fanless embedded industrial panel computer specially designed by JHCTECH for rail applications. It is a decoding display terminal suitable for subway video surveillance systems. ALAD-A1001T industrial panel computer, with high-performance, real-time and high-definition display software and hardware processing platform, provides carrier-level high reliability for CCTV systems, can withstand the high vibration of the subway, and is stable for a long time in relatively harsh environments. run. Aluminum design, fanless design, 10.1 inch LED TFT LCD, exquisite and compact, suitable for small space installation.

Equipped with Intel® Core i3 7100U CPU, 1*DDR4 2133 SODIMM, maximum support 16GB, support 4G/LTE/GSM/Wifi/BT/GPS and other functions, 2*SATA 3.0 can ensure the effective storage of data. The video surveillance system (CCTV) provides a comprehensive train internal monitoring system solution. Data is collected through the IP camera in the front-end subway car, imaged in real time, and transmitted to the tablet computer in the driver cab through the switch for real-time, high-definition display. At the same time, it can decode the video of the NVR/integrated monitoring server in real time. Operators can monitor the passenger flow, train entry and exit, and the passengers in real time, improve passenger safety by monitoring the carriages, also improve operational efficiency by strengthening operational management, to ensure passenger safety and disaster prevention.

Indian Railways CCTV Video Storage Server



As one of the main transportation methods, railway transportation plays an important role in realizing seamless and efficient transfer of passengers and cargo. As a very important subsystem in urban rail transit construction, CCTV video surveillance system is responsible for the security and protection of operation management and ensures the safety and efficiency of the railway system.

Customer application requirements

Vehicle CCTV is a system for video surveillance of trains, which consists of cameras, codecs, networks, and back-end storage management systems. Customers of Indian Railways hope to monitor the conditions in the train and the operation of key equipment in real time through the on-board CCTV video surveillance system to ensure the safety of the train and detect emergencies in the compartment in time to ensure the safety of passengers. Due to the special running environment of rail trains, industrial computer hardware products with high reliability, high resistance and continuous operation are the key. The device needs to have the following characteristics:

- Equipped with EN50155 specification, able to withstand harsh environmental changes and long-term operation.
- Support wide temperature operation, fanless design
- With dual hard drives to store and backup video surveillance data
- VGA port and HDMI port for connecting to a monitor



SIGM-3252

Related applications

According to the customer's requirements, we selected the SIGM-3252 in the SIGM series to match the customer's needs. The video surveillance server is the decoding, playback and storage control device of the vehicle surveillance system CCTV. SIGM-3252, as a video surveillance server, collects the situation of the train cabin through train cameras, and uses dual hard disks to store and backup monitoring data to comprehensively monitor train safety.

VGA and HDMI interfaces are used to display the video on the local monitor, and dual audio is connected for language broadcast, and the relevant monitoring data will be transmitted to the monitoring platform through the wireless network. In addition, the SIGM-3252 box computer adopts a unique fanless design, supports wide temperature operation, and has high reliability. It has passed EN50155 and E-mark certification, and can operate all day long in harsh environments such as dust and high vibration to ensure safe operation. Iron standard power input, DC 48/72/110V ($\pm 40\%$) wide-voltage DC power supply, which can effectively reduce the risk of unstable power supply caused by vibration during train running.

Application Of Nanchang Metro PIS System

As an important role of the urban rail transit system, over 120 million people take the subway to commute every day. To ensure the safety and efficiency of railway systems, more advanced transportation system technologies, such as PIS passenger information systems, are being widely deployed.

The train arrival announcements that our passengers hear during their daily rides, the running information displayed on the trains, etc., are actually functioned by the PIS system. Next, follow JHCTECH to learn more about the PIS system in the subway.

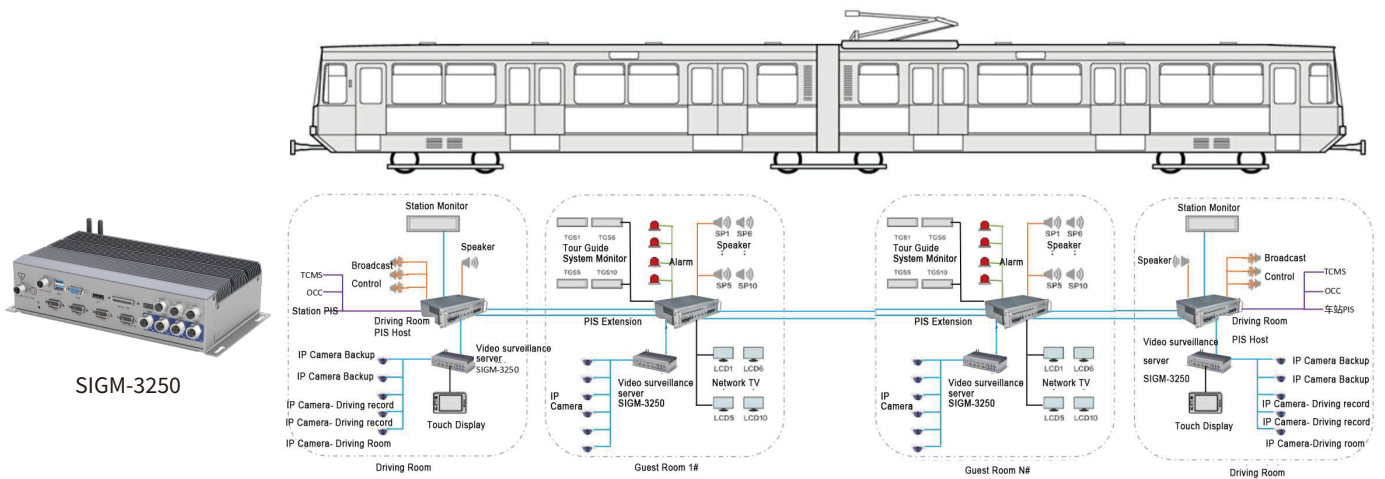


Application Structure

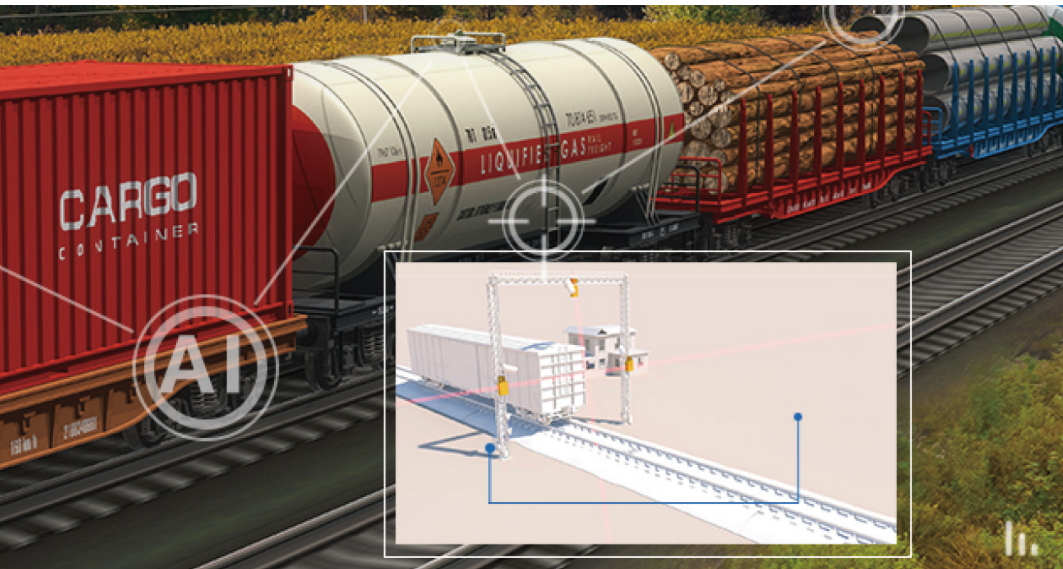
The hardware of the whole system consists of: driving room PIS host, passenger room PIS extension, video monitoring server, broadcast console, pickup + emergency alarm, TGS display, LCD network TV, monitoring TV touch display, etc.

System Features

- High reliability design: Embedded +Linux+ vehicle-level system design to ensure the overall reliability and stability of the system
- High redundancy design: bus redundancy, backup audio bus redundancy, PIS host and video server at both ends are redundant to each other
- Easy maintenance design: Adopt modular design, CPIC and EIO standardized design, integrated design
- Low power consumption design: Adopt embedded platform, no fan design, no noise and low power consumption
- Integrated design: The plug-in chassis design is adopted, and the functional module is an online replaceable unit, which reduces wiring and makes maintenance easier
- Distributed design: The controller is distributed in a distributed setting, the video surveillance is independent of the PIS host, so a single point failure will not affect the normal operation of other controllers



Intelligent Video Inspection System Of Rail Freight

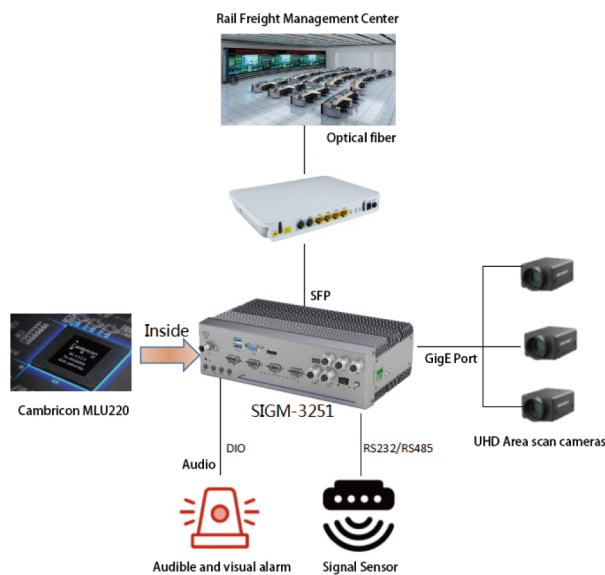


If high-speed rail technology initiated the "speed revolution" of railway transportation, then the application of artificial intelligence technology will create the "smart revolution" of railway.

The railway transportation industry has an important development position in our country's economy and society, and is the main artery of national economic development. As one of the main modes of modern transportation, railway freight transportation is also one of the two basic modes of land freight transportation. It occupies an important position in the entire transportation field and plays a more important role.

Application Structure

SIGM-3251 is a fanless ruggedized track-used computer. The product adopts JHCTECH OSBC design specification. The STX-I907 motherboard and ECB-262 daughter card are connected without cables through the JHCTECH Express-01 high-speed interface bus. Customized ECB-262 card, onboard Cambrian MLU220 chip and 4GB LPDDR4 memory, data exchange through PCIeX2 (gen.3) and X86 Core CPU, and extended gigabit optical port for and background management for communication, multiple Gigabit Ethernet ports are connected to the area scan camera. The specific hardware physical architecture is as follows:



Related applications

As an MEC for trackside AI edge computing, Sigm-3251 is the brain at the edge of the entire detection system, and is also a new multi-architecture AIoT product of Jihecheng in rail transit. Using the X86 embedded platform + Cambrian MLU220T acceleration chip architecture scheme, it can realize functions such as device access, video capture, communication management, AI inference deep learning, data storage and forwarding, brake alarm and remote management. The following specific operation steps are completed in this system: intelligent information collection, synchronous intelligent identification, intelligent passing vehicle alarm, generation of vehicle inspection report and data filing and uploading.

Automatic Gate Control Of Italian Ports

In traditional port management, many control and inspection procedures require manual operation, requiring personnel to detect passing vehicles, etc. Simply relying on manual operation not only takes a long time, the inspection is also not always reliable, which makes the management of gates not efficient. With the development of logistics, the daily volume of vehicles at the port gates is high, which has prompted port operators to start adopting entry and exit automation solutions to improve their gate workflows to increase competitiveness.



Customer application requirements

An Italian system integrator dedicated to providing customers with solutions for intelligent gate control systems, which have been adopted by important operators of Italy's larger ports and freight terminals. It uses advanced video technology to remotely manage transportation procedures, automatic license plate capture and code recognition, high-precision inspection and measurement operations. It does not require operators to manage and go through various procedures at the entrance and exit, thus greatly improving the safety and accuracy of data acquisition, and greatly reducing the time required for vehicle inspection and border crossing procedures, effectively improving the efficiency of entrance and exit traffic. The intelligent system has the following characteristics:

- Traffic control procedures at the entrance are fully automated
- Highly modular platform tailored to specific operational needs
- Manage sensors, actuators and interfaces for automatic lane control procedures
- Capture and record high-definition footage at each border crossing
- Full integration with TOS (Terminal Operating System)
- Remote/unmanned control of transport procedures

The company made the following requirements for the required hardware products:

- Sturdy and durable industrial computer, with fanless design, suitable for harsh working environment, high-intensity long-term uninterrupted work
- Rich IO interfaces and flexible expansion options to connect multiple peripheral devices
- Computational performance sufficient to perform a series of system operations to collect, analyze and process data information



KMDA-3201

Related applications

Combined with the needs of customers, JHCTECH selected KMDA-3201 for this project. KMDA-3201 is a high-performance box computer with a fanless cooling design and a solid hardware design. Wide temperature and wide voltage design, DC 9-30V wide voltage power supply, to ensure that the system can maintain long-term stable and fast operation in harsh environments. At the same time, the box computer is small in size and provides abundant I/O interfaces, including 7 USB and 3 LAN ports, which can meet the requirements of customers to connect various peripheral devices. The serial port can be connected to the gate and the fee display. Since all kinds of image information data are time-sensitive, the high-speed USB port ensures that the data can be transferred efficiently. With Intel Gen.9 HD Graphics, it supports dual 4K display output.

Thailand Power Enterprise Data Gateway



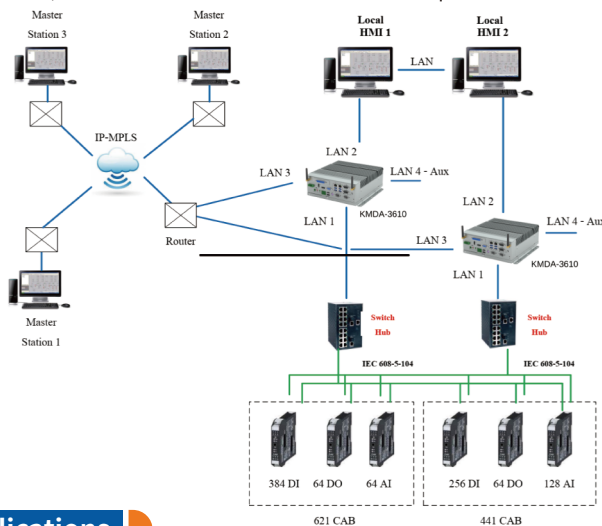
Electricity is an important part of modern life, and maintaining the stable and safe operation of power plants is the key to ensuring social power supply. The key to a reliable gateway solution is the quality of the selected hardware products in order to easily monitor the power site and ensure accurate and timely data transmission.

Customer application requirements

Customer application requirements

A leading energy company in Thailand is responsible for the generation and transmission of electricity in Thailand, as well as the sale of bulk electricity. They wanted to find a reliable gateway solution to maintain the operation of the power plant for data acquisition, communication protocol conversion, data storage and forwarding.

The required hardware must support operation in harsh environments and require cooling with a fanless heatsink. In addition, the I/O interface slot can only be wired to the expansion I/O interface and power input of the hard disk. They also need to be rugged to ensure stable system operation. In addition, the CPU needs to be equal to or better than the Core i5-6500, and it needs 4 port expansion and 4 USB ports, 4 network ports, the network ports are connected to the switch, and the switch is connected to the data acquisition sensor.



KMDA-3610

Related applications

JHCTECH's KMDA-3610 is an industrial grade fanless chassis that perfectly matched the customer's requirements. Equipped with Intel Skylake-S/Kaby-lake-S Celeron/Penti-um/ Core I3/I5/I7 processors to meet CPU requirements. KMDA-3610 has DC 12V-24V wide voltage input and -20 ~ 65°C, SSD /10 ~ 55°C, HDD operating temperature range, can withstand the harsh environment of power plants, and has passed the requirements of anti-vibration and anti-shock , which ensures stability. KMDA-3610/S001 has 4 USB ports, which can be connected to peripherals such as keyboard and mouse for operation. At the same time, it is equipped with 246 dual network port modules to meet the requirements of 4 Gigabit Ethernet ports. 1x Mini PCIe with SIM slot for expansion support.

Thailand Solar Power Station Project

Photovoltaic power generation is a process of directly converting sunlight energy into electrical energy through solar cells according to the principle of photovoltaic effect, and it is one of the main forces to replace fossil fuel power generation. Due to the continuous decline in the cost of photovoltaic power generation, the scale of photovoltaic power generation is developing rapidly, and solar energy has gradually become an important renewable and clean power source in the world.



Customer application requirements

An energy company in Thailand hopes to find a reliable communication management machine to be applied in photovoltaic power plants, to meet the needs of analyzing and managing the operation status of equipment, and to ensure the safe, reliable, economical and efficient operation of the power grid. This project requires hardware equipment with the following functions:

- Low power consumption, high reliability, can adapt to harsh environments such as dust and strong wind, and run for a long time
- The structure needs to be equipped with a "compact" and fanless design, with wide temperature and wide pressure performance
- Stable performance, more than 2 network ports and 6 serial ports, support information collection and management, and efficiently process data



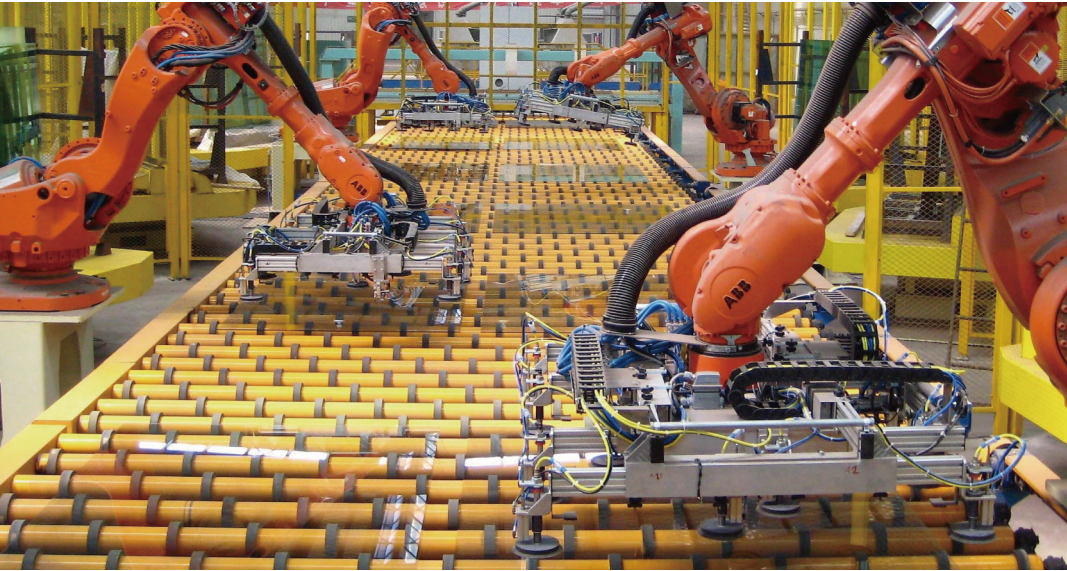
KMDA-2702

Related applications

JHCTECH's KMDA-2702 is a compact box computer with 210*144*82.7mm size, low power consumption, high economic reliability, and is suitable for solar photovoltaic power generation systems. The U-shaped aluminum moment heat dissipation profile can meet the fanless independent heat dissipation function and achieve the dustproof effect.

Equipped with Intel Baytrail-D Celeron J1900 CPU, 2.0-2.42GHz quad-core processor for effective data acquisition and processing. DC 9-36V wide voltage power supply, D-Jack with M8 nut connector, with short circuit, overvoltage and overcurrent protection functions. Wide temperature work, stable performance, can adapt to harsh environments. KMDA-2702 has multiple I/O interfaces, equipped with 10 COMs, supports RS232/422/485, collects electricity and collects sensor data. It supports wireless/wired transmission at the same time, integrates 3 Intel I211AT Gigabit Ethernet, 1*Mini PCIe, and supports 4G LTE/Wifi/BT and other wireless functions.

Indonesia Automation Factory SCADA System



Now all industries are emphasizing automated production. In the process of factory automation and informatization, electricity is the key to ensuring the normal operation of production lines. The power monitoring system SCADA is an indispensable system in automated factories. The traditional manual operation mode is replaced by the automatic management operation mode, which needs to calculate and process a large amount of data in a timely and fast manner. Therefore, it is very important to select a reliable hardware platform suitable for SCADA systems.

Customer application requirements

A well-known power system integrator in Indonesia provides solutions for automated factories. By upgrading its power equipment operation and maintenance management system, it provides a scientific basis for the scheduling and maintenance of the power supply system, thereby ensuring the traction power supply system and the power distribution of the entire line. The electrical system operates safely and reliably. In order to ensure the system can work quickly and stably, the required hardware products must meet the following conditions:

- Rugged, fanless design to meet harsh industrial environments, ensuring all-weather stable operation
- Anti-interference ability
- Stable performance CPU, collects and analyzes the operation data of power equipment, and provides a fast and accurate basis for the scheduling of the power supply system.
- Abundant IO function interface to realize data acquisition, control output and communication.
- With GPRS, it can communicate with the remote terminal



BRAV-7201

Related applications

Reliable hardware products are the key to the entire SCADA system. JHCTECH's BRAV-7201 can effectively meet the needs of customers. BRAV-7201 adopts a fanless design to meet the requirements of industrial applications and achieve 24hrs uninterrupted and stable operation. Equipped with Intel Skylake-U/Kabylake-U processor, the performance is stable, and the operation data of power equipment can be collected and analyzed efficiently. Dual-channel DDR4 2133MHz, up to 32GB. It adopts DC 9-30V wide voltage power supply, rich IO function interface, supports HDMI+DP, dual 4K display output, 5*LAN, 4*USB3.0, supports RS 232/422/485. Through the display interface, multiple man-machine interfaces can be connected, the serial port can realize data acquisition, DIO can realize control output, and at the same time, it can communicate with the upstream system through the network port. The device expansion interface supports 1*Mini PCIe, and realizes the communication with the remote terminal through GPRS.

Waterproof Panel PC in Spanish Food Processing Plant

In food processing fields such as beverages, meat, fish, seafood, etc., cleaner production in food processing is crucial. Today, food processing enterprises are gradually moving towards informatization and automation. They use intelligent technology to understand and master the relevant information of food in raw material transportation, production process, transportation process and storage process, so as to improve production efficiency and ensure the safe production of food.



Customer application requirements

The working environment of the food processing industry is usually harsh, often involving water, moisture, dust, etc. Therefore, enterprises have strict requirements of tablet computers used in food production environments in terms of corrosion resistance, easy cleaning, sensitivity and easy operation. A Spanish food processing company wanted to find a reliable industrial flat panel solution for its aquatic processing workshop. Due to the humid environment in the processing workshop and the need to maintain hygiene and cleanliness, the customer's requirements for the control platform are very strict:

- Easy to clean and maintain
- Small size, supports a variety of installation methods
- Waterproof design of equipment, IP65 front sealing, anti-corrosion casing, prevent any type of substances from entering
- Abundant I/O interfaces, which can connect all levels of sensors, motion modules, etc. through serial communication
- Stable performance, low power consumption, fanless cooling, and easy entry and access to all data while wearing industry standard gloves



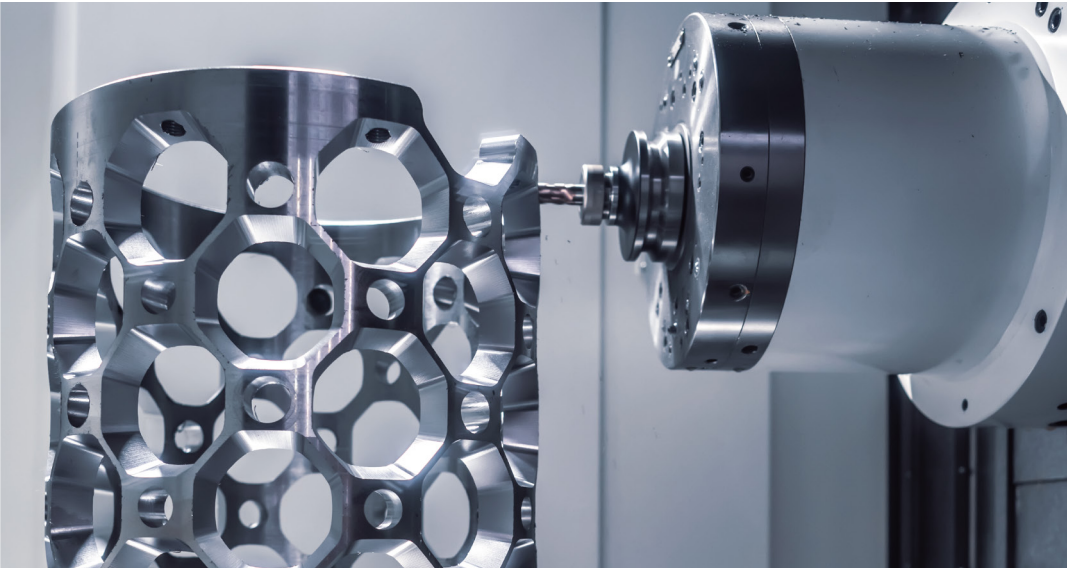
WPPC-H1580T

Related applications

According to the customer's application scenario, JHCTECH's WPPC-H1580T was finally selected to be used in the aquatic product processing workshop. The WPPC-H1580T Industrial Panel PC features a five-sided waterproof design, a SUS304 stainless steel case for the front panel, and a 3.0 mm 5052 aluminum alloy for the back cover, which has industrial-grade strength and quick-cleaning features to prevent bacteria growth and rust. IP65 protection, full flat front panel, no fan structure, effectively prevents water, dust and other external pollutants from entering the device. The touch screen used is a five-wire resistive touch screen, which is convenient for food processing operations to be operated with gloves. In addition, the WPPC-H1580T adopts a self-developed high-precision automatic correction touch chip. When there is liquid erosion or water droplets on the manipulation finger, the liquid water droplets on the touch panel surface and a small amount of dust will not affect any operation control.

The WPPC 15-inch industrial panel PC is equipped with a high-performance and low-power Intel® Celeron J1900 CPU with rich I/O interfaces. It can connect the servo drive through the network port, connect the sensors at all levels, switches and signal lights through the serial port, and connect the data exchange between the whole workshop and even several factories through the wireless WIFI network, realize the integration of big data, and understand the production process and quality specifications in real time. Also realizes the data statistics of the traceability process of every single product.

Malaysia CNC Machining Center System Application



"Industry 4.0" is characterized by the combination of digitization and automation, making machines intelligent, interactive and easy to use. Automated production equipment can effectively solve the problem of product quality defects caused by differences in the level of operators. With the continuous improvement of modern machining requirements for complex, sophisticated and automated equipment, CNC machine tools have been widely used.

Customer application requirements

The CNC machine tool is mainly composed of input, output device, numerical control device, motion controller, servo system, detection feedback device and machine tool host. The program instructions input to the numerical control device are recorded on the information carrier, received by the program reading device, or manually input by the keyboard of the numerical control device. The numerical control device includes the program reading device and the input, operation, control and output parts composed of electronic circuits. Input commands through the man-machine interface, and after the commands are processed by the control system, various control information is formed and sent to the servo system to instruct the machine tool to perform various operations. CNC machine tool equipment plays a key and even core role in processing quality and efficiency. Damage or downtime of processing equipment and reduction in production efficiency will cause certain losses.

The largest machinery manufacturer in Malaysia hopes that JHCTECH can provide an embedded box computer with stable performance and high reliability, which is used in the control system of CNC machine tools to maintain the stable and reliable performance of CNC machine tools. For the above purposes, the required equipment must meet the following conditions:

- Fanless design, low power consumption, high reliability, high precision, high timeliness, dust-proof, shock-proof, anti-corrosion, etc.
- There is a display interface that can be connected to a touch display, which can work stably for a long time, and MTBF is very small
- The hardware device has 2 PCI expansion slots, which can be connected to the motion control card
- The box is small in size and can meet the installation requirements in small spaces



KGEC-6300

Related applications

The Malaysian customer finally chose JHCTECH's KGEC-6300 edge controller. Active and passive heat dissipation design, strong corrosion resistance, stable performance, after strict testing, can meet the long-term unattended operation in the environment, suitable for use in the customer's factory environment. KGEC-6300 can be equipped with Intel® Kabylake-S/Skylake-S CPU to meet the complex data processing requirements of CNC machines. The expansion interface supports one PCIeX4/1 PCI, which meets the needs of customers to connect their customized motion control cards. At the same time, the hardware device has abundant I/O interfaces, which can provide 2 LANs, 4 USBs, 2 COMs, 1 DVI-I, and 1 DP. Display interface +USB can support touch display, serial port and DIO function can be connected to switches and signal lights. In addition, the small size of KGEC-6300 supports wall-mounting, which can be used in small spaces.

Machine Vision Logistics Sorting Line

In traditional logistics management, manual good sorting can easily lead to incorrect sorting of goods and low work efficiency. With the rapid growth of logistics, many companies have begun to take actions to improve their logistics workflow to increase competitiveness. Automatic sorting systems are widely adopted by logistics companies to improve sorting efficiency and accuracy and reduce logistics costs.



Customer application requirements

In order to ensure the normal operation of the entire logistics sorting system, embedded box computer hardware products with powerful performance, strong durability, good stability and high accuracy are required to provide strong support. A well-known logistics company found Jihecheng and put forward corresponding requirements. The hardware equipment must have:

- Stable operation in harsh industrial environment
- High performance, support CPU+GPU dual processor
- can support long-term uninterrupted work
- Support DDR4, fast data reading speed
- Abundant I/O interfaces, with good expandability, can be connected to multiple external devices, including display terminals
- Support dual Gigabit Ethernet ports



KMDA-3602/ALAD-151T

Related applications

According to the specific situation of customers, JHCTECH provides the configuration plan of KMDA-3602 embedded box computer with ALAD-151T display terminal. KMDA-3602 adopts a combination of active and passive heat dissipation design, excellent anti-interference, anti-shock and anti-vibration design, which can adapt to complex and changeable industrial environments and ensure stable operation. Equipped with Intel Core i7-7700T CPU, GTX 1060 graphics card, stable performance, support 2*DDR4, maximum support 32GB, can quickly judge the received data and improve the ability to handle events.

The GPU can decode the video of 4 POE web cameras at the same time, identify the pictures, and measure the size of the goods by accurately analyzing the pictures of the goods. Efficient identification capabilities enable reliable and efficient identification of goods on fast conveyor belts (3m/s). In addition, the KMDA-3602 I/O interface is rich in configuration and has strong expansion capability. Dual Gigabit Ethernet ports, 4 POEs, can connect various communication and sensing devices. DC 6-48V wide voltage power supply, support short circuit, reverse connection, over voltage, overcurrent protection.

ALAD Industrial Panel PC in Forklift Application



In the warehousing process, stackers are very important. The traditional method of manually mobilizing stackers to transport materials will inevitably lead to confusion of data and untimely calls, resulting in problems such as low efficiency and inaccurate inventory records. The intelligent stackers makes the operator not only greatly shorten the time to find the goods when delivering, transporting and sending the goods, but also reasonably classify and control the goods, so as to achieve the purpose of improving efficiency, reducing costs and effective control.

Customer application requirements

Stackers are changing from a handling tool to an intelligent operation terminal, which can effectively allow workers to improve work efficiency and reduce work errors. A customer in Israel approached us and asked us to provide an industrial tablet solution for their stacker truck, which needs to have the following characteristics:

- Integrated industrial tablet computer with touch display, to meet the unique installation method of forklifts
- Fanless design; Low power consumption, suitable for dusty storage environments
- Stable power supply requirements;
- Abundant I/O interfaces, which can be connected to scanner guns or RFID readers
- It has certain expansion capabilities to meet the needs of wireless networks, and can communicate through 4G/Wifi.



ALAD-K1520T

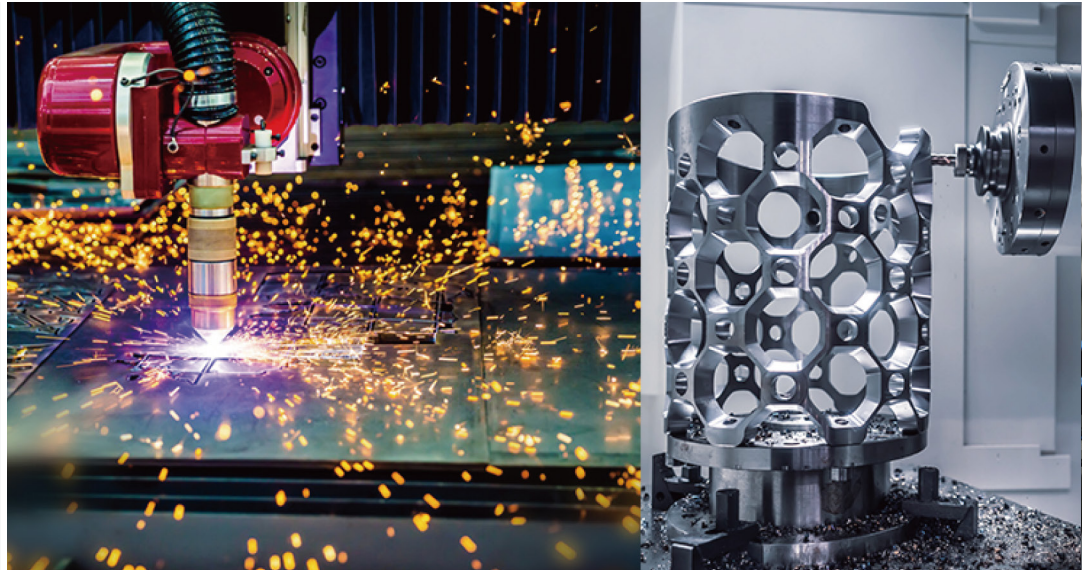
Related applications

After understanding the customer's actual application needs, the ALAD-K1520T industrial tablet PC was recommended to the customer for their stacker. In addition to having a solid aluminum alloy all-in-one case, the whole machine also adopts a fanless design for heat dissipation, and the front panel is IP65 grade-proof, which is suitable for storage environments with heavy dust. It's equipped with Intel® Skylake-U/Kabylake-U Celeron series processors or Core I3/I5/I7 processors. Using 15.0-inch 1024*768 resolution high-brightness TFT LCD, it can run stably for a long time. The DC 9-36V power input is suitable for the power supply environment of the vehicle battery.

Through the I/O interface, external equipment such as scanning guns or RFID readers can be connected to forklift trucks to quickly identify goods and improve on-site work efficiency. In addition, the ALAD-K1520T industrial tablet computer supports 1*Mini PCIe, with SIM card slot, and supports 4G LTE/GSM/WIFI/BT/GPS, which satisfies customers to establish real-time communication and data interaction with the background center through the WiFi interface.

High-end X86 Industrial Edge Controller Solutions

As the basis for the development of all industries, manufacturing has become the main body of our country's national economy, witnessing the take-off of China's economy, and how it quietly changes people's lives. Since "Made in China 2025" was first written into the "Government Work Report" by the state in 2015, this year has entered the second five years. At present, "Industry 4.0" and "China Smart Manufacturing 2025" have now reached a critical stage, and informatization and industrialization will be deeply integrated. In the next 5 years, the market capacity of high-end CNC machine tools, industrial robots and visual inspection will increase dramatically.



Software and hardware solutions

1. Intel industrial edge nodes have two standard specifications, Type E and Type F. The KMDA-3230, KGEC-6310 and KMDA-3301 in the JHCTECH product series are all product solutions designed according to this standard specification.

Intel Edge Control Platform ECI is a software reference platform that integrates real-time computing, load consolidation, application and platform management, infrastructure management, industrial bus protocols, control APP paradigms, information security, and functional safety. Intel ECI is perfectly adapted to Intel industrial edge node products, edge controllers KGEC-6310 and KGEC-6320, can use ECI to develop RTOS.

2.The solutions to realize RTOS are:

- It can be debugged and developed based on the ECI platform to generate an open source Xenomai Linux or Preempt RT Linux real-time operating system;
- It can also integrate real-time components such as EC-Win, INTIME and RTX2016 under Windows 10, and optimize it to become Windows RTOS;
- Adopt professional and efficient real-time systems such as VxWork and QNX.



KKMDA-3230/KGEC-6310

Market Application

X86 general-purpose PLC and embedded multi-axis motion controllers can be widely used in the following industries: robots, CNC machinery, semiconductor and electronic processing, digital printing, measurement and control testing, packaging machinery and construction machinery, etc.

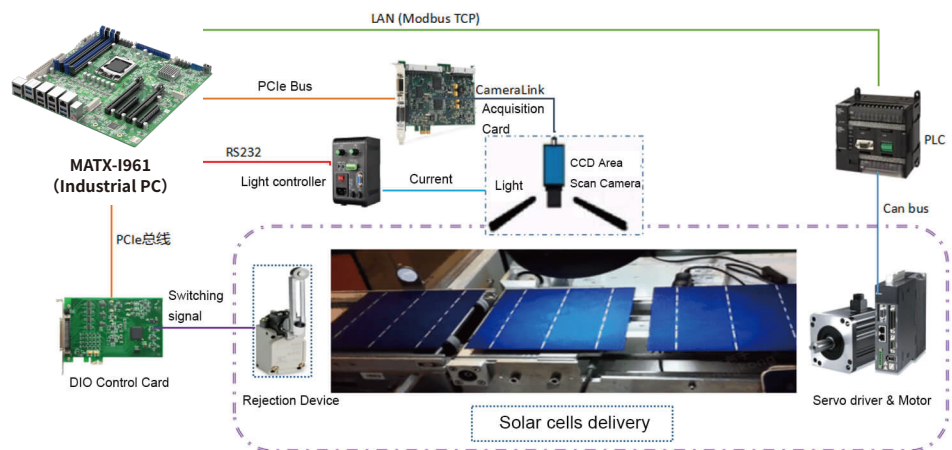
Visual Inspection System Applied in Solar Industry



Photovoltaic industry is a rising industry based on semiconductor technology and new energy demand, and it is also very competitive in the future global advanced industry. In recent years, the photovoltaic industry has developed rapidly in our country. At present, China is actively promoting the development and application of smart photovoltaics. With policy support and technological progress, the photovoltaic industry has grown rapidly, with cost reductions and product upgrades accelerating. In this context, China's photovoltaic application market has grown steadily, and the installed capacity and power generation have continued to increase.

The basic structure of the detection system

- Main controller X86 industrial computer
- CameraLink video capture card
- DIO control card
- Optical acquisition sensor -- area scan CCD industrial camera
- Digital light source controller and light source combination
- PLC programmable controller and servo drive transmission equipment
- Transmission line with reject device
- Intelligent vision system software



Features

- Achieve 2mm edge damage, can detect 1*1mm surface holes or defects
- Identify scratches with a length of more than 2mm, and can detect broken grids with a length of more than 1mm
- Open platform: Intel mature X86 architecture + Windows10 open operating system
- Strong computing power: Intel Coffee lake Core I3/I5/I7/I9 CPU, can be configured with up to 8 cores and 16 threads, and the highest frequency can reach 5.0GHz overclocked processor
- Engineering-level software architecture: general-purpose visual platform software, customizable GUI
- Compatible with vision software: VisionPro, Halcon, OpenCV and vision softwares
- Compatible with a variety of 2D/3D camera brands: support LMI, SmartRay, Cognex, Keyence, SICK, PhotoNeo, etc., which is convenient for users to select cameras
- PLC communication: Integrate a variety of PLC communication protocols, which can communicate with Siemens, Mitsubishi, Omron and other brand PLCs in the form of register access, and are more compatible with servo control of different transmission lines
- Robot communication and guidance: Integrated with TCP/IP protocol, it can communicate directly with ABB, KUKA, Yaskawa and other robots, and can realize the application expansion of the visual positioning of the robotic arm
- Project management and interactive interface: integrated parameter setting, data storage and management, data analysis, report output, record storage and analysis, etc., friendly and convenient operation interface

Intelligent AGV Logistics Warehousing Solution

Warehousing management occupies a core position in logistics management. In traditional warehouse management, data collection relies on manual entry or bar code scanning, which results in low work efficiency; unclear division of cargo spaces in the warehouse, and chaotic stacking is not conducive to convergence; outdated physical inventory technology often results in discrepancies between accounts and actual accounts; high error rate, adding extra cost; lack of process tracking, difficulty in defining responsibilities, Industry 4.0, by introducing the AGV dynamic logistics system and changing the existing manual handling mode, it can effectively solve the existing pain points of warehousing logistics management and realize logistics automation. Among them, the AGV car is an indispensable tool in the intelligent logistics warehouse.

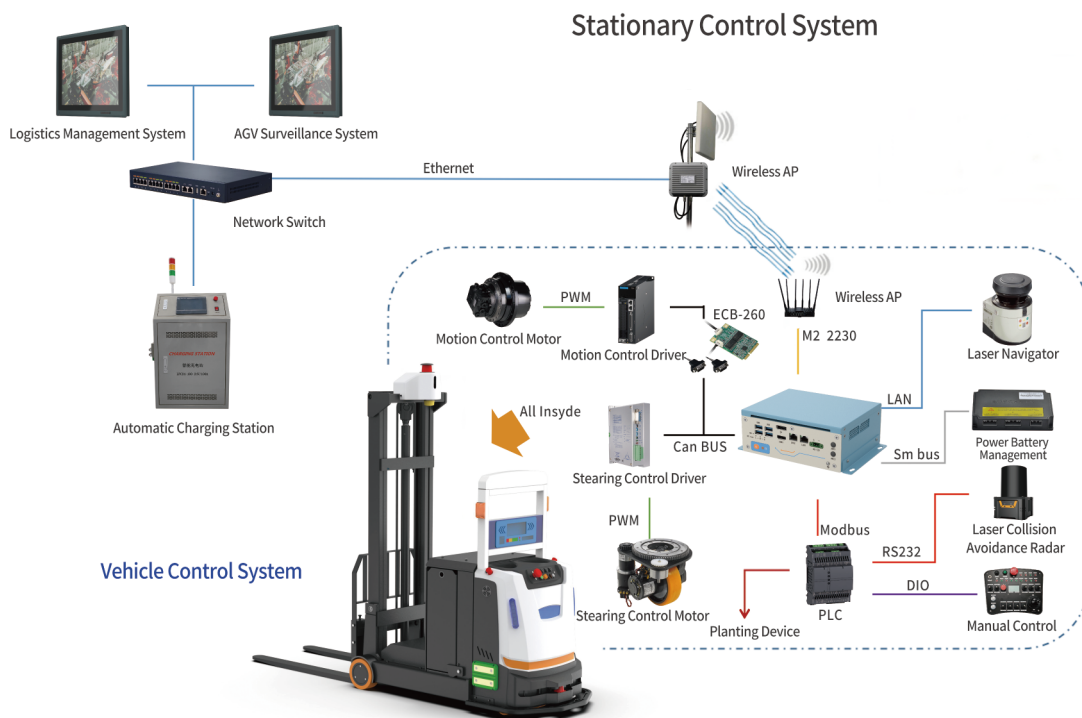


Structure introduction

JHCTECH intelligent AGV logistics warehousing solution is based on X86, adopts Intel Gen. 8th Whiskeylake-U series processor, low-power onboard CPU, and a small PADR-M101 box with a size of only 200*140*67.5mm computer. The network port is connected to the laser navigator, the serial port is loaded with Modbus protocol and PLC communication, the Mini PCIe interface is inserted into the ECB-260 module to realize the Can bus connection to the walking/steering drive. The M.2 2230 external wireless AP, and the SATA3.0 connection to the solid state drive. The DC 9-36V wide voltage power supply OFX-075 can be directly connected to the vehicle power battery, and the power battery can be managed through the Sm bus. The specific hardware system architecture is as follows:



PADR-M101



Automatic Urine Sediment Analyzer Application



With the vigorous development of new-generation information technologies such as 5G, cloud computing, Internet of Things, artificial intelligence, and big data, it is becoming a reality to install "intelligent brains" for medical equipment. The inspection is fully automated, which not only reduces the labor intensity of the majority of medical examiners, avoids various human factors affecting the urine sediment inspection, improves the efficiency and accuracy of urinalysis, but also brings economic benefits to the hospital. It plays an important role in improving the health service level of hospitals and alleviating the shortage of medical resources.

Customer application requirements

The automatic urine sediment analyzer adopts the automatic identification technology of microscopic images to automatically locate and capture the formed components in the urine, and automatically identify and classify and count the formed components in the urine through morphological methods. A routine testing equipment is an important tool for automatic urine inspection in medical laboratories, and has the advantages of simple and fast operation, etc., so it is widely used in clinical laboratory departments, nephrology laboratories and other medical diagnoses. A brand medical equipment company found JHCTECH and the hardware device needs to meet the embedded, low-power, fanless design, integrate multiple I/O interfaces, and can expand the system through multiple protocol interfaces.

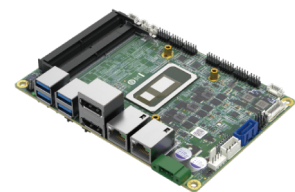
Related applications

According to the specific analysis of the product launch environment by the customer, JHCTECH provides the ECM-I910 embedded single board computer configuration scheme. The solution of ECM-I910 in the system application of automatic urine sediment is embedded, low power consumption, fanless design, 1*eDP+USB touch display, integrated graphics card, network card, support mSATA and other storage devices, integrated Multiple serial, parallel and other I/O interfaces. Also the system expansion can be carried out through multiple protocol interfaces to meet various special needs of customer equipment.

The automatic urine sediment analyzer is composed of an optical detection system, a hydraulic system, an electrical impedance detection system, an electronic system and other parts; it adopts a three-dimensional robotic arm injection needle to automatically detect the induction positioning sample, and automatically injects the sample continuously; after automatic mixing, The urine sample is injected into the flow counting cell through a high-precision pump valve system, and then a fully automatic digital integrated microscope is used to scan the flow counting cell in a "弓" shape line by motion. JHCTECH ECM-I910 embedded single-board computer connects mechanical systems, optical systems, circuit control systems, etc.

Technical parameters of ECM-I910 main board in automatic urine sediment instrument

- Main control core: high reliability embedded X86 ULT Core I5 quad-core high-performance processor
- Touch screen: high-brightness liquid crystal display, long-life resistive touch screen (operable with gloves)
- Operating language: Chinese and English two operating languages are optional
- Result storage: 1000 groups of patient data are automatically stored, and measurement data is automatically stored when power is turned off
- Communication interface: Gigabit Ethernet port, optional wireless WLAN, can be connected to a computer workstation, print standard reports
- Printer: Built-in parallel high-speed thermal printer, or external printer to print reports in Chinese and English



ECM-I910

JHCTECH IoT Computer
Connecting the Dots



JHCTECH

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