Intelligent Mobile Solutions
Logistics, Commercial Fleets, and Heavy Duty Machines

- Ports
- Logistics Center
- Heavy Duty Machines
- Utility Fleets
- iBus
- Mobile Worker

DeviceOn

Enabling an Intelligent Planet

www.advantech.com
As a leading provider of intelligent mobile solutions, Advantech offers comprehensive system integration, hardware, software, customer-centric design services, and global logistics support. Our sector maintains two mature product lines to effectively satisfy diverse industrial requirements.

**In-Vehicle & Rugged Computers**

This product line focuses on rugged design, certified car power designs, Android, x86, and RISC-based architectures, making them ideal for ports, warehouses, heavy duty, utility fleets, and clean energy buses. Advantech also offers various products that feature a full suite of RF protocols, shock and vibration resistance, and comprehensive software development kits to facilitate the development of applications.

**Industrial Tablets**

AIM industrial tablets, available in 8” and 10” sizes, are designed for a variety of industrial applications. They provide real-time data access, enabling field workers to make informed decisions on the spot. This streamlines workflows and improves efficiency to optimize quality and increase productivity. The AIM series tablets are also equipped with extension ports for integrating additional modules that expand system functionalities to support a wide range of applications.
Rugged All-in-One Computers
High Performance for Optimized Productivity and Reliable Operation

In-Vehicle Edge AI Computers
Tough, Smart, Reliable, and Versatile in Harsh Scenarios

Application Scenarios
- Intralogistics
- Ports
- Mining
- Agriculture
- Factories with Harsh Environments

Star Products
High Performance
Ultra-Rugged System
Multi-OS Support
Excellent Wireless Connectivity

Advanced Functionality for Efficient Operation
- Sunlight-readable display with optical bonding technology
- Glove-compatible touchscreen
- AddOn Module for extended I/O ports

Rugged System for Challenging Operating Environments
- Full IP66 rating
- Shock & vibration resistance
- Wide operating temperature range (-30 ~ 50°C)
- IP68-rated touchscreen

Easy System Integration & Device Management
- Supports Windows, Linux, and Android OS
- Built-in Advantech MSuite software tools
- SOTI, Navis, and StayLinked certified

Uninterrupted Data Transmission
- Supports Wi-Fi 6, 4G/LTE, GPS, and BT 5.3
- Fast WLAN roaming
- Integrated NFC module
- Optional connector for external antenna

DeviceOn | Mobile ready | Mobileordion

Rugged System for Challenging Operating Environments
- Full IP66 rating
- Shock & vibration resistance
- Wide operating temperature range (-30 ~ 50°C)
- IP68-rated touchscreen

Easy System Integration & Device Management
- Supports Windows, Linux, and Android OS
- Built-in Advantech MSuite software tools
- SOTI, Navis, and StayLinked certified

Uninterrupted Data Transmission
- Supports Wi-Fi 6, 4G/LTE, GPS, and BT 5.3
- Fast WLAN roaming
- Integrated NFC module
- Optional connector for external antenna

DeviceOn | Mobile ready | Mobileordion

In-Vehicle Specialization
- Enables IPxPT
- 12V/24V certified car power
- Zero data loss CANs & CAN Open
- Intelligent vehicle power management mechanism

Connectivity
- Expansion module for 4G/5G, WLAN & V2X
- Embedded uBlox GPS
- IP65 with I/O cover

Ruggedized
- 5M3, MIL-STD-810
- Fanless wide temperature design (-30C ~ 70°C)*

Best-Fit I/O
- One cable to pair with the driver console (TREK-30X)
- Dual display output & dual audio output
- 10 x LAN (TREK-60) 6 LAN (TREK-60N)
- Rich I/Os (COM, isolated DIO, USB)

TREK

DLT

* Features differ by model.
Industrial Tablet Solutions
Equipped with application-oriented peripherals

Environmental Sensing Solutions
Ensuring food and pharmaceutical safety

Star Products

Peripherals

Application Scenarios

Retail & Hospitality  Manufacturing  Logistics & Warehousing  Field Service

Application Scenarios

Healthcare  Cold Storage  Food Factories  Retail Stores  Refrigerated Trucks
Digitalization and the pandemic have changed the global logistics industry significantly. Many logistics companies have had to adapt and improve their operations. Advantech provides hardware solutions for intralogistics and warehouses. This includes rugged vehicle-mounted terminals (VMTs), industrial-grade tablets, all-in-one (AiO) touch computers, and various accessories. These can be integrated with warehouse management systems to boost efficiency and profitability.

**Cold Storage Operation & Environment Monitoring**
- Reliable cold storage operation using rugged forklift-mounted computers and LoRa sensors for transport and real-time temperature monitoring

**Shipping and Receiving of Goods**
- Efficient and accurate inbound goods processing using forklift-mounted computers and mobile tablets

**Order Picking & Packing**
- Efficient and accurate order picking using forklift-mounted computers to access picking instructions and optimize route planning
- Paperless and accurate order packing using all-in-one touch computers to access packing lists and instructions

**Wireless Communication**
- Industrial wireless AP & gateways
- Reliable wireless connectivity

**Inventory Management**
- Real-time inventory checking using industrial-grade tablets
- First-in-first-out valuation

**Goods Allocation**
- Automated goods allocation and transport using AGVs and AMR
- Goods-to-person solution with sensor fusion technologies

**Applications**
As cargo ships grow in size and volume, global container ports are challenged with daily operations, goods handling, and equipment management. To address these issues, ports are increasingly adopting innovative and automated solutions for enhanced efficiency, safety, and security. Advantech, a leading IoT solutions provider, leverages its expertise in industrial automation and smart city solutions to offer a comprehensive Smart Port 4.0 management solution. Our integration of IoT, 5G, big data, AI, and more drives digital transformation in modern ports, fostering innovation for smarter applications.

**Yard Field Service**
- Enabling efficient cargo inspections and issuing of reports.
- Support for real-time asset tracking and operation recording.

**Intelligent Connected Cranes and Stackers**
- Streamlined port operations with Terminal Operating System (TOS)
- Automated container information entry with AI-based Optical Character Recognition (OCR) system

**Truck Management**
- Camera system that can automatically identify vehicle plate, chassis number, and container number.
- In-vehicle computers on trucks transfer all the necessary data in real time to the gate computer, including plate number, driver's license, and container number.

**Cold Chain Management**
- Display of real-time temp. data of all sensors installed in the location.
- Enabling in-depth monitoring and management of the end-to-end cold chain.
- Providing managers with a quick overview of the KPI of different locations.

**Port Warehouse Management**
- Support for various warehouse applications, such as order picking, inventory management, and cold storage.
- Providing seamless processing of goods and storage for port customers.

**Wireless Communication**
- LoRaWAN technology allows sensors and IoT devices to be deployed in inaccessible or remote parts of the port, enhancing asset tracking and monitoring with its long-range capabilities and low power consumption.
- High-speed and real-time dual-band Wi-Fi and LTE enable real-time asset tracking and optimization of port operations.

| Applications | 10 11 |

---

**Truck Management**
- Camera system that can automatically identify vehicle plate, chassis number, and container number.
- In-vehicle computers on trucks transfer all the necessary data in real time to the gate computer, including plate number, driver's license, and container number.

**Cold Chain Management**
- Display of real-time temp. data of all sensors installed in the location.
- Enabling in-depth monitoring and management of the end-to-end cold chain.
- Providing managers with a quick overview of the KPI of different locations.

**Port Warehouse Management**
- Support for various warehouse applications, such as order picking, inventory management, and cold storage.
- Providing seamless processing of goods and storage for port customers.

**Wireless Communication**
- LoRaWAN technology allows sensors and IoT devices to be deployed in inaccessible or remote parts of the port, enhancing asset tracking and monitoring with its long-range capabilities and low power consumption.
- High-speed and real-time dual-band Wi-Fi and LTE enable real-time asset tracking and optimization of port operations.

| Applications | 10 11 |

---

**Intelligent Connected Cranes and Stackers**
- Streamlined port operations with Terminal Operating System (TOS)
- Automated container information entry with AI-based Optical Character Recognition (OCR) system

**Truck Management**
- Camera system that can automatically identify vehicle plate, chassis number, and container number.
- In-vehicle computers on trucks transfer all the necessary data in real time to the gate computer, including plate number, driver's license, and container number.

**Cold Chain Management**
- Display of real-time temp. data of all sensors installed in the location.
- Enabling in-depth monitoring and management of the end-to-end cold chain.
- Providing managers with a quick overview of the KPI of different locations.

**Port Warehouse Management**
- Support for various warehouse applications, such as order picking, inventory management, and cold storage.
- Providing seamless processing of goods and storage for port customers.

**Wireless Communication**
- LoRaWAN technology allows sensors and IoT devices to be deployed in inaccessible or remote parts of the port, enhancing asset tracking and monitoring with its long-range capabilities and low power consumption.
- High-speed and real-time dual-band Wi-Fi and LTE enable real-time asset tracking and optimization of port operations.

---

**Yard Field Service**
- Enabling efficient cargo inspections and issuing of reports.
- Support for real-time asset tracking and operation recording.

**Intelligent Connected Cranes and Stackers**
- Streamlined port operations with Terminal Operating System (TOS)
- Automated container information entry with AI-based Optical Character Recognition (OCR) system

**Truck Management**
- Camera system that can automatically identify vehicle plate, chassis number, and container number.
- In-vehicle computers on trucks transfer all the necessary data in real time to the gate computer, including plate number, driver's license, and container number.

**Cold Chain Management**
- Display of real-time temp. data of all sensors installed in the location.
- Enabling in-depth monitoring and management of the end-to-end cold chain.
- Providing managers with a quick overview of the KPI of different locations.

**Port Warehouse Management**
- Support for various warehouse applications, such as order picking, inventory management, and cold storage.
- Providing seamless processing of goods and storage for port customers.

**Wireless Communication**
- LoRaWAN technology allows sensors and IoT devices to be deployed in inaccessible or remote parts of the port, enhancing asset tracking and monitoring with its long-range capabilities and low power consumption.
- High-speed and real-time dual-band Wi-Fi and LTE enable real-time asset tracking and optimization of port operations.

---

**Yard Field Service**
- Enabling efficient cargo inspections and issuing of reports.
- Support for real-time asset tracking and operation recording.

**Intelligent Connected Cranes and Stackers**
- Streamlined port operations with Terminal Operating System (TOS)
- Automated container information entry with AI-based Optical Character Recognition (OCR) system

**Truck Management**
- Camera system that can automatically identify vehicle plate, chassis number, and container number.
- In-vehicle computers on trucks transfer all the necessary data in real time to the gate computer, including plate number, driver's license, and container number.

**Cold Chain Management**
- Display of real-time temp. data of all sensors installed in the location.
- Enabling in-depth monitoring and management of the end-to-end cold chain.
- Providing managers with a quick overview of the KPI of different locations.

**Port Warehouse Management**
- Support for various warehouse applications, such as order picking, inventory management, and cold storage.
- Providing seamless processing of goods and storage for port customers.

**Wireless Communication**
- LoRaWAN technology allows sensors and IoT devices to be deployed in inaccessible or remote parts of the port, enhancing asset tracking and monitoring with its long-range capabilities and low power consumption.
- High-speed and real-time dual-band Wi-Fi and LTE enable real-time asset tracking and optimization of port operations.
Advantech's mining operation solutions offer high computing capability and durability to withstand harsh environments faced by vehicles like dump trucks and excavators. These solutions, designed to endure shock and vibrations, empower tasks such as communication, geographic information analysis, and fleet management, aiming to enhance on-site safety, boost productivity, and improve management efficiency.

**Applications**

### Mining Operation Solutions

- **Collision Avoidance**
  - DSRC/V2V position enhancement for high-accuracy fleet deployment
  - NVIDIA AI-empowered semi-autonomous vehicle/machine control

- **Underground Mine Mapping**
  - AI simulation and data analysis provide accurate mapping to enhance site safety
  - Water-resistant Fanless In-vehicle Computer

- **Semi-Autonomous / Remote Control**
  - NVIDIA AI-empowered semi-autonomous vehicle/machine control
  - Ruggedized AI Inference System

- **Wireless Communication**
  - 5G/4G/long-range Wi-Fi enables millisecond response time & big data communication

- **Payload Management**
  - Promotes efficiency and longevity of shovels by optimizing power usage through the dig cycle

- **Site Monitoring**
  - Real-time air quality, temperature, and wind speed monitoring and analysis to enhance hazard prediction

- **Fleet Dispatch Management**
  - In-vehicle computing improves operator performance through activity monitoring

---

**Devices and Solutions**

- **TREK-154** Blind spot detection camera
- **TREK-50N** Rugged AI Platform based on NVIDIA Jetson Orin
- **TREK-60N** Dual-System Rugged AI Platform for Harsh Environments
- **MIC-733** AI Inference System Based on NVIDIA Jetson AGX Orin
- **PWS-872FL** 10.1” Rugged tablet with Windows OS
- **DTL-V73 10”/12” Rugged VMT with Multi-OS Support
- **DLT-V7212 P+** 12.1” Rugged VMT with P-CAP Touchscreen
- **EKI-9508E-L** Unmanaged Ethernet Switch
- **UNO-430** Waterproof Edge Intelligence Gateway
- **ITA-460** Water-resistant Fanless In-vehicle Computer
- **TREK-60N FL** Dual-System Rugged AI Platform for Harsh Environments (Core™ i)
- **TREK-60N FL** Water-resistant Fanless In-vehicle Computer
- **TREK-60N** Dual-System Rugged AI Platform for Harsh Environments (Core™ i)
- **PWS-872FL** 10.1” Rugged tablet with Windows OS
- **DTL-V73 10”/12” Rugged VMT with Multi-OS Support
- **DLT-V7212 P+** 12.1” Rugged VMT with P-CAP Touchscreen
- **EKI-9508E-L** Unmanaged Ethernet Switch
- **UNO-430** Waterproof Edge Intelligence Gateway
Public transportation consistently strives to enhance safety and security for smart cities. With advanced technology such as edge AI, 5G, ADAS, V2X etc., and reliable system design that fits transportation requirements, Advantech draws from extensive industrial expertise to deliver reliable solutions. These address a spectrum of challenges in public transportation scenarios, including control centers, parking facilities, buses, bus stations, and roadside infrastructure.

**Bus-Driving Safety and In-Vehicle Computing Solutions**
- Real-time video surveillance on buses to enhance passenger safety
- Informative signage system for bus arrivals and passenger crowding information to improve the onboard experience.

**Buses—Interactive Services**
- Generating extra profit from selling digital advertising spaces
- Optimizing passenger experiences with internet connectivity, entertainment, and bus information

**Roadside Infrastructure**
- V2X (Vehicle-to-Everything) solution enabling direct communication between vehicles and infrastructure
- Traffic analysis empowered by AI computing, with real-time connectivity to optimize city transportation

**Bus Stops**
- Reduced waiting times with bus arrival information
- Improved passenger flow and crowd management

**EV Charging**
- Optimized charging process with energy metering and manageability
- Clear and functional HMI solution with enhanced interactive control

**Bus/Fleet Control Center and Depot Solution**
- Enabling efficient fleet dispatch for better passenger experiences
- Prompt instructions for bus drivers via reliable connectivity

**Applications**

1. **TREK-150**, **TREK-80**
   - Modular AI Platform for Scalable Surveillance
2. **USM-110**
   - 4K Ultra-Compact RISC-Based Hospitality Box Computer
3. **DS-082**
   - AMD Ryzen Ultra-Slim Digital Signage Player
4. **UTC-520IT**
   - 21.5" Ubiquitous Touch Computer (IP66 & 69K)
5. **MIO-5375**
   - 11th Gen. Intel® Core™ Processor
6. **UNO-1372G-J**
   - Small-Size DIN-Rail IPC
Heavy Duty Machine Solutions
Dedicated to Mining, Agricultural, and Construction Vehicles

- Equipment I/O expansion for sensor fusion
- Improves payload measurement accuracy

- V2X
- Rugged design endures environments with explosion hazards (ATEX/C1D2)

- Route management operational accuracy
- Blind spot detection enhances operational safety

- ISO 25119 - Functional Safety (FuSa)

Intelligent Bus Solutions
Enhancing All-Round Driving Safety and Management Efficiency

- Enhance Passenger Satisfaction
- Increase Driving Safety
- Optimize Operational Efficiency
- Augment Advertising Revenue

Surface Mining
- 12/24/48V Vehicle Power Management
- -30~70°C Wide Operating Temperature Range

Underground Mining
- Vehicle Communication CAN, J1708, J1939, Automotive Ethernet
- GNSS, DR, RTK Wi-Fi 6E, 5G

Agriculture
- 12/24/48V Vehicle Power Management
- -30~70°C Wide Operating Temperature Range

Construction
- Vehicle Communication CAN, J1708, J1939, Automotive Ethernet
- GNSS, DR, RTK Wi-Fi 6E, 5G

iBus Management Cloud Solution

Fleet Overview
- Advertising and Media Management
- Ticketing Management
- Event Analysis
- Enhance Passenger Satisfaction
- Increase Driving Safety
- Optimize Operational Efficiency
- Augment Advertising Revenue

Heavy Duty Machine Solutions
Dedicated to Mining, Agricultural, and Construction Vehicles

- Equipment I/O expansion for sensor fusion
- Improves payload measurement accuracy

- V2X
- Rugged design endures environments with explosion hazards (ATEX/C1D2)

- Route management operational accuracy
- Blind spot detection enhances operational safety

- ISO 25119 - Functional Safety (FuSa)

Intelligent Bus Solutions
Enhancing All-Round Driving Safety and Management Efficiency

- Enhance Passenger Satisfaction
- Increase Driving Safety
- Optimize Operational Efficiency
- Augment Advertising Revenue

Surface Mining
- 12/24/48V Vehicle Power Management
- -30~70°C Wide Operating Temperature Range

Underground Mining
- Vehicle Communication CAN, J1708, J1939, Automotive Ethernet
- GNSS, DR, RTK Wi-Fi 6E, 5G

Agriculture
- 12/24/48V Vehicle Power Management
- -30~70°C Wide Operating Temperature Range

Construction
- Vehicle Communication CAN, J1708, J1939, Automotive Ethernet
- GNSS, DR, RTK Wi-Fi 6E, 5G

iBus Management Cloud Solution

Fleet Overview
- Advertising and Media Management
- Ticketing Management
- Event Analysis
- Enhance Passenger Satisfaction
- Increase Driving Safety
- Optimize Operational Efficiency
- Augment Advertising Revenue
Intelligent Mobile Solutions Design to Order Services (DTOS)

IMS DTOS department offers three key features, with relevant technical specifications:

**Rugged Design for Harsh Environments**
The IMS DTOS team excels at creating devices with a wide operating temperature range (-30 ~ 70°C) and IP69K dust and water protection. They also ensure shock and vibration tolerance, meeting MIL-STD-810G and EN60721-3-5 class 5M3 standards. In-house testing facilities validate and optimize designs.

**System Integration Capabilities**
The team integrates mobile devices with existing systems and instruments, meeting specific standards like UL201, ISO-25119 for Agriculture Function Safety, and ISO 7637-2 (E-Mark) for fleet management. This results in reliable mobile computing products.

**Market-Proven Consulting Services**
Our team benefits from close partnerships with hardware and software vendors, offering advanced technology and software. They provide custom proposals and feasibility analysis. A disciplined approach ensures milestones are met and customers’ unique visions are realized.

With expertise in design, system integration, and project management, the Intelligent Mobile DMS service is more than a passive vendor; we are a strategic resource provider and business partner delivering precise design and manufacturing services.

CAN 2.0 and Automotive Ethernet

**CAN BUS and CAN FD**
In the modern automotive industry, CAN BUS (Controller Area Network) and CAN FD (CAN Flexible Data Rate) stand out as two of the most critical technologies. Here are three key highlights of these technologies in automotive applications:

- **Real-Time Data Communication:** CAN BUS and CAN FD facilitate efficient, instant data sharing among vehicle systems, enhancing overall performance and safety.
- **High-Capacity Data Transfer:** CAN FD offers higher data transfer rates, accommodating data-intensive applications like HD video and advanced sensors, expanding the possibilities for vehicle technology.
- **Improved Reliability and Efficiency:** These technologies reduce failure risks, have low power consumption, and simplify electronic system design, resulting in more reliable, cost-effective vehicles with prolonged lifespans.

**Automotive Ethernet**
With its cutting-edge 1000BASE-T1 (802.3bp) technology, automotive ethernet addresses critical issues, delivers significant value, and boasts three key technical features:

- **High-Speed Data Transmission**
  With speeds up to 1 Gbps, it ensures seamless high-definition video and real-time sensor data transmission for advanced driver assistance systems.

- **Low Latency Communication**
  Boasting ultra-low latency, often within microseconds, it supports real-time system interactions, vital for features like emergency braking.

- **Scalability**
  Automotive Ethernet adapts to evolving data demands, supporting technologies such as autonomous driving and vehicle connectivity, laying a robust foundation for future automotive innovation.
Tolerant of Vibration, Shock, and Vehicle Power Fluctuations

**Vehicle Power Management**
Efficient power management requires embedded software control. Software design must be integrated with hardware design from the beginning of power development to avoid complications during system implementation. The vehicle power management mechanism is designed to handle various use scenarios for different applications, e.g., startup delays to avoid voltage drop during engine startup, and shutdown delays to avoid operation system hang-up during the shutdown process. Remote wakeup by the cellular module can enable shorter system-ready time for emergency tasks and 24/7 asset tracking.

**Vehicle Power Protection**
The automotive environment is fraught with electrical hazards, including electromagnetic interference, electrostatic discharge, and other electrical disturbances. They are generated by various vehicular subsystems such as ignition, relay contacts, alternators, injectors, and accessories. The system is designed to provide thorough protection to prevent system damage caused by vehicle power fluctuations.
- ISO-7637-2 4.6.5 pulse 5a test
- E-Mark

**In-Vehicle Solutions Built to Withstand Shock and Vibration**
Fleet management systems can be negatively impacted by shocks and vibrations under varying road conditions and driving situations. In response to this concern, Advantech performs a series of lifecycle profile tests designed to test environmental situations. In response to this concern, Advantech performs a series of lifecycle profile tests designed to test environmental situations.

**World-Class RF Solution**

**Wi-Fi Technology**
- Facilitates automatic device switches and greater roaming capabilities through diversified Wi-Fi technology, widely applied in diverse sectors such as warehouse management, transportation, mining, and construction industries.
- Greater capacity and wider channels for high-definition content with Wi-Fi 6E support.

**LoRa (Long-Range Low-Power Wireless Communication) Technology**
- Long-Range Connectivity: LoRa technology is known for its ability to transmit data over long distances, making it suitable for applications that require communication over several kilometers, in both urban and rural environments.
- Low Power Consumption: LoRa devices are energy-efficient, consuming very little power during both transmission and standby modes. This low power consumption extends the battery life of devices, making them ideal for remote and low-maintenance IoT deployments.

**V2X (Vehicle-to-Everything) Technology**
V2X is communication between a vehicle and any entity that may affect or may be affected by the vehicle. It is a vehicular communication system that incorporates other more specific types of communication including V2I (vehicle-to-infrastructure), V2N (vehicle-to-network), V2V (vehicle-to-vehicle), V2P (vehicle-to-pedestrian), and V2D (vehicle-to-device).
- V2V can be used to directly communicate from vehicle-to-vehicle and warn vehicles if they are too close.
- V2I can help special vehicles, such as fire trucks or ambulances, gain priority at traffic lights.

**GNSS Technology**
- Catering to the requirements of mining, we enhance accuracy by supporting SBAS. At the same time, navigation output settings such as static hold are offered to meet specific customer needs.
- In response to requests for centimeter-level accuracy, we offer support for the RTK (Real-Time Kinematic) module. This module utilizes phase measurements of the signal’s carrier wave, in addition to signal information. It relies on either a single reference station or an interpolated virtual station to provide real-time corrections.

**WWAN 5G Technology**
- Ultra-reliable low-latency communication (uRLLC) helps the vehicle quickly obtain signals such as speed limit signs, traffic lights, or other street devices and make best judgments.
- Enhanced Mobile Broadband (eMBB) has faster connections, higher throughput, and larger capacity to help the system upload large-capacity information to the cloud.

---

**Power Management Flow Diagram**

**Power Spectral Density (PSD)**

**Power Supply Management Diagram**

---

**Vehicle Power Protection Diagram**

**Vehicle Power Management Diagram**

---

**EMI/EMS Diagram**

**Power Management Diagram**

---

**Vibration Measurement Diagram**

---
Robust In-Vehicle Computers Ensure Stable Operation in Extreme Environments

Advantech’s in-vehicle computers are built for extreme temperature resilience, with operating ranges from -30°C to 70°C. Component selection is fine-tuned and simulation software is employed to maintain stability. Comprehensive testing covers CPUs, memory, storage, wireless modules (Wi-Fi, LTE), and I/O interfaces (CAN Bus, DI/O, LAN) under full-load conditions to ensure smooth operation in harsh temperatures. This meticulous design and testing result in a secure, stable hardware platform, allowing worry-free software and system development.

Benefits

Environmental Adaptability: A wider operating temperature range makes systems suitable for a broader range of application scenarios, including extremely high or low temperature environments.

Reliability: A fanless design enhances system reliability by lowering the risk of mechanical failures and reducing maintenance requirements.

Durability: Industrial-grade components and materials make systems more durable and capable of withstanding extreme environmental conditions.

Qualified Thermal Material
Selection/integration of the most suitable thermal interface material solutions for extreme environments.

Heat Pipe Design
The heat pipe is designed to efficiently dissipate heat via the top fins.

Fanless Design
Fanless designs conduct heat and provide airflow without a fan for improved durability and design flexibility.

Advantech’s new generation of in-vehicle computer products adheres to internal testing standards such as IEC 60068-2 and ISO 16750-4.
• High- and low-temperature burn-in tests.
• High-low temperature thermal shock tests.
• Rigorous testing extends to 20,000 cycles of high-temperature power cycling.

Highly Accelerated Life Testing (HALT):
• Identifies system weaknesses and vulnerabilities.
• Leads to improvements in system design.

FUSA—Navigating the Future with Confidence: Functional Safety Meets Tech Trends

Functional Safety is the discipline focused on preventing or mitigating hazards resulting from system or equipment failures. It involves identifying potential risks, assessing their impact, and implementing safety measures to ensure that systems operate without endangering people or the environment.

Functional Safety is an ongoing journey, and Advantech is committed to gradually raising safety levels to achieve new milestones. This involves enhancing design capabilities, ensuring safety standards, and ultimately making a lasting investment in long-term business sustainability.

Benefits

Enhanced Safety: Functional Safety measures reduce the risk of accidents and hazards, ensuring the safety of people and assets.

Compliance: Compliance with industry-specific safety standards and regulations, avoiding penalties and legal issues.

Reliability: Improved reliability and performance of systems and equipment, reducing downtime and operational disruptions.


Risk Mitigation: Better risk management and protection against potential liabilities.
At Advantech DTOS, customized services are not merely a business strategy but also a commitment. We deeply understand that each customer is unique, with distinct needs, objectives, and desires. Therefore, our goal is to respond to the needs of each customer in a dedicated service-oriented manner, providing genuinely valuable solutions.

Our customization capability is not only evident in our products and services but also ingrained in our culture and values. Our team is dedicated to details, places a high value on listening to customers’ voices, and creatively meets their expectations. We firmly believe that true cooperation and professional expertise are essential for achieving mutual success and assisting customers in reaching their goals.

Rugged Design

Our industrial tablets are engineered with a focus on ruggedness, ensuring their durability in harsh and demanding conditions. They are built to withstand extreme temperatures, moisture, dust, and shock, making them suitable for use in environments where standard consumer devices would falter. Robust materials and innovative engineering techniques are employed to create devices that are not only tough but also reliable, minimizing downtime and maintenance costs.

Battery Optimization and Management

Efficient and dependable battery performance is paramount for mobile workers who rely on continuous operation. This enables the industrial tablets to extend usage times while maintaining optimal performance levels. Our commitment to conserving battery power ensures that our devices seamlessly adapt to the demanding energy requirements of challenging industrial tasks.

Application-Oriented Peripheral Integration

In various industrial domains, specialized peripherals and accessories are often required to enhance productivity. Our custom services are dedicated to seamless integration design to accommodate a wide range of application-specific peripherals. Whether you need a dedicated automotive signal communication module, multi-point network quality inspection instruments, or any other specific tools, our integration design capabilities are here to meet these demands. This flexibility ensures that your industrial tablet can evolve according to your requirements, adapting to the diverse needs of your industry.
Sensing Technology

Wireless Communications
Advantech’s robust sensing solution excels in achieving wireless sensor networks, harnessing various wireless technologies. We offer multiple communication options, allowing us to seamlessly adapt to diverse communication environments. For instance, we use LoRa communication for cold chain applications in metal environments, and we implement LPWAN in standalone devices to extend battery life. From on-site networks to cloud communication and even satellite communication, our solution can adapt to a wide range of scenarios.

Power Management
Power management is the key to ensuring optimal performance and longevity for battery-based edge devices. Advantech’s LEO team has a great deal of expertise and is dedicated in this field, making the CCM sensors and LEO solution the ideal choice for addressing this critical aspect.

Optimized Data
Reduce the amount of data transmitted by batching data whenever possible. Minimize the frequency of network communication. Opt for protocols that support efficient data compression and transmission.

Hardware Management
Disable peripherals that consume power when not in use, employ intelligent sleep modes, and utilize energy-efficient algorithms.

Energy Harvesting
Integrate energy harvesting techniques to recharge or supplement the battery.

DeviceOn-iService Suite
Unlock full control of your IT devices with DeviceOn-iService Suite. Manage devices, update software, and monitor operations with ease, all from one central platform.

Key Features:
- **Device Builder**: Streamline device setup with swift enrollment and activation. Effortlessly configure devices for optimal efficiency.
- **Device Updates**: Keep your devices up-to-date with over-the-air software management. Customize updates to fit your enterprise’s needs.
- **Device Manager**: Gain complete oversight with digital monitoring and notifications. Be the first to know about issues and resolve them efficiently.
- **Remote Control & Recovery**: Take control with integrated services for quick issue resolution, minimizing downtime.
- **System Dashboard & Analysis**: Get valuable insights into your devices with our comprehensive overview dashboard. Make informed decisions and optimize operations.
Industrial Android (GMS, AER)

Industrial Android refers to the use of the Android operating system in industrial settings. Industrial Android devices are designed to withstand harsh environments, have robust hardware, and often come with specialized software for industrial purposes. They can be vehicle-mounted and are used in various industries including manufacturing, logistics, and healthcare.

Benefits

GMS (Google Mobile Services)

While the Android Open Source Project (AOSP) provides common, device-level functionalities, Google Mobile Services (GMS) is a collection of proprietary Google apps and APIs that support enhanced functionality across devices. Apps such as Google Search, Google Play, YouTube, Gmail, and more work together seamlessly to ensure Android provides a great user experience.

EDLA (Enterprise Devices License Agreement)

EDLA stands for Enterprise Device License Agreement and is a new agreement offered by Google to extend GMS approvals. This license applies if the device lacks a battery, screen size is greater than 18 inches, or if it is a headless unit with a separate display unit. It covers Rugged, POS and Kiosk devices. Additionally, EDLA devices are required to provide security patch support for at least 24 months (2 years) from product launch to make sure those devices are protected and Android users are kept safe.

AER (Android Enterprise Recommended)

A list is compiled of devices and service providers that meet Google’s strict enterprise requirements. This allows you to feel good about setting your business up on mobile, and it makes it easy to scale and support your device fleet. Standardized features let you manage devices seamlessly and consistently every time. You also get timely security patches (every 90 days) and major updates are guaranteed (+1 OS update).

iMobile DevStack

iMobile DevStack software SDKs/Utilities streamline your workflows in integration, deployment, management and data collection. Advantech mobile software SDKs help you to get more productivity in every stage of your device lifecycle, so that you can focus more on driving the creative and growth of your business.

Integration Tools:

Comprehensive SDKs accelerate the integration of your applications with mobile resources, including fieldbus CAN protocol, GNSS sensors, ADAS sensors, and power management.

Staging Tools:

Our pre-built MDevice, device configuration, and MStage tools assist Windows and Android mobile device deployment through features such as mobile device settings, kiosk mode, OS-related settings, and HMI displays.

Management Tools:

The built-in AIM Dashboard helps check and diagnose tablet devices with just a few clicks. It reduces unnecessary repairs and downtime by monitoring components such as the battery, scanner, RF, cameras, and more. In addition, Advantech DeviceOn iService Suite enables remote management of Advantech devices.

Data Collection:

A suite of SDKs are provided for collecting RFID and IoT sensing data into your business applications or cloud storage quickly and easily.

Maximize Your Mobile Device Productivity

Integrate

Developers

Rapid integration of business apps with IMS hardware

IT Admins

Automate rapid device staging and security of devices

Manager

Maximize device uptime, avoiding the risks of device failures and costly troubleshooting

Field Staff

Utilize tools for improving productivity in the field and making data collection uncomplicated

Secure & Deploy

Mobile Resource SDK

Configuration Tool

Device Diagnostic Tool

Scanner Worker Tools

Power Management SDK

Staging Tool

Device Security Tool

CAN Communication SDK

Scanner Access SDK

Wireless Sensing SDK

Manage

Data Collection
Enhancing Waste Management Efficiency with the TREK-674 Fleet Management System

North America’s leading waste management systems provider

Solution
Enhancing the efficiency of waste management is a crucial aspect of creating a smarter and more efficient city. The Advantech fleet management system cooperates with system integration partners to elevate the operation and management efficiency for waste truck fleet managers.

With real-time monitoring of driver behaviors and vehicle operating status, managers can optimize decisions regarding vehicle maintenance. This includes predicting wear and tear on vehicles, thereby preventing unexpected malfunctions.

Why Advantech?
• Improved fleet operational performance
• Seamless integration with top billing and maintenance software
• Monitoring of driver behavior and optimized routing
• Reduced maintenance and fuel costs
• Improved driving safety and diagnostics

Advantech has Partnered with Komatsu to Provide Computing Systems Specific for Mining Scenarios

Komatsu is a leading manufacturer of construction, mining, and industrial heavy equipment

Solution
Advantech provided a rugged TREK in-vehicle platform for Komatsu’s semi-automated construction equipment to realize features such as 3D modeling manipulation and graphical user interfaces. Advantech also provided ultra-rugged DLT computers to Modular Mining, a Komatsu subsidiary providing operation optimization systems for the mining industry, and to Komatsu’s Autonomous Haulage System, the world’s first autonomous driving system for large mining dump trucks.

Advantech’s application-oriented middleware and software also enhances Komatsu’s productivity. With the assistance of semi-automated equipment, management has been able to lower the criteria for operators.

Why Advantech?
• Robust design capabilities to meet demanding environmental standards: extensive operating temperature range (-30°C – 70°C), resistance to shocks and vibrations (compliant with MIL-STD-810G and 5M3).
• Comprehensive expertise in in-vehicle design, incorporating CAN Bus support and efficient vehicle power management for streamlined vehicle operations.
• Exceptional and specialized support through iMobile SDK, ensuring enhanced stability in operation and robust in-vehicle system support.

Collaboration Between Handsfree and Advantech Stretches the Boundaries of Emergency Services

Handsfree group is a leading supplier for emergency services in UK

Solution
Security and safety issues rank as top priorities in every country. Ensuring a prompt and reliable emergency response during life-threatening or critical events brings a sense of reassurance to governing bodies and the public. Recognizing this, Handsfree Group selected Advantech as a strategic key supplier to develop a Fixed Vehicle Device (FVD) for the United Kingdom Emergency Services Network (ESN).

The initial feedback on the R5 has been highly positive among users. This positive reception is not only attributed to the system surpassing expectations but also because Handsfree Group provides a one-stop service. This service encompasses supplying the FVD and related accessories, handling installation, and providing necessary software.

Why Advantech?
• Ability to Integrate multiple voice communication methods, including wireless solutions (such as LTE, Wi-Fi, Airwave DMO (device to device), Bluetooth headsets, handsfree speakers, and microphones)
• Data-intensive connectivity and reliable Airwave/TETRA networks
• Rigid and thorough product development support
• Spec support on the Android operating system, GMS/EDLA, and real-time communication
• High-quality, stable, and rugged hardware

Advantech Supports VinBus Intelligent Bus Solutions to Reduce Carbon Emissions

First VinBus electric buses launched in Vietnam

Solution
VinFast, a subsidiary of Vietnam’s largest conglomerate VinGroup, that builds vehicles, wanted a partner capable of supplying the smart solutions needed to manufacture electric buses. Advantech’s superior hardware and software integrated solutions for electric buses and extensive experience implementing similar projects in Taiwan made them a logical partner. VinBus opted to collaborate with Advantech and use their TREK Intelligent Electric Bus Management System. Combined with intelligent features, these electric buses attract previously reluctant people. The project will also reduce the amount of time people spend on motorcycles, further reducing air pollution.

Why Advantech?
• A total ADAS solution for enhanced driving safety
• Superior hardware & software solutions for electric buses
• Extensive experience implementing similar projects
• Reliable hardware performance
• Reliable system performance that encourages individuals to choose public transportation, thereby contributing to a further reduction in air pollution
Improving Operational Efficiency at the Port of Salalah with Advantech's DLT Series of Rugged Vehicle-Mounted Terminals

APM Terminals - Port of Salalah, Oman

Solution
To enhance operational efficiency and productivity, APMT Port of Salalah has invested in the upgraded version of the Navis N4 terminal operating system (TOS). The port was also in search of new RDT devices with superior system resources to achieve superior computing performance. Advantech's DLT series of rugged vehicle-mounted terminals (VMTs) proved to be a suitable solution offering a comprehensive range of products with the desired specifications. These industrial-grade systems are not only cost-effective but also contribute to efficient and reliable port operations. Moreover, with Helicon Technologies serving as a local partner in the UAE, Advantech was able to provide enhanced customer support in terms of service, consultation, installation, and quality commissioning throughout the duration of the project.

Why Advantech?
• DLT series terminals are durable, high-performance VMTs to withstand harsh port environments while ensuring efficient and reliable operations.
• DLT series VMTs are both Navis N4 and SOTI MobiControl certified to provide seamless integration.
• Advantech has been working closely with regional partners to ensure successful project implementation and provide comprehensive local support and customer service.

Intelligent Connected Tugger Trains with DLT Series VMTs Improve Assembly Logistics at Multinational Car Plants

German multinational manufacturer of luxury vehicles and motorcycles

Solution
Efficiency and precision in production logistics are crucial for car manufacturing. A German multinational car manufacturer has adopted a mixed transport system, incorporating autonomous and connected tugger trains, to streamline the intricate process of supplying more than 20,000 numbered parts to its assembly lines. Utilizing Advantech's DLT series of Vehicle-Mounted Terminals (VMTs) along with dynamic route guidance, these intelligent connected tugger trains navigate between warehouses based on delivery priority. They efficiently deliver parts directly to the portioning zones in the assembly hall. Integrated into the manufacturing control and reporting systems, the DLT provides an intuitive interface for tugger train operators, facilitating smart collaboration with autonomous transport systems.

Why Advantech?
• The DLT series offers industrial-grade, high-performance VMTs to ensure reliable and efficient operations.
• Advantech offers strong local technical and sales support for customers to build the best solutions.
• Advantech is a leading provider of IoT solutions with a strong global network and infrastructure in more than 28 countries.

DLT Series Rugged VMTs with Defroster Improve Cold Storage Operations

Japan’s largest 3rd-party logistics and cold storage service provider

Solution
Cold storage solutions are essential for delivering a stable supply of refrigerated food to businesses and residences all around the world. In Japan, the country’s largest third-party logistics and cold storage service provider collaborated with Brain Corporation and Advantech to upgrade its two warehouses located in Osaka and Tokyo. These warehouses feature 0°C (32°F), -25°C (-13°F), and -35°C (-31°F) degree storage areas that are integral to the storage and provision of refrigerated and frozen goods. When forklifts operate between zero and sub-zero temperature areas, forklift VMTs face various frost and condensation issues. Advantech's DLT series VMTs not only support wide operating temperatures, but are also equipped with a screen defroster, ensuring stable and efficient cold storage operations.

Why Advantech?
• DLT series VMTs are durable, high-performance VMTs to withstand harsh port environments while ensuring efficient and reliable operations.
• DLT series VMTs are both Navis N4 and SOTI MobiControl certified to provide seamless integration.
• Advantech has been working closely with regional partners to ensure successful project implementation and provide comprehensive local support and customer service.

Manufacturing Transformation: The Power of Industrial Tablets Unleashed

A semiconductor manufacturing company in China

Solution
At semiconductor workstations, a strategically positioned tablet is precisely configured to eliminate errors. Its efficiency is further enhanced with the integration of a barcode scanner, marking the transition to a paperless system. This shift not only reduces costs but also aids in real-time operations. Within the Manufacturing Industry's Semiconductor Package Product Line, a 10-inch tablet is essential, fostering brand loyalty thanks to its reliability. Local service is also tailored to meet diverse client needs with precision.

Why Advantech?
• Tablets are implemented at each semiconductor workstation to eliminate personnel errors.
• Enhanced production/warehouse efficiency with the integration of barcode scanners.
• Paperless record system to reduce management costs and enable real-time mission dispatching.
Enhancing Equipment Patrol Inspection with the AIM-75S Industrial Tablet

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• 10″ display not only allows for viewing more detailed images, but also ensures ease of use for the operator.
• Impressive performance, and expandable with accessories, enabling easy and stable connection to other devices (e.g., joystick).
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation times outdoors.

A railway company in China

An international catering group in Taiwan

Solution
In recent years, the company has primarily focused on two pivotal information technologies, AI and IoT, to elevate food quality and safety management standards. For instance, the utilization of LEO-S temperature monitoring sensors ensures that storage devices and heating equipment maintain appropriate temperature levels, complying with standards to inhibit microbial growth. This significantly alleviates the administrative burden on employees tasked with recording refrigerator temperatures and ensures the safe operation of heating equipment during food preparation. Furthermore, in the event of equipment malfunctions, LEO-S sensors can promptly detect and report abnormalities, enabling relevant personnel to take immediate corrective actions.

Why Advantech?
• LEO-S55 wireless LoRaWAN sensors are easy to install, minimizing various installation issues.
• Advantech engages directly with customers, understanding their needs, and offering valuable suggestions.
• LoRa enables high-penetration data transmissions, allowing one gateway to cover an entire floor of a store.

Solution
Advantech cold chain solutions has been implemented in marine transportation from RD&D Cold Logistics Co., Ltd. sailing to Taiwan's Penghu Islands. A comprehensive solution involving LoRa, 4G, and Wi-Fi technologies has been developed. The TREK-120 LoRa wireless sensor is placed in the cold chain containers. In the absence of a 4G signal at sea, Wi-Fi is utilized to transmit the temperature back to the cockpit. Immediate alerts are triggered if an abnormal temperature is detected, notifying the crews. Additionally, a 4G plus Wi-Fi route is set up in the cockpit to relay the container temperature information. This effectively addresses temperature monitoring during maritime navigation, achieving comprehensive maritime cold chain management.

Why Advantech?
• The TREK-120 wireless sensor utilizes high-penetration data transmissions through LoRa, enabling seamless transfer of cold chain data between trucks and cargo ships.
• Long battery life and easy calibration.
• Quick installation, taking only 90 seconds to set up.

Temperature Management Solution for Both Sea and Land

Mobile Computing Solution for Various Applications—Agriculture, Military, Harbors, and Large Town Squares

Solution
Drones play a crucial role in extensive search and investigation operations, spanning agriculture, military, harbor security, and public spaces. They provide valuable insights and surveillance capabilities. To effectively control these drones, PWS-872 tablets are commonly used as mobile command centers, offering a effective control area for operators.

Why Advantech?
• An 10″ display not only allows for viewing more detailed images, but also ensures ease of use for the operator.
• Impressive performance, and expandable with accessories, enabling easy and stable connection to other devices (e.g., joystick).
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation times outdoors.

Agriculture, military, harbors, and large town squares in the USA, Taiwan, and Japan

An international catering group in Taiwan

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

Taiwan’s largest third-party logistics company

Why Advantech?
• 8″ display with camera allows you to see more detail in images while maintaining good mobility.
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• 8″ display with camera allows you to see more detail in images while maintaining good mobility.
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.

A railway company in China

Solution
Ensuring the safety and functionality of the railway system and equipment requires an essential mobile, durable, and flexible solution. This solution must offer real-time updates on the status and connections of every railway and equipment component. High mobility ensures on-site access, durability withstands wear and tear, and flexibility makes it easy to adapt to changes, fostering efficient operations. This dynamic solution plays a pivotal role in maintaining railway safety and functionality.

Why Advantech?
• With a rugged design, stable wireless connection, and operating temperature range of -10 to 50°C, it can operate smoothly even when used outdoors in winter or summer.
• The replaceable battery design reduces downtime for battery changes and charging, supporting longer operation.
In-Vehicle Box

| Model Name | TREK-570 | TREK-50 | TREK-20N FL | TREK-20N
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processor</td>
<td>Intel® Core™ i7-6700HQ</td>
<td>Intel® Core™ i5-6200U</td>
<td>Intel® Core™ i5-6200U</td>
<td>Intel® Core™ i7-6500U</td>
</tr>
<tr>
<td>Memory</td>
<td>16 GB DDR4</td>
<td>8 GB DDR4</td>
<td>8 GB DDR4</td>
<td>8 GB DDR4</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 2.5&quot; SSD</td>
<td>1 x 2.5&quot; SSD</td>
<td>1 x 2.5&quot; SSD</td>
<td>1 x 2.5&quot; SSD</td>
</tr>
<tr>
<td>Display</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
</tr>
<tr>
<td>VGA, HDMI</td>
<td>1 x VGA, 1 x HDMI</td>
<td>1 x HDMI</td>
<td>1 x HDMI</td>
<td>1 x HDMI</td>
</tr>
<tr>
<td>Video Input</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
</tr>
<tr>
<td>Vehicle I/O Ports</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
</tr>
<tr>
<td>Generic I/O Ports</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
</tr>
<tr>
<td>Car Power Design</td>
<td>Supports 12V vehicle power</td>
<td>Supports 12V vehicle power</td>
<td>Supports 12V vehicle power</td>
<td>Supports 12V vehicle power</td>
</tr>
<tr>
<td>Environment</td>
<td>Operating Temperature: -30°C to 70°C</td>
<td>Operating Temperature: -30°C to 70°C</td>
<td>Operating Temperature: -30°C to 70°C</td>
<td>Operating Temperature: -30°C to 70°C</td>
</tr>
<tr>
<td>Physical</td>
<td>Dimensions (W x H x D): 220 x 72 x 118 mm</td>
<td>Dimensions (W x H x D): 314 x 75.5 x 165.5 mm</td>
<td>Dimensions (W x H x D): 314 x 75.5 x 165.5 mm</td>
<td>Dimensions (W x H x D): 314 x 75.5 x 165.5 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1.45 kg</td>
<td>4.2 kg (excluding SSD)</td>
<td>4.2 kg (excluding SSD)</td>
<td>5.8 kg (excluding SSD)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Name</th>
<th>TREK-50N FL</th>
<th>TREK-50N</th>
<th>TREK-20N</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processor</td>
<td>Intel® Core™ i7-8559U</td>
<td>Intel® Core™ i7-8559U</td>
<td>Intel® Core™ i7-8559U</td>
</tr>
<tr>
<td>Memory</td>
<td>8 GB DDR4</td>
<td>8 GB DDR4</td>
<td>8 GB DDR4</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 2.5&quot; SSD</td>
<td>1 x 2.5&quot; SSD</td>
<td>1 x 2.5&quot; SSD</td>
</tr>
<tr>
<td>Display</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
</tr>
<tr>
<td>VGA, HDMI</td>
<td>1 x HDMI</td>
<td>1 x HDMI</td>
<td>1 x HDMI</td>
</tr>
<tr>
<td>Video Input</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
</tr>
<tr>
<td>Vehicle I/O Ports</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
</tr>
<tr>
<td>Generic I/O Ports</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
</tr>
<tr>
<td>Car Power Design</td>
<td>Supports 12V vehicle power</td>
<td>Supports 12V vehicle power</td>
<td>Supports 12V vehicle power</td>
</tr>
<tr>
<td>Environment</td>
<td>Operating Temperature: -30°C to 70°C</td>
<td>Operating Temperature: -30°C to 70°C</td>
<td>Operating Temperature: -30°C to 70°C</td>
</tr>
<tr>
<td>Physical</td>
<td>Dimensions (W x H x D): 220 x 72 x 118 mm</td>
<td>Dimensions (W x H x D): 314 x 75.5 x 165.5 mm</td>
<td>Dimensions (W x H x D): 314 x 75.5 x 165.5 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>3.8 kg</td>
<td>3.8 kg</td>
<td>3.8 kg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model Name</th>
<th>TREK-20N FL</th>
<th>TREK-50N</th>
<th>TREK-20N</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processor</td>
<td>Intel® Core™ i7-8559U</td>
<td>Intel® Core™ i7-8559U</td>
<td>Intel® Core™ i7-8559U</td>
</tr>
<tr>
<td>Memory</td>
<td>8 GB DDR4</td>
<td>8 GB DDR4</td>
<td>8 GB DDR4</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 2.5&quot; SSD</td>
<td>1 x 2.5&quot; SSD</td>
<td>1 x 2.5&quot; SSD</td>
</tr>
<tr>
<td>Display</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
</tr>
<tr>
<td>VGA, HDMI</td>
<td>1 x HDMI</td>
<td>1 x HDMI</td>
<td>1 x HDMI</td>
</tr>
<tr>
<td>Video Input</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
<td>2 x RJ-45 for 10/100 Base T(X) PoE</td>
</tr>
<tr>
<td>Vehicle I/O Ports</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
<td>8 x RJ-45, 2 x USB 3.0 Type A</td>
</tr>
<tr>
<td>Generic I/O Ports</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
<td>1 x Smart Display Port 2.0</td>
</tr>
<tr>
<td>Car Power Design</td>
<td>Supports 12V vehicle power</td>
<td>Supports 12V vehicle power</td>
<td>Supports 12V vehicle power</td>
</tr>
<tr>
<td>Environment</td>
<td>Operating Temperature: -30°C to 70°C</td>
<td>Operating Temperature: -30°C to 70°C</td>
<td>Operating Temperature: -30°C to 70°C</td>
</tr>
<tr>
<td>Physical</td>
<td>Dimensions (W x H x D): 220 x 72 x 118 mm</td>
<td>Dimensions (W x H x D): 314 x 75.5 x 165.5 mm</td>
<td>Dimensions (W x H x D): 314 x 75.5 x 165.5 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>3.8 kg</td>
<td>3.8 kg</td>
<td>3.8 kg</td>
</tr>
</tbody>
</table>

*Product Selection Guide*

**System**
- Processor (Intel® Xeon®):
  - 4324, 4336, 4340
- Memory (Committed DDR4):
  - Up to 16 GB DDR4
- Storage:
  - Up to 2 TB SSD
- Display:
  - 1 x Smart Display Port 2.0

**Digital I/O**
- Video Input:
  - 4 x HDMI
- Video Output:
  - 1 x Smart Display Port 2.0

**Vehicle I/O**
- 8 x RJ-45 for 10/100 Base T(X) PoE
- 2 x USB 3.0 Type A

**Generic I/O**
- 2 x USB 3.0 Type A
- 1 x Smart Display Port 2.0

**Car Power Design**
- Supports 12V vehicle power

**Environment**
- Operating Temperature: -30°C to 70°C
- Power Rating: 12V DC
- IP Rating: IP54

**Physical**
- Dimensions (W x H x D): 220 x 72 x 118 mm
- Weight: 1.45 kg

*Model Name*
- TREK-50
- TREK-50N FL
- TREK-50N
- TREK-20N FL
- TREK-20N
- TREK-20N
Product Selection Guide

In-Vehicle Display

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Compatible Model</td>
<td>Paired with TREK-570</td>
<td>Paired with TREK-570D/570-60N</td>
<td>Paired with TREK-570</td>
<td>Paired with TREK-570</td>
<td>Paired with TREK-570D/570-60N</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screen Type</td>
<td>7” (16:9) TFT LCD</td>
<td>7” (16:9) TFT LCD</td>
<td>10.4” (4:3) TFT LCD</td>
<td>10.4” (4:3) XGA TFT LCD</td>
<td>10.4” (4:3) TFT LCD</td>
<td>10.4” (4:3) XGA TFT LCD</td>
</tr>
<tr>
<td>Max. Resolution</td>
<td>800 x 600</td>
<td>800 x 600</td>
<td>1024 x 768</td>
<td>1024 x 768</td>
<td>1024 x 768</td>
<td>1024 x 768</td>
</tr>
<tr>
<td>Brightness (cd/m²)</td>
<td>500 nits</td>
<td>500 nits</td>
<td>400 nits</td>
<td>500 nits</td>
<td>500 nits</td>
<td>500 nits</td>
</tr>
<tr>
<td>Viewing Angle (H/V)</td>
<td>140°/120°</td>
<td>120°/100°</td>
<td>178°/178°</td>
<td>176°/176°</td>
<td>176°/176°</td>
<td>176°/176°</td>
</tr>
<tr>
<td>Touchscreen</td>
<td>4-wire resistive type</td>
<td>4-wire resistive type</td>
<td>5-wire resistive type</td>
<td>5-wire resistive type</td>
<td>10 Fingers projected capacitive touchscreen</td>
<td>10 Fingers projected capacitive touchscreen</td>
</tr>
<tr>
<td>Physical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (W x H x D)</td>
<td>89.5 x 67 x 39 mm / 3.52 x 2.64 x 1.54 in</td>
<td>89.5 x 67 x 39 mm / 3.52 x 2.64 x 1.54 in</td>
<td>102 x 22 x 38 mm / 4 x 0.86 x 1.49 in</td>
<td>102 x 22 x 38 mm / 4 x 0.86 x 1.49 in</td>
<td>120.5 x 31 x 86.5 mm / 4.74 x 1.22 x 3.4 in</td>
<td>120.5 x 31 x 86.5 mm / 4.74 x 1.22 x 3.4 in</td>
</tr>
<tr>
<td>Mounting</td>
<td>RAM mount</td>
<td>RAM mount</td>
<td>RAM mount</td>
<td>RAM mount</td>
<td>RAM mount</td>
<td>RAM mount</td>
</tr>
</tbody>
</table>

ADAS Module

<table>
<thead>
<tr>
<th>Model Name</th>
<th>TREK-540</th>
<th>TREK-563</th>
<th>TREK-614</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Forward Collision Avoidance (FCA), Lane Departure Warning (LDW), Heads-Up Display, and Pedestrian Detection</td>
<td>Driver Behavior Monitoring, Drowsiness, Yawning, Lack of attention, Collision avoidance, Pedestrian detection, Driver assistance</td>
<td>Blind Spot Monitoring</td>
</tr>
<tr>
<td>License Plate Area</td>
<td>120 x 220 cm (5 x 8) x 2.7 x 8.4 in</td>
<td>according to vehicle type (i.e., lower side of windshield for a sedan)</td>
<td>N/A</td>
</tr>
<tr>
<td>Mask Wearing Detection</td>
<td>Whether the driver is wearing a face mask</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Driver Fatigue Detection</td>
<td>Alerts for Drowsiness (eyes closed longer than threshold time)</td>
<td>Alerts for Drowsiness (eyes closed longer than threshold time)</td>
<td>N/A</td>
</tr>
<tr>
<td>Distraction Detection</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Detection Conditions</td>
<td>Suitable for low-light environments, reflected ambient light, and drivers wearing coated glasses</td>
<td>Suitable for low-light environments, reflected ambient light, and drivers wearing coated glasses</td>
<td>N/A</td>
</tr>
<tr>
<td>Camera Sensor</td>
<td>CMOS type, 720p resolution, 115 dB dynamic range, 800 x 600 horizontal FOV</td>
<td>CMOS type, monochrome, global shutter, active pixel array, 1280 x 960, 1.5 MP, 45° horizontal FOV</td>
<td>CMOS type, 1280 x 960/1280 x 720 viewing resolution, 100 dB dynamic range, 180°/170° viewing FOV (horizontal)</td>
</tr>
<tr>
<td>Camera Module (w/o mount)</td>
<td>1 x 2-wire RS-232, 1 x video out (RCA, male), 1 x SDP 2.0 port</td>
<td>1 x 2-wire RS-232, 1 x video out (RCA, male), 1 x SDP 2.0 port</td>
<td>1 x 2-wire RS-232, 1 x video out (RCA, male), 1 x SDP 2.0 port</td>
</tr>
<tr>
<td>Camera Port</td>
<td>1 x 2-wire RS-232, 1 x video out (RCA, male), 1 x SDP 2.0 port</td>
<td>1 x 2-wire RS-232, 1 x video out (RCA, male), 1 x SDP 2.0 port</td>
<td>1 x 2-wire RS-232, 1 x video out (RCA, male), 1 x SDP 2.0 port</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>7.2 W (typical) including both camera-module and ECU box</td>
<td>8.4 W (typical), including with camera-modules and ECU box</td>
<td>&lt;4W</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-25 ~ 85°C / -13 ~ 185°F</td>
<td>-20 ~ 85°C / -4 ~ 185°F</td>
<td>-40 ~ 85°C / -40 ~ 185°F</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-30 ~ 85°C / -22 ~ 185°F</td>
<td>-40 ~ 105°C / -40 ~ 227°F</td>
<td>-40 ~ 105°C / -40 ~ 227°F</td>
</tr>
<tr>
<td>Shock (1000g)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Certification</td>
<td>ECE, E-4, E-5, E-6</td>
<td>ECE, E-4, E-5, E-6</td>
<td>ECE, E-4, E-5, E-6</td>
</tr>
<tr>
<td>Dimensions (W x H x D)</td>
<td>212.75 x 141.80 x 25.0 mm</td>
<td>89.5 x 67 x 39 mm / 3.52 x 2.64 x 1.54 in</td>
<td>50.4 x 47.1 x 1.96 in (w/o bracket)</td>
</tr>
<tr>
<td>Weight</td>
<td>1.07 kg</td>
<td>1.7 kg</td>
<td>0.64 kg</td>
</tr>
</tbody>
</table>

[Image 153x671 to 198x707] [Image 217x673 to 265x707] [Image 284x669 to 342x718] [Image 353x671 to 414x717] [Image 420x672 to 482x717] [Image 487x668 to 554x718]
<table>
<thead>
<tr>
<th>DLT-V73</th>
<th>DLT-V73X</th>
<th>DLT-V73S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screen Size</strong></td>
<td>10.4&quot;/12.1&quot;</td>
<td>10.4&quot;/12.1&quot;/15.1&quot;</td>
</tr>
<tr>
<td><strong>CPU</strong></td>
<td>Intel® Core™ i5-1145GRE quad-core, 1.5 GHz</td>
<td>Intel® Core™ i5-1145GRE quad-core, 1.5 GHz</td>
</tr>
<tr>
<td>RAM</td>
<td>4 GB RAM</td>
<td>4 GB RAM</td>
</tr>
<tr>
<td>Storage</td>
<td>16 GB - 256 GB (eMMC)</td>
<td>16 GB - 256 GB (eMMC)</td>
</tr>
<tr>
<td><strong>OS</strong></td>
<td>Windows 10 IoT Enterprise</td>
<td>Windows 10 IoT Enterprise</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>10.4&quot; XGA color TFT with 1024 x 768 resolution, 500 cd/m²</td>
<td>10.4&quot; XGA color TFT with 1024 x 768 resolution, 500 cd/m²</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>1 x CAN, 1 x USB-C 3.2 Gen1, 1 x USB-A 3.2 Gen1, 1 x RSMA for WLAN, 1 x SMA for WWAN</td>
<td>1 x CAN, 1 x USB-C 3.2 Gen1, 1 x USB-A 3.2 Gen1, 1 x RSMA for WLAN, 1 x SMA for WWAN</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>via battery pack (supports up to 20 minutes)*</td>
<td>via battery pack (supports up to 20 minutes)*</td>
</tr>
</tbody>
</table>

* Optional features
### AIM & R Tablet

<table>
<thead>
<tr>
<th>Model</th>
<th>AIM-77</th>
<th>AIM-65</th>
<th>AIM-68</th>
<th>AIM-75S</th>
<th>AIM-76S</th>
<th>PWS-722PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Rockchip RK3309 Quad-core ARM 1.2GHZ, 2x2.0GHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory</td>
<td>4GB/8GB LPDDR4</td>
<td>2GB DDR3</td>
<td>4GB DDR3</td>
<td>8GB LPDDR5 S</td>
<td>4GB DDR4</td>
<td>4GB DDR4</td>
</tr>
<tr>
<td>Storage</td>
<td>64GB/128GB eMMC, 128GB Micro SD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>10.1” IPS LCD</td>
<td>8” IPS LCD</td>
<td>10.1” FHD LCD</td>
<td>10.1” FHD LCD</td>
<td>8” IPS LCD</td>
<td>10.1” FHD LCD</td>
</tr>
<tr>
<td>Resolution</td>
<td>WXGA 1280 x 800</td>
<td>WXGA 1360 x 768</td>
<td>WXGA 1360 x 768</td>
<td>WXGA 1360 x 768</td>
<td>WXGA 1360 x 768</td>
<td>WXGA 1360 x 768</td>
</tr>
<tr>
<td>Teether</td>
<td>10 point, multi-touch PCAP</td>
<td>10 point, multi-touch PCAP</td>
<td>10 point, multi-touch PCAP</td>
<td>10 point, multi-touch PCAP</td>
<td>1 point, multi-touch PCAP</td>
<td>10 point, multi-touch PCAP</td>
</tr>
<tr>
<td>Wireless Communication</td>
<td>eLAN, BT, NFC, WiFi enabled</td>
<td>eLAN, BT, NFC, WiFi enabled</td>
<td>eLAN, BT, NFC, WiFi enabled</td>
<td>eLAN, BT, NFC, WiFi enabled</td>
<td>eLAN, BT, NFC, WiFi enabled</td>
<td>eLAN, BT, NFC, WiFi enabled</td>
</tr>
<tr>
<td>Battery</td>
<td>7.7V, 34Wh, lithium-ion</td>
<td>10.8V, 26Wh, lithium-ion</td>
<td>10.8V, 26Wh, lithium-ion</td>
<td>10.8V, 26Wh, lithium-ion</td>
<td>10.8V, 26Wh, lithium-ion</td>
<td>10.8V, 26Wh, lithium-ion</td>
</tr>
<tr>
<td>U/D</td>
<td>Standard, 400 x 400 GMOS sensor</td>
<td>Standard, 400 x 400 GMOS sensor</td>
<td>Standard, 400 x 400 GMOS sensor</td>
<td>Standard, 400 x 400 GMOS sensor</td>
<td>Standard, 400 x 400 GMOS sensor</td>
<td>Standard, 400 x 400 GMOS sensor</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
<td>-20 ~ 60°C</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
<td>IP65</td>
</tr>
<tr>
<td>Drop Tolerance</td>
<td>75 cm (30 in)</td>
<td>75 cm (30 in)</td>
<td>75 cm (30 in)</td>
<td>75 cm (30 in)</td>
<td>75 cm (30 in)</td>
<td>75 cm (30 in)</td>
</tr>
</tbody>
</table>

### AIM Peripherals

#### VESA / Vehicle Dock / Office Cradle

<table>
<thead>
<tr>
<th>Applicable Model</th>
<th>AIM-65/68/75S</th>
<th>AIM-65/68/75S</th>
<th>AIM-65/75S</th>
<th>AIM-65/75S</th>
<th>AIM-68/68S/78S</th>
<th>PWS-722 Series</th>
<th>AIM-77</th>
</tr>
</thead>
</table>

#### Desk Dock / Thermal Printer

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Extension Modules

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Charging Station Accessories

<table>
<thead>
<tr>
<th>Applicable Model</th>
<th>AIM-65/65/68/75S/78S</th>
<th>AIM-65/75S</th>
<th>PWS-722 Series</th>
<th>AIM-65/65/68/75S/78S</th>
<th>AIM-77</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### LEO-S Sensors

<table>
<thead>
<tr>
<th>Model Name</th>
<th>TREK-120 LoRa Temperature &amp; Humidity Sensor</th>
<th>TREK-120 LoRa Temperature &amp; Humidity Probe Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Range</td>
<td>-40 ~ 70°C</td>
<td></td>
</tr>
<tr>
<td>Accuracy Range</td>
<td>± 0.2°C from 0~70°C</td>
<td>± 0.3°C from -40~0°C</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01°C</td>
<td></td>
</tr>
<tr>
<td><strong>Relative Humidity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Range</td>
<td>0~100% RH</td>
<td></td>
</tr>
<tr>
<td>Accuracy Range</td>
<td>± 2% from 0~100% at 25°C</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01%</td>
<td></td>
</tr>
<tr>
<td><strong>NFC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>13.56 MHz</td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td>Bulk download configuration and sensor data</td>
<td></td>
</tr>
<tr>
<td><strong>LoRa</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wireless Technology</td>
<td>Advantech LoRa technology</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>920 ~ 925 MHz for Taiwan, 902 ~ 920 MHz for US, 863 ~ 870 MHz for Europe, 470 ~ 510 MHz for China, 921~922 MHz for Japan</td>
<td></td>
</tr>
<tr>
<td>Wireless Range</td>
<td>&gt;500 meters (Line of Sight)**</td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mount Options</td>
<td>Fixed by adhesive tape, magnet, fastener, screws</td>
<td>Fixed by adhesive tape, magnet, fastener, screws</td>
</tr>
<tr>
<td>Dimensions (W x D x H)</td>
<td>123.4 x 65 x 24.5 mm (4.88 x 2.56 x 0.91 in)</td>
<td>105.4 x 71 x 69.5 mm (4.1 x 2.8 x 2.7 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>108 g (0.23 lb)</td>
<td>115.4 g ± 6.5 g (1.28 ± 0.14 lb)</td>
</tr>
<tr>
<td>Probe Type</td>
<td>N/A</td>
<td>Stainless steel 304</td>
</tr>
<tr>
<td>Probe Cable Length</td>
<td>N/A</td>
<td>2 m</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40 ~ 70°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40 ~ 85°C</td>
<td></td>
</tr>
<tr>
<td>Working Humidity</td>
<td>0 ~ 100% (non-condensing)</td>
<td></td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP65</td>
<td></td>
</tr>
<tr>
<td>Drop Tolerance</td>
<td>4 ft, drop onto concrete</td>
<td></td>
</tr>
<tr>
<td>Certifications</td>
<td>CE, FCC, NCC</td>
<td></td>
</tr>
</tbody>
</table>

* **Relative Humidity** Accuracy Range normalized to 0~100% RH at 25°C.

**Dependent on usage scenario:

<table>
<thead>
<tr>
<th>Model Name</th>
<th>LEO-S57 LoRaWAN Temperature &amp; Humidity Sensor</th>
<th>LEO-S57 LoRaWAN Temperature Probe Sensor</th>
<th>LEO-S592 Insertion Temperature Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Range</td>
<td>-30°C ~ 70°C</td>
<td>-20°C ~ 50°C</td>
<td>-30°C ~ 70°C</td>
</tr>
<tr>
<td>Accuracy Range</td>
<td>± 0.5°C</td>
<td>± 0.5°C</td>
<td>± 0.5°C</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01°C</td>
<td>0.01°C</td>
<td>0.01°C</td>
</tr>
<tr>
<td><strong>Relative Humidity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Range</td>
<td>0~100% RH</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Accuracy Range</td>
<td>10% to 90% RH (± 3%), below 10% and above 90% RH (± 1%)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.50%</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>NFC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>13.56 MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td>Yield (Configuration)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LoRaWAN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wireless Technology</td>
<td>Advantech LoRaWAN technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>US915/AU915/KR920/AS923/CH915</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wireless Range</td>
<td>100 meters (Line of Sight)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mount Options</td>
<td>Magnet, fastener, screws</td>
<td>Probe, 15 x 400 mm</td>
<td>Stainless steel 304</td>
</tr>
<tr>
<td>Dimensions (W x D x H)</td>
<td>85.5 x 85.3 x 27 mm (3.38 x 3.36 x 1.06 in)</td>
<td>Node 15 x 26 mm</td>
<td>Stainless steel 304</td>
</tr>
<tr>
<td>Weight</td>
<td>23.0 g</td>
<td>1.5 kg</td>
<td></td>
</tr>
<tr>
<td>Probe Type</td>
<td>Stainless steel 304</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probe Cable Length</td>
<td>2 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-30°C ~ 70°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-30°C ~ 70°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Humidity</td>
<td>0 ~ 100% (non-condensing) at 25°C (77°F)</td>
<td></td>
<td>0 ~ 100% (non-condensing) at 25°C (77°F)</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drop Tolerance</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certifications</td>
<td>FCC, TSEIC, CE**</td>
<td></td>
<td>FCC, TSEIC, CE**</td>
</tr>
</tbody>
</table>

* Tested under laboratory conditions and for guideline purposes only

**CE by project
<table>
<thead>
<tr>
<th>Model Name</th>
<th>LEO-S592</th>
<th>LEO-OS50</th>
<th>LEO-S573</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>4.2&quot; B/W ePaper</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>NFC</td>
<td>Y (Configuration)</td>
<td>Y (Configuration)</td>
<td>NA</td>
</tr>
<tr>
<td>LED</td>
<td>ROG</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Button</td>
<td>1 x Power Button</td>
<td>1 x Power Button (Internal)</td>
<td>1 x Power Button (Internal)</td>
</tr>
<tr>
<td>Power</td>
<td>5-24 VDC</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>-20°C ~ 85°C</td>
<td>-20°C ~ 70°C</td>
<td>-20°C ~ 70°C</td>
</tr>
<tr>
<td>Working Humidity</td>
<td>10% ~ 90% (non-condensing)</td>
<td>0 ~ 90% (non-condensing)</td>
<td>0 ~ 90% (non-condensing)</td>
</tr>
<tr>
<td>Wireless Range</td>
<td>50 meteres + (Line of Sight)**</td>
<td>100 meteres + (Line of Sight)**</td>
<td>50 meteres + (Line of Sight)**</td>
</tr>
<tr>
<td>Dimensions</td>
<td>100.8 x 114 x 22 mm</td>
<td>147 x 71 x 65.5 mm</td>
<td>50 x 50 x 18 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>680 g</td>
<td>550 g</td>
<td>11 g</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP30</td>
<td>IP30</td>
<td>IP30</td>
</tr>
<tr>
<td>Certification</td>
<td>FCC, CE***</td>
<td>FCC, CE***</td>
<td>FCC, CE**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Range</th>
<th>Accuracy</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40°C to 85°C</td>
<td>±1°C</td>
<td>3.5mm Terminal Block</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Humidity</th>
<th>Range</th>
<th>Accuracy</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ~ 100%</td>
<td>±1%</td>
<td>3.5mm Terminal Block</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CO₂</th>
<th>Range</th>
<th>Accuracy</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>400~2000ppm</td>
<td>±2%</td>
<td>3.5mm Terminal Block</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brightness</th>
<th>Range</th>
<th>Accuracy</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>6000 Lux</td>
<td>±20%</td>
<td>3.5mm Terminal Block</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PM2.5/PM10</th>
<th>Range</th>
<th>Accuracy</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ~ 1000 μg/m³</td>
<td>±20%</td>
<td>3.5mm Terminal Block</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HCHO*</th>
<th>Range</th>
<th>Accuracy</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ~ 6 mg/m³</td>
<td>±10%</td>
<td>3.5mm Terminal Block</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Serial Ports</th>
<th>Bit Rate</th>
<th>Protocol</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 x DI + 2 x DO</td>
<td>1200~115200 bps</td>
<td>Transparent (RS232), Modbus RTU (RS485)</td>
<td>3.5mm Terminal Block</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analog Input</th>
<th>Voltage</th>
<th>Resolution</th>
<th>Interface Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x PT100 RTD Input</td>
<td>±10 mV</td>
<td>2 x PT100 RTD Input</td>
<td>3.5mm Terminal Block</td>
</tr>
</tbody>
</table>

* Tested under laboratory conditions and for guideline purposes only
**CE by project
### Worldwide Offices

#### Asia Pacific

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Kunshan</td>
<td>86-512-5777-5666</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Taipei</td>
<td>886-2-7732-3399</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Eindhoven</td>
<td>31-40-267-7000</td>
</tr>
<tr>
<td>Poland</td>
<td>Warsaw</td>
<td>00800-2426-8080</td>
</tr>
<tr>
<td>USA</td>
<td>Milpitas, CA</td>
<td>1-408-519-3800</td>
</tr>
</tbody>
</table>

#### Asia Pacific

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Tokyo</td>
<td>81-3-6802-1021</td>
</tr>
<tr>
<td></td>
<td>Osaka</td>
<td>81-6-6267-1987</td>
</tr>
<tr>
<td></td>
<td>Nagoya</td>
<td>81-0800-500-1055</td>
</tr>
<tr>
<td>Korea</td>
<td>Seoul</td>
<td>80-363-9494/5</td>
</tr>
<tr>
<td></td>
<td>Singapore</td>
<td>65-6442-1000</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Kuala Lumpur</td>
<td>60-3-7725-4188</td>
</tr>
<tr>
<td></td>
<td>Penang</td>
<td>60-4-537-9188</td>
</tr>
<tr>
<td>Thailand</td>
<td>Bangkok</td>
<td>66-02-2488306-9</td>
</tr>
<tr>
<td>Vietnam</td>
<td>Hanoi</td>
<td>84-24-3399-1155</td>
</tr>
<tr>
<td></td>
<td>Hochiminh</td>
<td>84-28-3836-5856</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Jakarta</td>
<td>62-21-751-1939</td>
</tr>
<tr>
<td>Australia</td>
<td>Melbourne</td>
<td>61-3-9797-0100</td>
</tr>
<tr>
<td>India</td>
<td>Bangalore</td>
<td>1-800-425-5070</td>
</tr>
<tr>
<td></td>
<td>Pune</td>
<td>91-94-2260-2349</td>
</tr>
</tbody>
</table>

#### Europe

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eindhoven</td>
<td></td>
<td>31-40-267-7000</td>
</tr>
<tr>
<td>Breda</td>
<td></td>
<td>31-76-523-3100</td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toll Free</td>
<td></td>
</tr>
<tr>
<td>Munich</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>00800-2426-8080/81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>49-89-12599-0</td>
<td></td>
</tr>
<tr>
<td>Dusseldorf</td>
<td></td>
<td>49-2103-97-855-0</td>
</tr>
<tr>
<td>France</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paris</td>
<td>33-1-4119-4666</td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milan</td>
<td></td>
<td>39-02-9544-961</td>
</tr>
<tr>
<td>UK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newcastle</td>
<td>London</td>
<td>44-0-191-262-4844</td>
</tr>
<tr>
<td></td>
<td></td>
<td>44-0-870-493-1433</td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madrid</td>
<td></td>
<td>34-91-668-86-76</td>
</tr>
<tr>
<td>Sweden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockholm</td>
<td></td>
<td>46-0-864-60-500</td>
</tr>
<tr>
<td>Poland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warsaw</td>
<td></td>
<td>48-22-31-51-100</td>
</tr>
<tr>
<td>Russia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moscow</td>
<td>St. Petersburg</td>
<td>7-495-783-80-02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7-812-332-57-27</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Usti nad Orlici</td>
<td>420-465-524-421</td>
</tr>
<tr>
<td>Ireland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Galway</td>
<td></td>
<td>353-91-792444</td>
</tr>
</tbody>
</table>

#### Middle East and Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>City</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Israel</td>
<td>Kadima-Zoran</td>
<td>072-2410527</td>
</tr>
<tr>
<td>Turkey</td>
<td>Istanbul</td>
<td>90-212-222-0422</td>
</tr>
<tr>
<td></td>
<td>Bursa</td>
<td>90-850-840-3995</td>
</tr>
</tbody>
</table>

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only. All product specifications are subject to change without notice. No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher. All brand and product names are trademarks or registered trademarks of their respective companies. © Advantech Co., Ltd. 2023