Mobile Resource Management

Quality In-Vehicle Computers

- Long Haul Trucks
- Local Fleets
- eBus Systems
- Utility Fleets

ADVANTECH DLOG

Competence in Mobile Computing

www.advantech-dlog.com

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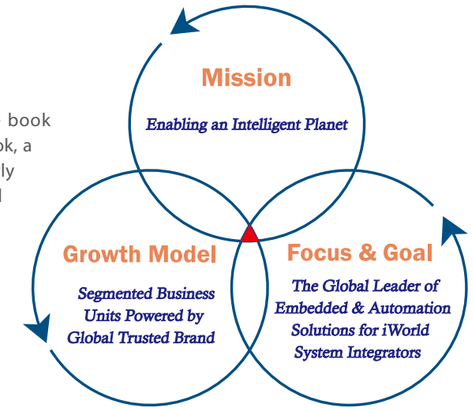
About Advantech

Advantech: Enabling of an Intelligent Planet

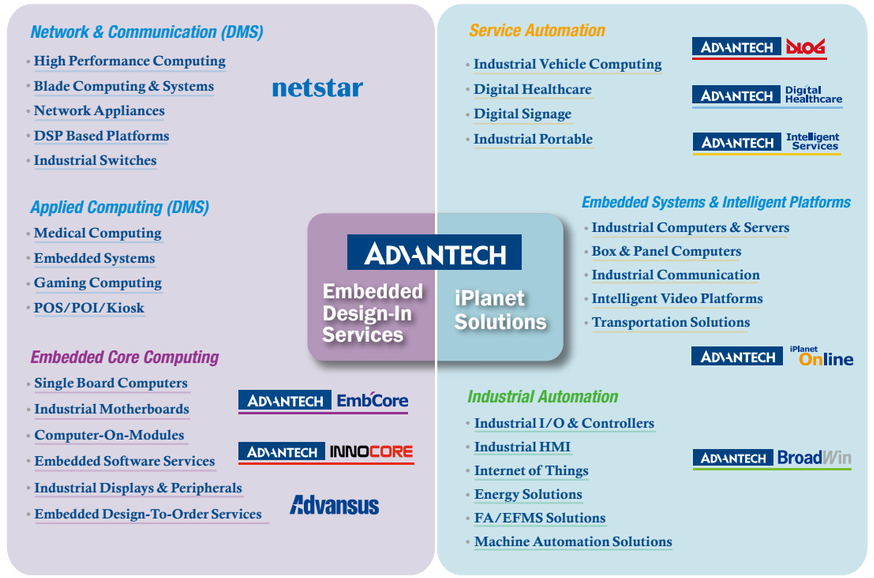
Founded in 1983, Advantech is a leader in providing trusted innovative embedded and automation products and solutions. Advantech offers comprehensive system integration, hardware, software, customer-centric design services, and global logistics support; all backed by industry-leading front and back office e-business solutions. We cooperate closely with our partners to help provide complete solutions for a wide array of applications across a diverse range of industries. Advantech has always been an innovator in the development and manufacture of high-quality, high-performance computing platforms, and our mission is to empower these innovations by offering trustworthy products and services that enable an intelligent planet. With Advantech, there is no limit to the applications and innovations our products make possible.

Advantech's Good-to-Great 3-Circle Principle

The Advantech 3-Circle Principle is based on the book "Good to Great," by Jim Collins. According to the book, a company looking for longterm success should clearly address these three fundamental principles, and commit to their continuing, solid execution.
Advantech is fully committed to this approach and has defined the Advantech "Good to Great 3-Circle Principle" as a means of adhering to it.



Advantech Corporate Structure and Growth Engines



About Advantech-DLoG

Advantech is a leading global manufacturer of industrial PCs and has established a great deal of experience and expertise in specialized industrial vehicle computing, such as that used in forklifts, cranes, trucks and trailers.

DLoG GmbH, established in 1985, made a name for itself as a global player in the field of industrial applications for in-vehicle computing solutions in extremely demanding environments. DLoG has extensive marketing experience in Europe, and is renowned for its excellent German craftsmanship and design capabilities. The company, ranked third in the European market, is a leading provider of rugged industrial computers used in construction machinery, fork-lift trucks, mining engineering, and industrial manufacturing.

DLoG was acquired by Advantech in March 2010. Following the acquisition, Advantech began expanding its global industrial in-vehicle computing market under the new brand name Advantech-DLoG. Combining the experiences and leading market positions acquired by both companies, Advantech-DLoG aims to become the leading supplier of industrial vehicle computing products and services for select vertical markets worldwide, such as warehousing, heavy duty applications and fleet management.

Advantech-DLoG delivers industry leading innovations, a very high level of quality, and is backed by an extensive support, sales and marketing network of more than 5,000 employees in 21 countries and 71 major cities with fast time-to-market services for worldwide customers.

Fleet Management Solutions

Fleet Management is a Complicated Business:

Operational costs are constantly on the increase. Fleet managers usually try to solve the need for vehicle tracking, followed by driver accountability, on-time delivery, monitoring vehicle usage, number of stops, etc. And high fuel costs, the largest business expense outside of the fleet managers' control, can be offset by automated vehicle location tracking and by reporting and analyzing vehicle data. Vehicle tracking, scheduling software and asset management improves managers' fleet monitoring abilities to streamline the mobile work activity and reduce company operating expenses.

Advantech-DLoG In-vehicle Solution Design Capability

Advantech-DLoG industrial mobile computing solutions provide a wide range of products for a variety of vertical markets. Advantech-DLoG offers integrated solutions for all aspects of industrial mobile computing: systems that work under a wide range of temperatures; certified power systems; x86 and RISC-based architectures; a full suite of RF protocols; standardized vehicle diagnostic tools; rich I/O connectors; vibration and shock resistance; and a comprehensive software developer kit to facilitate application development, speeding up time-to-market for system integrators, and helping reduce costs.

Advantech-DLoG TREK Series Provides In-vehicle Power Design

The first priority for the in-vehicle environment is solving the crucial problems presented by dirty power sources. In most present-day motorized vehicles, DC power storage is provided by a lead-acid rechargeable battery, and that battery is charged by the engine and the generator or alternator. The DC voltage in such a vehicular environment is seriously impacted by ignition signals, motor RPMs (speeding up or slowing down), loading devices (audio system, MOD, PND, lamps, horn, etc.) and the temperature.

Wide DC Input Range

Normally, for a 12V/24V vehicular power system, the DC voltage may go down to 6V/8V during peak loading (see Figure 1), and then again it may be subject to engine charging up to a maximum of 32~34 V. If there were no power protection, this dirty power input might cause a fleet management system malfunction; in fact this very thing happens easily in old trucks. Therefore, providing for a wide DC input voltage range avoids damage to the system.

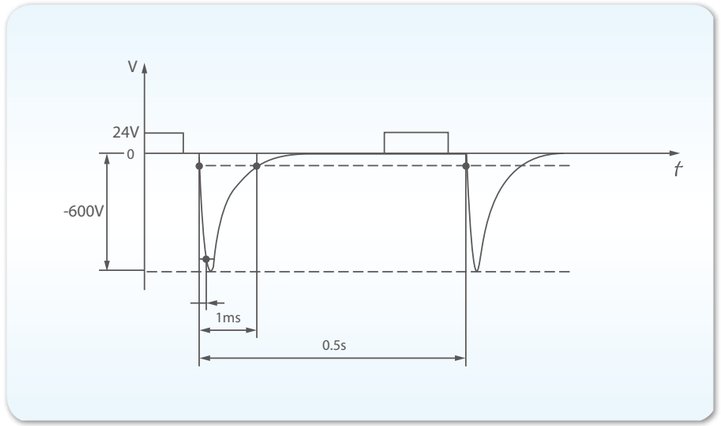


Figure 1 in ISO 7637-2 for 24-V vehicle power system

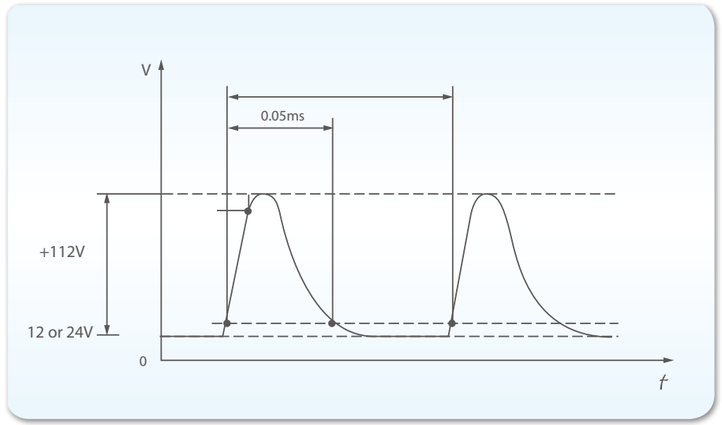
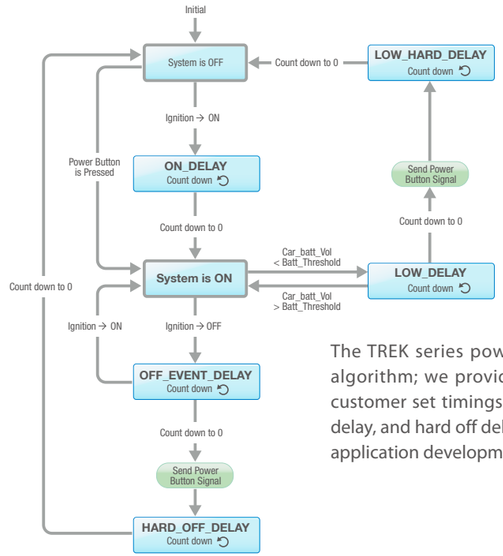


Figure 2 in ISO 7637-2 for 24-V vehicle power system

Power Management

Efficient powernet energy 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.

Power Management Flow Diagram



The TREK series power design mechanism integrates a power management algorithm; we provide a power management demo AP and API that lets the customer set timings for their power on/off delay requirements, ignition on/off delay, and hard off delay, all of which benefits customers considerably by reducing application development effort.

SAE J1113/ ISO 7637-2/ E-mark Certifications

The automotive environment is fraught with electrical hazards. These hazards, including electromagnetic interference, electrostatic discharges and other electrical disturbances, are generated by various vehicular sub-systems such as ignition, relay contacts, alternator, injectors, and accessories. These generated hazards can occur directly in the wiring harness in case of conducted hazards, or may affect electronic modules indirectly via induction. These hazards can impact the electronics in two ways—either on the data lines or on the power rail wires, depending on the environment. Therefore, in order to assure good power design, Advantech-DLoG TREK series products are always certified—our guarantee of design quality.

Benefits

- Vehicle-Grade Power Certifications:
  - E-mark: Certification for vehicles / vehicle components. E-mark is the indication of conformity with European Union Directives for motor vehicles.
  - ISO 7637-2: Road Vehicles – Standards for electrical disturbance from conduction and coupling - Part 2: Electrical transient conduction along supply lines only on vehicles with nominal 12 V or 24 V supply voltage, second edition, 2004.
  - SAE J1455: Recommended environmental practices for electronic equipment design in heavy-duty vehicle applications.
- SAE J1113: Electromagnetic susceptibility measurement procedures for vehicle components (except aircraft).
- Wide-range DC input supports 6-36 V.
- Software supports SDK for easy power settings (delay, ignition, on/off control, hard off).
- Protection against low power conditions.

Thermal Solutions

Keep Your Cool with Wide-Range Thermal Solutions

Industrial-grade computing systems are designed to work under extreme conditions. In a vehicle, it is possible for temperatures to reach up to 50º C in the cab, and up to 70º C in the engine compartment. Hardware expected to perform in these conditions requires special design and materials, special cooling considerations, and extensive temperature testing. Software must be designed with thermal management in mind, and stringent testing should be performed to ensure reliable performance under extreme and rapidly changing temperatures.

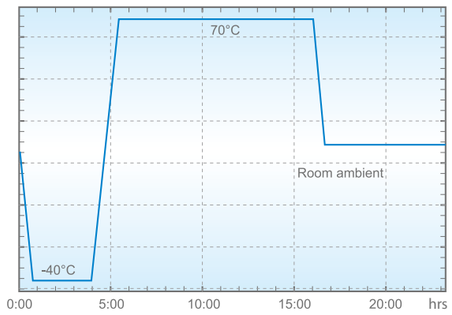
Increased Reliability for Long-Term Peace of Mind

Systems designed to run under a wide range of temperatures operate more reliably, and protect investments over the long-haul. System monitors can be programmed to send warning notifications or to shutdown systems when certain thresholds are reached. More reliable equipment can handle the demand from fluctuating changes in temperature, and operation across large geographic areas, helping fleet managers maintain a competitive edge.

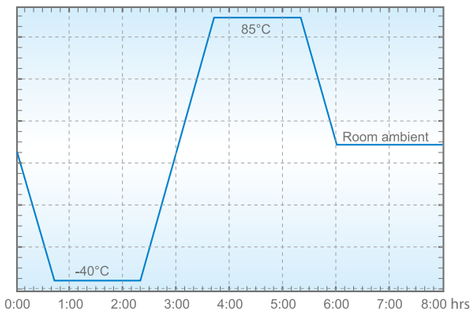
1. About standards

Advantech-DLoG's in-vehicle TREK series products all support operation under a wide range of working temperatures. TREK-550 was tested in accordance with SAEJ1455 4.1.3.1 standards over a 24 hr period; the results are shown below for reference:

SAE J1455 Figure 2a - 24 Hour Thermal Cycle



SAE J1455 Figure 2b - Short (8 Hour) Thermal Cycle



2. How we achieve wide range temperature operation

During the early design stage, a thermal simulation is performed and double checked against actual test results. Key components of TREK-550 selected for durability testing are put under a wide range temperature test as defined for industrial equipment (-40 to 85° C) (see Figure 2b). The result is that the system is able to operate without failure at a range of -30 to 70° C (see Figure 2a).

3. Mechanical design concept

Modules, such as the WLAN module, CPU, NB and RAM are are designed to be attached to the top cover, which is made of aluminum heat sink material to reduce thermal load and dissipate heat efficiently. The WWAN module is also attached to metal on the bottom of the unit to help dissipate heat.

This table shows results of our key components test:

Parts List	Test Temperature (70°C)	Spec Temperature
RAM	Pass	85 (Tc)
CPU	Pass	100 (Tj)
South bridge	Pass	85 (Ta)
CF card	Pass	85 (Ta)
GPS module	Pass	85 (Ta)
HSDPA/CDMA/GPRS	Pass	90 (Tc) *

*Tc: Case Temperature
*Tj: Junction Temperature
*Ta: Ambient Temperature

Benefits

- More reliable for mission critical applications
- Long-term protection of investment
- Space-efficient design
- Fanless, low noise operations
- Control and monitoring of in-vehicle systems, pre-failures, driver behavior, fuel consumption, and more

Advantech-DLoG Capabilities

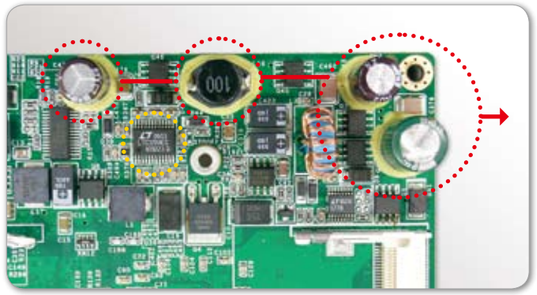
Vibration and Shock

Fleet Management systems can be installed in many locations in a vehicle. But with varying road conditions and driving situations, shocks and vibrations can impact these systems. In response to this concern, Advantech-DLoG performs a series of life cycle profile tests designed to test environmental conditions and physical acceleration on its mobile data products. These tests allow engineers to design products that withstand vibration and shock, and comply with SAE J1455 4.9.4.2, MIL-STD-810G 514.5 , and EN60721-3-5 class 5M3 standards.

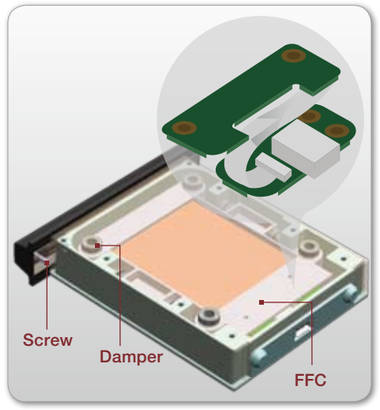
How does Advantech-DLoG technology reduce the impact of shock and vibration?

Advantech-DLoG's broad range of mobile data terminal products is suitable for use in any vehicle—including trucks, transit buses, taxis, subways, and light rail. Advantech-DLoG strives to produce mobile data terminals that perform ever more reliably under the severe conditions that occur in mobile environments.

- Capacitors and other fragile board components are prone to damage or failure due to shock or constant vibration. Advantech-DLoG strengthens these components by adding a durable, heat-resistant (up to 100° C) industrial adhesive in order to increase resistance to vibration or shock.



- Hard disks are is protected by some special designs including 2 screws in front of the HDD, 12 dampers and a FFC cable inside HDD box to prevent environmental shock impact our HDD.

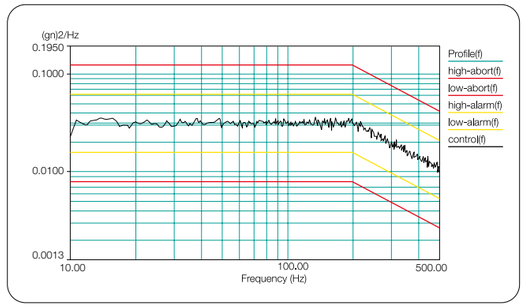


Advantech-DLoG responds to the problems associated with electronic systems operating in harsh vehicle environments by thorough research and design. Quality Assurance personnel physically test products in the environment in which they will be used. The development and testing that is conducted follow SAE J1455 4.9.4.2, and MIL-STD-810G 514.5 , and EN60721-3-5 class 5M3 standards.

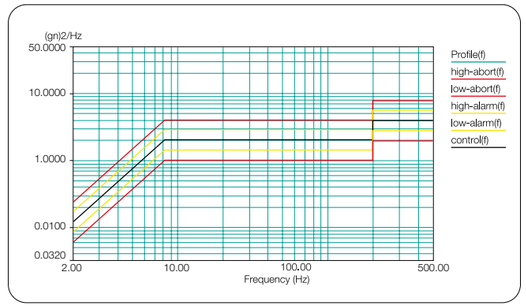
The "EN60721-3-5 class 5M3" standard certification means the product can withstand three times the shock and vibration of most military MIL-810F grade computing devices.

Note: EN60721-3-5 : Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 5: Ground vehicle installations"

Test Vibration Curve

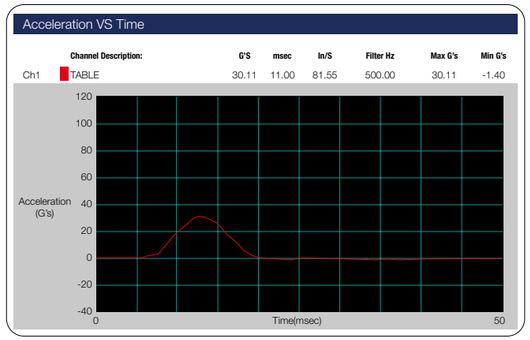


EN 60721-3-5 Class 5M3 Random Vibration Test (3.38Grms)
10~500Hz, 3.38Grms, 1hr/per axis
Test PSD: 10~200Hz: 3 m^2/S^3, 200~500Hz, 1 m^2/S^3

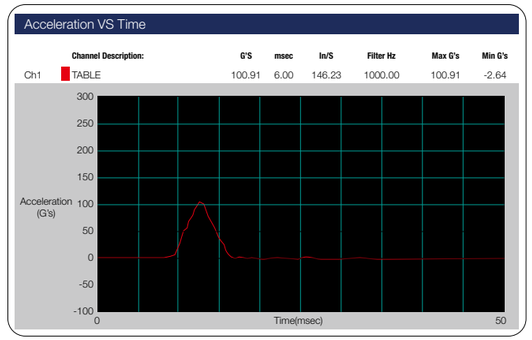


EN 60721-3-5 Class 5M3 Sine Vibration Test (4G)
2~8Hz: 7.5mm displacement, 8~200Hz:
2G, 200~500Hz: 4G, 1hr/per axis

Test Shock Curve



EN 60721-3-5 Class 5M3 Shock Test – Level I (30G /11ms)



EN 60721-3-5 Class 5M3 Shock Test – Level II (100G /6ms)

RF Solutions Combine Advanced GPS with Wireless WAN Communications

Fleet operators must manage large vehicle fleets in geographically challenging situations. Advantech-DLoG TREK products integrate Assisted GPS (AGPS), dead reckoning, Bluetooth, and WWAN protocols (GPRS or CDMA/HSDPA), ensuring effective operation near tall buildings, mountains, canyons, in tunnels and in underground parking lots—improving management and competitiveness. The equipment is also designed to withstand a wide range of operating temperatures, as well as handling shocks and vibration. Advantech-DLoG design and production flow are compliance with ISO/TS 16949, with a quick time to first fix on satellite and very effective accuracy.

About GPS

One problem affecting management of vehicle fleets is the accuracy of location data. This accuracy is greatly dependent on the techniques used to determine location. Advantech-DLoG has teamed up with a leading chip manufacturer specializing in AGPS and dead reckoning, to develop a unique low-power consuming technology that delivers reliable, advanced GPS solutions. These solutions provide optimal sensitivity, connectivity, noise immunity, and continued tracking in areas where satellite signals are interrupted.

AGPS Technology

GPS users expect instant position information. Under adverse signal conditions, however, data downloads from satellites to the GPS receiver and subsequent positional fix can take an unacceptably long time. AGPS boosts acquisition performance by providing satellite positional data to the GPS receiver via wireless networks or the internet. This enables the GPS receiver to compute a position within seconds, even under poor signal conditions. The service is available free-of-charge, in both online and offline versions that are easy to integrate into the system.

Dead Reckoning Technology

Dead reckoning technology supplements GPS data using additional sensors that detect distance travelled with an odometer and turn rate with a gyroscope, providing an accurate position in tunnels, indoor parking facilities, roofed logistics centers, urban canyons and any other environment where obstructed GPS signals hinder positioning.

The following chart shows that when there is no GPS signal, drivers must rely completely on dead reckoning technology to extrapolate location. With a poor signal, drivers rely on a blend of both GPS and dead reckoning data for position information.

About Radio Transmission Technology

Customers today are more sophisticated and demand a broader set of services for fleet management applications, such as broadband 3.5G access. Advantech-DLoG TREK products utilize a module from Sierra Wireless, the leader in worldwide 3.5G embedded solutions, to transmit and receive data packets via CDMA/EV-DO, quad-band GPRS/EDGE, and UMTS/HSPA. With an FCC part 22 & 24E approval, reliability and sensitivity of the system is ensured.

Benefits

- Integrated AGPS and dead reckoning, improves signal acquisition and maintenance
- Open antenna detection prevents tampering
- Real-time communications with central dispatch
- Multiple WWAN protocol support (CDMA/EV-DO, quad-band GPRS/EDGE, and UMTS/HSPA)
- Bluetooth allows driver to transmit data to the cab via a mobile device
- Wi-Fi eases software upgrades allowing them to be done over the air
- Satellite Communications (Quake) permits connectivity in remote areas

MRM SUSI Package Reduces Cost and Time-to-Market for In-Vehicle Applications

The MRM SUSI Package is a software API layer which allows system integrators to effortlessly communicate with hardware on a system. It sits between a user application and the operating system, eliminating the complex programming required to make low-level system calls. Using the MRM SUSI Package, customers can more efficiently develop application programs, evaluate platform performance, quickly add peripheral support, and provide post-installation maintenance/debugging support. In the past system integrators had to program complicated system calls to device drivers which communicated with the hardware layer. Now they can interact directly with the MRM SUSI Package, reducing development time and easing product deployment.

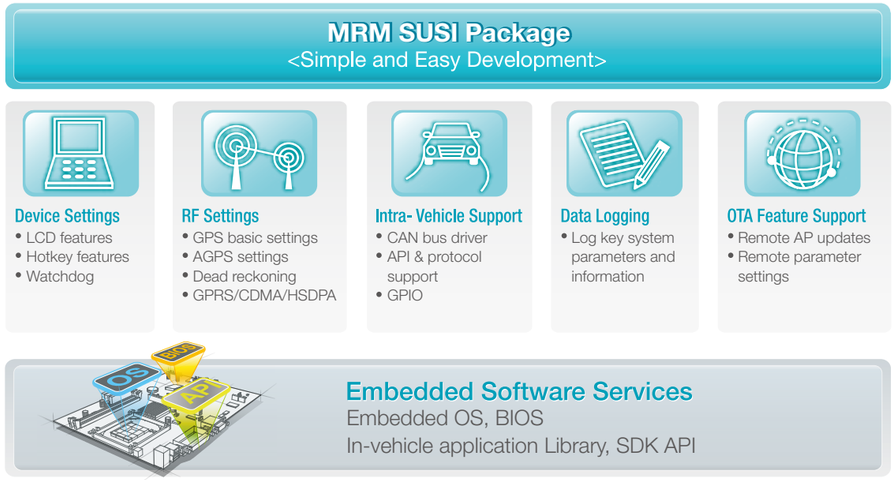
Helping System Integrators Get Work Done Efficiently

MRM SUSI Package sends event triggers for various functions. The user application can listen for an event trigger and respond to it. And more functions will continue to be added to the SDK over time. The main package includes support for the following functional categories:

- Device settings—LCD settings, hotkey features, and watchdog settings
- RF settings—GPS, AGPS, dead reckoning, GPRS/CDMA/HSDPA, VOIP, WLAN, Bluetooth
- In-vehicle communications—CAN bus / API and protocol support, GPIO
- Data logging—capture of key system information and parameters
- Over-the-Air (OTA) support—remote application updates, and remote parameter settings

MRM SUSI Package IMC also runs on multiple operating systems (Win XP, Win CE, or Linux), providing user application portability across platforms without change.

Diagram



Benefits

MRM SUSI Package assists system integrators by giving them easy access to low level hardware functions, saving them time and money in their product development cycle.

- Allows easier and more efficient programming
- Makes user applications portable across different operating systems
- Speeds up time-to-market
- Event-driven callback triggers are faster and more proactive
- Supports a complete portfolio of protocols and standards for in-vehicle computing solutions
- Gives the system integrator a single interface

ISO/TS 16949 Drives Continuous Improvements in Automotive Standards

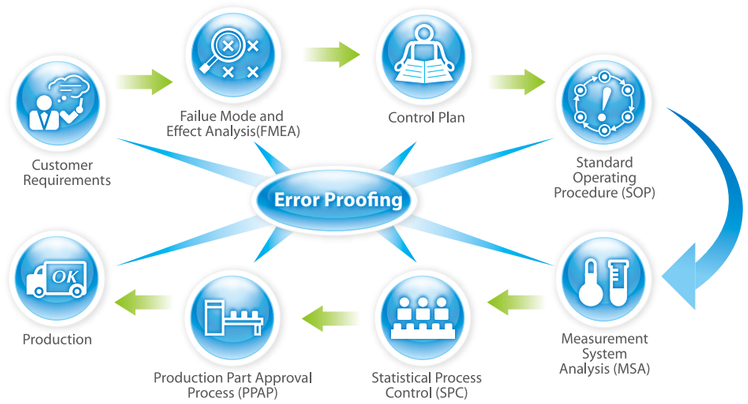
ISO/TS 16949 is a technical standard based on ISO9001. It aligns automotive standards of quality control from the US (QS9000), Italy (AVSQ), France (EAQF), Germany (VDA6.1), and Japan into a process-based system of continual improvement, defect prevention, and optimization of the supply chain through reduction of waste. It was authored by SGS, and requires group members to perform detailed root cause analysis of product defects and failures, as well as waste and variation analysis. The key metrics of ISO/TS16949 are: production part approval process (PPAP), advanced product quality planning (APQP), failure mode and effect analysis (FMEA), measurement system analysis (MSA) including gauge repeatability and reproducibility (R&R), and statistical process control (SPC). As a condition of keeping the certification, mandatory change implementation with measurable improvements must take place after the analysis is done, thereby ensuring a system of continuous improvement.

Advantech-DLoG is committed to following the ISO/TS16949 standard in its in-vehicle products, as part of a continuous self-improvement effort. Annual audits will ensure that vehicle-grade standards related to ISO/TS16949 are met and measurable in accordance with the certification requirements. Advantech-DLoG is ready to take first tier customer projects and customized ODM requests.

Process Flow

ISO/TS 16949 methodology follows the advanced product quality planning process (APQP). It begins by defining customer and regulatory requirements, including scope, and team organization. Planning and definition follow, in which a strategy is chosen, benchmarks and goals set, reliability studies performed, and customer input gathered. In the product design and development phase, two types of failure mode and effect analysis (FMEA) are performed: design failure mode and effects analysis (DFMEA), and process failure mode and effects analysis (PFMEA). A control plan including process capability, SOP, and measurement systems analysis (MSA) follow the FMEA. Statistical process controls (SPC) monitor processes ensuring they operate at full potential. The production part approval process (PPAP) provides validation and management signoff. In the final production phase, feedback, assessment, and corrective actions are measured in relation to customer satisfaction, service, delivery, and consistency.

ISO/TS 16949 Process Flow



Benefits

- Solid design and production
- Lower defect rates, which lead to lower manufacturing costs
- Increased efficiencies along the entire supply chain
- A single internationally agreed upon standard for quality management, which is easily recognizable
- Measurement, analysis and continuous improvements

Industrial Ecosystem Benefits Everyone

Compatibility and interoperability are critical concepts for mobile communications products. With these principles in mind, Advantech-DLoG works closely with its suppliers to assure both compatibility and interoperability. As a participant in a well-developed industrial ecosystem, Advantech-DLoG offers customers pre-vetted options from a stable of standard protocols that ensure communications with maximum mobility and compatibility.

1. For external module/devices: Advantech-DLoG provides solutions and options that our customers craft into different application solutions. A number of devices have been tested and certified compatible with our TREK series products; our customers can refer to our peripherals list and select the options they need. Some examples are: RFID, barcode scanner, RAM mount, and external CAN bus solutions. Customers realize savings in effort required for selecting and testing peripheral vendors. This win-win strategy benefits Advantech-DLoG suppliers and customers.
2. For internal module vendors: Especially for functions such as GPS/GPRS, Wifi, and Bluetooth, the associated RF communication modules are critical elements for in-vehicle products. Since quality is extremely important, we source only world-recognized RF modules. We check for approved certifications, such as PTCRB, R&TTE, etc., so our customers save time and expense. Close cooperation with our eco-partners benefits all concerned.

Benefits:

- Assured hardware compatibility
- Assured protocol compatibility
- Assured interoperability
- Reduced sourcing effort
- Reduced testing
- Faster time to market
- Stable systems

Advantech-DLoG partners with the companies below to serve the marketplace and offer leading edge products. In order to keep up to date with new technology and to develop cutting edge solutions for our customers, Advantech-DLoG's open philosophy enables us to serve more effectively and to bring valuable new solutions to market more quickly. These are Advantech-DLoG's most valued partners:

OS	Core Chip	Vehicle Communication Provider	GPS	RF module	Others
Microsoft, Linux, Android	Intel, ST,TI	Simma, ATBS	U-blox	Sierra, CINTERION	ALK, iris

Application Story

Cutting Edge Local Fleet Management

Introduction

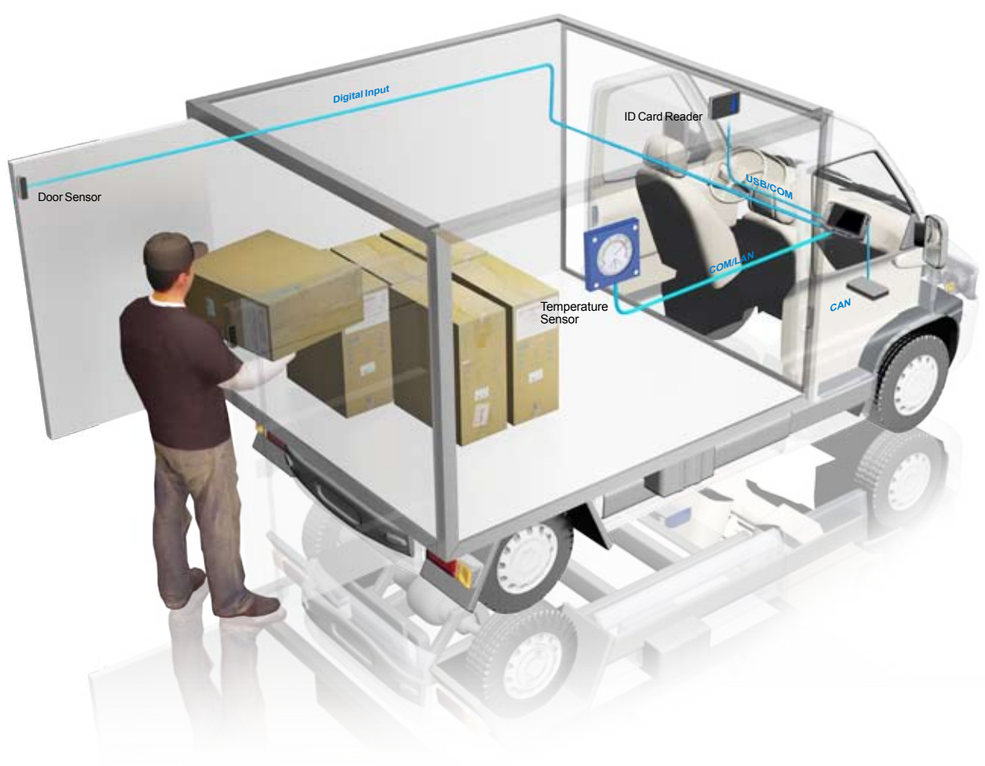
When it comes to fleet management, Advantech-DLoG is proud to play a role in advancing safety, efficiency, and profitability. One notable example is the Mobile Data Terminal (MDT) that helps manage moving fleet assets. With built-in GPS, CDMA/GPRS/HSPA+, the MDT keeps drivers and dispatchers in close communication. And depending on sensor outfitting, the Advantech-DLoG MDT can track everything from mileage, routing, speed, acceleration, braking, oil pressure, fuel consumption, An important additional function is the logging of driver duty and rest hours to help maintain compliance with safety and hours-of-service regulations. The TREK-722/723 ARM base MDT can be mated with a software solution that takes virtually all the drudgery out of tedious logging and tracking, enabling well-informed management for even the most complex fleet operations.

Solution

TREK-722/723 is a RISC platform with 5"/7" display all-in-one MDT. The radio frequency options and programmable function keys make TREK-722/723 suitable for local feet management, especially small truck, local delivery, government fleet and taxi. It is designed with vehicle power compliant to ISO7637-2 & SAE J1113 ensuring the system is stable in dirty car power system.

In cold applications, it is important to monitor temperature during food transportation. When the driver is out of the vehicle or off the duty, a fleet owner doesn't normally have access to the status of fleet assets and vehicles. But, with the suspend/wakeup feature of TREK-722/723, 24/7 monitoring mechanisms are supported via periodic, digital input or WWAN wakeup. The fleet owner can monitor vehicle and cargo on a daily, weekly, or specific time basis. If a driver or a thief opens a vehicle door when unattended, an event is triggered by the door sensor to inform a center operator responsible for asset security. Furthermore, the operator can remotely wakeup the TREK-722/723 via SMS to have access to vehicle data.

System



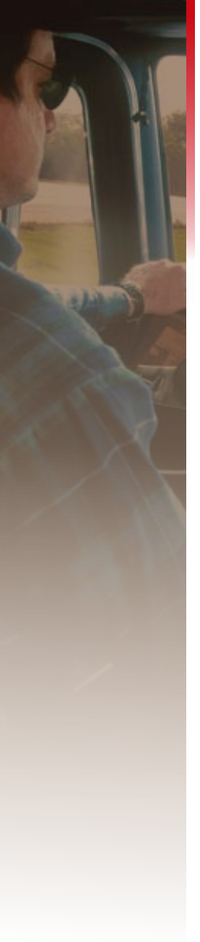
Benefits

- Advantech-DLoG's mobile data terminal computing is a highly integrated solution for fleet management applications. The system integrator benefits from Advantech-DLoG MDT's reduced software development needs, which means faster time to market.
- Improved efficiency for fleet managers and route planners
- Enhanced driver productivity and efficiency
- Well-rested drivers operating well-maintained equipment help keep highways safe for everyone
- Real-time communications and information delivered to driver and the central office
- Collected data can be marketed for additional income (e.g. : Some fleet owners sell up-to-date temperature and route condition information to other businesses.)

NEW

TREK-722/723 (RISC All-in-One Mobile Data Terminal)

- 5" & 7" LCD (800 x 480) with resistive touchscreen
- 24/7 monitoring & reporting
- Cortex-A8 TI AM3703 800 MHz
- WinCE6.0 & optional Android 2.3.4
- Built-in CAN bus with J1939 protocol
- Built-in GPS with AGPS feature, BT, CDMA/GPRS/HSPA+
- Operating temperature -20 ~ 60° C
- Storage temperature -30 ~ 80° C



Application Story

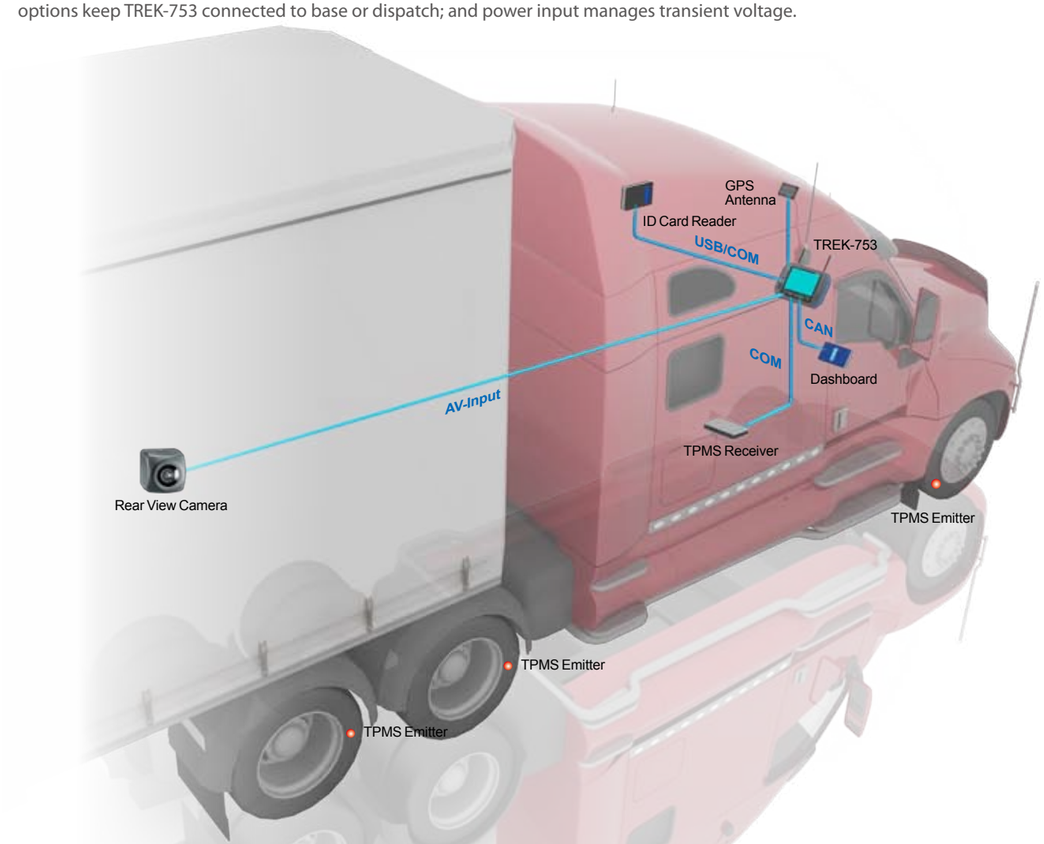
In-Vehicle TREK-753 Boosts Long Haul Trucking Efficiency

Introduction

Managing vehicle fleets in the long haul trucking industry is challenging: vehicles and drivers are spread out geographically; central offices need to consolidate information for billing and invoicing; and customer service needs to stay on top of deliveries to be able to communicate with clients. It seems there is never enough time in the day to get the work done in this highly competitive business. A large company in the United States was trying to sort out just these types of challenges to improve their operating efficiency and maintain their competitive edge. Billing and invoicing for the company is done at the end of the driving day, when the bills of lading are collected from drivers. The company was looking for a way to spread this workload throughout the work day rather than trying to do it all at the end of the day. The ability to process billing and invoicing in real-time during the day would improve the efficiency of the freight carrier. The system needed to be small enough to fit into the tight spaces of a truck cab; it had to have features like integrated wireless cellular technology and USB support; and it needed to be able to withstand transient vehicle power, vibrations, and extremes in temperature.

System

The TREK-753 mobile data terminal operates as the information center of the vehicle. USB connectors allow easy access to maintain peripherals; the CAN port with J1939 support to receive vehicle diagnostic information; wireless options keep TREK-753 connected to base or dispatch; and power input manages transient voltage.



Solution

Advantech-DLoG's TREK-753 mobile data terminal fulfilled all the requirements of the carrier, as well as providing an added benefit: the new system allowed them to send delivery confirmations and invoices within 10 minutes of delivery, improving invoice payments, and improving customer support. TREK-753 is equipped with a 7" TFT LCD screen with adjustable brightness and a backlight. Its fanless, rugged aluminum enclosure withstands vibrations, is dust resistant, and waterproof. It supports a wide range of operating temperatures—perfect for use inside a vehicle cab that is subject to weather extremes. The DC power input is designed to handle transient voltage conditions, ignition cold crank, and has power on/off delays to allow stabilization of voltage during engine start. TREK-753 has many flexible communication options: IEEE 802.11b/g/n, GPS, GPRS/HSDPA/CDMA cellular technology, offering real-time voice and data transmission. The company is very satisfied with the implementation of TREK-753 in its fleet.

Benefits

Advantech-DLoG's TREK-753 mobile data terminal benefits long haul truckers by providing real-time wireless access. The benefits include:

- Immediate delivery notifications available to customers
- Rugged, fanless design in a small form factor
- Waterproof and dustproof with IP54 I/O cover protection
- GPS tracking capability
- Increased efficiency by load balancing workflow
- Increased visibility of support, leading to more customer satisfaction
- Ability to operate in extreme temperatures with transient voltage protection
- Flexible expansion capabilities with a variety of peripheral connectors
- Built-in GPS, GPRS, HSDPA, CDMA, Bluetooth and wireless LAN, enabling different RF communication technologies.

TREK-753 (7" Mobile Data Terminal)

- 7" WVGA TFT LCD, adjustable brightness
- 5 programmable function keys with backlight
- Rugged aluminum enclosure and fanless design
- Windows® Embedded Standard (WES) 2009, WinCE6.0 and Ubuntu Linux 10.04
- Flexible expansion capability for IEEE 802.11b/g/n WLAN, GPS, GPRS/CDMA/HSDPA
- Extreme temperature operating capability
- Reliable wide DC power input for in-vehicle application

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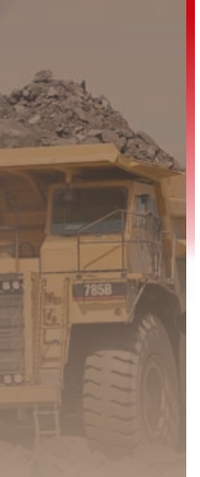


Application Story

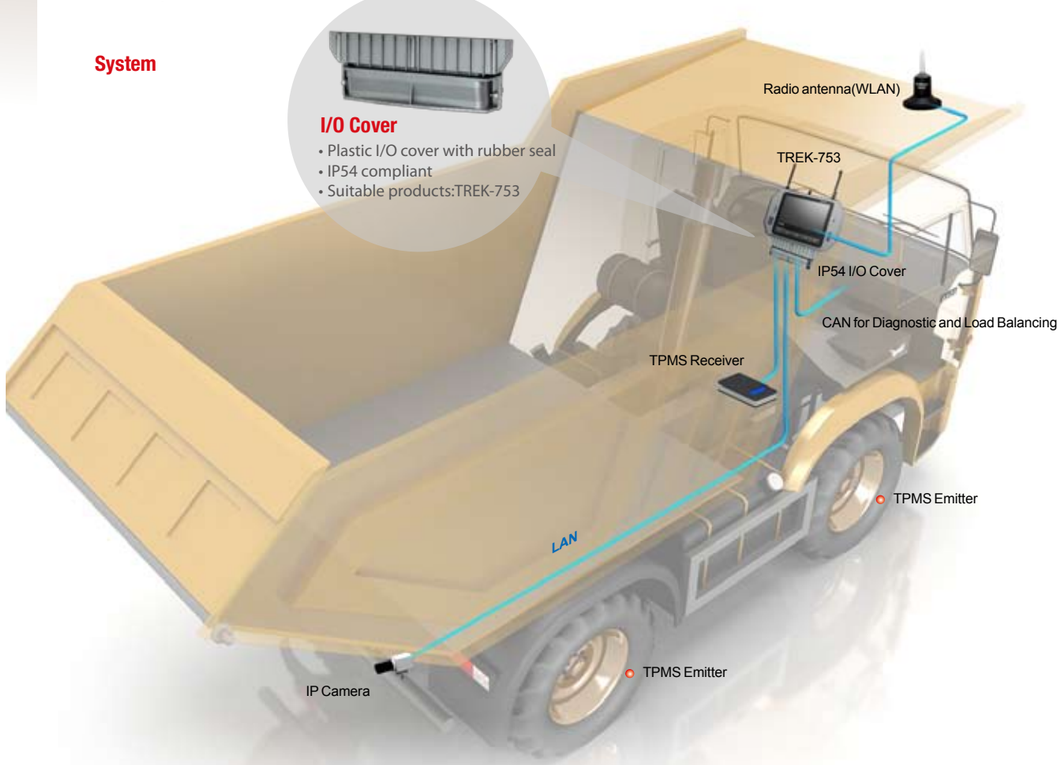
TREK-753 Increases Safety in the Mines with a Proximity Warning System

Introduction

The mining industry faces many challenges, first and foremost of which is safety. Conditions in mine shafts are often cramped and grueling, with workers facing a dark, damp, and uncomfortable environment. Inside the shafts, equipment, vehicles, and personnel all operate near one another, excavating with equipment ranging from large trucks to handheld picks. Mining customers are looking to solutions to increase worker safety, as well as provide a means to monitor mining trucks. Monitoring has to be accessible by vehicle operators and the equipment has to fit within the small confines of the cab. Metrics from the system also needs to be available to management to help them manage several important business controls: driver behavior, root cause analysis of failures, identification of training needs, and direct, real-time supervision of operators.

Mining vehicles operate business critical applications in situations where downtime spells disaster. Operating in extreme temperatures, mining vehicles require computing solutions that monitor, analyze, predict and report information about vehicle, driver, components, location, and more. Specific software applications such as truck queuing systems, tire-pressure management, shovel hang time, load scheduling, and collision avoidance can mean the difference between continuous operation and meltdown. A single tire on a mining truck might have a replacement cost of thousands of dollars with an order lead-time of several months, and downtime for the vehicle is not an option.

System



I/O Cover

- Plastic I/O cover with rubber seal
- IP54 compliant
- Suitable products:TREK-753

Solution

For a solution to be effective in these environments it needs to occupy a small footprint which can be mounted in a vehicle cab where space is a premium. Additionally it needs to have a dimmable screen for use in low-light conditions found in mines. The TREK-753 meets these requirements. TREK-753 is a rugged, compact, vehicle-mounted computer, with an IP54-rating for the entire system. TREK-753 has an IP54-rating which certifies protection against water and dust. The I/O cover extends this protection to cable attachments and connectors. This allows the system to operate in wet or dirty environments where spray from water or dust churned up from the road might otherwise cripple computer equipment. Off-road applications such as open-pit mining, or tractors and other farming vehicles can rely on the rugged protection offered by TREK-753.The unit is fanless with an aluminum chassis design, and fits easily into space-constrained areas.
TREK-753 LCD has been upgraded to reduce brightness. Reduced lighting makes the system easier to use in the darkness of a mine shaft. The TREK-753 mounted in a vehicle cab is also able to display proximity information, monitor health conditions of vehicle components through its CAN Bus attachments, track navigation and location, prevent collisions, and monitor driver behavior all in real-time. TREK-753 improves efficiency, safety and productivity. It is cost-effective, and relied on by companies around the world.

System Description

Advantech-DLoG's TREK-753 makes an optimal in-vehicle cab mount solution helping keep mining equipment in service, improving efficiency, and giving management and drivers the access they need to important metrics.
The WLAN connection receives proximity information from RFID tags, and delivers comprehensive data to both driver and dispatch. Safety and collision avoidance are increased and management knows the precise whereabouts of its equipment in the field.

Benefits

TREK-753 brings customers many benefits. These are just a few:

- Efficient dispatch control
- Increased safety due to proximity warning system
- Improved asset management and vehicle diagnostics
- Reduced downtime and increased productivity
- IP54 protection with I/O cover
- Rugged, industrial design for long-term use
- Dimmable screen, important in dark mining environments

TREK-753 (7" Mobile Data Terminal)

- 7" WVGA LCD with 5 programmable adjustable brightness hot keys
- Windows® Embedded Standard (WES) 2009, WinCE6.0 and Ubuntu Linux 10.04
- Supports analog video input & CAN2.0b with J1939 protocol
- Supports WLAN communications
- 48 V: 18 ~ 58 V input range for specific applications
- Fanless and ruggedized aluminum chassis, able to work under -30 ~ 60° C temperature range

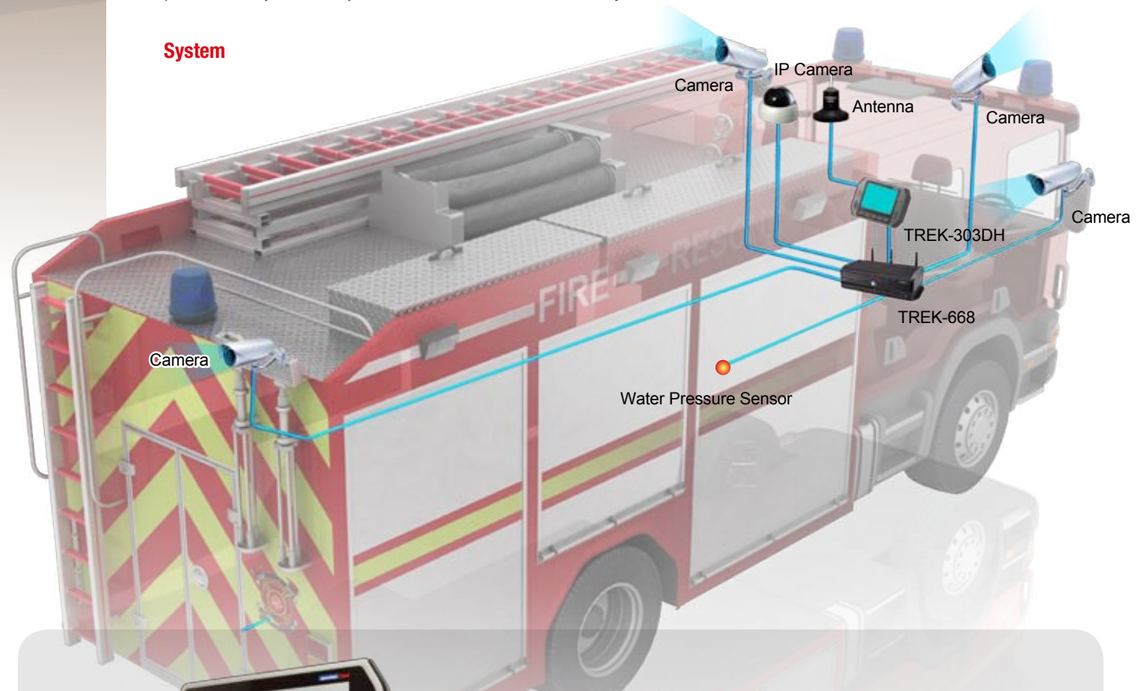
Application Story

Safety Should Never Be Compromised

Introduction

Fleet management and in-vehicle surveillance personnel need instant access to critical information when responding to emergencies and life threatening events. Advantech-DLoG provides video surveillance to back-end dispatchers to assist them in issuing commands and guidance to personnel. This boosts efficiency at fire scenes and aids in quick rescues, reducing emergency response times. In situations where every second counts, dispatch systems must be able to rapidly communicate with emergency vehicle systems and personnel. Advantech-DLoG offers advanced mobile data solutions that provide real-time access to critical applications such as emergency dispatch, preventative maintenance vehicle diagnostics, and driver behavior management. Vehicle monitoring and video surveillance help increase driving safety; knowing that risky driving behavior is being recorded serves to encourage drivers to drive professionally and safely. This in turn reduces collisions, injuries, maintenance and insurance costs.

System



TREK-303DH (7" Smart Vehicle Display)

- 7" display with touchscreen supports 800 x 480 resolution
- -30 to 70° C wide range temperature
- Five user-defined function keys, 2-watt speaker x 2, and USB host.
- Supports auto-dimming
- One cable connects with TREK box solutions
- Power on/off button on the side
- CE/FCC/CCC certified

Solution

TREK-668 is an industrial-grade, dual-core computing box designed to provide high-quality video surveillance and fleet management for police cars, ambulances, fire engines, buses and trains. TREK-668 supports vehicle tracking and positioning, and is capable of dead-reckoning, which allows vehicle locations to be traced even when the vehicle is in a tunnel. TREK-668 supports the J1939 protocol for vehicle diagnostics and driver behavior management, and it also supports high-quality, MPEG-4, MJPEG, H.264 recording and transmission of up to twelve camera inputs. It has one PSE for an IP camera, and dual display/dual audio interfaces which support different resolutions. TREK-668 has eight audio inputs and provides a hybrid recording function allowing for images to be transmitted as either digital or analog video signals. TREK-668 provides reliable on-board recording and can transmit images or alarms for remote monitoring over wireless, GPRS, 3G, or HSDPA network connections

- Automotive grade working temperature range (-30° C to 60° C).
- Rich I/O including CAN, RS-232, RS-485, J1708, 4DI/4DO (isolated), Line out, Mic in, and USB.
- 4/8/12 channel analog video input, one PSE for IP Camera. Camera supports 30 frames, D1 resolution per channel per second. (and supports up to 16 channels at half D1 resolution).
- 2 SSD/ 2.5 MHDD for external accessible
- Built-in communication modules, including GPRS/HSDPA/CDMA, WLAN and Bluetooth; supports dual SIM, dual HSDPA; supports dual SIM cards and dual WWAN module mechanism.
- GPS with AGPS and dead reckoning technology (Gyro & speed line).
- Certifications: CE/FCC/E-mark, MIL-STD-810G, ISO 7637-2, SAEJ1455, SAE J1113 regulations.
- Ignition on/off delay; software controllable for car power management.

Benefits

- Real-time video streaming to back-end office for command and control decision-making for collective intelligence.
- Real-time communications and information delivered to driver and the central office.
- Dual display, coupled with TREK-303 and VGA output for displaying jurisdictional geo-fencing for police beats, fire response districts and strategic maps, building plans for tactical operations; Routing and location assistance.
- Preventative vehicle diagnostics monitoring; driver behavior management.
- Rugged equipment ensures access to data in harsh, in-vehicle environments.
- Dual SIM cards, free roaming charges

NEW

TREK-668 (In-vehicle Surveillance with Fleet Management Computing Box)

- 4/8/12 analog video input with power, 8 audio in, 30 frame, D1 resolution, per second, per channel. Compression by H.264, MPEG4, MJPEG. One PSE for IP Camera
- 2 x mobile HDD/SSD with SAE J1455, vehicle-grade shock & vibration
- Vehicle-grade working temperature -30° C ~ 60° C
- Rich I/O : CAN (1939), J1708, COMs, isolated DIO,Audio, USB, etc.
- Dual WWANs, GPS (AGPS, Dead reckoning), WLAN and Bluetooth

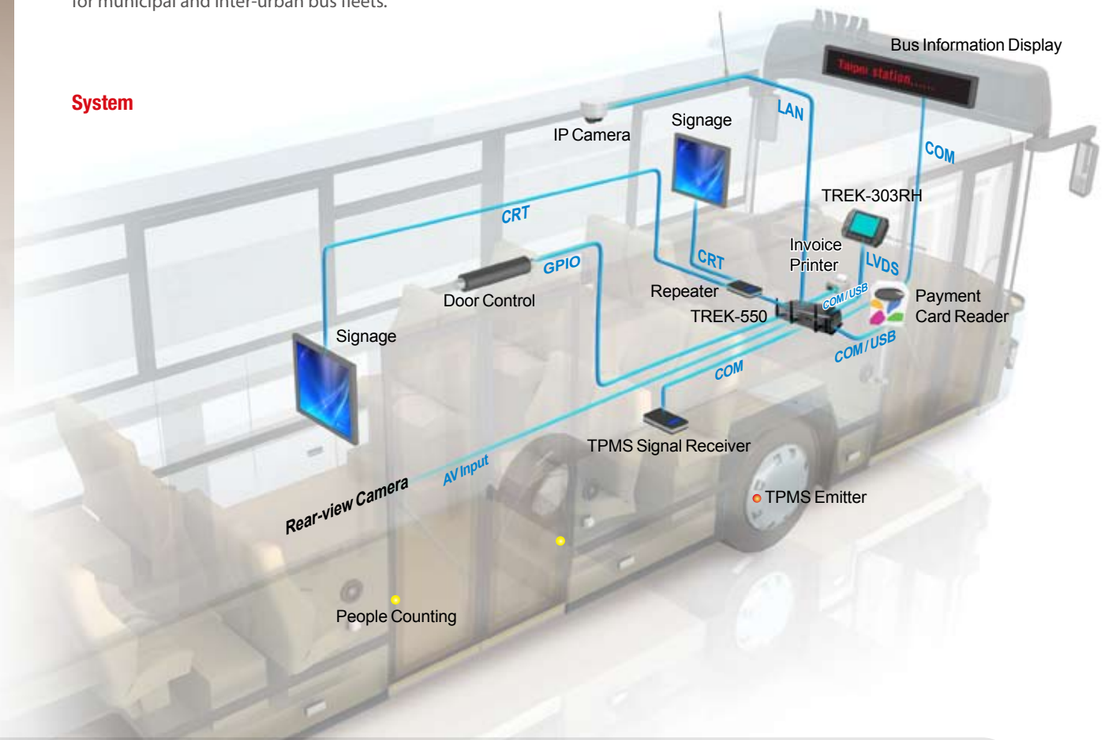
Application Story

Mobile Data Terminal Solutions for e-Bus Systems

Introduction

Customers looking for smart vehicle solutions for sophisticated e-Bus systems have a diverse set of needs. Advantech-DLoG is helping system integrators design e-Bus systems as part of a sophisticated wireless infrastructure to bring mobile onboard computing and back-office communications in the transportation industry to the next level. Advantech-DLoG uses its knowledge to deliver an industrial grade Intel® Atom™ processor based, in-vehicle box computer ideal for municipal and inter-urban bus fleets.

System



Solution

Advantech-DLoG fulfills the requirements of metropolitan bus fleets with the TREK-550 in-vehicle box computer and the TREK-303H smart vehicle display providing:

- ISO 7637-2, SAE J1455 & SAE J1113 certifications—guarantees operation in an environment with a wide range of working temperatures, transient power disturbances, vibration and shock.
- TREK-303H smart vehicle display (LVDS) – designed to fit in the tight space of a cab and provide the driver with an easily-controlled touch panel interface
- Door sensor (GPIO) – allows a passenger counter to keep track of the number of riders onboard
- In-vehicle surveillance (LAN) – enhances security by recording an interior view of the passenger compartment via an IP camera
- Real-time rear view camera (Video-in) – increases safety by preventing accidents and alerting driver of pedestrians at the rear of the bus
- Vehicle status monitoring (CAN with J1939) – provides driver/dispatch with vehicle metrics and diagnostic information
- Tire Pressure Monitoring System (COM) – increases safety by monitoring and reporting tire pressure
- In-vehicle signage display (CRT) – enables delivery of unique information at different points on the bus through dual independent video and audio connections
- Advanced GPS (module) - includes dead reckoning and AGPS support for continual navigation when satellite tracking is unavailable
- Built-in GPRS, HSDPA, CDMA, Bluetooth and wireless LAN, enabling different RF communication technologies.

Benefits

Advantech-DLoG's mobile data terminal computing system is a full-featured, comprehensive solution.
Its benefits include:

- Real-time billing and invoicing
- Enhanced safety for passengers and drivers
- Improved efficiency for fleet managers and route planners
- Real-time communications and information delivered to driver and the central office
- Industrial design that is both reliable and space-conscious
- Proactive vehicle diagnostics monitoring
- Ability to learn bus position and other information by smart phone

TREK-303RH (7" Smart Vehicle Display)

- 7" 16:9 automotive-grade 800x480 LED type TFT LCD display
- 4-wire touchscreen
- Light sensor for auto backlight control
- Five software configurable hotkeys in front panel with green LED backlight
- One cable to pair with TREK-550 with a simple connection
- One USB host in front panel for easy maintainence

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TREK-550 (x86 In-Vehicle Computing Box)

- Automotive grade SAE J1455 / E-mark working temperature range (-30° C to 70° C) with Intel® Atom™ Industrial In-Vehicle Computing Box Z510PT/Z520PT
- Built-in 50 channel GPS with AGPS & dead reckoning feature (Gyro & speed line)
- CAN bus 2.0B with J1939 protocol support & J1708 communication
- Built-in G sensor for auto accident reporting & two video-input ports for rear view monitoring application
- Built-in GPRS/CDMA/HSDPA, Bluetooth & WLAN
- Dual independent display output port & dual independent audio output port (one for driver, the other for passenger)
- Reliable 12V/24V car power solution with 6V ~ 36VDC-input and ISO-7637, SAE J1113

Product Information

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Model Name		TREK-753	TREK-722	TREK-723	TREK-303RL	TREK-303RH	TREK-303DH
Processor		Industrial grade Intel Atom XL Z510PT 1.1 GHz (Z520PT 1.3 GHz as option)	TI ARM Cortex-A8 AM3703 800 MHz		-		
Design Compatible Models		-	-		Paired with TREK-510	Paired with TREK-550/ TREK-668	Paired with TREK-550/ TREK-668
OS		WES 2009, WinCE6.0 and Ubuntu Linux 10.04	WinCE6.0 & optional Android 2.3.4		-		
Memory	Size	One 200-pin SODIMM socket, Supports up to 2 GB DDR2 400/533 memory module (WinCE upto 512MB)	On board 256MB Mobile LPDDR		-		
	Module Type	1 x 200-pin SODIMM	On board LPDDR		-		
Storage		1 x external accessible SD slot, 1 x external accessible CF slot	On board NAND type 2GB for boot loader, operating system & customer apps 1 x push-push type SD slot		-		
Display	Size/Type	7" (16:9) TFT LCD	5" TFT LCD	7" TFT LCD	7" (16:9) TFT LCD		
	Max. Resolution	800 x 480	800* 480	800* 480	480 x 234	800 x 480	
	Max. Colors	262 K	262K	262 K	262 k		
	Brightness (cd/m²)	400 with TS (typical)	350 with TS (typical)	400 with TS (typical)	450 with TS (typical)	400 with TS (typical)	
	Viewing Angle (degrees)	70° / 70° / 60° / 60°	70°/70°/70°/50°		70° / 70° / 70° / 50°	70° / 70° / 60° / 60°	
	Backlight MTBF	50,000 hrs	20,000 hrs		10,000 hrs	50,000 hrs	
Touchscreen	Technology	4-wire resistive type; optional support for sunlight readable feature by AR touch solution	4-wire resistive type		4-wire resistive type		
Brightness Control		2 x hotkeys in front panel; built-in light sensor for auto backlight adjustment	Built-in light sensor for auto backlight adjustment		2 x hotkeys in front panel; built-in light sensor for auto backlight adjustment		Built-in light sensor for auto backlight adjustment
I/O Port		3 x USB host, 2 x RS-232 with DC-out, 1 x RS485, 1 x CAN w/ J1939, 1 x J1708, 4 x isolated DI/DO	2 x USB host, 2 X RS-232, 1 x CAN with J1939 protocol, 2 x DI/DO		36-pin locking type connector (connect to TREK box), power/wake up button		
Audio		Built-in 2 watt speaker	Built-in 2 watt speaker		Built-in 2 watt speaker		2 * 2 watt speaker
WWAN		GPRS : Cinterion MC55i qual-bands CDMA : Sierrawireless MC5728V HSDPA : Sierrawireless MC8790V	GPRS : Cinterion TC63i qual-bands HSPA+ : Cinterion PH8 CDMA : Sierrawireless MC5728V		-		
					-		
Network (LAN)		1 x 10/100/1000 Mbps	-		-		
WLAN		802.11b/g/n	-		-		
Power		12V/24V car power design. DC-input 6V ~ 36V with ISO-7637-2, SAE J1113 & E-mark; option to support 48V car power system	12V/24V car power design. DC-input 6V ~ 36V with ISO-7637-2, SAE J1113 & E-mark		12 V +- 5% (Powered by Trek Box)		
Operating Temperature		-30° C ~ 60° C	-20° C ~ 60° C		-30° C ~ 70° C		
Certifications		UL, CB, CE, FCC, CCC, MIL STD 810G, SAE J1455, e mark	CE, FCC, UL, CUL, CB		UL, CB, CE, FCC, CCC, NCC	UL, CB, CE, FCC, CCC	CE/ FCC
Dimensions (W x H x D)		256 x 161 x 56 mm	165 * 115 * 43 mm (TREK-722)/ 213 * 145 * 43 mm (TREK-723)		244 x 160 x 41 mm		212.75 x 141.85 x 35 mm
Weight		2.2 kg	0.65 kg (TREK-722)/ 0.85 kg (TREK-723)		0.8 kg		0.76 kg

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Model Name		TREK-510	TREK-550	TREK-668
Processor		STM STA2062 ARM-based 333 MHz RISC SoC	Industrial grade Intel Atom XL Z510PT 1.1 GHz (Z520PT 1.3 GHz as option)	Intel Atom N2600 1.6Ghz. (Dual core)
OS		WinCE 5.0	Win CE 6.0, WES 2009, XP and Linux (Ubuntu 10.04/2.6.34)	WES7/Win7
Memory		Mobile DDR 128 MB	One 200-pin SODIMM socket, Supports up to 2 GB DDR2 400/533 memory module (WinCE only support upto 512MB)	DDR3 up to 2GB
Video	CRT	-	1 x VGA output by DB-15 (supports different content with LVDS port)	1 x VGA output by DB-15 (supports different content with LVDS port)
	LVDS	Yes	1 x (supports different content with CRT port)	1 x (supports different content with CRT port)
	Video in	-	2 x composite analog video input ports for real-time rear-view monitor feature (doesn't support video recording)	For surveillance: support up to 12 Video inputs, with 12V/2A power supply for camera
I/O Interface	Audio	Mic-in, Line-out, SPK-out	Mic-in, Line-out, SPK-out	Mic-in, Line-out, SPK-out, 8 audio input
	Ethernet	-	1 x 10/100/1000 Mbps Ethernet (with LEDs)	1 x Giga LAN 10/100/1000 Mbps Ethernet controller, supports POE IP camera ;compliant IEEE 802.3af and provides up to 15.4 watts power output
	USB	2 x USB host ports, 1 x USB client port	4 x USB host ports	4 x USB host ports
	Serial Ports	2 x full function RS-232 with DC Output, 1 x 4-wire RS-232/485	2 x full function RS-232 with DC Output, 1 x 4-wire RS-232,1 x RS-485, 1x J1708	2 x full function RS-232 with DC Output , 2 x RS-485
	DI/O	4 x Isolated dry contact digital inputs and 4 x isolated relay driver output	4 x Isolated dry contact digital inputs and 4 x isolated relay driver output	8 x Isolated dry contact digital inputs and 4 x isolated relay driver output
	CAN	CAN 2.0 A/B (J1939 protocol support)	CAN 2.0 A/B (J1939 protocol support)	CAN 2.0 A/B (J1939 protocol support)
GPS		32-Channel GPS engine embedded in SoC; optional to support uBlox LEA-5S	50-Channel uBlox LEA-6S with AGPS as default; u-blox LEA-6R with AGPS & dead-reckoning feature (built-in Gyro & speed line) as option	50-Channel uBlox LEA-6S with AGPS as default;u-blox LEA-6R with AGPS & dead-reckoning feature (built-in Gyro & speed line) as option
WWAN		GPRS : Cinterion MC55i qual-bands CDMA : Sierrawireless MC5728V HSDPA : Sierrawireless MC8790V	GPRS : Cinterion MC55i qual-bands CDMA : Sierrawireless MC5728V HSDPA : Sierrawireless MC8790V	GPRS : Cinterion MC55i qual-bands CDMA : Sierrawireless MC5728V HSDPA : Sierrawireless MC8790V (2 SIM, 2 Mini PCIe slot for WWAN/ WLAN)
Storage	On-Board Flash	2 GB on-board flash	-	-
	SD	1 x external-accessible port (for memory mode only)	-	-
	CF	-	1 x external-accessible port (for memory mode only)	1 x external-accessible port (for memory mode only)
	SATA	-	Option to support built-in 2.5" SSD (either solution with CF slot)	2 X SSD (optional SATA 2.5" MHD)
Power Requirements	Input Voltage	12V/24V car power design. DC-input 6V ~ 36V with ISO-7637-2, SAE J1113 & e mark	12V/24V car power design. DC-input 6V ~ 36V with ISO-7637-2, SAE J1113 & e mark	12/24V car power design. DC-input 9~32V with ISO-7637-2, SAE J1113 & e mark
Operating Temperature		-30° C ~ + 70° C	-30° C ~ + 70° C	-30° C ~ 60° C
Certifications		UL, CB, CE, FCC, CCC, MIL STD 810G, SAE J1455, E-mark	UL, CB, CE, FCC, CCC, MIL STD 810G, SAE J1455, E-mark	UL, CB, CE, FCC, CCC, MIL STD 810G, SAE J1455, E-mark
Dimensions (W x H x D)		261 x 125 x 57 mm	266 x 149 x 68 mm	346 x 97 x 196.2 mm
Weight		1.0 kg	1.2 kg	5.7 kg (including 2 HDD)

RISC All-in-one Mobile Data Terminal

TREK-722/723

Features

- 5" & 7" LCD (800 x 480) with resistive touchscreen
- 24/7 monitoring & reporting
- Cortex-A8 TI AM3703 800 MHz
- WinCE6.0 & optional Android 2.3.4
- Built-in CAN bus with J1939 protocol
- Built-in GPS with AGPS feature, BT, CDMA/GPRS/HSPA+
- Operating temperature -20 ~ 60° C
- Storage temperature -30 ~ 80° C

Introduction

TREK-722/723 is a RISC platform with 5"/7" display all-in-one Mobile Data Terminal (MDT). The radio frequency options and programmable function keys make TREK-722/723 suitable for local fleet management, especially small truck, local delivery, government fleet and taxi. It is designed with vehicle power compliant to ISO7637-2 & SAE J1113 ensuring stability in a car with a "dirty" power system. With Suspend/Wakeup feature, TREK-722/723 supports a 24/7 monitoring mechanism with periodic, digital input & WWAN wakeup.

Specifications

	Model	TREK-722	TREK-723
Display	Type	5" industrial grade wide screen TFT LCD	7" industrial grade wide screen TFT LCD
	Luminance	350 cd/m2 (without touchscreen), auto brightness controlled	400 cd/m2 (without touchscreen), auto brightness controlled by light sensor
	Resolution	800 x 480	800 x 480
	View Angle (R/L/B/T)	70/70/70/50	70/70/70/50
	Contrast Ratio	500 (typical)	500 (typical)
	LED Lifetime	20000 hr (minimum)	20000 hr (minimum)
Touchscreen	Type	4-wire resistive with flat panel design	
	Light Transmission	81±3%	
Kernel	CPU	TI ARM Cortex-A8 AM3703 800 MHz	
	RAM	On board 256MB Mobile LPDDR	
	Storage	On board NAND type 2GB for boot loader, OS & customer's APs 1 x push-push type SD slot	
	Watchdog	Yes	
	RTC	Yes with one time swappable 200 mAh lithium coin battery	
	Operating System	WinCE 6.0 R3 core version / Android Gingerbread 2.3.4 support by project	
Function	GPS (Optional)	Built-in 50 channel u-blox LEA-6S with internal antenna	
	Bluetooth (Optional)	Built-in Class 2 Bluetooth V2.1+EDR with internal antenna	
	WWAN (Optional)	• Built-in Quad-band GPRS module Cinterion TC63i with internal antenna • Built-in UMTS/HSPA+ module Cinterion PH8 with internal antenna • Built-in CDMA/EV-DO module Qualcomm Gobi3000 with internal antenna	
	WLAN (Optional)	Capable of supporting external dongle via USB host port	
	Audio	1 x built-in 2 W mono speaker 1 x MIC input, 1 x mono line-in, 1 x stereo line-out via high density cable	
	Video	1 x CVBS input via high density cable 1 x Y/C input via high density cable	
	USB Client	1 x USB client I/F via USB mini-B connector with rubber door protection	
	USB Host	1 x USB host I/F via USB A-type connector (500 mA) with rubber door protection 1 x USB host I/F via high density cable with USB A-type connector (500 mA)	
	Serial Port	2 x 4-wire RS-232 via high density cable	
	GPIO	2 x isolated digital input (DI) which can wake up system via high density cable 2 x isolated digital output (DO) via high density cable	
	CAN bus	1 x CAN bus 2.0a/b with J1939 protocol via high density ca	
	Function Key	5 x programmable function keys with green LED	
Power Supply	Input Voltage	12 V/24 V option supports 6 ~ 36 V car power design with ISO7637-2 & SAE J1113 compliant	
	Ignition ON/OFF	Power on delay, default 2 seconds; Power off delay, default 5 seconds; Hardware power off delay, default 30 seconds. SW configurable	
	Suspend/Wakeup	300 mW low power saving mode with periodical, DI, WWAN wakeup mechanism	
Mechanical	Material	Plastic chassis with aluminum heat sink	
	Ingress Protection	IP54 except I/O plate at the bottom	
	Weight	650 grams (TREK-722) / 850 grams (TREK-723)	
	Dimension (W x H x D)	165 x 115 x 43 mm (TREK-722) / 213 x 145 x 43 mm (TREK-723)	

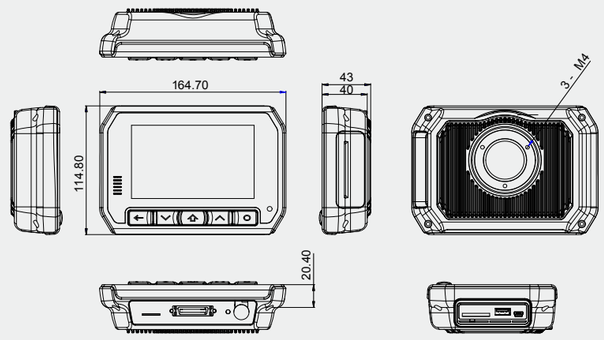
Specifications Cont.

Environmental Specifications	Operating Temperature	-20 ~ 60° C
	Storage Temperature	-30 ~ 80° C
	Relative Humidity	10 ~ 90% @ 40° C (non-condensing)
	Shock/Vibration	Compliant to MIL-STD-810G, SAE J1455, Class 5M3 according to DIN EN 60721-3-5
	Certificate	CE, FCC, UL, CUL, CB, CCC, C-tick, E-mark, PTCRB

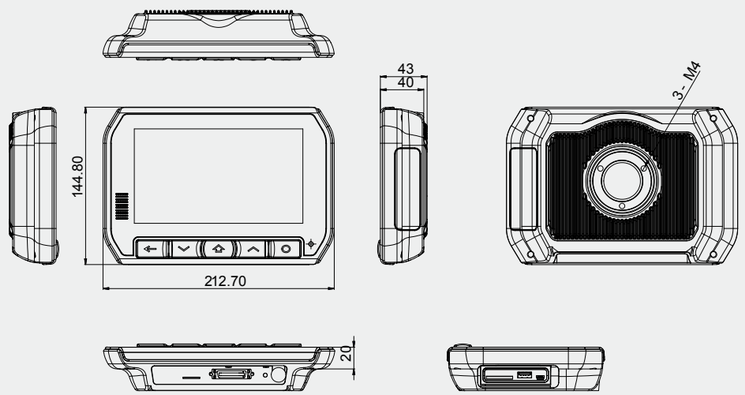
Dimensions

Unit: mm

TREK-722



TREK-723



Ordering Information

Part Number	Description
TREK-722R-A0E	TREK-722 barebone
TREK-722R-CBCEA0E	TREK-722R-A0E w/ GPS, CDMA, BT, CE
TREK-722R-GBCEA0E	TREK-722R-A0E w/ GPS, GPRS, BT, CE
TREK-722R-HBCEA0E	TREK-722R-A0E w/ GPS, HSPA, BT, CE
TREK-723R-A0E	TREK-723 barebone
TREK-723R-CBCEA0E	TREK-723R-A0E w/ GPS, CDMA, BT, CE
TREK-723R-GBCEA0E	TREK-723R-A0E w/ GPS, GPRS, BT, CE
TREK-723R-HBCEA0E	TREK-723R-A0E w/ GPS, HSPA, BT, CE

Accessories

Part Number	Description
1700020042	A Cable MDR 40P/USB-A(M)+Audio Jack*2+DC Jack+BN
1700019611	Cigarette lighter cable for testing purposes (30cm)
9666074302E	19V adapter for TREK-743 test purposes
RAM-MOUNT-02	VESA RAM mount w/2.5" DIA. base,1.5" ball
RAM-MOUNT-07E	75mm VESA base, RAM-202U, and socket ARM

7" Mobile Data Terminal with Intel® Atom™ Z510PT/Z520PT Processor

TREK-753

ITS/Telematics Excellent 100

TAIWAN EXCELLENCE 2012

Features

- 7" WVGA LCD with 5 programmable adjustable brightness hot keys
- Windows® Embedded Standard (WES) 2009, WinCE6.0 and Ubuntu Linux 10.04
- Supports analog video input & CAN2.0b with J1939 protocol
- Supports CDMA/HSDPA/GPRS, GPS, WLAN, BT communications
- 12 V/24 V option: 6 ~ 36 V input range compliant to ISO7637-2 & SAE J1113 standards
- 48 V option: 18 ~ 58 V input range for specific applications
- Fanless and ruggedized aluminum chassis, able to work under
- -30 ~ 60° C temperature range

Introduction

TREK-753 is a new generation, all-in-one 7" mobile data terminal with touchscreen, with a compact design for commercial vehicles. With an Intel® Atom™ Z510PT/Z520PT processor,the system is high performing with wired connections like Gigabit Ethernet & CAN2.0b with J1939 protocol support; users can also connect to network services using easily with CDMA/ HSDPA/ GPRS/ GPS/ WiFi/ BT options. Focused on the automotive market, TREK-753 is designed with vehicle power which is compliant with ISO7637-2 & SAE J1113, ensuring the system is more stable during engine starts. Die casting and a ruggedized chassis not only provide more capabilities in a wide range of temperatures (-30 ~ 60° C), but TREK-753 is also suitable for harsh environments subject to shock (100 G, 6 ms) and vibration.

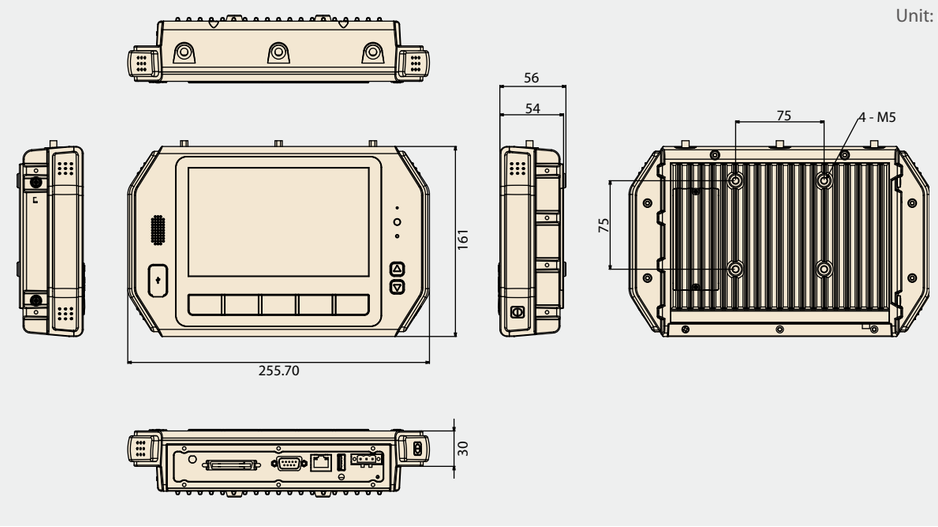
Specifications

Processor System	OS	Windows® Embedded Standard (WES) 2009, WinCE6.0 and Ubuntu Linux 10.04
	CPU	Onboard Intel Atom 1.1 GHz / 1.33 GHz (optional)
	Chipset	Onboard Intel LE82US15EE
	Watch Dog	Yes
	RTC	Yes with one time 200mAh li-ion coin battery
	RAM	1 x 200-pin SODIMM socket supports a memory module of up to 2 GB
	Storage	1 x external accessible type II Compact Flash memory card (bootable device) 1 x SD card with external access for extra capacity (SD function is not available with WinCE6.0)
	Bus Expansion	1 x mini-PCIe slot for built-in WLAN (b/g/n) module 1 x mini-PCIe slot for built-in CDMA/HSDPA (USB 2.0 interface)
LCD	Display Type	7" 16:9 industrial degree TFT color TFT LCD, LED backlight
	Luminance	400 cd/m2 (average with TS)
	Max. Resolution	WVGA 800 x 480, 10% ~ 100% brightness controlled by two hardware buttons on the front panel and a light sensor
Touchscreen	Type	4-wire analog resistive type, continuous resolution, optional support for sunlight readable touchscreen
I/O Function	COM	3 x COM ports: • 1 x full function RS-232 port supports high speed (up to 1Mb max.) with 12 V/2.5 A in I/O plate • 1 x full function RS-232 supports high speed (up to 1 Mb max.) port via high density connector • 1 x RS-485 port via high density connector
	Audio	1 x built-in 2 W speaker on front panel 1 x line-in, 1 x line-out, 1 x microphone input via high density connector
	Function Keys	5 x green lit, programmable function keys, 2 x for LCD back light adjustment
	USB	3 x USB 2.0 ports 1 x rubber door protection at front panel, 1 x type A connector with cable clip, 1 x high density connector
	Video Input (Rear View Monitor)	1 x video input for rear view camera via high density connector
	LAN	1 x 100/1000T Gigabit Ethernet via RJ-45 connector
	Light sensor	1 x light sensor on front cover for auto LCD backlight adjustment
	DI/DO	4 x isolated digital input & 4 x isolated digital output ports
	CAN Bus	1 x CAN 2.0b with J1939 protocol via high density connector
	J1708	1 x J1708 via high density connector
RF Function	GPS (Optional)	Built-in 50 channel GPS uBlox LEA-5S with SMA connector for external antenna
	Bluetooth (Optional)	Built-in Class 2 Bluetooth V2.0 + EDR module with internal antenna
	WWLAN (optional)	Built-in Quad-band 900/1800/850/1900MHz GSM/GPRS module Cinterion MC55i with SMA connector for external antenna
		Built-in HSDPA module Sierrawireless MC8790V with SMA connector for external antenna
		Built-in CDMA module Sierrawireless MC5728 with SMA connector for external antenna
	WLAN (Optional)	Built-in AzureWave AW-NE768 IEEE 802.11b/g/n with SMA connector for external antenna
Power Supply	input Voltage	• 12 V/24 V option supports 6 ~ 36 V car power design with ISO7637-2 & SAE J1113 compliance • 48 V option supports 18 ~ 58 V input for specific applications
	Ignition On/Off	Power on delay, default 2 seconds; Power off delay, default 5 seconds; Hardware power off delay, default 30 seconds. SW configurable
	LED indicator	1 x yellow LED shows system power ready (on front panel)

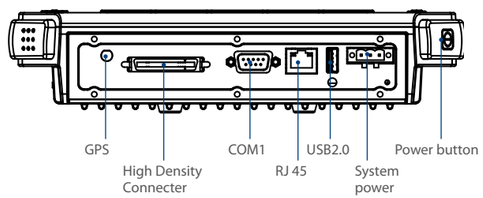
Mechanical Design	Material	Aluminum
	Protection	IP54 (except I/O plate), option to support entire system IP54 with additional I/O cover (9668TREK37E)
	Weight	~2.2 kg (~4.85 lbs)
	Dimensions (W x H x D)	255.7 x 161 x 56 mm (10.04" x 6.30" x 2.20")
Environmental Specifications	Operating Temperature	-30 ~ 60° C
	Relative Humidity	Compliant to 10 ~ 90% @ 40° C (non-condensing)
	Vibration Shock	MIL-STD-810G (US highway truck), Method 516.5, SAE J1455, Class 5M3 in accordance with DIN EN 60721-3-5
	Certifications	FCC class B (include Part 22 24E), UL, CUL, CE, CCC, CB, E-mark

Dimensions

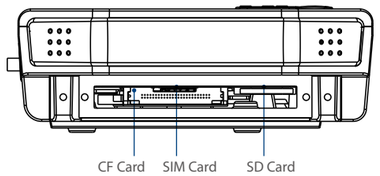
Unit: mm



Fully Integrated I/O



Side View



Ordering Information

Part Number	Description
TREK-753R-0A0E	TREK-753R Bare bone with Z510 1.1 G CPU
TREK-753R-1A0E	TREK-753R Bare bone with Z520 1.3 G CPU
TREK-753S-0A0E	TREK-753R Bare bone with 1.1 G CPU/SR T/S*
TREK-753R-CWBXPA0E	TREK-753R w/CDMA/GPS/WLAN/BT/1 GB RAM/4 G CF/WES
TREK-753R-HWBXPA0E	TREK-753R w/HSDPA/GPS/WLAN/BT/1 GB RAM/4 G CF/WES
TREK-753R-GWBXPA0E	TREK-753R w/GPRS/GPS/WLAN/BT/1 GB RAM/4 G CF/WES

*Note: SR T/S stands for Sunlight Readable TouchScreen.

TREK-753 CTOS Kit

Part Number	Description
9668TREK30E	TREK-753R RevA0 GPS kit
9668TREK31E	TREK-753R RevA0 WiFi (Azurewave) kit
9668TREK32E	TREK-753R RevA0 HSDPA kit
9668TREK34E	TREK-753R RevA0 GPRS kit
9668TREK35E	TREK-753R RevA0 AC/DC power kit
9668TREK36E	TREK-753R RevA0 BT module kit

Accessories

Part Number	Description
1700019307	High density cable (2 meters)
1700019611	Cigarette lighter cable for testing purpose (30cm)
RAM-MOUNT-01	VESA RAM mount w/clamp base 1.5" ball
RAM-MOUNT-06E	VESA RAM mount w/VESA base, 1.5" ball
9668TREK37E	IP54 I/O housing cover for TREK-753

7" Smart Vehicle Display

TREK-303DH

Features

- 7" display with touchscreen supports 800 x 480 resolution
- -30 to 70° C wide range temperature
- Five user-defined function keys, 2-watt speaker x 2, and USB host.
- Supports auto-dimming
- One cable connects with TREK box solutions
- Power on/off button on the side
- CE/FCC/CCC certified

Introduction

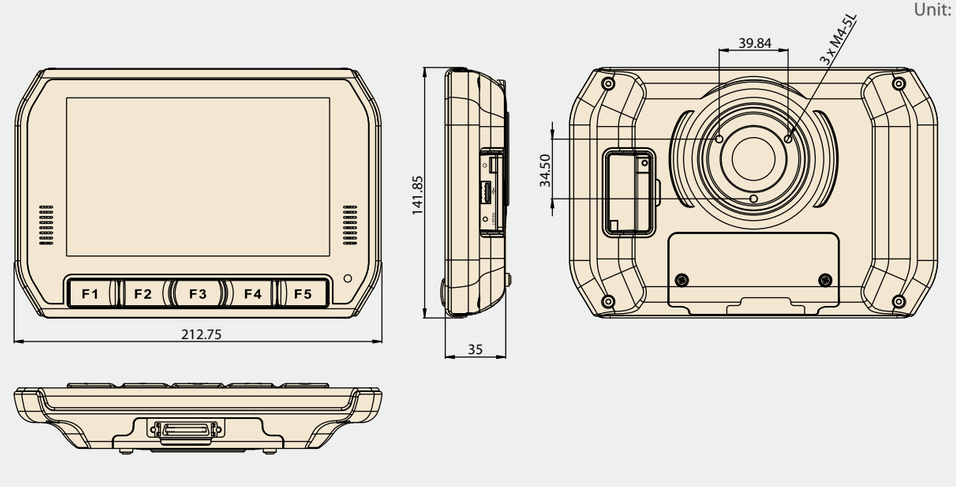
The TREK-303DH is a vehicle display system for Mobile Resource Management (MRM) applications in trucks and buses. The TREK-303DH touch panel is ideal for fleet management and dispatch applications. It also meets requirements for automotive grade working temperatures (-30 ~ 70° C). TREK-303DH provides excellent display capabilities, featuring lightweight housing, it's compatible with RAM mounting solutions that customers can easily install. TREK-303DH supports resolutions of 800 x 480; it is compatible with TREK box solutions connecting with only one cable. TREK-303DH is designed with drivers in mind: when the system requires powering up or waking up, it can be easily controlled from the button located on the side; and for night driving, the panel has an auto detecting light sensor to automatically adjust brightness.

Specifications

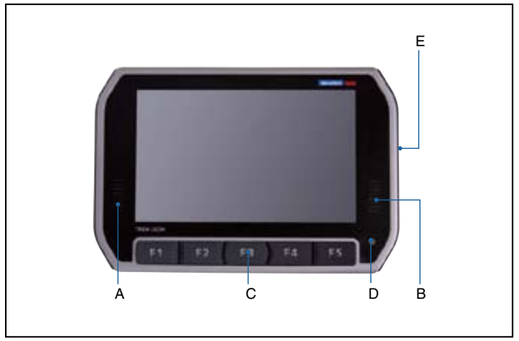
LCD	Design Compatible Models	Paired with TREK box solutions
	Resolution (pixel)	800 x 480
	LVDS interface	18-bit
	Pixel Pitch	0.2168 (H) x 0.2168 (V)
	Brightness (cd/m2)	390 (typical) with touchscreen
	View Angle (R/L/B/T)	70° / 70° / 60° / 60°
	Contrast Ratio	500
	Lamp Life (hrs)	50,000 (hrs)
	Lamp Type	LED
Touchscreen	Touchscreen	4-wire resistive
Front Plane	Speaker	2-watt x 2
	Hotkeys	5 hotkeys (user defined)
	Brightness Control	Supports auto-dimming
Side Cover		Power button, USB host X 1, reset button
Bluetooth		Optional, supports Bluetooth Class II, version 2.0 + EDR, antenna built-in
Power	DC Input	12 V +- 5%
	Power Consumption	~12 W (Max.), ~4 W (normal)
Mechanical	Mounting	Design compatible with RAM mount
	Material	PC
	Weight	0.76 kg
	Dimensions	212.75 x 141.85 x 35 mm
Environment	Operating Temperature	-30 to + 70° C
	Storage Temperature	-40 to + 80° C
	Vibration	MIL-STD-810G, SAE J1455 4.9.4.2
	IP Rating	IP 31 (entire system), IP 54 (without I/O)

Dimensions

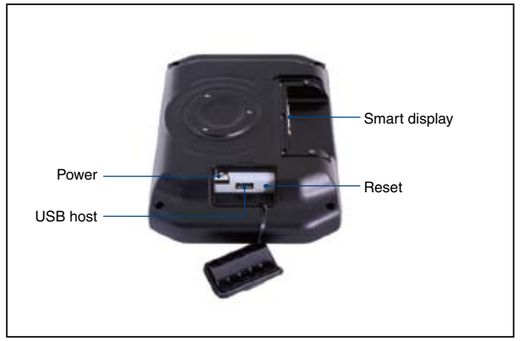
Unit: mm



Fully Integrated I/O



A. B. Spaeker
C. User-defined hotkeys
D. Light sensor
E. Reset, power, USB host (side)



Ordering Information

Part Number	Description
TREK-303D-HA0E	7" vehicle display system, 800 x 480 resolution, with 4-wire resistive touchscreen, 2-watt speaker x 2
RAM-MOUNT-07E	5.625" double socket arm for 1.5" ball base
1700018342	2-meter cable (paired with TREK-550 and TREK-668)

Packing List

Part Number	Description	
TREK-303D-HA0E	7" vehicle display system, 800 x 480 resolution, with 4-wire resistive touchscreen, 2-watt speakers x 2	1
1930001722	RAM mount screw	3

ARM-based, In-Vehicle Computing Box

TREK-510

ITS/Telematics
Excellent 100

Features

- ST ARM based STA2062 333 MHz CPU with Win CE
- Automotive grade working temperature range (-30 to 70° C)
- Rich I/O such as CAN, multi-COMs, isolation 4DI/4DO, line out, Mic in,USB, SD
- Built-in RF communication modules, such as GPRS/HSDPA/CDMA
- Certifications: CE, FCC, E-mark and MIL-STD-810G, ISO7637-2, SAE J1113, SAE J1455 regulations
- Ignition on/off delay; SW detectable/controllable for car power management

Introduction

The TREK-510 is a dedicated box computer for industrial vehicle fleets, transport trucks, buses and taxis. TREK-510 combined with a variety of I/O connectors can be connected to devices like OBD-II or TPMS (Tire Pressure Monitoring System).
Built-in wireless communications-WWAN enable TREK-510 to send important driver/vehicle/location/car information back to the control center. TREK-510 can also operate in extreme environments with features like a wide working temperature range (-30 to 70 degrees) and anti-shock/vibration design. TREK-510 also uses a special design to handle the critical issue of in-vehicle power. Special power protection (ISO7637-2/SAE J1455 Class A/ SAE J1113) and car power management software (Ignition on/off, delay on/off, low battery monitor) prevent electrical noise and surges from impacting the system, guarding against damage from transient car power.

Specifications

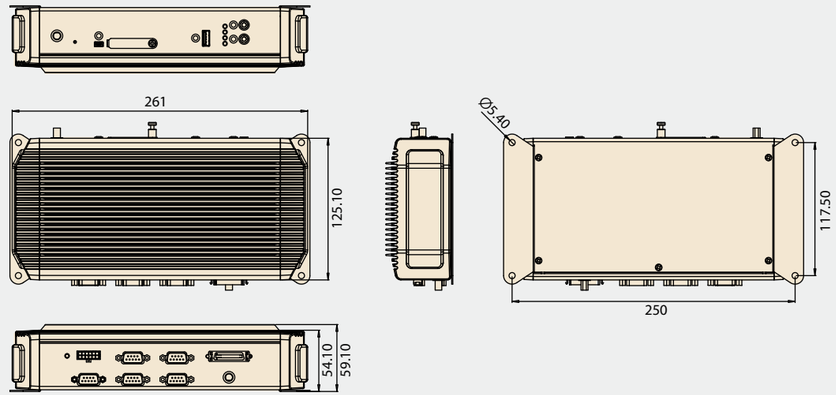
System	Soc	STM industrial degree STA2062 ARM9-based 333 Mhz RISC SOC	
	System Memory	Mobile DDR 128 MB	
	Watchdog	Yes	
	RTC	Yes, with one time 200 mAh coin battery	
	Operating System	Win CE 5.0 English core version as default	
Physical	Dimensions	261 x 125 x 59.1 mm	
	Weight	1.5 kg	
Storage	On Board Flash	2 GB on board flash for bootloader, image & Customer's AP	
	SD slot	1 x (external accessible)	
Display Interface	Smart Display Port	Design compatible with TREK-303L, 7" smart display, the signal includes: • 18-bit LVDS out • 1 x RS-232 • 1 x audio line out • 1 x USB Host • 12 V @ 1 A output	
I/O	CAN	1 x CAN 2.0 A/B by DB9 with J1939 protocal	
	USB Host	1 x USB 2.0 host port by type A	
	USB Client	1 x USB Client by Mini Type AB	
	Mic In	1 x RCA jack	
	Speaker-out	1 x RCA jack	
	COM Port	COM 1&2: 2 x Full Function RS-232, 5 V/12 V @ 0.5 A, ping9, by jumper selection COM3: 1 x 4-wire RS-232/485 (controlled by software), 5 V/12 V @ 0.5 A, ping9, by jumper selection	
	Isolation DI/DO	4 x Isolated dry contact digital inputs from DB9 connector (2500 Vrms protection) 4 x relay driver from DB9 connector	
Communication	WWAN	GPRS - Cinterion MC55i: Support GPRS class 10 (Quad-band) CDMA - Sierra Wireless MC 5728V: Support EV-DO REV A, EV-DO,CDMA (1900 MHz, 800 MHz) HSDPA - Sierra Wireless MC 8790V: Support EDGE, GPRS, GSM, HSDPA, HSUPA (GPRS/EDGE class B, multislot class 12) (Quad-band)	
GPS	RF Receiver Type	32 Channels (built-in), GPS L1 frequency, C/A code	50 channels, GPS L1 frequency (option)
	Cold Start	39 s	29 s
	Warm Start	33 s	29 s
	Hot Start	< 1 s	< 1 s
	AGPS	3 s	< 5 s
	Acquisition	145dBm	160dBm
	Protocol	NMEA Input/output, ASCII, 0183, 2.3 (compatible to 3.0)	
	Antenna	SMA connector for external antenna	
G-sensor		Yes, built-in	
LED	LED indicator	Power (Red), GPS operation (Blue), WWAN link (Green), Status (Green)	

Specifications Cont.

Car Power Design	DC-Input	Supports 12/24V car power systems (6V ~ 36V wide DC input, ISO 7637, SAE J1113)
	Power Management	Power on/off delay, Power on delay, 2 sec by default Power off delay, 5 sec by default Delay time allow control by SW configuration Low voltage protection
	HW Reset	Yes, 1 reset button
Environment	IP rating	IP31
	Operating Temp.	-30° C ~ +70° C
	Storage Temp.	-40° C ~ +85° C
	Vibration/shock	MIL-STD-810G, Method 516.5
	EMC	CE, FCC
Certifications	Safety	CE, CB
	Vehicle Power Regulations	E-mark, SAE J1455, SAE J1113, ISO7637-2, compliance
Mechanical	Material	Top cover (Aluminum extrusion) Side cover (PC) Bottom & I/O cover (metal)

Dimensions

Unit: mm



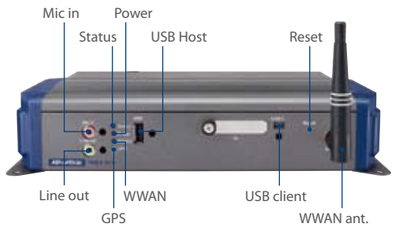
Ordering Information

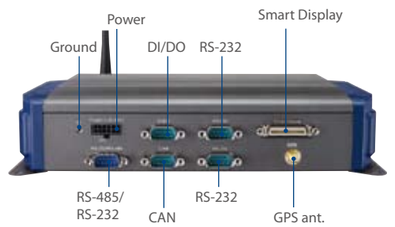
Part Number	Description
TREK-510-GCEA0E	Vehicle computing system with ST 2062 processor, 128 MB RAM and 2 GB NAND flash, GPS, GPRS, Win CE 5.0
TREK-303R-LA0E	7" vehicle display system, 480 x 234 resolution,
1700018342	2-meter cable (paired with TREK-510)

Packing List

Part Number	Description	Quantity
TREK-510-GCEA0E	ARM-based, in-vehicle computing box	x1
1700018306	Power cable	x1
1750001380	GPS Antenna	x1
1750006080	WWAN Antenna	x1
2068051000	Startup manual CD	x1
19900018848T000	Cable clip for MIC in, line out, USB host,USB client	x4

Fully Integrated I/O





Intel® Atom™ In-Vehicle Computing Box

TREK-550

ITS/Telematics Excellent 100 | BC AWARD | TAIWAN EXCELLENCE 2011

Features

- Supports Win CE 6.0, WES 2009, XP and Linux (Ubuntu 10.04/2.6.34)
- Automotive grade working temperature range (-30 to 70° C)
- Rich I/O including CAN, LAN, RS-232, RS-485, J1708, 4DI/4DO (isolated), Line out, Mic in, USB, and Video-in
- Built-in communication modules, including GPRS/HSDPA/CDMA, WLAN & Bluetooth
- GPS with AGPS and dead reckoning technology (Gyro & speed line)
- Certifications: CE/FCC/E-mark, MIL-STD-810G, ISO 7637-2, SAE J1455, SAE J1113 regulations
- Dual independent display/audio output for both driver and passenger
- Ignition on/off delay; SW controllable for car power management

E13 | Windows Embedded | FC CE RoHS

Introduction

The TREK-550 is a dedicated box computer for industrial vehicle fleets, transport trucks, buses and taxis. TREK-550 combined with variety of I/O connectors can be connected to devices like OBD-II or TPMS (Tire Pressure Monitoring Systems). Dual display/dual audio interfaces supporting different resolutions can deliver different applications to different displays; eg: one application to a fleet driver and another to a digital signage application.Built-in wireless communications (WWAN, WLAN, BT) enable TREK-550 to send important driver/vehicle/location/cargo information back to the control center. TREK-550 can also operate in extreme environments with features like a wide working temperature range (-30 to 70° C). TREK-550 also uses a special design to handle the critical issue of in-vehicle power. Special power protection (ISO7637-2/SAE J1455 Class A/ SAE J1113) and car power management software (Ignition on/off, delay on/off, low battery monitor) prevent electrical noise and surges from impacting the system, guarding against damage from transient car power. TREK-550 also supports a rear view monitor via a video port connection. With this feature, drivers can monitor the environment on both sides of the truck in real-time for driving safety. TREK-550 can also support dead-reckoning, meaning the truck can still be traced even when the driver is driving in a tunnel.

Specifications

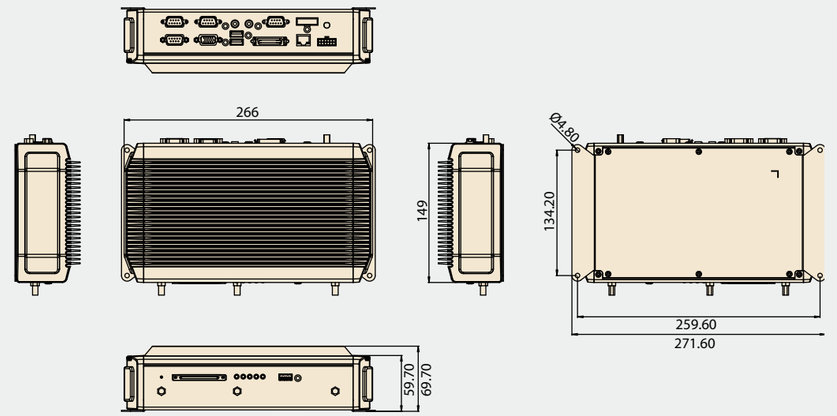
System	CPU	Intel Atom XL Z510PT 1.1 GHz (Z520PT 1.3 GHz is optional) (Industrial grade)
	Chipset	Intel LE82US15EE
	System Memory	1 x 200-pin SODIMM socket; Supports up to 2 GB industrial DDR2 400/533 memory module
Physical	Dimensions (W x H x D)	266 x 149 x 69.7 mm
	Weight	2 kg
Storage	Compact Flash	1x Type II (externally accessible)
Display interface	Smart Display Port	Design compatible with TREK-303H, 7" smart display signal includes: • 8-bit LVDS out • 2 x RS-232 ports • Mono audio out • 1 x USB host • 12V DC output @ 1A output
I/O	CAN	1 x CAN 2.0 A/B (J1939 protocol is ready, 2500Vrms isolation protection) via box header
	Video in	• 2 x composite video inputs for rear view monitor; bypass to digital display port; doesn't support video recording(NTSC, PAL, SECAM with automatic format detection)
	USB Host	3 x USB host ports type A connectors with cable clip (front I/O panel x1; rear I/O panel x2)
	Mic in	1 x Mic-in jack with cable clip
	Line out	1 x line out jack with cable clip
	COM port	• 2 x full function RS-232 ports, 5 V @ 500 mA, 12 V @ 250 mA, ping9, jumper selected • 1 x 4-wire RS-232, 1 x RS485, 1 x J1708
	Isolation DI/DO	• 4 x isolated dry contact digital inputs via DB9 (2500 Vrms protection) • 4 x relay drivers via DB9
	VGA output	1 x VGA output via DB-15 (independent display)
	LAN	1 x 10/100/1000 Ethernet (with LEDs) via RJ-45 with cable clips
Communication	WWAN	GPRS - Cinterion MC55i (option), CDMA -Sierra Wireless 5728V (option) and HSDPA-MC8790V (option), with SMA connector for external antenna
	WLAN	Optional, supports 802.11 b/g/n, with SMA connector for external antenna (through internal Mini PCI Express)
	Bluetooth	Optional, supports Bluetooth Class II, Version 2.0 + EDR, antenna built-in
GPS (dead reckoning)	Model	ublox industrial grade LEA 5S
	RF Receiver Type	50 channels GPS L1 frequency, C/A code
	Cold Start	29 s
	Warm Start	29 s
	Hot Start	<1 s
	AGPS	<5 s
	Acquisition	• 160 dBm
	Protocol	NMEA (Input/Output, ASCII, 0183,2.3 (compatible to 3.0) UBX (u-blox proprietary protocol) (Note: Dead Reckoning optional)
G sensor		Built-in
LED	LED indicator	• Power (Red) • Storage Access (Green) • WLAN data transfer (Green) • WWAN link (Green) • GPS operation (Blue)

Specifications Cont.

Car Power Design	DC-input	Supports 12/24 V car power system by ISO7637-2 & SAEJ1113 (6V ~ 36V wide DC input)
	Power Management	Power on/off delay, • Power on delay, 2 sec default • Power off delay, 5 sec as default • Delay time controllable by SW configuration • Low voltage protection
	HW Reset	1 reset button
Environment	IP Rating	IP 31
	Operating Temp.	-30° C ~ +70° C
	Storage Temp.	-40 °C ~ +85° C
	Vibration/Shock	MIL-STD-810G/ 202A, Method 516.5, EN60721-3 (5M3) compliant
	EMC	CE, FCC, IC
Certifications	Safety	CE, CB
	Vehicle Power Regulation	E-mark, SAE J1455, SAE J1113, ISO7637-2 level IV compliant
Mechanical	Material	Top cover (Aluminum extrusion) Side cover (PC) Bottom & I/O cover (metal)

Dimensions

Unit: mm



Ordering Information

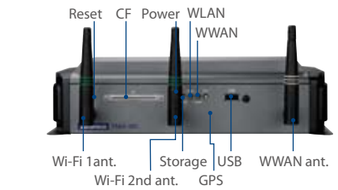
Part Number	Description
TREK-550-00A1E	Intel Atom Z510PT 1.1 GHZ GPRS Barebone
TREK-550-01A1E	Intel Atom Z510PT 1.1 GHZ HSXPA CDMA Barebone
TREK-550-10A1E	Intel Atom Z520PT 1.3 GHZ GPRS Barebone
TREK-550-11A1E	Intel Atom Z520PT 1.3 GHZ HSXPA / CDMA Barebone
9668TREK20E	Cinterion MC55i 4 Band GPRS Kit
9668TREK21E	Sierra Wireless 5728V CDMA Module Kit
9668TREK22E	Sierra Wireless 8790V HSUPA Module Kit
9668TREK23E	802.11 B/G/N Module Kit
9668TREK25E	u-blox LEA-5S GPS Module Kit

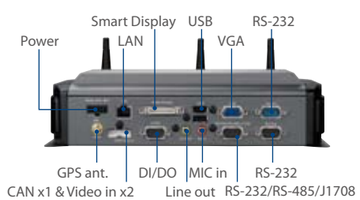
(Note: Module kits include RF, antenna and internal cable)

Packing List

Description	Part Number	Quantity
TREK-550		x1
CAN/Video-in cable (15 cm)	1700018743	x1
Power cable (1.8 m)	1700018306	x1
Startup manual CD	2068055000	x1
Cable clip for Mic in, line out, USB host, LAN	1990018848T000	x6

I/O Connectors





In-vehicle Surveillance with Fleet Management Computing Box

TREK-668

Features

- Automotive grade working temperature range (-30° C to 60° C)
- Rich I/O including CAN, RS-232, RS-485, J1708, 4DI/4DO (isolated), Line out, Mic in, USB.
- 4/8/12 channel analog video input, one PSE for IP Camera supports 30 frames D1 resolution per channel per second. (Supports up to 16 channels for half D1 resolution)
- Built-in communication modules, including GPRS/HSDPA/CDMA, WLAN & Bluetooth, supports dual SIM, dual HSDPA, supports dual SIM cards and dual WWAN module mechanism
- GPS with AGPS and dead reckoning technology (Gyro & speed line)
- Certifications: CE/FCC/E-mark, MIL-STD-810G, ISO 7637-2, SAEJ1455,SAE J1113 regulations
- Ignition on/off delay; SW controllable for car power management

Introduction

TREK-668 is an industrial-grade, dual-core computing box designed to provide high-quality video surveillance and fleet management for police car, ambulance, fire engine, buses and trains.TREK-668 delivers tracking and positioning and also supports dead-reckoning, which allows a truck to be traced even if the driver is in a tunnel. It supports the J1939 protocol for vehicle diagnostics and driver behavior management, and it supports high-quality, MPEG-4, MJPEG, H.264 recording, and transmission for up to 12 camera inputs. It has one PSE for an IP camera, and dual display/dual audio interfaces which support different resolutions. Each camera input provides motion detection capabilities; there are 8 audio inputs. The TREK-668 provides reliable on-board recording and can transmit images or alarms for remote monitoring over a wireless, GPRS, 3G, or HSDPA network connection.

Specifications

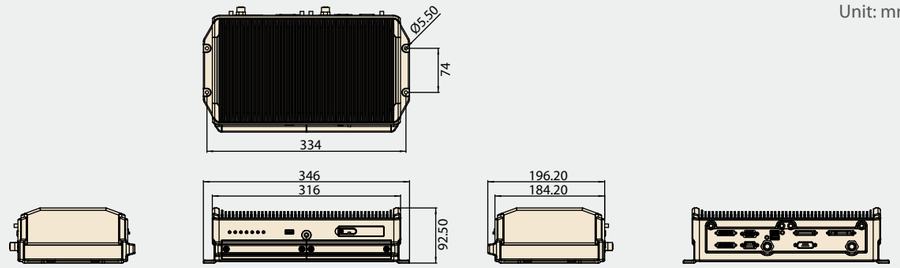
Core	CPU	Intel Atom N2600 1.6Ghz. (Dual core)
	System Memory	DDR 3 800MHz , up to 2GB
	Chipset	Intel® NM10 Express Chipset
	Graphic	Integrated 2D/3D Graphics Engine Supports Directx* 10.1 compliant Pixel Shader* v2.0 and OGL 3.0
	Video Encoder Engine	Stretch S7
	OS	Windows WES7/Win7
Video/Audio	LVDS out	18-bit LVDS interface (Paired with TREK-303D-HA0E, 800 x480 resolution)
	VGA	1 x via DB15
	Video in for Surveillance	4/8/12 Video inputs, with 12V/2A power supply for camera
	Video Compression	MJPEG, H.264, MPEG4, by D1 resolution 30 frames per channel per second
	Video/Audio Input Connector and Format	DVI-I connector, (NTSC, PAL), with 12V/2A power supply
	Audio in	Up to 8 mono audio inputs
	Audio Compression	Audio format G.711
	Mic in	1x via extended I/O port
	Line out	1x via extended I/O port
Storage	Storage	2 x optional SSD/ SATA 2.5" MHDD, external accessible with key protection 1 x Type I/II CompactFlash card
I/O	RS-232	1 x RS-232 full function; one via extended I/O port; 1 x RS-232 full function with 12V / 0.5A via DB92
	RS-485	1 x RS-485 with auto flow control via extended I/O port; 1 x RS-485 design reserve for PTZ camera via DVI-I port (either DVI 1-8 port, or DVI 9-16 port)
	J1708	1 x DB15 female connector, integrated with CAN bus in single one connector
	USB	4 x USB (2 on rear I/O panel, 1 on front panel, one for TREK-303)
	DI/DO	8 in, 4 out 4 x isolated DI and 4 x relay DO via extended I/O port; 4 x isolated DI via DB15 connector
	LAN (PSE)	1 x Giga LAN 10/100/1000 Mbps Ethernet controller, supports POE IP camera, IEEE 802.3af compliant, and provides up to 15.4 watts power output
	CAN Bus Port	1 x CAN bus (Protocol: J1939)
	LED	1. Power (red) 2. CF (green) 3. WiFi (Green) 4. WWAN (Green) 5. GPS (blue) 6. HDD/SSD (amber)
RF	WWAN	HSDPA/CDMA: Sierra Wireless MC8790V/MC5728V via miniPCIe card GPRS: Cinterion MC55i (GSM/GPRS, class10) (Note: option supports dual SIM, dual HSDPA or GPRS, 3.5G, in this case, doesn't support WLAN)
	WLAN	802.11a/b/g/n (by MiniPCIe)
	Bluetooth	Bluetooth Class II, version 2.0 + EDR, antenna built in
GPS	GPS	Default LEA-6S, option ublox LEA-6R (Gyro on board) for dead reckoning (Note: Must connect with direction and speed line)
	Channels	50 channels (Supports GPS and Galileo system)
	Cold/ Warm Start	29 s
	Hot Start	< 1 s

Specifications Cont.

GPS	Aided Start	< 5 s
	Reacquisition	-160 dBm
Security	G-sensor	For auto SOS
Power	Reset Button	Supported
	Power Out	+12 V / 2 A via DVI-I per port; +12V / 1.5A and 5V/1.1A via extended I/O port; DB9 Pin 9 (optional with 5 V / 0.5 A jumper selected); +12 V / 1.5 A via smart display port (Default for TREK-303)
	DC Input	9~32 VDC (12/24V) car power compliant with SAE J1113, ISO7637-2 level IV
Environment	Dimensions (W/D/H)	346 x 97 x 196.2 mm
	Weight	5.7 kg (including 2 HDD)
	Operating Temp.	-30°C to 60°C
	Storage Temp.	-40°C to 85°C
	Humidity	95% ±5%
	Vibration	Compliant with SAE J1455, MIL-STD-810G, Method 516.5
Certifications	RF Certifications	Part 22/24E certified, RF module PTCRB certified, whole system PTCRB compliant.
	Safety	CE/FCC

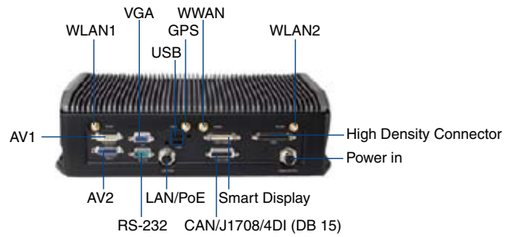
Dimensions

Unit: mm



I/O Connectors

Rear View



Front View

Remark: RS-485 x1 (Either AV1 or AV2)

Ordering Information

Part Number	Description
TREK-668-00A0E	TREK-668 barebone with Blutooth
9668TREK58E	WLAN Kit w/antenna for TREK-668
9668TREK59E	GPRS Kit w/antenna for TREK-668
9668TREK60E	HSXPA Kit w/antenna for TREK-668
9668TREK61E	GPS (LEA-6S) Kit w/antenna for TREK-668
9668TREK62E	GPS (LEA-6R) Kit w/antenna for TREK-668

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