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JHCTECH

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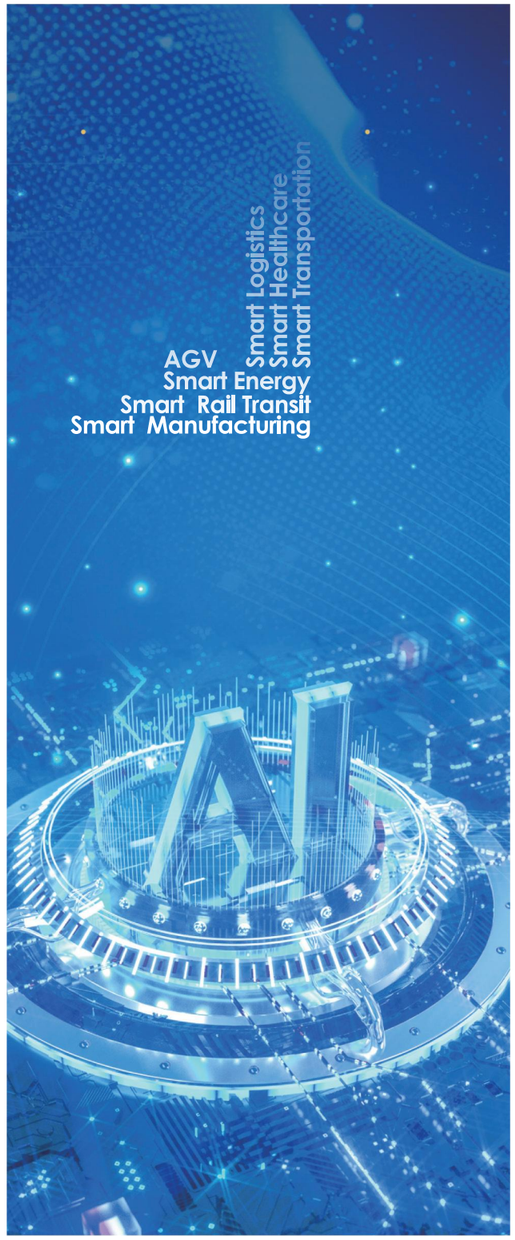
JHCTECH IoT Computer Connecting the Dots

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.

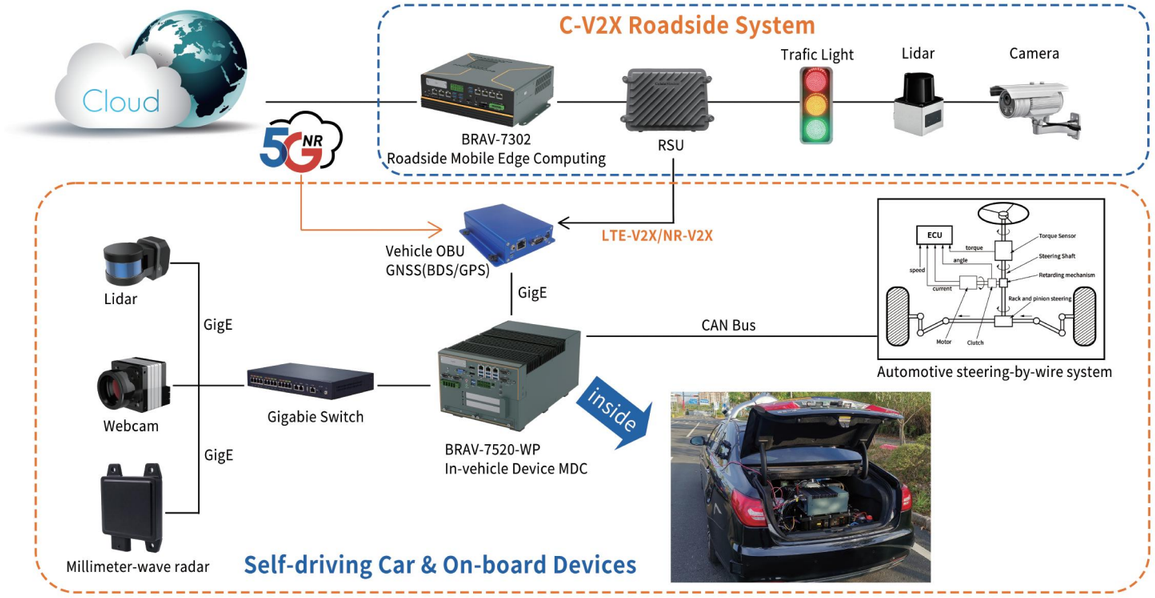
CATALOGUE



CATALOGUE

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 application solutions

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 IntelTM Xeon RE or 9th/8th Gen Core TM 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 vehical 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 application solutions

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.

India L4 Autonomous Trucks

According to reports from the China Academy of Information and Communications Technology and the Research Center for Artificial Intelligence and Economic Society, the global autonomous driving industry is developing rapidly, and multiple scenarios such as unmanned delivery vehicles, unmanned shuttles, autonomous trucks, etc. are accelerating testing and exploration. Level 4 autonomous driving is entering a new stage of comprehensive application, with further advancements in technology and infrastructure. In scenarios such as ports, long-distance freight transportation, and mining areas, there are harsh working environments, high labor intensity, labor shortages, and an increased risk of major safety accidents. Autonomous trucks can not only meet the efficient operation of cargo, minerals, etc. but also improve safety during freight transportation. They serve as an important tool to address industry needs.

Customer application requirements

Autonomous trucks use high-resolution remote sensors, various deep neural networks, and high-performance, energy-efficient computing to enhance the safety and efficiency of daily logistics. A powerful and stable edge computing system is essential for the Autonomous Operating System (AOS) of trucks. It needs to assist vehicles in real-time decision-making, data processing, and fusion, execute positioning and mapping tasks, provide performance redundancy and security, and enhance privacy and data security. In simple terms, a robust edge computing system acts as the brain of autonomous trucks, helping them navigate and operate autonomously quickly, accurately, and safely. The required equipment needs to meet the following conditions:

- Shock-resistant design for high reliability, suitable for onboard environments
- High-performance processor supporting AI/GPU cards for fast and accurate processing of data from onboard perception units
- Wide-voltage DC power supply and capability to power devices such as radars
- Abundant IO interfaces to connect with different sensor devices
- CAN bus interface to meet system integration with onboard line control systems
- Efficient heat dissipation design for continuous stable operation

BRAV-7721

Related application solutions

The development of the Autonomous Operating System (AOS) for trucks aims to achieve autonomous navigation and operation without human intervention. JHCTECH provides leading-edge computing product support for the development of autonomous driving truck operating systems. Behind the truck's autonomous driving system is software and computing power, which process large amounts of data from cameras, LiDARs, and radars, critical for the safe operation and decision-making of vehicles. JHCTECH's BRAV-7721-S001 is a workstation-grade edge computing system, featuring a shock-absorbing design suitable for use in vehicle-mounted scenarios.

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.

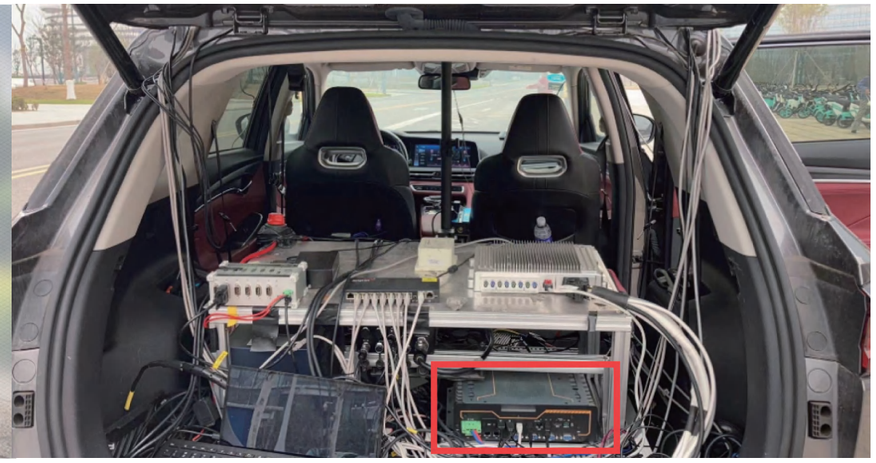
BRAV-7302

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.

Open Road Data Collection System Application

Advanced Driver Assistance Systems (ADAS), as key systems for vehicle active safety, are directly coupled with vehicle power systems, braking systems, and steering systems. They are control systems in vehicles that require extremely high reliability. Therefore, road tests for ADAS controllers' functionality and performance are indispensable. Road tests record the functionality implementation of ADAS systems under different conditions, as well as system missed detection events and false detection events. Post-analysis of video and data helps pinpoint issues and optimize the system.



Customer application requirements

To ensure multi-data high-synchronization collection, intelligent monitoring of the test process, efficient multidimensional data processing, and the generation of accurate analysis reports, there is a need for a powerful, highly stable, and precise data collection system onboard computing unit hardware product to provide robust support. This is required to rapidly and accurately identify the test scenarios required for ADAS testing. The testing system requires the hardware to have the following functions:

· Adoption of high-performance processor, support for AI inference card, and open system platform to efficiently process vehicle perception unit data information with low latency.
· Richly expandable IO interfaces, capable of connecting to a variety of different sensor devices and communicating with the tested vehicle's communication bus.
· Multiple storage options and larger storage capacity, separate system disk and data disk, using automotive-grade solid-state storage, with RAID0/1 functionality to protect data security.
· DC 9-36V wide voltage power supply with reverse connection, over-current, and over-voltage protection, adaptable to the complex and changing power supply environment of mobile vehicles.
· Designed with a shock-absorbing chassis to improve shock and impact resistance, providing better applicability in onboard environments.

BRAV-7601

Related application solutions

This project adopts the JHCTECH BRAV-7601, equipped with Intel® Comet Lake 10th-Gen CPU series processors, 8 cores and 16 threads; expandable to up to 16 channels of CAN 2.0 and CAN-FD; 6 Ethernet ports, including 2 POE ports; 8 camera inputs; 4 serial ports; 2*1TB solid-state storage (expandable), with 4G LTE, WIFI6, and high-precision BDS or GPS. It connects to the vehicle CAN bus, synchronously collects and monitors video, high-precision inertial navigation, intelligent cameras, millimeter-wave radar, lidar, road environmental information, and other full-range data for scenario data collection, combined with scenario platforms for simulation scenario generation.

High-performance AI Edge Computing Empowers Vehicle-mounted Ground Truth System

In recent years, the intelligent driving industry has been booming. For intelligent driving vehicles that have been developed, comprehensive testing is required before they can be commercially produced to ensure the safety of users' lives and property. Direct road testing of test vehicles will face various problems such as safety, economy, site reliability, scene diversity, and cycle time. Virtual simulation testing can only serve as auxiliary verification, and the test results are not ideal. Therefore, there is an urgent need for a ground truth system for intelligent driving and ADAS testing to ensure the authenticity and effectiveness of the tests and assist test personnel in evaluating test vehicles.

Customer application requirements

The vehicle-mounted ground truth system is a data acquisition system composed of millimeter-wave radar, lidar, high-precision inertial navigation, and other vehicle-mounted sensors plus efficient data recording equipment. Since it can process data to generate data (ground truth) that is more reliable than the measured sensor, the ground truth system is often used to evaluate the performance of the measured sensor. At the same time, based on the accuracy of data collection, after cleaning, labeling, and data mining of the ground truth data, a natural driving scene dataset can be formed, and then a natural driving scene library can be built.

To ensure multi-data high-synchronous collection, data collection recording, real-time data playback, efficient multi-dimensional data processing, and data verification, a high-performance, highly stable, and precise vehicle-mounted AI edge computing hardware product is required to provide strong support, with the following functions:

· High-performance processor supporting graphics cards and AI accelerator cards, open system platform, low latency, and high efficiency in processing data from vehicle perception units;
· Rich IO interfaces and powerful expansion capabilities, connecting multiple different sensor devices, and connecting to the tested vehicle communication bus;
· Multiple storage options and larger storage capacity, separate system disk and data disk, using automotive-grade solid-state storage, data disk supporting RAID0/1 function to protect data security;
· DC9-36V wide voltage power supply with reverse connection, overcurrent and overvoltage protection, adaptable to the complex and changeable power supply environment of mobile vehicles;
· Designed with a shock-absorbing chassis to enhance resistance to shock and impact, with better applicability in vehicle-mounted environments.

BRAV-7721

Related application solutions

The vehicle-mounted solution deployed lidar, millimeter-wave radar, vehicle-mounted cameras, PTP time synchronization module, RTK inertial navigation, and vehicle-mounted Ethernet switches. JHCTECH's BRAV-7721-WP undertakes important tasks such as recording vehicle sensor data, real-time data playback, and data verification.

In this project, JHCTECH's BRAV-7721-WP adopts an Intel i9-13900K CPU, with 1*PCIe expansion slot carrying an RTX 4090 GPU, providing powerful performance to meet the performance requirements of data collection, analysis, and verification.

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 application solutions

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!

Western (Chongqing) Science City Vehicle-road Collaboration

The intelligent connected automobile industry is not limited to the vehicle end but also includes infrastructure development at the roadside and platform establishment, making it a crucial component of smart transportation and smart city construction. The Western (Chongqing) Science City is the main platform for technological innovation in the Chengdu-Chongqing region. In 2022, it aimed at the new track of the intelligent connected new energy vehicles, driving industrial transformation around scenarios. With vehicle-road collaboration technology as the core and driven by smart networks and autonomous driving city demonstration applications, it is strategically constructing intelligent connected vehicle demonstration zones in different regions and phases to accelerate the opening of autonomous driving test roads.

Customer application requirements

Today's intelligent connected cars and autonomous driving face many limitations, such as blind spots and reduced recognition accuracy under adverse weather conditions, all of which can affect driving safety. To solve this problem, integrating "smart roads" and "real-time cloud" is imperative. The realization of vehicle-road coordination and holographic intersections with integrated "vehicle-road-cloud" is crucial, with a powerful and robust edge computing system (MEC) playing a decisive role.

The V2X vehicle-road collaboration network employs a radar-vision fusion solution, which is equipped with a variety of sensors and requires high computing power MEC edge computing to fuse and process various collection data from high-definition cameras, Lidar, and Millimeter-wave Radar. Therefore, there are extremely high requirements for the computing power of MEC edge computing hardware.

· Extremely high computing power meets the demands of AI deep learning and processing of data collected by multi-channel LiDAR, Millimeter-wave Radar, and High-definition Cameras;
· Wide temperature design and efficient heat dissipation method adapt to intersection installation environment;
· Low power consumption design compliant with road test infrastructure design regulations, with power consumption below 100W;
· Wide voltage design, stable power supply;
· Support 4G/5G wireless communication modules for real-time data broadcasting to intelligent driving vehicles;
· Equipped with a clock synchronization function to minimize the time difference between different devices.

BRAV-7131

Related application solutions

JHCTECH's BRAV-7131-S001 serves as a front-end edge computing MEC to provide strong assistance to the Western (Chongqing) Science City Intelligent Connected Vehicle Demonstration Zone. BRAV-7131-S001 is equipped with NVIDIA Jetson AGX Orin 32GB module, which has extremely powerful computing power support and has a computing power of up to 200TOPS. It has five LAN ports and supports NPT network timing. It can connect Lidar, Millimeter-wave Radar, and high-definition cameras through switches to transmit raw data. It uses super computing power to support AI deep learning fusion and processing of collected data to achieve structuring. BRAV-7131 has a variety of network solutions, including 1*M.2 B-Key 3052, which can support 4G LTE/5G NR wireless function modules and enable real-time broadcast of data. Multiple isolated IO interfaces improve the device's own lightning protection and surge protection capabilities; the whole machine adopts a combination of active and passive heat dissipation, with an operating temperature range of -20~60°C, suitable for Chongqing's outdoor temperature environment. DC 9~36V wide voltage power supply design, while power consumption is only 50.4W, meeting the road test infrastructure design requirements.

Domestically-made Highway Toll System

"Information Innovation + transportation" is an important support for the pilot construction of a transportation powerhouse and the construction of a transportation modernization demonstration zone, and it is a key task to achieve independent and reliable transportation "new infrastructure". Since the Ministry of Transport of China promoted the direction of smart high-speed innovation in July 2021, innovative solutions in intelligence, digitization, and domestication are being promoted across the country. promoting the digital transformation of the entire process of highway construction, maintenance, and operation, facilitating the deep integration of highway transportation with industrial chain supply chains, vigorously develop the highway digital economy, and provide service guarantees to accelerate the construction of a transportation powerhouse, a science and technology powerhouse, and a digital China.

Customer application requirements

The trend of domestication substitution in transportation is unstoppable, and Guangzhou Transportation Investment Mechanical and Electrical Engineering Co., Ltd. has implemented a hardware domestication solution for the Beisanhuan Science and Education City Toll Station. Key points of this domestication hardware replacement include brand domestication and hardware domestication, replacing the traditional X86 architecture processor platform. They have approached JHCTECH for assistance in the domestication transformation of the Beisanhuan Science and Education City Toll Station and have put forward the following requirements:

· Independent domestically-made brand;
· The domestically-made rate of the complete machine (chips, motherboards, components...) is not less than 90%;
· Openness supports domestically-made operating systems;
· Equipped with isolated IO function, the equipment is highly safe and reliable;
· Powerful performance, wide voltage design, not prone to downtime;
· Wide-temperature fanless design adapts to on-site installation environment

CNTI-3A51

Related application solutions

JHCTECH's CNTI-3A51 is a domestically-made platform ITS-specific edge controller that was developed in collaboration with Loongson Technology over several months. The domestically-made rate is as high as 90%. It is used as a lane controller in the domestically-made renovation plan of the Guangzhou Beisanhuan Science and Education City Toll Station.

The CNTI-3A51 is equipped with the Loongson 3A5000 processor, LS7A1000 chipset, 4 cores, and a frequency of 2.3-2.5GHz, fully meeting the requirements of the highway toll collection system. It supports open domestic operating systems such as UOS, Ubuntu Kylin, LOONGNIX, and OpenEuler. This project adopts the UOS system, with toll software independently developed by Guangzhou Transportation Investment Mechanical and Electrical Engineering Co., Ltd.

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 application solutions

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 application solutions

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 LGA1151 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.

Heavy Goods Vehicle (HGV) Electronic Toll Collection (ETC) System

The significant passage of heavy goods vehicles on roads causes damage, requiring substantial human and financial resources for compensation. According to regulations issued by a European country's government, fees are levied on heavy goods vehicles (HGVs) of the N3 category, with a total weight exceeding 12 tons, for the damage caused to important public roads. To facilitate and manage the collection of tolls, the implementation of the heavy goods vehicle (HGV) electronic toll collection (ETC) system is imperative.

Customer application requirements

This ETC toll collection system covers all highways in the country, collecting, processing, storing, and automatically uploading mobile data of heavy goods vehicles (HGVs) with a total weight exceeding 12 tons. As an essential component of the infrastructure, the toll collection system requires a computer with good performance, stability, and the ability to process large volumes of video streams and image data. This computer will be installed at each high-speed gantry cabinet, receiving data from peripheral devices and performing basic analysis before uploading it to the data center. A major toll system operator approached JHCTECH due to its excellent performance in the high-speed ETC toll collection industry, hoping that we could provide strong hardware support for their system. They presented the following requirements:

· Sturdy and durable, dustproof, shockproof, and moisture-resistant, suitable for harsh road environments;
· High performance to meet the processing needs of large volumes of video data and graphics information;
· Fanless design, high reliability, and easy maintenance;
· Rich IO interfaces and expandability requirements, capable of connecting multiple peripheral devices;
· Wireless communication capabilities such as 4G/Wifi/BT.

KMDA-3602

Related application solutions

After testing different products, JHCTECH's KMDA-3602 was finally selected.
The KMDA-3602 is a high-performance fanless box computer from JHCTECH, equipped with 6th generation Intel® Skylake-S/7th generation Intel® Kabylake-S processors, supporting GPU usage with a maximum power consumption of 120W. NVIDIA or AMD MXM3.1 GPU modules provide it with high computing speed and performance to meet the processing needs of multiple video streams and graphics information, ensuring powerful and stable performance. The machine adopts an anti-shock design, ensuring smooth operation in harsh road installation environments; it features rich IO interfaces, including 3*LAN, 4*POE, 2*COM, etc., to connect multiple external devices. With strong expandability, it meets the requirement of transmitting data to the Platon toll system via 4G/Wifi/BT wireless functions. The fanless heat dissipation design adapts to temperature and humidity changes, with excellent waterproof, dustproof, and corrosion-resistant capabilities, while also being able to operate stably under wide temperature and voltage ranges.

Empowering Hunan Pingyi Smart Expressway

In November 2022, the first "Smart Expressway" in Hunan Province, the Pingyi Expressway, was officially completed and opened to traffic.
Unlike conventional expressways, the Pingyi Expressway extensively utilizes cutting-edge technologies such as artificial intelligence, big data, the Internet of Things (IoT), and vehicle-road coordination to create the country's first comprehensive smart expressway operation and management platform. Serving as the intelligent brain of the expressway, it ensures passenger and driver safety through real-time event detection, rapid response, and coordinated joint operations, thus safeguarding the journey with the power of technology.

Customer application requirements

In the lane system, ensuring that all lanes at toll stations are equipped with ETC functionality is essential for facilitating fast vehicle passage, and the ETC gantry system is a crucial facility for eliminating provincial toll stations and enabling electronic toll collection without stopping. Therefore, both the ETC gantry toll system and the toll lane controllers (ETC lanes and hybrid lanes) must meet higher reliability and stability requirements.
For vehicle-road coordination applications, edge computing plays an irreplaceable role in realizing various use cases, requiring robust, reliable, and universal AI computing power support.

· Working environment temperature of -35°C
· Power supply interface for all devices on the lane
· Processor must meet 10 cores 20 threads, compact size, mountable on the pole box, and support 70TOPS~300TOPS computing power

KMDA-3610/3921/6920

Related application solutions

The ETC gantry toll system adopts the JHCTECH KMDA-3610/S001 product solution, with one main and one backup cabinet inside the gantry. The product complies with relevant Chinese industrial standards and application specifications, featuring reinforced-grade fanless design, capable of operating within a wide temperature range from -20°C to 65°C. It has high stability and reliability, being dustproof, corrosion-resistant, shockproof, and anti-electromagnetic interference, ensuring continuous and reliable operation under harsh environmental conditions.
The lane controller adopts the JHCTECH KMDA-3921(TCC-650) integrated lane controller, featuring fanless heat dissipation and providing 12*COM ports (expandable via PCI/PCIe cards), 6*USB ports, 4*LAN ports (expandable via I-Port), 32-bit relay IO (expandable), and DC 5V, 12V, 24V power supply methods to meet the power supply interface requirements for all devices on the lane.
For smart expressway event detection edge computing, JHCTECH utilizes the KMDA-6920, powered by Intel® 10th Gen Comet Lake processors, capable of supporting 70TOPS~300TOPS computing power. Its compact size perfectly meets the requirements for mounting on the pole box and is deployed at 16 toll gates and 2 tunnels. Different computing power product solutions are used for 18 scenarios to process different structured data, providing Pingyi Expressway with the ultimate safety and stable smart expressway event detection and toll system.

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:

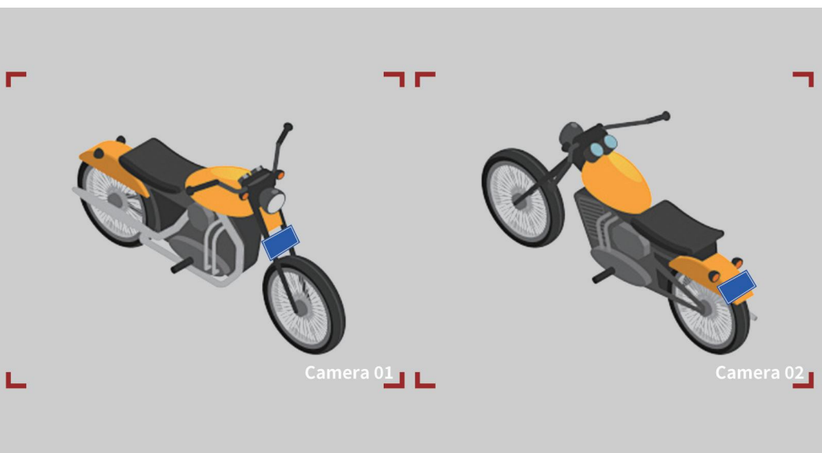
-Equipped with a high-performance processor to handle multiple video streams
-Must support operation in harsh environments, low power consumption, fanless design, wide-temperature range
-Equipped with 7 LAN ports to connect cameras, ground coils, traffic light controllers, etc.

KMDA-3601

Related application solutions

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.

Automatic Number Plate Recognition (ANPR) System for Motorcycles in South Korea



With the increasing number of motorcycles in South Korea, traffic accidents are on the rise, involving violations such as not wearing helmets or reversing illegally. In the past, Korean motorcycles only had license plates at the rear, making traffic law enforcement inconvenient. By adding license plates to the front of motorcycles and implementing a license plate recognition system, real-time photos or videos can be effectively captured to assist law enforcement actions, ultimately improving road traffic safety for two-wheelers. In license plate recognition applications, a powerful high-performance control unit is crucial.

Customer application requirements

A customer from South Korea approached us seeking a perfect hardware solution to capture traffic violations, record passing vehicle license plate numbers, and alert the public to traffic violations, thereby standardizing public infractions. As the acquisition and processing unit for Automatic Number Plate Recognition (ANPR), it needs to have the following features:

· Continuous operation in harsh outdoor environments, with a working temperature range of -20°C to 70°C.
· Intel 10th generation I5/I7 high-performance CPU.
· Low power consumption characteristics.
· High-speed storage function to ensure data effectiveness.
· Support for MXM cards, capable of simultaneously processing data from at least 4 cameras.

BRAV-7601

Related application solutions

After numerous tests, the JHCTECH BRAV 7601 has successfully passed certification from the South Korean customer. The BRAV-7601 is a high-performance AI edge computing system, equipped with Intel® Comet Lake 10th generation CPU, multiple IO interfaces, and 7 LAN ports for connecting and transmitting data with external cameras. It features a CPU+GPU dual processor configuration, supporting up to 190W MXM GPU modules/AI acceleration cards, such as NVIDIA 1650/1660S/3060 MXM GPU modules, while simultaneously processing data from 4 cameras. With 1*M.2 M-Key, it supports NVMe ultra-high-speed solid-state storage to ensure data effectiveness. As a roadside system, the BRAV-7601 has low power consumption, operates within a temperature range of -20°C to 60°C, and supports wide voltage DC9-36V power supply. It is resistant to shock and vibration, effectively meeting the hardware requirements of the automatic number plate recognition system, and can withstand various harsh field environments, ensuring long-term stable operation of the equipment.

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

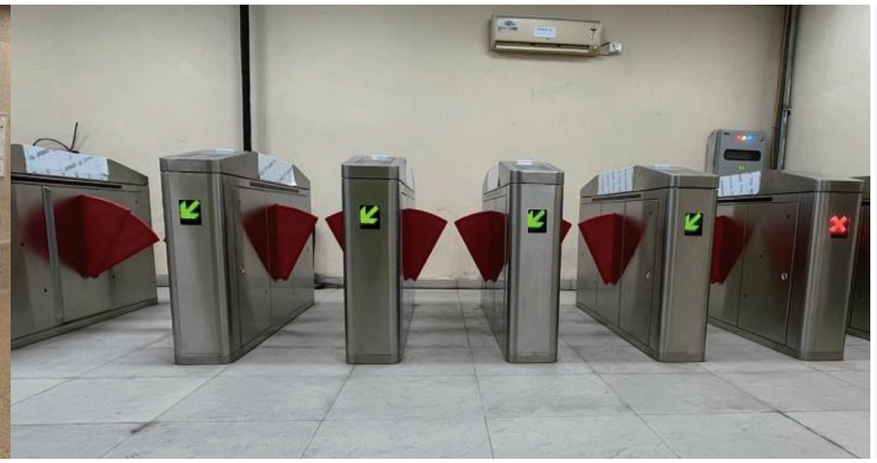
KMDA-5920

Related application solutions

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.

KMDA Series Supports the Southeast Asia Subway AFC System

Traditional manual ticket sales cannot meet today's huge and efficient travel demand. Therefore, the application demand for Automatic Fare Collection (AFC) systems is particularly urgent and important.



Customer application requirements

The AFC system comprises the Application Management System (Settlement Center System, Central Computer System, Site Computer System) and Ticket Collection Equipment (Automatic Ticket Vending Machines, Exit/Entry Gates, etc.). Leveraging cutting-edge technologies such as computers, the Internet, and mechatronics, the AFC system achieves centralized control over automatic ticketing, inspection, and network systems. This intelligent, high-efficiency, safe, and reliable system has been widely adopted in urban rail transit globally, significantly enhancing travel efficiency.

This customer approached JHCTECH with the expectation that we could provide a reliable and efficient fanless industrial computer for their automatic ticket gate machines. Each automatic ticket gate machine corresponds to an industrial computer. Considering the operating principles and characteristics of the automatic ticket gate machines, the specified requirements are as follows:

· The performance can meet basic control, analysis and transmission.
· Multiple I/O interfaces can connect all access control modules and their connected sub-components, with convenient wiring.
· The whole machine is miniaturized and easy to disassemble and assemble;
· Good stability, reliability, and maintainability.

KMDA-2602

Related application solutions

The customer finally selected JHCTECH's KMDA-2602-S001 to provide solid and stable support for its application. The KMDA-2602-S001 utilizes an Intel J1900 CPU with four cores and four threads, providing capabilities for basic control, data analysis, and transmission. With rich I/O interfaces, and 6*COM ports, it meets the connection requirements of automatic ticket throughput ports, non-contact IC cards, gates, alarms, and other equipment; Additionally, it features multiple network ports and USB interfaces for information communication with system terminals. All interfaces are distributed on the front and rear panels facilitating equipment wiring. The model is small and compact, and adopts a wire-free docking architecture, ensuring stable operation for extended periods, running continuously 24/7. The heat dissipation design, with upper and lower isolation, enables it to operate in the working range of -20°C to 65°C, making it well-suited for harsh working environments.

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 application solutions

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 application solutions

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 environ mental 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

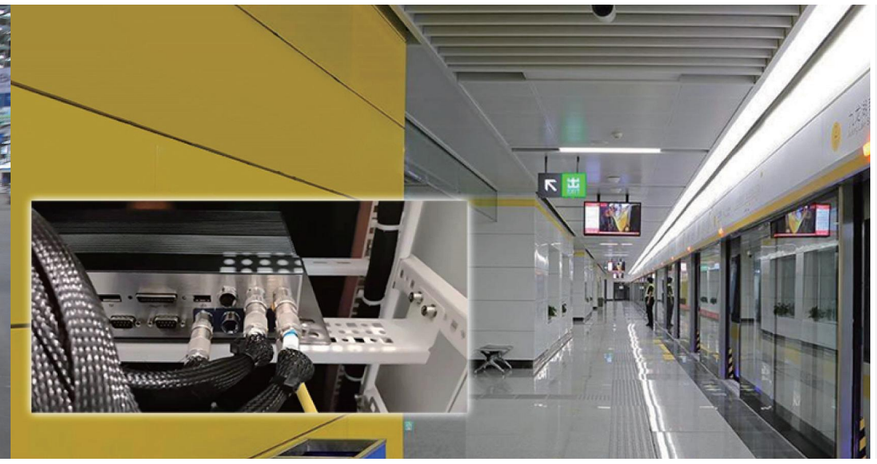
Related application solutions

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 (±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.



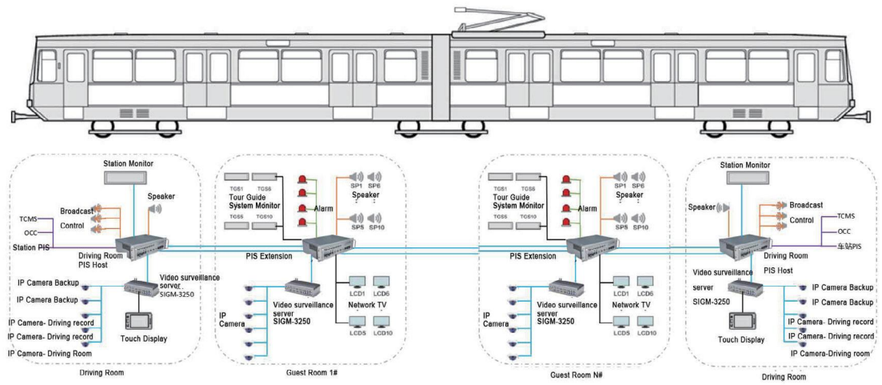
Application Structure

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 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, CPCI 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

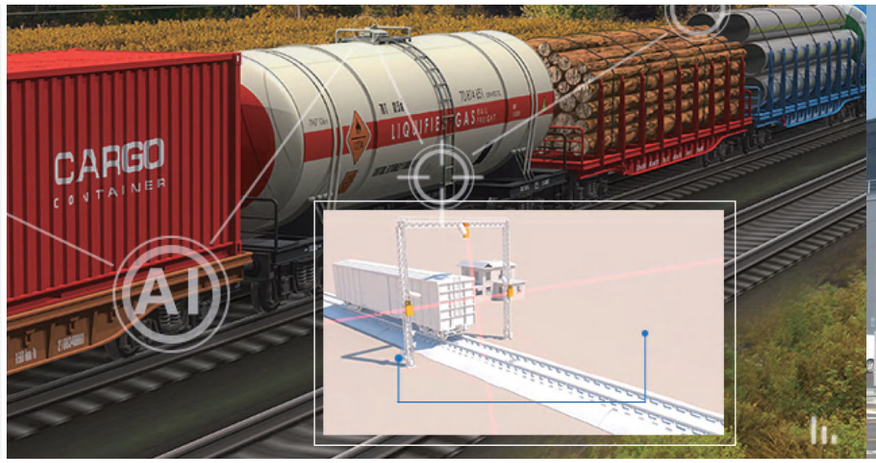
SIGM-3250



Intelligent Video Inspection System Of Rail Freight

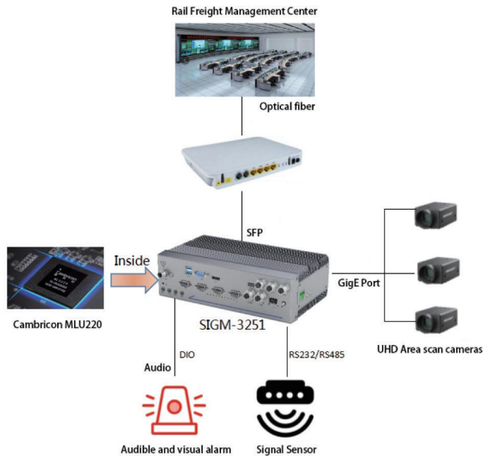
If high-speed rail technology initiated the "speed revolution" of railway transportation, then the application of artificial intelligence technology will create the "smart revolution" of railway.

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 an 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 application solutions

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

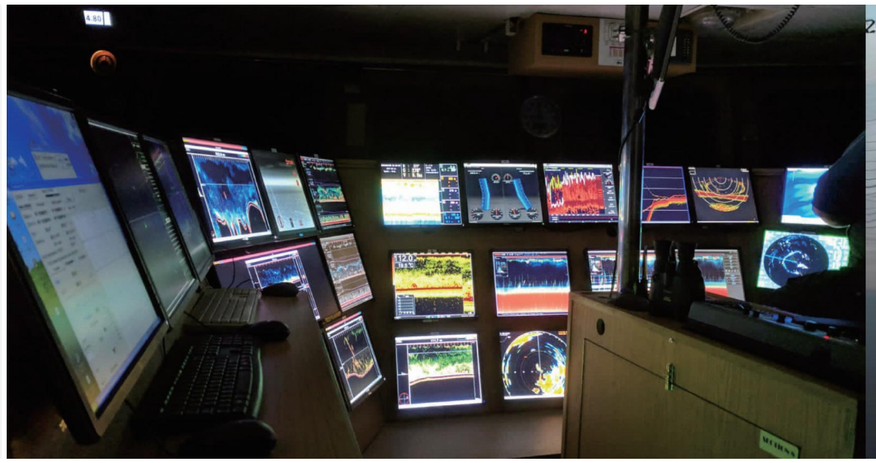
KMDA-3201

Related application solutions

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.

Empowering Control Systems for Spanish Fishing Vessels

In the field of fishing equipment, countries such as the United States, Japan, Norway, Spain, Iceland, Denmark, and Taiwan, have been leading the technological trends. The development of fishing equipment is increasingly moving towards large-scale, with automated, intelligent, and specialized equipment. Countries are intensifying research on fishing vessel types, fishing gear, fishery navigation technology, and automatic control technology for processing of aquatic products. Consequently, there is a growing demand for high-performance industrial controllers.



Customer application requirements

To complete the full cycle of work for large smart fishing vessels, including fishing, sorting, freezing, and packaging, multiple industrial computers are needed for different engine rooms and fishing gear to collect and transmit data. Additionally, a main controller needs to be equipped to connect with various sub-controllers for data monitoring and display.

As there are many fishing devices on the ship, such as surveying and mapping tools, fish finders, and sonars, data needs to be collected from different devices and transmitted via COM ports. Meanwhile, mapping, gyroscopic heading, depth, etc., require high-precision GPS positioning. This Spanish customer has the following requirements for JHCTECH:

· Performance: Stable performance, high reliability, and capable of long-term operation.
· I/O interfaces: 4-8 COM ports to connect various fishing gear for data transmission; 3 display interfaces to connect with the control console.
· Adaptation to the application environment: Due to the long-term work of fishing vessels at sea, in high-humidity environments, the equipment needs to be rugged and durable to withstand the high humidity environment throughout the year.
· High-precision GPS positioning to assist in ship mapping and determining heading.

KMDA-5610

Related application solutions

The KMDA-5610 is a fanless high-performance box computer. It features the Q370 chipset and is equipped with Intel® 8th/9th generation Coffee Lake series processors. It not only has stable performance for extended operation, but also has rich I/O interfaces, with 4*COM ports, 3*network ports, and 8*USB, to meet the data collection and output requirements of multiple fishing gear and control systems. Furthermore, it provides 1*VGA+2*DP, offering three independent display interfaces to realize different connections with the center console. Additionally, it is equipped with GPS functions to assist fishing boats in charting and more. With a moisture resistance range of 10~95% at 40°C and non-condensing properties, this solution can perfectly adapt to the long-term wet and cold conditions experienced by fishing boats. It is an ideal solution for applications on fishing boats.

Recently, JHCTECH's KMDA series has been upgraded again, with the KMDA-5610 being upgraded to the KMDA-7610. The appearance follows the design of the KMDA 5/6 series and is equipped with Intel® 12th generation Alder Lake-S/13th generation Raptor Lake-S series processors. This high-performance new product solution can solve customer needs more efficiently.

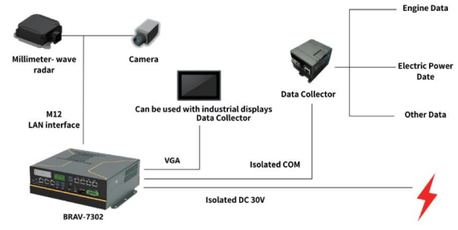
Vessel AIS Data Acquisition System

The shipboard comprehensive monitoring system integrates radar, AIS, CCTV, GPS, and other detection technologies, along with highly integrated real-time situational awareness and cognitive technologies, to effectively monitor the vessel and vessels within the vicinity. It extends the supervision range of shore-based monitoring centers, ensuring navigational safety and providing various technical means for maritime safety management authorities to achieve shore-based controllable data communication and dynamic data acquisition.

Customer application requirements

The vessel data remote acquisition controller is a MEC device used as onboard equipment to realize ship-shore data communication control, as well as the collection of vessel navigation data, engine room working condition data, maritime meteorological data and vessel AIS data. It is a key equipment for the maritime safety management authorities to realize shore-based controllable data communication and dynamic data collection. A large domestic land and marine equipment company approached us and hoped that we could provide it with reliable hardware support equipment. Specific requirements for the MEC device include:

· Adopting the AIoT (General CPU + AI Computing GPU) architecture scheme and an open system platform, it can perform multi-task management and control such as device access, data collection, parallel computing, network communication, early warning output, display interaction and storage;
· Comprehensive I/O interface allows access to multiple sensors (cameras and radars) and serial port acquisition modules;
· Dual-channel mutually redundant GPRS/3G/4G wireless network functions ensure remote communication between ship, shore and ship;
· Internal electronic components and PCB must be coated with three-proof coating to adapt to the high humidity and corrosive climate environment at sea;
· Reinforced structural shell, moderate size, easy installation, suitable for shipboard applications;
· Shipboard MEC needs to comply with the IEC-60945 international ship navigation electronic equipment standard;
· Wide-voltage power supply adapts to the complex and changeable power supply environment onboard ships.



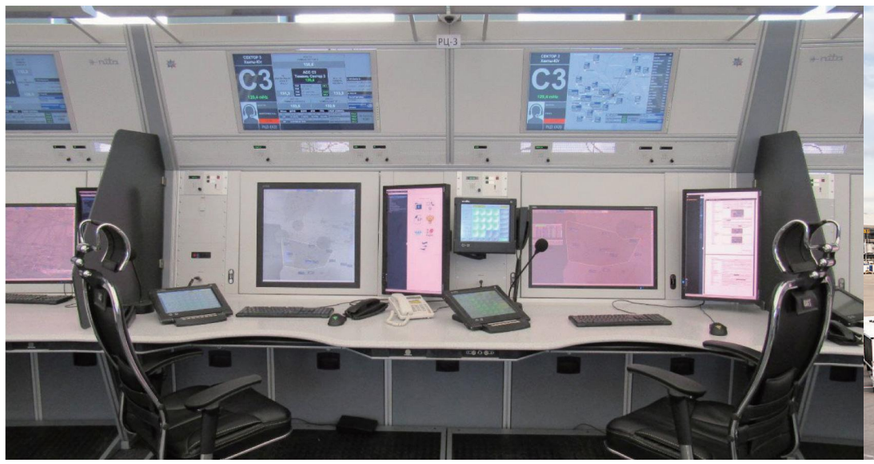
Related application solutions

JHCTECH is committed to providing customers with the most suitable hardware solutions. Considering the customer's scenario needs, we have finally selected BRAV-7302 as the shipboard MEC solution.

The entire machine adopts a floating ground design, passing EMC level 4 experiments; it features a DC 6~48V power supply design with short circuit, overvoltage, overcurrent, and undervoltage protection. The full-size PCB and all electronic components are coated with three-proof coating technology. It has independent efficient airflow cooling design for CPU and GPU, rugged and durable aluminum alloy and SGCC steel body, moderate size, flexible installation methods, and other advantages, suitable for mobile shipboard and complex marine application environments.

Spanish Airport Tower Air Traffic Control System

Air traffic control (ATC) is one of the three pillars ensuring aviation safety, where controllers oversee and coordinate the entire flight process from takeoff to landing for each aircraft. The ATC system constructs a seamless safety net for each aircraft. From departure at the airport, through airspace routes, to arrival at the destination airport, aircraft are safely guided by controllers in a series of handovers, like passing a relay baton from one runner to the next until reaching the finish line.



Customer application requirements

In an air traffic control system, receiving and exchanging information is crucial. Ground air traffic controllers command aircraft on the ground through the air traffic control system and guide them through specified controlled airspace. Additionally, they can provide advisory services for aircraft in non-controlled airspace from the air traffic control tower. A customer in Spain is seeking an industrial panel PC for use in their air traffic control system, and the device needs to meet the following criteria:

· Robust and durable, with high resistance to withstand the continuous operation demands of airport towers.
· Fanless design.
· Abundant IO interfaces to support multiple display functions.
· Support for aviation broadband communication systems to facilitate information exchange between air and ground.

ALAD-K1220T

Related application solutions

JHCTECH's ALAD-K1220T is an intelligent fanless embedded panel PC equipped with an Intel Core i3 7100U CPU, ensuring stable performance to meet the continuous operation requirements of airport control towers. It supports aviation broadband communication systems, directing aircraft through designated controlled areas while receiving advisory services for aircraft in uncontrolled airspace, facilitating information communication and interaction. With rich IO interfaces including 2*LAN, 4*USB 3.0, and 1*USB 2.0, along with a 12.1-inch 1024*768 high-brightness TFT LCD and 1*HDMI interface for display extension via HDMI. With DC 9~36V input and features such as shock resistance and corrosion resistance, it provides robust stability, offering high-reliability support for the system, making it the ideal choice for air traffic control tower information exchange applications.

ALAD Powers Airport Telematics

Airports are vast and complex infrastructure facilities involving multiple stakeholders and various operational scenarios, including airside, terminal buildings, and landside operations. Different personnel and business scenarios are involved. To facilitate information transmission, the automated reception and transmission center system has emerged, aiming to provide a fixed channel for information reception and transmission between controllers and flight crews, enabling seamless communication. This system provides data and information to ground operations, security, and fleet managers at airports, facilitating proactive management of ground vehicles operating at the airport. It offers valuable insights to improve safety, compliance, reduce costs, and operate more efficiently.

Customer application requirements

The automatic reception and transmission center is designed to provide a fixed information reception and transmission channel between controllers and flight crews. It requires an embedded panel computer to carry the system and effectively display information for transmission. Therefore, a stable embedded industrial panel computer is indispensable. A large overseas airport equipment supplier approached us and hoped that we could provide it with a cost-effective and stable panel computer solution. The device needs to have:

· Fanless, low-power design, with embedded panel installation features to seamlessly integrate into the equipment.
· Stable performance with certain anti-interference capabilities to adapt to the airport environment.
· Integrated touch display industrial panel computer.
· Meet wireless network requirements, capable of communication via 4G/Wifi.

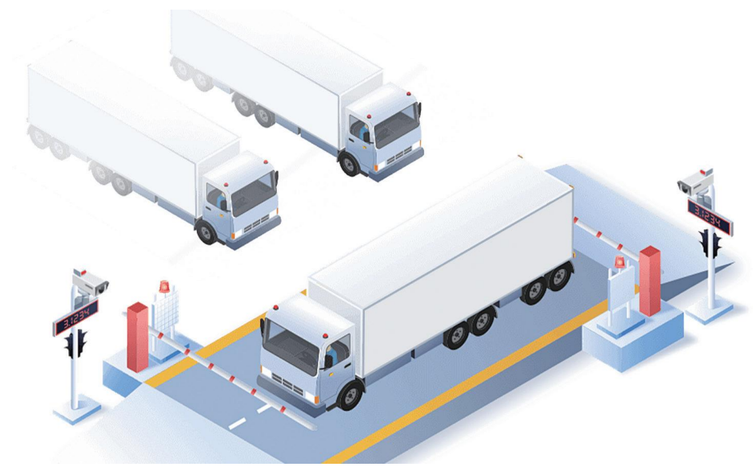
ALAD-A1001T

Related application solutions

After understanding the actual application conditions of the customer, JHCTECH recommended the ALAD-A1001T industrial panel PC for its automatic reception and transmission center. The device features a rugged aluminum alloy die-cast shell with finned heat dissipation, fanless cooling, and embedded panel installation, achieving IP65 front panel protection. It is equipped with the Baytrail Celeron J1900 CPU series processor, ensuring stable performance and efficient data transmission. The device features a 10.1-inch 1280*800 high-resolution high-brightness TFT LCD for long-term stable operation. Additionally, the ALAD-A1001T industrial panel PC supports 1*full-length Mini PCIe with PCIe X1 and USB signals, a SIM card slot, and features such as 4G LTE, Wifi/BT, meeting the customer's real-time communication and data interaction needs via the Wifi interface.

Logistics Weighbridge System

With the rapid development of technology and the booming of global trade, the logistics industry is facing unprecedented challenges. From weighbridge weighing to automatic loading, vehicle dispatching, and logistics transportation, every link requires refined management and optimized operating procedures. In logistics operations, weighbridge weighing is an indispensable part. Traditional manual operations are not only inefficient but also error-prone. By introducing an intelligent weighbridge management system, weighing accuracy and efficiency can be greatly improved.



Customer application requirements

The logistics weighbridge system is an integrated weighing device equipped with advanced technology, widely used in logistics, warehousing, production, and other fields. With high-precision sensors and intelligent control systems, it can accurately measure and record the weight of objects, improving work efficiency and accuracy. A logistics customer in Guangxi is looking for an industrial computer to serve as the "brain" of its logistics weighbridge system, requiring the following characteristics:

· Stable operation in harsh industrial environments.
· High performance, utilizing 10th generation Intel processor.
· The system has a large memory and fast data reading speed.
· Multiple IO interfaces, good expandability to connect multiple external devices.

PADR-S501-971

Related application solutions

In response to the customer's needs, JHCTECH recommended the PADR-S501-971 for its logistics weighbridge system. This standard 4U rack-mounted industrial computer features the Intel H420E chipset paired with 10th generation Comet Lake-S LGA1200 series processors, delivering powerful performance to efficiently meet the demand for camera data analysis. It supports 2*DDR4, with a maximum support of 64GB, enabling rapid analysis of received data and providing fast license plate recognition. With rich functional IO and 7 PCIe/PCI expansion capabilities, it can connect cameras for data collection, perform truck license plate recognition, and receive weight data from weighbridges via serial ports, uploading the data to the system for comparison of inbound and outbound weights and conducting truck load statistics. Certified by the China Compulsory Certification (CCC), it has high reliability, supports wide temperature operation, is resistant to shock and vibration, and is suitable for harsh working environments, meeting the continuous stability requirements.

Application of AGV in Turkish Logistics

AGVs play a crucial role in automated logistics, not only providing basic transportation functions but also seamlessly integrating with sorting, conveying, and packaging, making them indispensable in mobile operations within factories. Why are AGVs so favored? Externally, it's due to the global proliferation of intelligent manufacturing and technological advancements. Internally, it's driven by rising labor costs and the substantial demand for various energy resources by enterprises, prompting factories to undergo intelligent transformations. The upgrading demand for automation in production, manufacturing, and goods circulation, which form the industrial foundation, appears increasingly urgent.

Customer application requirements

AGVs represent a fully automated system capable of meeting the demand for unmanned vehicle material handling, serving as one of the best methods to reduce costs and increase productivity. A specialized onboard controller plays a decisive role in AGV operations by determining its motion path and speed, facilitating intelligent transportation, and automated warehousing in logistics scenarios. A leading AGV industry benchmark company in Turkey approached JHCTECH, hoping for a compact and efficient onboard controller solution for their autonomous navigation AGVs. The device needs to have the following features:

· Compact size, fanless design;
· Sturdy and stable, can operate stably for a long time;
· Wide voltage power supply;
· Rich IO functions;
· Certain expandability, supporting WIFI & CAN.

KMDA-2602

Related application solutions

JHCTECH's KMDA-2602-T002 perfectly meets the customer's requirements. KMDA-2602-T002 is a compact box PC featuring a brand-new slim design, making it highly suitable for installation in AGV environments. It is equipped with an Intel® Baytrail-D Celeron J1900 CPU, delivering both low power consumption and adequate performance. With a wide DC 9~36V voltage supply, it adapts to the power supply environment of vehicle batteries. It has abundant IO interfaces for connecting external devices, with serial ports supporting Modbus protocol. 1*Mini PCIe can be connected to JHCTECH's ECB-260 module for CAN bus connection to drive walking and steering. Another Mini PCIe supports functionalities like 4G LTE, Wifi/BT, meeting users' needs for establishing data interaction with the backend via Wifi.

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's intelligent logistics and warehousing AGV solution can be implemented using either the X86 architecture product KMDA-3302 or the ARM architecture product CNTI-R351, offering a dual architecture selection to meet different user needs. The KMDA-3302 is equipped with an Intel® Tiger Lake U Soc series CPU, while the CNTI-R351 features a Rockchip RK3588 processor. Both products are compact embedded solutions, well-suited for installation in AGV/ARM environments. Additionally, the entire system adopts shock absorption design to ensure stability during operation. Ethernet ports are used for connecting laser navigation devices, while serial ports support Modbus protocol and PLC communication. The KMDA-3302 can interface with walking/steering drives via the ECB-260 module inserted into the Mini PCIe interface for CAN bus connection. On the other hand, the CNTI-R351 has 2 built-in CAN ports for direct connection to walking/steering drives. With a wide voltage supply range of DC 9-36V, these devices can be directly connected to vehicle power batteries and manage power batteries via the Sm bus interface. The specific hardware system architecture diagram is as follows:

ALAD Industrial Panel PC Application in Warehouse Forklifts

In the warehousing process, forklifts play a crucial role. Traditional manual handling of materials using forklifts often leads to data discrepancies, delays in retrieval, and inaccuracies in inventory records, resulting in reduced efficiency and precision. However, the advent of intelligent forklifts has significantly enhanced the efficiency and accuracy of material handling by enabling operators to quickly locate, transport, and dispatch goods while also implementing proper categorization controls, thus achieving improved efficiency, cost reduction, and effective management.

Customer application requirements

Forklifts are transitioning from mere handling tools to intelligent operational terminals, effectively enabling workers to enhance efficiency and minimize errors. A customer from Israel approached us seeking an industrial panel PC solution for their forklifts, requiring the device to have the following features:

· Integrated touch display industrial panel PC is suitable for the unique installation method of forklifts.
· Fanless design with low power consumption to withstand dusty warehouse environments.
· Stable power supply requirements.
· Abundant I/O interfaces for connecting barcode scanners or RFID readers.
· Expandability to meet wireless networking needs, capable of communication via 4G/Wi-Fi.

ALAD-K1520T

Related application solutions

After understanding the customer's practical application requirements, we recommended the ALAD-K1520T 15-inch and ALAD-A1001T 10-inch industrial panel PCs for their forklifts, considering the varying installation space constraints. These devices feature robust aluminum alloy die-cast enclosures, a fanless design for heat dissipation, and IP65 front panel protection, suitable for dusty warehouse environments. Equipped with a 15.0-inch 1024*768 (10.1-inch 1280*800) high-resolution TFT LCD, these panel PCs ensure stable long-term operation. They accept DC 9-36V power input, adapting to vehicle battery power supply environments. With I/O interfaces, they can connect to external devices like barcode scanners or RFID readers for quick identification of goods, enhancing on-site work efficiency. Additionally, the ALAD-K1520T industrial panel PC supports 1*Mini PCIe with a SIM card slot, enabling 4G LTE/GSM/Wi-Fi/BT/GPS connectivity, meeting the customer's need for real-time communication and data exchange with the backend center via Wi-Fi interface.

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 application solutions

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.

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 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

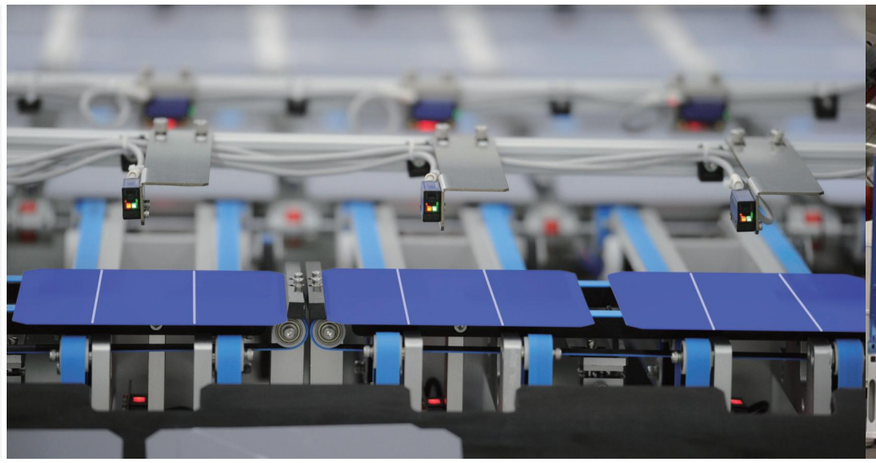
KMDA-2702

Related application solutions

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.

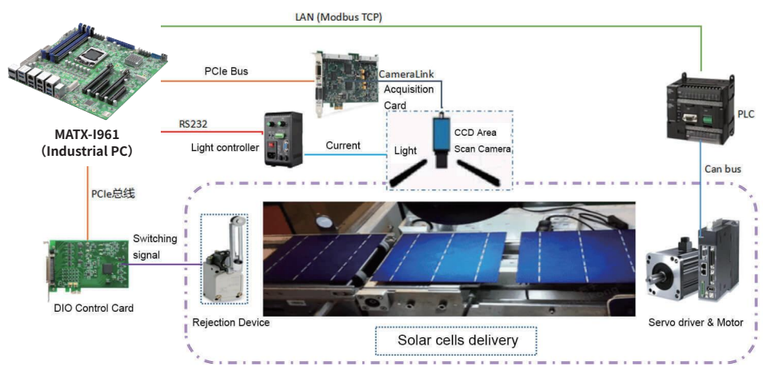
Visual Inspection System Applied in Solar Industry

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.



Customer application requirements

- 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

Multifunctional Mobile Energy Storage Charging Vehicle

With the rapid growth and widespread adoption of new energy vehicles, the supporting charging infrastructure has attracted increasing attention. Charging difficulties, range anxiety, and challenges in installing charging stations in residential areas remain significant concerns for most new energy vehicle users. In response to these pain points and various application scenarios, new types of charging products have emerged, among which the mobile energy storage charging vehicle is one.

Customer application requirements

Energy storage is the primary key technology for mobile charging vehicles, and the Battery Management System (BMS) is indispensable in battery storage and critical in mobile energy storage applications with multiple battery pack combinations. Therefore, there is an urgent need for a high-performance BMS main control device to provide strong support for multi-functional mobile energy storage charging vehicles. The customer approached JHCTECH with the following requirements:

- Equipped with a high-performance CPU capable of long-term uninterrupted operation.
- Support for DDR4, ensuring fast data access.
- Reliable storage to ensure separate operation of the system disk and data disk.
- Fanless heat dissipation design, suitable for high-temperature environments and vehicle-mounted applications.

KMDA-5920

Related application solutions

Based on these requirements, we provided the customer with an application solution using the KMDA-5920 paired with the ECB-260 CANbus function module. The KMDA-5920 adopts an X86 architecture Intel Core multi-core high-performance CPU, which can perfectly handle the computing power of the BMS main control, collect and analyze data, output control signals, estimate various battery states through algorithms, and provide a basis for vehicle status management and energy distribution. It can integrate multiple CAN-BUS field buses, with 2.5KV photoelectric isolation, ensuring the reliability of communication with various inspection modules. It has reliable storage, and dual 2.5-inch SATA3.0 easy-swap hard disk slots, which can meet the simultaneous normal operation of the data disk and the system disk. With fanless heat dissipation design, wide-voltage DC power supply, and flexible installation methods, it is suitable for vehicle-mounted applications.

Application of Industrial Panel PC in EMS Energy Storage Cabinet

With the rapid development of China's new energy industry and the continuous deepening of the energy revolution, energy storage, as a key support for future energy system development, has gradually become a focus of attention from all parties. Energy storage will be a key technology affecting the future energy landscape, with great significance for the safe, stable, and efficient operation of energy systems, improving the comprehensive utilization efficiency of energy, promoting the development of new energy industries, and driving energy strategic transformation. Energy Management System (EMS) is a crucial intelligent technology in the new energy storage industry, mainly responsible for optimizing the safe dispatch of energy.

Customer application requirements

Energy Storage EMS serves as the brain of the energy storage system, capable of monitoring, controlling, and optimizing the operation of energy systems, providing efficient and stable energy management for energy storage facilities. EMS needs to interface with a variety of devices: PCS, BMS, air conditioning, electric meters, smart circuit breakers, fire alarm hosts, various sensors, indicator lights, etc. Therefore, EMS first needs to be compatible with and support various protocols to fully integrate devices and their data. Especially for the real-time and comprehensive access of equipment alarm information. A large Chinese new energy industry solution provider found JHCTECH to recommend an industrial panel computer for its energy storage cabinet EMS, with the following requirements:

· Fanless design, embedded installation;
· As the brain of the energy storage system, the machine is required to run continuously without failure;
· Support wide temperature range, strong anti-interference ability, certain waterproof ability, and multiple IO interfaces;
· Realize real-time monitoring, scheduling, and intelligent management of energy storage data.

ALAD-A1001T

Related application solutions

After multiple discussions and experiments, JHCTECH has finally selected the ALAD-A1001T for this project. The ALAD-A1001T is a classic fanless industrial panel computer from JHCTECH, with a 10.1-inch size suitable for installation in the energy storage cabinet space. It features an onboard Baytrail Celeron J1900 CPU series processor, quad-core and quad-thread, capable of meeting the performance requirements for data management. With rich IO interfaces, including 2*COM, 2*LAN, 1*USB3.0, and 3*USB2.0, it meets the data access needs of devices such as PCS, BMS, air conditioning, electric meters, and alarm systems. It also features a 12.5" SATA3.0 HDD/SDD and a mSATA full-height card for effective data storage. The entire machine adopts a fanless design, and supports a wide temperature range, with storage temperature ranging from -20°C to 60°C and operating temperature ranging from 0 to 50°C for HDD (-10 to 55°C for SSD). With a sturdy structure, waterproof, dustproof, anti-interference, and stable performance, it ensures 24-hour continuous operation of the equipment.

Central Air Conditioning Gateway Application

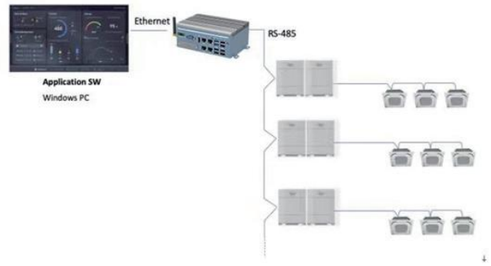
With the rapid development of the national economy, people's demands for living environments and comfort are increasing. Air conditioning systems and related equipment have become part of people's daily lives, leading to new energy consumption issues. Statistics show that building energy consumption accounts for about 35% of the total national energy consumption in China, with air conditioning consumption accounting for approximately 50% to 60% of building energy consumption. In the current scenario, where building energy consumption continues to rise as a proportion of total energy usage, especially amidst the increasingly urgent global 'energy crisis,' addressing energy efficiency in air conditioning, a significant component of smart building applications, has become an important and meaningful issue.

Customer application requirements

Compared with traditional air conditioning systems, intelligent central air conditioning control systems rely on technologies such as the Internet of Things and big data. They intelligently control air conditioning throughout the building based on the number of occupants and activity levels, using wired or wireless remote signals. Combined with advanced sensing devices, they monitor indoor temperature, humidity, etc., in real-time, adjusting ventilation and temperature to a comfortable level with minimal human intervention. Additionally, by automatically adjusting operational parameters based on indoor conditions, they avoid situations such as continuous air conditioning operation in unoccupied spaces or too low temperatures, thereby reducing electricity consumption and achieving more efficient energy use.

To ensure the efficient and stable operation of the system, the required hardware must meet the following conditions:

· The hardware device must provide communication interfaces: Ethernet, Wi-Fi, etc.
· Provide data acquisition interfaces: KNX, RS485, UART, support for embedded wireless modules such as Zigbee, etc.
· Accept custom development: Modular customization of data acquisition interfaces.
· Provide remote maintenance functionality.



KMDA-2630

Related application solutions

Reliable hardware products are the key to the entire intelligent building management system. JHCTECH's fanless embedded box computer KMDA-2630, through wired/wireless connections, links to the intelligent building management system. It collects data through multiple serial ports and transmits commands, simultaneously controlling multiple central air conditioners and linking to multiple external air conditioning units for data collection and upload to the management platform. This achieves remote monitoring of central air conditioning status, energy consumption monitoring, fault maintenance, equipment configuration, remote upgrades, and startup control.

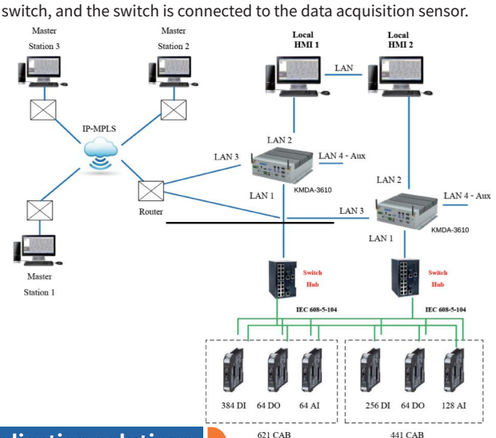
Thailand Power Enterprise Data Gateway

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 application solutions

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.

Mining Intelligent Comprehensive Management Platform

In February 2020, the "Guiding Opinions on Accelerating the Intelligent Development of Coal Mines" jointly issued by the National Development and Reform Commission and eight other ministries stated: "Construct an integrated platform that integrates multiple systems and functions such as intelligent production, safety assurance, and operational management to achieve intelligent applications such as collaborative coal mine production and sales, decision-making control, and integrated operation." This is of great significance for promoting the transformation and upgrading of the coal industry and facilitating its high-quality development.

Customer application requirements

The intelligent comprehensive management platform is based on the architecture of the industrial Internet cloud-edge-end. It is supported by the coal industry's big data management platform and relies on a unified intelligent mine basic information platform. Using microservice technology application component orchestration and scheduling technology, it has developed a series of intelligent coal mine comprehensive management business applications with unified deployment, authorization, operation management, and application modes. A domestic supplier of intelligent mine control platforms approached JHCTECH, hoping we could provide a high-performance 4U industrial computer for their system, with the following requirements:

· High performance, capable of processing multiple sets of data.
· Abundant IO interfaces, with multiple expansion capabilities for receiving operational data from various subsystems for real-time monitoring.
· Efficient heat dissipation and reliable power supply solutions.
· Products with extremely high reliability, anti-vibration, and shock resistance.

PADR-S501-980

Related application solutions

The PADR-S501-980 is a standard 19-inch 4U rack-mounted industrial computer, equipped with an Intel Q670 chipset and 12/13th generation Alder Lake-S/Raptor Lake-S LGA1700 series processors. It can support up to an I9-12900K 16-core 24-thread processor with a turbo frequency of up to 5.2GHz, delivering powerful processor performance and efficiently handling the access, analysis, and monitoring of a large amount of subsystem data. With 2*LAN, 3*COM, and 7*PCIe/PCI expansions, it can connect to receive data from subsystems. The 7+1 high-efficiency storage design perfectly separates data disks from storage disks, ensuring the reception of a large amount of system data while maintaining data security and stability. It features excellent air-cooled heat dissipation design, an extremely wide operating temperature range, and can operate normally without downtime in environments with storage temperatures ranging from -40°C to 85°C and operating temperatures from 0°C to 50°C. It also offers flexible and reliable power supply options, allowing for the installation of ATX (PS2) power supplies or Mini-sized 1+1 redundant power supplies with different power ratings to meet various needs. The product has undergone CCC certification, ensuring extremely high reliability.

Smart Substation in Spain

The large-scale smart grid initiative aims to enhance the efficiency of existing power grids, manage power demand to avoid blackouts and overloads, and expand the grid to provide electricity to rural areas. To improve efficiency and ensure safe operation, new intelligent systems with powerful computing platforms are crucial for maximizing the performance of existing assets and making the grid more resilient to interruptions.

Customer application requirements

Substation-level controllers refer to control systems used in substations, including various devices such as switches, protection equipment, meters, monitors, and communication devices, used to achieve the automation control and protection of substations. Due to the scale and complexity of substations, the implementation of substation-level controllers needs to consider various factors such as security, reliability, stability, interoperability, and maintainability. A smart substation solution provider in Spain approached JHCTECH, hoping we could provide suitable controllers for them.

· Fanless design;
· Abundant IO interfaces, including at least 4LAN, 4COM, 8-bit DIO;
· Adaptability to harsh working environments, operating temperature range of -25°C to 65°C;
· Support for 4G/Wifi/BT and other wireless communications to achieve communication with remote control rooms.

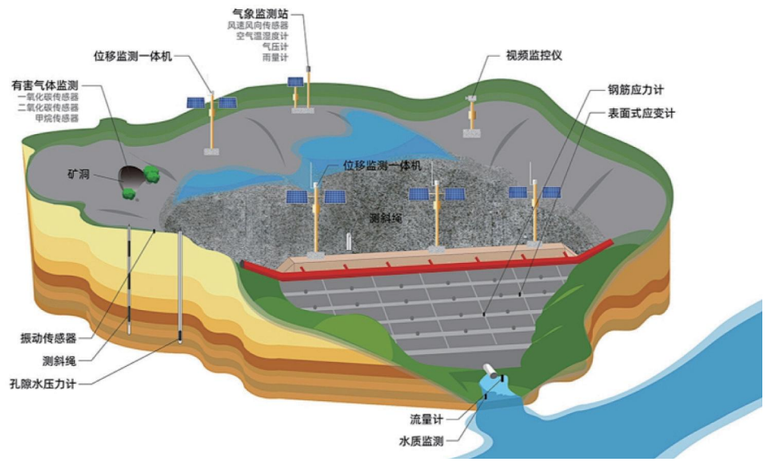
KMDA-3202

Related application solutions

JHCTECH's KMDA-3202, as a substation-level controller, can integrate and control different automation protocols, performing two main functions: acting as a substation-level controller and communicating with remote control rooms.
KMDA-3202 is a compact fanless industrial controller from JHCTECH, equipped with Intel® Skylake-U/ Kabylake-U CPU, supporting up to 32GB of DDR4 2133MHz dual-channel memory. It features rich IO interfaces, including 3*Intel LAN, 4*POE, 6*COM, 4*USB3.0, 8-bit DIO+16-bit isolated DIO, supporting multiple automation protocol integrations and connecting to external devices such as switches, data collectors, etc., for data collection and control. With 1*M.2 B-key, it can support dual 4G card wireless networks and Wifi/BT wireless communication modules, meeting the communication requirements with remote control rooms. The fanless design and low-power CPU allow it to withstand harsh operating temperature ranges from -20°C to 70°C, making it an ideal choice for substation gateway field solutions.

Intelligent Mine Environmental Monitoring

In recent years, the rapid rise of China's mining industry has significantly driven the rapid development of the national economy. The spatial and site conditions of mining activities are constantly changing, leading to a highly complex work environment and safety conditions. As a result, safety production is greatly threatened. The real-time online monitoring system of mines is of great significance.



Customer application requirements

Distributed Control System (DCS) for the Mine Online Monitoring System utilizes various sensors such as displacement sensors, rain gauges, video network monitoring, and other specialized equipment. It relies on remote sensing technology (RS), geographic information systems (GIS), and tailings dam safety monitoring technology to promptly acquire comprehensive and accurate data, triggering alarms in case of any abnormalities.
To ensure the timeliness, continuity, and high reliability of monitoring data, relevant industry enterprises have strict quality and performance requirements for the industrial computer hardware used in the system. A certain mine safety monitoring system supplier hopes that JHCTECH can provide an industrial computer for its environmental monitoring segment, achieving the collection and analysis of on-site environmental data such as temperature, humidity, wind speed, carbon monoxide, etc. The device is required to:

· Have a powerful and stable processor performance capable of continuous 24-hour operation.
· Operate within a working temperature range of 0-50°C.
· Offer rich IO, strong expandability, and support for external functional modules.
· Have undergone 3C certification and possess high reliability.

PADR-S501-964

Related application solutions

Based on the user's requirements, JHCTECH provides the PADR-S501-964 standard 19-inch 4U rack-mounted industrial computer. The product features an Intel H310 chipset paired with 8/9th generation Coffee Lake-S LGA1151 series processors, 2*DDR4, supporting up to 64GB, delivering powerful performance and extremely fast data transmission speeds to quickly receive collected data. With abundant functional IO and 4 PCIe/PCI expansion capabilities, it can connect to external sensors, receive and analyze data, and have high-speed wired/wireless network communication capabilities to transmit data to the integrated monitoring system. The direct-through high-efficiency air-cooling design ensures operational temperatures between 0-50°C, greatly enhancing system heat dissipation efficiency within limited space. Having undergone 3C certification testing, it features comprehensive reliability design, industrial-grade high reliability, and stability, fully meeting the outdoor operational requirements of mining area environmental online monitoring systems.

UK Offshore Applications: Underwater Oil Monitoring

With the strengthening of national environmental protection efforts, the detection of underwater oil in environmental monitoring has received considerable attention. The OSPAR (Oslo/Paris) Convention is the primary legal instrument for supervising marine environmental protection in the Northeast Atlantic Ocean. OSPAR has set the goal of achieving "zero harmful emissions" by 2020. The removal of offshore oil in water below 15 ppm is an unavoidable fact in oil and gas production, which brings opportunities and challenges for operations and environmental compliance.

Customer application requirements

Based on the water oil monitoring standards, it is necessary to coordinate the underwater oil monitoring system with the installed system for oil removal from water. The data analysis and presentation of the underwater oil monitoring system need to be achieved through high-performance hardware equipment. Therefore, a well-known pollution monitoring equipment supplier in the UK approached us, hoping that we could provide them with a cost-effective, rugged, and stable hardware device:

· Stable performance, small size, and low power consumption product.
· Rich I/O interfaces to connect multiple peripheral acquisition devices for data transmission.
· With display interfaces to connect display devices.
· Possess sufficient computing performance to execute a series of system operations, analyze and process data information.

KMDA-3212

Related application solutions

JHCTECH provided the customer with a tailored hardware solution — the KMDA-3212. It is equipped with 6th generation Intel Skylake-U Celeron 3855U, 7th generation Intel® Kabylake-U: Celeron 3865U, and 6th generation, 7th generation Core i3/i5/i7 CPUs, providing certain computing performance to support the system and analyze data. The rich I/O interfaces include 4*COM ports, 7*USB ports, and 3*LAN ports to connect different peripheral acquisition devices for data transmission. Integrated with the 9th generation Intel integrated graphics, HDMI, DP, and VGA triple display interfaces can be connected to display devices for real-time visualization. It adopts DC 12-24V wide voltage power supply. With wide temperature SSD, the operating temperature range can reach -20°C to 70°C. With HDD, the operating temperature range can reach -10°C to 50°C. It has passed vibration and shock tests and can operate in harsh environments.

Intelligent Hydropower Station Voltage Monitoring

The SCADA (Supervisory Control and Data Acquisition) system for hydropower stations is a form of control that utilizes digital electronic computers to monitor the electricity production process of hydropower stations. The use of computer control aims to enhance the automation level, improve power supply quality, ensure safe operation, increase labor productivity, reduce manpower, and achieve unmanned or minimally manned operations.

Customer application requirements

During the operation of the SCADA system for hydropower stations, there is still a crucial link – the voltage safety detection in the control room to ensure the safe operation of the entire facility. Through voltage transducers, the stability of the control room voltage is monitored, and alarms are triggered in case of voltage anomalies to protect the equipment in the control room. A certain small-scale hydropower station in China is seeking an industrial computer for its control room voltage monitoring with the following requirements:

· Economically and efficiently fulfill the functional requirements of the scenario.
· Abundant IO interfaces for connecting sensors and alarm devices.
· Possess strong expansion capabilities for connecting multiple data acquisition cards.
· Efficiently and rapidly receive data for quick response to anomalies.
· Equipment stability for continuous operation 24/7.
· X86 platform with high system openness and compatibility.

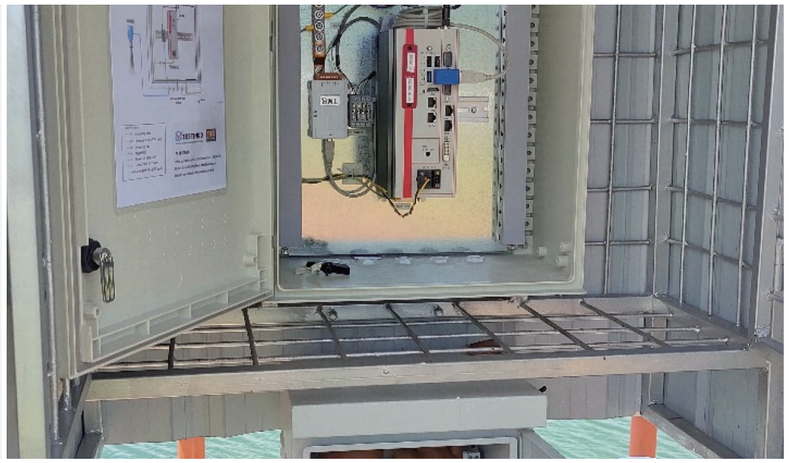
PADR-S501-953

Related application solutions

Ultimately, the PADR-S501-953 by JHCTECH was chosen, a standard 19-inch 4U rack-mounted industrial computer. It features an Intel H110 chipset supporting 6/7th generation SKL/KBL-S LGA1151 series processors, and 2*DDR4 memory slots with a maximum capacity of 32GB, offering economical efficiency and rapid reception of monitoring data. The X86 platform provides high system compatibility and openness, with 3*PCIe+1*PCI expansion slots supporting multiple data acquisition cards. It offers rich functional IO, including 6*COM ports and 8-bit DIO, for connecting voltage transducers, alarm devices, etc., to monitor control room voltage and issue timely alerts in case of anomalies. With excellent air-cooling heat dissipation design and selectable ATX power supplies with power consumption stair-stepping, it is certified by 3C (China Compulsory Certification) for high reliability, robust stability, and meets the demanding requirements of continuous 24/7 operation on-site.

Monitoring of Reservoir Dams in Indonesia

As important hydraulic structures, reservoirs and dams play an irreplaceable role in flood control, irrigation, power generation, and other aspects. However, due to the long construction period of dams, complex influencing factors, and continuous changes in the natural environment, the safe operation of dams faces severe challenges. The online monitoring system for reservoir dam safety can continuously monitor various indicators of the dam in real-time, promptly detect abnormal states of the dam, provide a basis for taking effective response measures, and is of great significance for ensuring the safe operation of dams.



Customer application requirements

The online monitoring system for reservoir dam safety mainly consists of three parts: data acquisition, data processing, and data display. The data acquisition part obtains data such as displacement, settlement, seepage, water level, etc., of the dam through various sensors and monitoring devices; the data processing part filters, denoises, calculates, and processes the collected data to extract useful information; the data display part presents the processed data in the form of graphics, reports, etc., facilitating users to view and analyze.

As the core part of the entire monitoring system, the data processing part requires the use of a powerful and robust industrial controller as its brain. The company in Indonesia that provides monitoring solutions for a certain dam has approached JHCTECH hoping that we can provide such a solution, and they have the following requirements for us:

· Fanless design, low power consumption, high reliability, suitable for harsh environments, and long-term operation.
· Abundant IO interfaces for connecting external sensors and receiving collected data.
· Support for 4G and wireless functions such as WiFi/BT to ensure the transmission of analyzed data to the server.
· Compact size, with interfaces all located on one side for easy installation and debugging.
· Stable power supply requirements.

KGEC-6310

Related application solutions

After many discussions and tests, the JHCTECH KGEC-6310 was finally selected. The KGEC-6310 is a new edge controller equipped with Intel® Whiskey Lake-U CPU series processors, providing powerful and stable performance for efficient analysis, processing, and transmission of collected data. It features 2 DDR4 memory slots supporting up to 64GB, enabling fast data judgment upon reception. With abundant I/O resources including 4 LAN ports, 4 USB ports, and 2 COM ports, it can connect to various external sensors to receive and transmit collected data. For instance, ultrasonic water level sensors connect to the KGEC-6310 via serial ports for data transmission.

The KGEC-6310 also includes 1 Mini PCIe slot supporting 4G, WiFi, and Bluetooth wireless functions, facilitating data transmission to network servers over the Internet. Its aluminum chassis design with fanless cooling ensures compactness, powerful functionality, and convenient installation with all interfaces on one side. It operates on a wide voltage supply of DC 12~24V with protection against overcurrent, overvoltage, and reverse connection.JHCTECH as a global embedded product solution provider, focuses on user application scenarios, vertical industries, and practices strategic goals of “Scenario Empowering Product Innovation.” In recent years, JHCTECH has been increasing its investment in the energy & environmental protection industries. In the future, it will continue to actively promote innovative research and development of products to provide satisfactory product solutions for users.

Building a New Type of Livestock and Poultry Health Epidemic Prevention IoT in Taiwan

Smart agriculture has emerged as a new field of technological development, bringing the advantages of digital transformation such as big data, artificial intelligence, automated robots, and linked data into agriculture. Innovative modern technology has opened up new perspectives, propelling traditional animal husbandry industries into a new era.

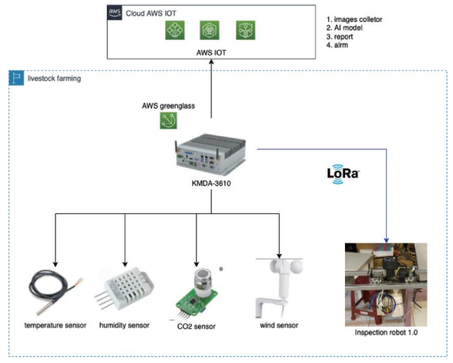
Customer application requirements

In the current poultry farming industry, as the number of laborers decreases, automation and professional analysis become increasingly important in framework management. Physical inspection of chickens is a crucial daily task in modern poultry production, requiring significant labor to perform. Therefore, a robot for inspecting chickens becomes an excellent solution, detecting early signs of disease by inspecting dead chickens, reducing the cost of manual inspections. Not only can it reduce the workload under framework management, but it can also improve bird health in a better way.

In this case, a livestock company in Pingtung, Taiwan, has developed a patrol robot, deploying a fixed-track robot in the first poultry house as an initial experimental demonstration site. Thus, they need an intelligent farm host to control and monitor the robot's chicken inspection tasks and collect environmental data to the cloud for further analysis. Due to the dirty and harsh environment of the poultry house, the hardware has the following high specifications:

· WIFI/4G antenna - Collect environmental data from the cloud and remote monitoring.
· Fanless design - There is a large amount of dust and moving chickens in the farm.
· Image collector - Transmit robot images to the cloud for further inspection.
· Com port - Support RS232/485 for environmental sensors.
· Long-term stability - The system must operate stably in dirty and harsh environments.

KMDA-3610



Related application solutions

The JHCTECH’s KMDA-3610, as an industrial-grade fanless high-performance box PC, fully meets customer requirements. It is equipped with Intel Skylake-S/Kabylake-S Celeron/Pentium/Core i3/i5/i7 series processors and has DC 12V-24V wide voltage power supply. With a wide temperature SSD, the operating temperature range can reach -20~65°C; with HDD, the operating temperature range can reach -10~55°C. It has passed vibration and shock tests, capable of working in harsh environments to ensure equipment stability.

The KMDA-3610 has complete data acquisition and protocol forwarding capabilities, remotely controlling patrol robots to perform chicken inspections and uploading environmental data to the cloud for further analysis. It has comprehensive data acquisition and protocol forwarding capabilities, providing accurate and reliable data in real-time through data storage and forwarding, improving the practicality and effectiveness of production information, making it an ideal hardware in data gateway solutions.

Collaborating with JHCTECH to Accelerate Scientific Data Exchange at the National Genomics Data Center

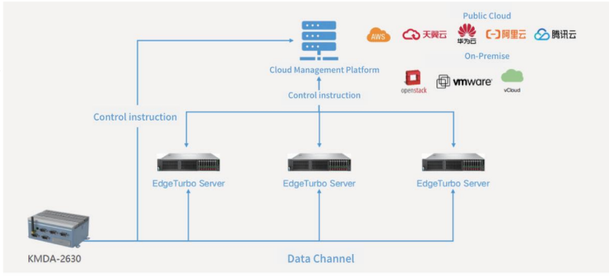
The National Genomics Data Center (NGDC) developed the Genome Sequence Archive (GSA) in 2015, marking China's first sequencing data archiving system. It has integrated all metadata from NCBI, SRA, and full daily data updates from SRA starting April 20, 2022 (both metadata and raw sequence data). As of May 28, 2022, GSA has archived 4.6 million sequencing datasets, covering nearly 20 million experimental data and over 207.4 million sequencing reactions, with a total sequence data volume exceeding 13PB.

Customer application requirements

With diverse file types, varied sizes, and massive quantities of gene sequencing datasets, traditional file transfer systems can no longer meet the growing demand for scientific data exchange. The situation has even necessitated resorting to mailing hard drives for file copies, severely impacting research efficiency and data security. There is an urgent need to leverage cloud platforms for fast data transmission and secure storage. Additionally, robust edge computing computers are required to provide basic hardware support for the cloud platform, hosting software systems to accelerate file uploads and enhance transmission efficiency. An integration company approached us seeking a high-performance edge computing hardware product to jointly facilitate rapid data transmission at the National Genomics Data Center. Their requirements are as follows:

· Small size, ultra-low power consumption
· Stable performance to ensure reliability during data transmission
· Hardware with communication interfaces: Ethernet port, Wi-Fi, etc.

KMDA-2630



Related application solutions

JHCTECH's KMDA-2630 is an ultra-low-power, compact fanless box computer equipped with Intel Elkhart lake SoC Celeron series quad-core or dual-core processors. It can handle CPU performance pressure when uploading data to the cloud, meeting the required CPU performance. It supports a 2.5G bandwidth network and dual USB 3.1 gen2 10G high-speed ports. With 1*M.2 B-key 3052 slot featuring PCIe X1+USB2.0+SIM slot, it can support 5G RN or 4G LTE wireless router modules, meeting the required communication interface needs.

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.

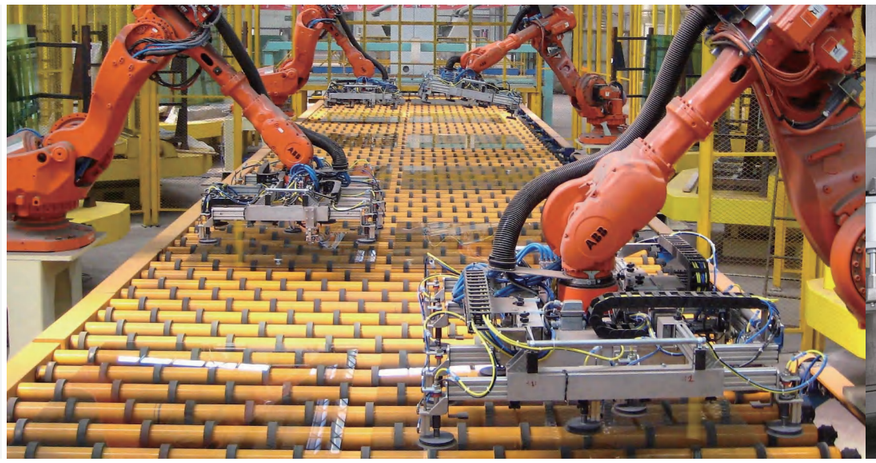
Technical parameters of ECM-I910 main board in automatic urine sediment instrument

· 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

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 application solutions

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

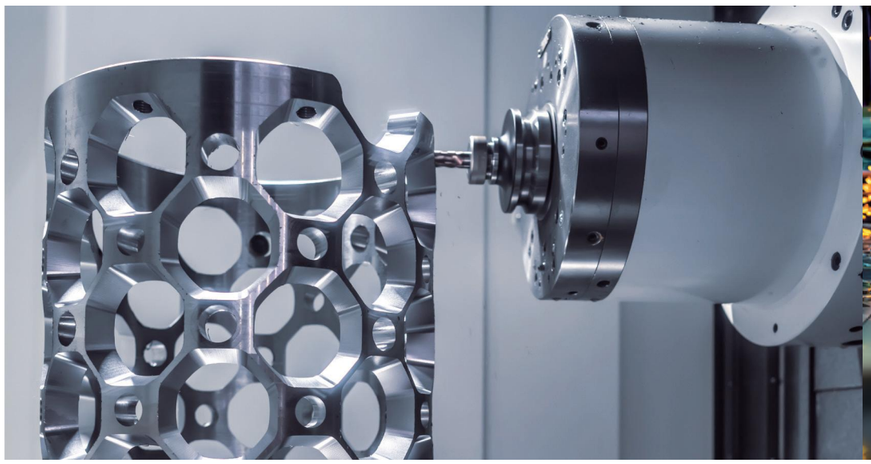
Related application solutions

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 application solutions

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.

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.

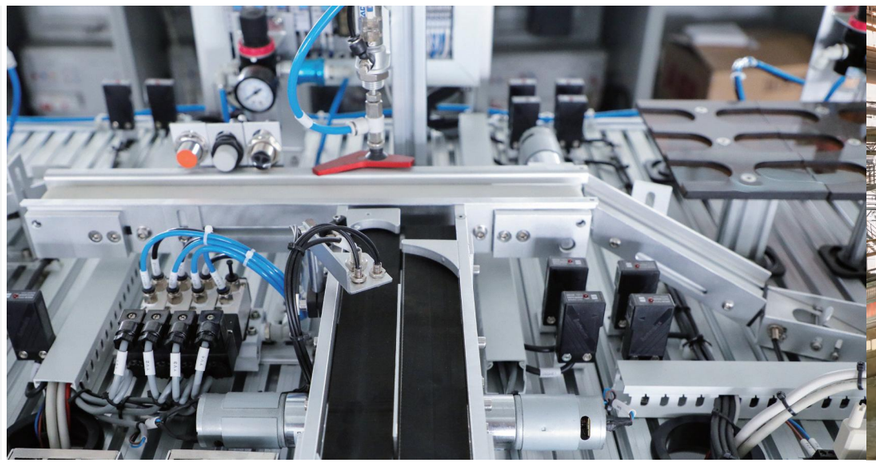
KKMDA-3230/KGEC-6310

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.

Guangxi Automation Production Line Equipment Control

Currently, China's manufacturing industry is undergoing a crucial period of transformation and upgrading, urgently requiring the construction of modern intelligent factories to enhance automation levels. The development of advanced technologies such as robotics and artificial intelligence has fueled the increasing trend of industrial automation. Traditional manufacturing enterprises are intensifying their investments and improvements in automation equipment. The industrial automation equipment industry, as an essential component of smart factories, is experiencing rapid development.



Customer application requirements

Automation production lines have become key means to improve production efficiency and reduce costs. In this wave of automation transformation, industrial computers, as crucial control nodes, play an indispensable role. A customer in Guangxi approached JHCTECH, hoping we could provide a low-power professional industrial controller for the upgrade of their automation production line control. The requirements are as follows:

· Fanless design to adapt to dusty working environments in factories.
· Stable performance with at least 2 network ports, 4 serial ports, and support for various industrial protocols.
· Low power consumption, high reliability, wide temperature, and voltage performance.

KMDA-2602

Related application solutions

JHCTECH, guided by customer needs, has successfully developed numerous high-quality, high-performance industrial computers specifically for automation production line systems. After multiple communications with the client, JHCTECH KMDA-2602 was ultimately selected.
KMDA-2602 is a compact fanless box computer with a wire-free docking architecture and top and bottom isolated heat dissipation design. Equipped with an INTEL Celeron J1900 quad-core, four-thread processor, it meets performance requirements under low power conditions. It features abundant IO interfaces, including 4 Gigabit LAN ports and 6 COM ports, supporting various industrial protocol integrations for controlling startup, speed adjustment, braking, and reverse operations. It operates on DC 9-36V wide voltage power supply with short circuit, overvoltage, and AC protection functions. It operates under wide temperature conditions and features real-time temperature LED analog display.

ALAD Industrial Panel PC Enable Intelligent Metallurgical Manufacturing

Steel manufacturing is one of the crucial engineering processes in the manufacturing industry. In modern factories, the Industrial Internet of Things (IIoT) in smart factories, as a gateway to digital transformation, connects intelligent devices, opening new windows of process visibility. It integrates big data, artificial intelligence, automated processes, and linked data into manufacturing, providing innovative modern technology with a fresh perspective and insight, opening a new chapter for traditional manufacturing industries.

Customer application requirements

In the current steel manufacturing industry, operators not only have to work in high temperatures without air conditioning but also endure harsh outdoor working environments and the large amount of steel dust generated in the production process. Therefore, a rugged tablet PC must meet all customer requirements in this environment and ensure the smooth operation of all manufacturing processes, assisting in updating all data to the local control center and cloud data center for more product testing and predictive analysis. In this case, a smart steel plant in Taichung, Taiwan, has requested the following requirements:

· WIFI/4G antenna - Collect environmental data from the cloud and remote monitoring.
· Touch panel design - Operators should work on the panel indicators and change formulations.
· Robust operation in challenging environments - Work in high temperatures, sunlight, and harsh outdoor working environments.
· Com port - Support RS232/485 device sensors.
· Long-term supply - Product lifecycle of at least 5 years.

ALAD-K1520T

Related application solutions

The JHCTECH's ALAD-K1520T is an industrial-grade panel PC that perfectly matches customer requirements, equipped with Intel® SkylakeU/Kabylake-U CPU Celeron/Pentium/Core I3/I5/I7 processors to meet CPU requirements. It adopts an aluminum alloy die-cast chassis, LED TFT LCD, capacitive/resistive touch, and DC 9V-36V wide voltage input, allowing workers to operate smoothly in harsh environments. It also has rich IO expansion, allowing all devices to be connected to the cloud via Ethernet, COM ports, or mini PCIe interfaces, providing real-time information to workers and issuing alerts to remind them of dangerous situations.

Application of KMDA in the Food Packaging Industry

With the continuous advancement of science and technology and the emergence of various food processing products, new requirements have been raised for packaging technology and packaging equipment. Packaging machinery plays an increasingly important role in the circulation field. The competition in packaging machinery is becoming increasingly fierce, and highly automated, intelligent, multifunctional, efficient, and low-consumption packaging equipment is increasingly favored by the industry, with the automation level of the process increasing. Automation technology now accounts for over 50% of packaging production lines, with extensive use of computer-aided design and electromechanical integration control to improve productivity, equipment flexibility, and agility.

Customer application requirements

As the modern food processing industry develops, the requirements for packaging speed and quality are constantly increasing. For food packaging, downtime can lead to production losses. A food packaging machinery solutions provider in Europe approached us, hoping that JHCTECH could find a stable industrial computer capable of uninterrupted operation. This computer is needed to accurately display product types during operation and allow for changes to packaging parameters without downtime. They presented the following requirements:

· Robust and stable, capable of 24/7 uninterrupted operation.
· Compact size for easy installation.
· Support for multiple real-time industrial Ethernet protocols.
· Multiple IO interfaces for controlling internal components.

KMDA-2630

Related application solutions

In response to the customer's needs, we selected the KMDA-2630, which is robust and stable, ensuring efficient food packaging processes and preventing downtime. The JHCTECH KMDA-2630 is a compact, fanless, low-power consumption embedded computer equipped with an Intel Celeron J6412 processor, featuring four cores and four threads, fully covering the control requirements of food packaging machines. It features 2*Intel® I226V network chips with a maximum bandwidth of 2.5Gbps, supporting multiple real-time industrial Ethernet protocols; and 2*Realtek 8111H Gigabit networks. With 4*COM ports: 2*RS232/422/485 (DB9 male), and 2*RS232 (DB9 male) for connecting various internal components and controlling their movements. The whole machine adopts a fanless aluminum frame, and exquisite chassis, and supports DC 12V or wide voltage DC 9-36V power supply, offering flexible power options.

Industrial Panel PCs Empower Tobacco Production Intelligence

With the continuous improvement of automation in the tobacco industry, tobacco informatization has introduced integrated manufacturing systems. By adopting advanced computer technology, control technology, automation technology, and information technology, factory automation equipment is integrated to control, schedule, and monitor the entire cigarette production process. Like in-process industries, many automation products such as industrial computers, human-machine interfaces, PLCs, intelligent robots, and machine vision are widely used in the tobacco industry.

Customer application requirements

A large tobacco factory approached JHCTECH seeking an industrial panel PC for its cigarette packaging workshop to be used as a host computer. It needed to run system configuration software, send instructions to PLC controllers, and monitor the status and production data of production equipment in real time to control the production process. The device needed to have the following features:

· Touch display integrated industrial panel PC suitable for embedded panel installation.
· Fanless design, front panel I65 protection rating, adapt to harsh production workshop environments;
· Wide voltage DC 9~36V power input with over-current and over-voltage protection to meet stable power supply requirements.
· Communicate with PLC through serial port or communication card;
· Open X86 platform, suitable for different PLC controllers.

ALAD series industrial panel PC

Related application solutions

JHCTECH's ALAD series industrial panel PC not only has a solid shell formed by aluminum alloy die-casting, but also adopts a fanless design for heat dissipation, and front panel IP65 protection rating, making it suitable for harsh production workshop environments. Using Intel® Skylake-U/Kabylake-U Celeron series processors or Core I3/I5/I7 processors, the open X86 platform is adapted to different PLC controllers. DC 9-36V power input is adopted to ensure long-term stable operation of the machine. With multiple IO interfaces, it can communicate with PLC through serial ports or communication cards, so that the configuration software can issue instructions to control the normal operation of production equipment.

Cement Plant Ingredient Management

After decades of development, China's cement industry has gone through a process of "keeping pace, catching up, and leading" in the global cement industry. Currently, whether it's production technology or equipment levels, it generally holds a leading position worldwide. However, the cement industry belongs to traditional manufacturing, and its current development model is relatively extensive. With the acceleration of high-quality economic development and the promotion of ecological civilization construction in China, speeding up the transformation and upgrading of traditional industries towards informatization, intelligence, and green low-carbon direction is the general trend.

Customer application requirements

The construction of intelligent factories integrates "intelligent production, intelligent operation and maintenance, and intelligent management" into one, focusing on key links such as raw material preparation, crushing and grinding, kiln control, logistics warehousing, and online detection. It forms an intelligent, digital, and integrated system with functions such as intelligent perception, automatic execution, deep learning, intelligent decision-making, and password protection. A cement factory in Guangxi hopes that JHCTECH can provide a stable and reliable 4U industrial computer for its key process of raw material preparation for ingredient management. To meet the above requirements, the equipment needs to:

· Have stable performance, with a processor at least higher than the Intel 7th Gen CPU;
· Adopt a standard 4U rack-mounted structure;
· Have multiple IO functions for connecting with sensors;
· Have a display interface to connect with a monitor for stable long-term operation.

PADR-S501-961

Related application solutions

Finally, the JHCTECH PADR-S501-961 was selected, a standard 19-inch 4U rack-mounted industrial computer certified by CCC (China Compulsory Certification), with super reliability. It is equipped with an Intel Q370 chipset and supports 8/9th generation Coffee lake-R LGA1151 series processors, with 4 PCIe expansion capabilities for connecting multiple serial ports to receive and transmit data from various sensors to the system. It supports functions like 4G/Wifi/BT for transmitting collected data to the system. It features rich functional IO, including 1HDMI+2DP for connecting independent displays, allowing real-time monitoring of production line material ratios and progress. With excellent air-cooling heat dissipation design and support for wide temperature operation, it boasts high reliability.

Assists a Vietnamese Fish Processing Plant

As the food industry advances toward automation and intelligence, modern technology seems to bring new hope for seafood processing enterprises. Some argue that with the support of high technology, seafood processing can also achieve intelligent production, moving from small-scale production towards efficient, batch production. This not only greatly reduces labor costs but also ensures efficiency and quality.

Customer application requirements

The food processing industry often accompanies harsh working environments, especially seafood processing, which is constantly exposed to high humidity. Therefore, companies have strict requirements for displays applied in food processing environments, including corrosion resistance and easy cleaning. A fish processing plant in Vietnam approached us, hoping we could provide a display screen for the online showcasing of fish products in their workshop. Due to the workshop's perennial damp environment and the need for cleanliness, the customer has strict requirements for the product:

· Easy to clean and maintain
· Sturdy and durable, supporting multiple installation methods
· Front panel waterproof design, with IP65-rated front enclosure, and corrosion-resistant shell

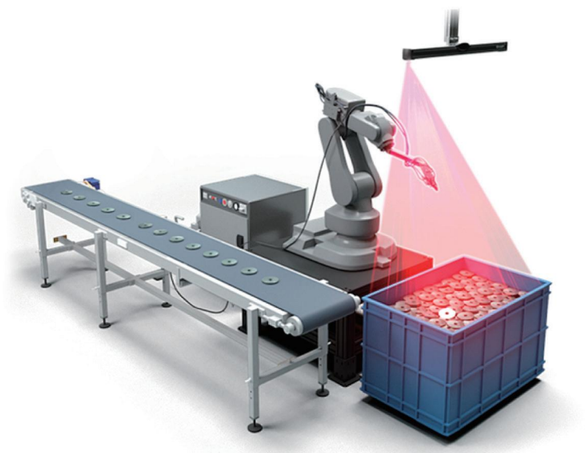
ALAD-151T

Related application solutions

In response to the customer's application scenario, JHCTECH's ALAD-151T was ultimately selected for use in their fish processing workshop. The aluminum die-cast shell, embedded without fans, is easy to clean and maintain. The flat panel design with IP65 protection effectively prevents external pollutants such as water and dust from entering the equipment, reducing equipment maintenance. It features a 5-wire resistive touch screen for convenient glove-operated food processing. It has HDMI audio and video signal and VGA signal inputs. It adopts a wide voltage DC power input of 9~36V. At the same time, the click life can reach 35 million times, with an ultra-long service life.

Appearance and Defect Detection in Processing and Manufacturing Industry

Machine vision is one of the foundational technologies in industrial automation. Over the past few decades, it has helped improve product quality, accelerate production speeds, and optimize manufacturing and logistics processes. Now, this mature technology is merging with artificial intelligence, leading the transition towards Industry 4.0. Machine vision technology enables industrial equipment to "see" its own operations and make rapid decisions based on what it observes. The most common applications of machine vision include visual inspection and defect detection, part localization and measurement, as well as product identification, classification, and tracking.



Customer application requirements

A typical machine vision application system includes image capture, lighting systems, image digitization modules, digital image processing modules, intelligent judgment decision modules, and mechanical control execution modules. In the machine vision industry, the performance of industrial computers affects the processing speed and runtime of the entire vision system, making it a key component. A high-reliability, high-stability industrial computer device is indispensable.

The customer approached us hoping to provide a product for appearance and defect detection. Based on the characteristics of industry applications, they presented the following requirements:

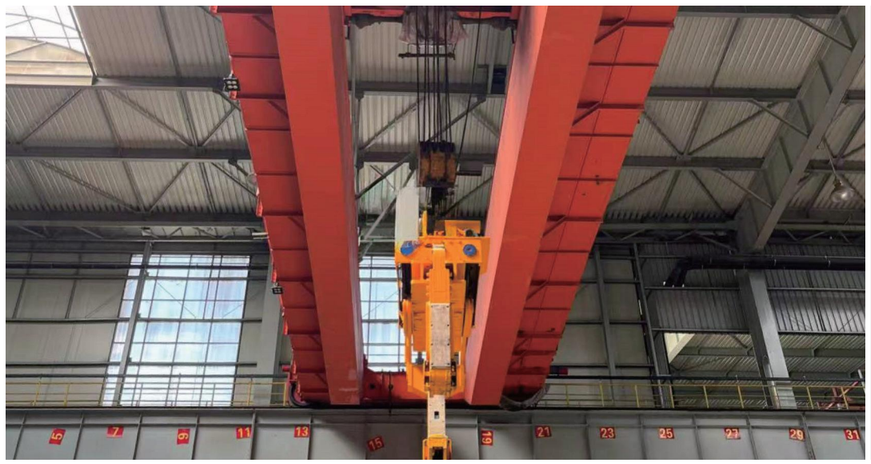
· Fanless design, low power consumption, high reliability, high precision, high timeliness, dust-proof, shock-proof, and corrosion-resistant.
· Adaptability to factory workshop environments.
· Rich and diverse I/O interfaces to meet the needs of connecting different peripheral devices as required.
· Compact device size.

KGEC-6300

Related application solutions

The customer ultimately chose to adopt JHCTECH's KGEC-6300 edge controller. It adopts a passive heat dissipation design, with an operating temperature of up to 60°C (using wide temperature SSD). It is rugged, corrosion-resistant, and stable in performance, passing rigorous testing to meet the requirements for normal operation in factory environments over the long term. Equipped with Intel® Skylake-S or Kabylake-S series processors, the high-performance processor can meet the precise and rapid detection of parts and output results, with ultra-high timeliness. It has abundant I/O resources, providing 2*LAN, 4*USB, 2*COM, 1*DVI-I, and 1*DP, to meet the access of different peripheral devices. Serial ports and DIO functions can connect switches and signal lights. In addition, the KGEC-6300 is compact in size and supports various installation methods (wall-mounted, rail-mounted).

Unmanned Crane Intelligent System



The unmanned overhead crane system in the intermediate warehouse is an important part of building a digitalized factory. By constructing an unmanned system in the warehouse area, intelligent management of the cold rolling warehouse area is achieved. The system plans to utilize technologies such as crane position tracking, coil anti-sway, and crane collision avoidance to achieve safe and orderly management and effectively improve the operational efficiency of the warehouse. It integrates seamlessly with the cold rolling MES system and first and second-level production line systems, effectively connecting the logistics and information flow of the factory, representing an intelligent integrated system that embodies advanced production and efficient management in modern steel enterprises.

Customer application requirements

Current Situation: The entry and exit of steel coils in the intermediate warehouse require coordination between crane operators and warehouse workers. The involvement of human factors is too high, and any oversight or mistake in identification or recording can cause significant disruption to the shipping work of the intermediate warehouse, seriously affecting work progress and accuracy. Additionally, the presence of too many personnel in the intermediate warehouse can lead to safety accidents. There is an urgent need for an intelligent system to assist in achieving unmanned entry and exit of steel coils in the intermediate warehouse. The customer approached us to provide an industrial panel PC installed on the crane to replace manual scanning and recording for unmanned entry and exit. They presented several requirements:

· Integrated touch display industrial panel PC
· Fanless design, low power consumption, suitable for use in dusty factory environments
· Rich I/O interfaces, capable of connecting scanning devices
· Stable power supply

ALAD-K1520T

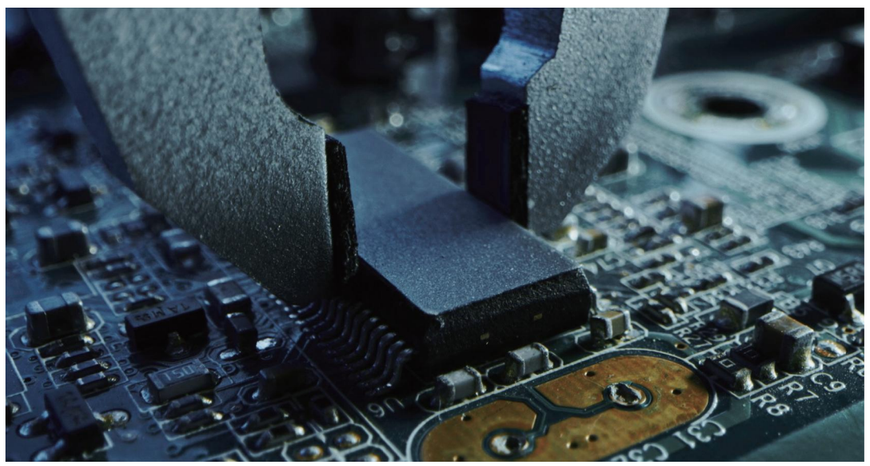
Related application solutions

After communication with the customer, we recommended the ALAD-K1520T industrial panel PC for use in their unmanned crane system. In addition to its rugged aluminum alloy die-cast integrated shell, it adopts a fanless design for heat dissipation and achieves an IP65 protection level on the front panel, suitable for dusty factory environments. It uses Intel® Skylake-U/Kabylake-U Celeron series processors or Core i3/i5/i7 processors. It features a 15.0-inch 1024*768 resolution high-brightness TFT LCD, supporting a full-flat 5-wire resistive touch screen or optional surface projected capacitive multi-touch screen. It accepts DC 9~36V power input. It has rich and comprehensive I/O interfaces, capable of connecting scanning devices to quickly scan and record steel pipe information, improving efficiency and accuracy, and reducing reliance on manual labor.

With the official commissioning of the unmanned crane intelligent management system, the busy figures of the warehouse workers moving between the steel coils disappeared, and the crane cab remained empty. However, the entire intermediate warehouse still operates smoothly and efficiently.

Data Collection and Analysis for Semiconductor Manufacturing Processes

Currently, semiconductor manufacturing systems have basically realized the informatization of manufacturing systems and the automation of manufacturing equipment. Various sensing devices continuously collect data from the semiconductor manufacturing process through a perfect communication network. Numerous information systems and automated production processes generate a large amount of data. In the process of controlling the core indicators of semiconductor manufacturing production lines, various decisions increasingly rely on data and analysis, and the role of data in semiconductor manufacturing enterprises is becoming more and more apparent.



JHCTECH IoT Computer Connecting the Dots

Customer application requirements

A professional intelligent manufacturing solution provider in Taiwan has approached us, hoping that we can provide reliable hardware equipment to achieve data collection and analysis for semiconductor processes. Due to the large amount of data and the requirement for high precision in data and analysis, they have put forward the following requirements for us:

· The equipment needs to be rugged and durable to ensure stable operation of the system.
· CPU performance needs to be equivalent to Core i5-6500 or better, and capable of high-precision data analysis.
· Adopt a fanless cooling design to reduce hardware maintenance.
· Rich I/O interfaces.

KMDA-3610

Related application solutions

JHCTECH's KMDA-3610 is an industrial-grade high-performance fanless box PC that perfectly meets the needs of this customer. It is equipped with 6th generation Intel® Skylake-S/seventh-generation Intel® Kabylake-S Celeron/Pentium/Core i3/i5/i7 processors, meeting the CPU requirements. The KMDA-3610 adopts an aluminum extruded heat sink shell and a fully fanless cooling design. It has 2*2.5" SSD/HDD SATA3 shock-absorbing drive bays, supporting multiple hard drives to operate. At the same time, the KMDA-3610 adopts a wide voltage supply of 12~24V and meets requirements for vibration and shock resistance, ensuring the stability of the equipment.