

▶ Railway Control  
and Management

▶ Fleet Management

▶ Vehicle Telematics

▶ Mobile Surveillance

**Lanner**

# Intelligent Transportation

Solution Brief





## Enabling Intelligence in Train Control and Management

LVR-8300

### Background

Many governments and transportation companies in the world are seeking intelligent and secure rolling stock solutions to reduce traffic congestion, air pollution and commuting time between urban and rural areas. In fact, today's passengers and operators demand more than just reliability and efficiency, but also comfort, infotainment and environmental friendliness. To meet the ever complicated demands, a more integrated system with high degree of modular flexibility and scalability is required to integrate train-and-ground communication, air conditioning, door sensing/warning, passenger information system, and also surveillance and infotainment. A major Europe-based rolling stock manufacturer and provider came to Lanner with the following system requirements:

- Exceptional Computing Capability
- EN50155 Certified
- Digitalized Serviceability
- Modular Flexibility and Scalability
- Convenient Maintenance

### Lanner Solution

Lanner's LVR-8300 is a highly-integrated 3U rail system packing high-processing CPU, sixteen M12 PoE ports, EN50155 certified endurance and multiple modular expansions to operate as the brain of intelligent rail systems.

LVR-8300 is built with a high-processing, 4th Generation Intel® Core™ i5 4422E CPU (codenamed Haswell). The CPU is able to handle high-volume data transmissions and information flow, and process multimedia contents efficiently. Built with Intel x86 open-standard, the system structure can be easily diagnosed and maintained.

LVR-8300 offers up to sixteen M12 PoE Ethernet ports for connections with networking devices like WiFi access points and/or IP surveillance equipments. With M12 connectors, LVR-8300's Ethernet ports can function reliably in rail environments.

LVR-8300 has been EN50155 certified for protections against shock, vibration, temperature, humidity and surge. Regarding hardware component reliability, LVR-8300 is designed with open-standard architecture and hardware monitoring capability for convenient diagnose and maintenance

LVR-8300 is a highly scalable system with multiple modular expansions providing I/O functions including serial COM ports, GPIO, DVR, SATA/mSATA storage space, and the mini-PCIe sockets with SIM card readers for WiFi/3G/4G connectivity. This high-scalability nature allows LVR-8300 to be adapted in various rolling stock environments, simply by applying function-specific modules.

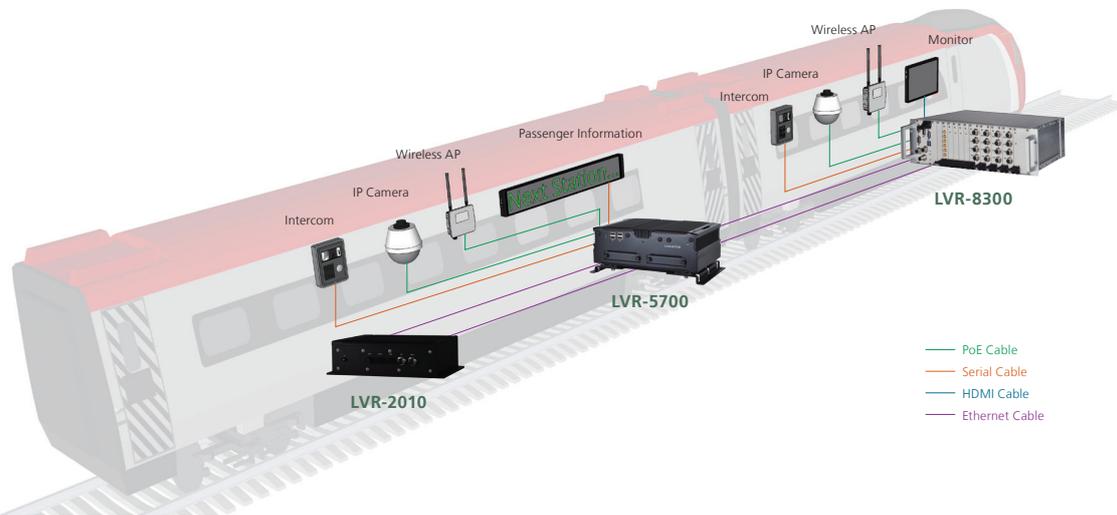
### Key Applications

- Onboard Video Surveillance
- Audio Intercom
- GPS Location-Based Service
- Digital Signage and Infotainment
- Emergency Alarm System
- Passenger Information System
- Driver Advisor System
- Wi-Fi Hot Spot

# Enabling Intelligence in Train Control and Management



## Scenario



## Featured Products



### LVR-8300

#### Rackmount Rolling Stock Control Box

- Intel® Core™ i5-4422E/Celeron 2002E Processor
- Support 16 x IEEE 802.11at PoE Ports
- Robust Vibration-proof IP67 / M12 I/O Ports
- Flexible I/O Module Design for Customization
- EN50155 Compliance

### LVR-5700

#### Fanless Rolling Stock IP67 Control Box

- Intel® Core™ i7-3517UE 1.7 GHz
- Robust Vibration-proof IP67 / M12 I/O Ports
- Pass MIL-STD-810G Vibration & Shock Test
- EN50155 Compliance

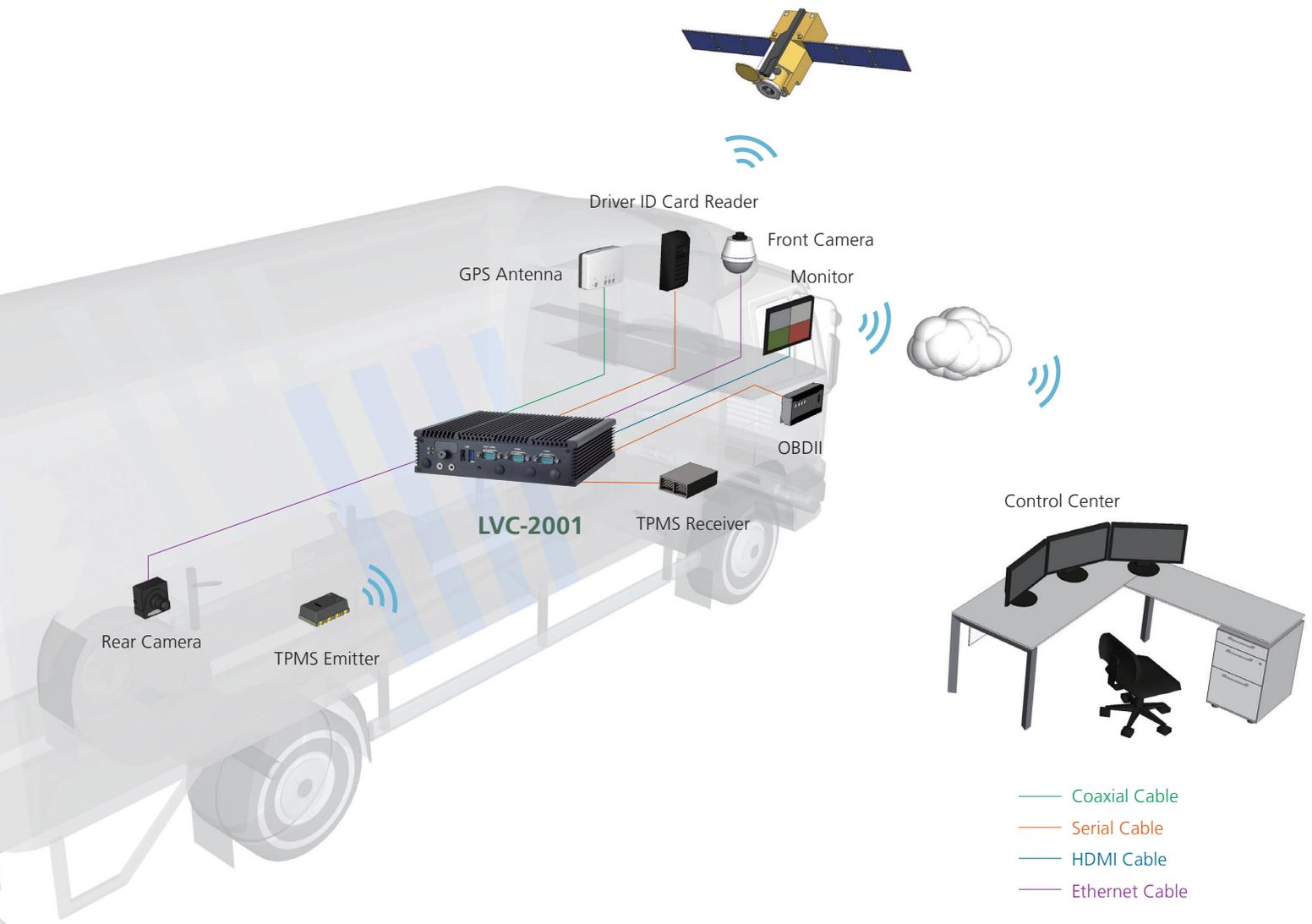
# Networked Vehicles Improves Service Fleet Productivity



## Background

Nowadays, service fleet managers have put a strong emphasis on vehicle-to-center networking and communications in order to improve their productivity, cost-effectiveness and customer satisfaction. They are mostly centered at driver safety, fuel-efficiency, usage-optimizations, and asset monitoring. In other words, fleet managers wish to establish more efficient communication and job-dispatch mechanisms between service fleets and operation centers. To optimize fleet-management serviceability, Lanner has identified several technical requirements:

- Asset Monitoring
- Networked Vehicles and Telematics
- Navigation
- Shock and Vibration



# Networked Vehicles Improves Service Fleet Productivity



## Lanner Solution

To strengthen communications between dispatched fleets and operation centers, Lanner's VLC- product lineups are designed with multiple mini-PCIe sockets for Wi-Fi and Cellular (3G/4G/LTE) modules. In addition, Lanner's VLC-2001 supports multiple SIM card function so that service fleets can automatically switch to different regional network service providers/carriers when traveling to another region/country. This will greatly save SIM roaming cost.

GPS is another necessary implementation in Lanner's vehicle computing line. With this navigation feature, vehicles on missions can optimize their traveling time with route planning, since time waste and fuel are the largest expense for fleet services.

Physical reliability is also taken into considerations. As vehicles are frequently on the road, sometimes unflat surfaces, Lanner's VLC-1000/2000/2001 are all MIL-STD-810G certified for shock and vibration. In addition, all these models have passed E13 certifications.

For driving record analysis, Lanner offers optional CAN Bus design to connect OBDII (On-Board Diagnostic 2) for vehicle diagnose and predictive maintenance. Aside from CAN Bus, Lanner's VLC-1000/2000/2001 (model dependent) are designed with G-sensor, providing further recorded data for physical impact of a vehicle.

## Featured Products



**LVC-1000**

### Compact Fanless Vehicle Gateway Controller with Intel Quark SoC X1001

- Intel® Quark™ X1001 400 MHz CPU
- Support VGA/HDMI & 2 x RJ45 GbE Ports with PoE
- High Speed CAN Bus Support
- CE, FCC, E-Mark Certification, RoHS Compliant



**LVC-2000**

### Compact Fanless Vehicle Gateway Controller with Intel BayTrail

- Intel® Atom™ E3845 1.91GHz CPU
- Support VGA/HDMI & 1 x RJ45 GbE Ports
- Support Optional CAN Bus
- CE, FCC, E-Mark Certification, RoHS Compliant



**LVC-2001**

### Compact Fanless Vehicle Gateway Controller with Intel BayTrail

- Intel® Atom™ E3845 1.91GHz CPU
- Support VGA/HDMI & 2 x RJ45 GbE Ports
- High Speed CAN Bus Support
- Support Multiple SIM Card Readers
- CE, FCC, E-Mark Certification, RoHS Compliant



**Enabling Intelligent Ambulances  
Through Mobile Cloud System**

**Background**

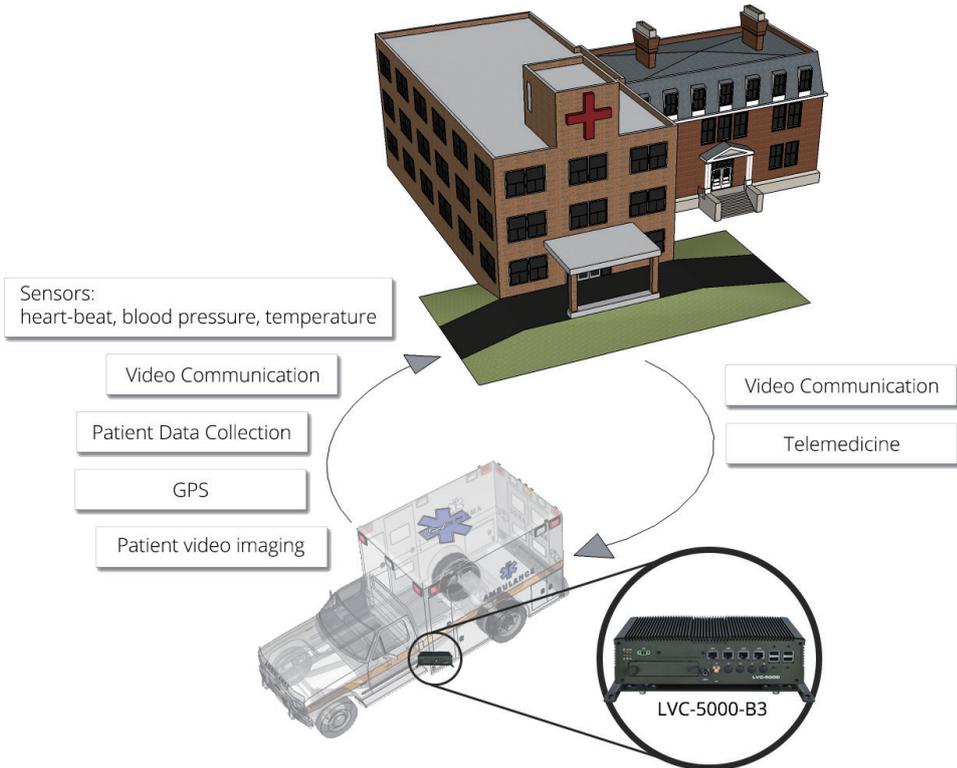
Today, many hospitals and health-care institutions are searching ways to improve survival rates for their emergency rooms. Most of the facilities used by current ambulances are below ideal. In fact, it has been reported that a considerable number of in-vehicle medical staff is still relying on radio systems to communicate with their hospital colleagues, which often fails to provide detailed communications so that hospital staff is frequently less-than-prepared when receiving the victim/patient.

Some medical institutions have begun using off-the-shelf computer systems to try to solve this problem but the benefit is limited due to their below-average performance and reliability in vehicle environments. Also the need for real-time unbroken communication with bus control centers over the city-wide 3G network.

**Functions Needed for a Mobile Medical Solution**

A rugged mobile platform with flexible and scalable Intel x86 microprocessors and multiple peripheral connectivity is the economical solution to conduct emergent medical missions such as telemedicine, video-communication, treatment preparations and clinical image transmissions. Critical functions include:

- Digitalized Measurement Results
- Mobile Surveillance
- Driver Behavior Data
- Peripheral Connectivity
- GPS Route Management





## Lanner Solution

Lanner's LVC-5000-B3 is a highly rugged and integrated vehicle computing platform built for mission critical applications. Built with Intel® Core™ i7 CPU, LVC-5000-B3 is capable of delivering high processing power and graphic presence required for video-communication and telemedicine so that detailed information can be conveyed with very low system latency.

To enable wireless network, LVC-5000-B3 offers both 3G and WiFi connectivity so that patient data can be linked to a MCA and enables the medical tablet to transfer data to hospital staff.

For in-vehicle monitoring purpose, LVC-5000-B3 is designed with 4 Ethernet LAN ports with PoE (Power-over-Ethernet) capability, ideal for installations with IP cameras to enable real-time surveillance.

Regarding connections with external devices to conduct medical operations, LVC-5000-B3 delivers 2 serial COM ports, GPIO, GPS sensor, and USB ports for purposes such as medical instruments and sensors, route and location tracking, and MCA connection. Regarding audio support, LVC-5000-B3 provides Mic In/Line Out ports for sound transmitting devices like microphone and speaker to conduct voice calls or recording tasks. In case of controversies, there is an ODB-II interface to retrieve data logs of driver behaviors.

## Featured Product



LVC-5000-B3

### In-Vehicle Computer with Intel® Core™ i7-3517UE

- Mobile NVR with 5 x PoE Ports
- 1 x Swappable 2.5" Drive Bay
- Built-in Suspension Kit
- E13 Mark Certification

## Key Applications

- Mobile Clinical Assistant
- GPS Route Management
- Mobile Surveillance
- Video Communication
- Patient Video Imaging
- Telemedicine

# Using the **LVC-5770** as In-vehicle Recorder for Evidence Collection Vans



## Background

A well-known solution provider in North America, one with 75 years experience in providing turnkey solutions for criminal investigation and forensic products, came to Lanner for an in-vehicle video recording solution intended for a fleet of evidence collecting vans. The hardware solution must be shock and vibration resistant in order to survive unfamiliar and unpredictable road conditions when coming across over the course of crime scene investigation and evidence collection. In addition, this in-vehicle computer must be able to connect up to 6 cameras at one time and provide quick data retrieval from computers to portable disks for submission, together with all collected evidence, at a speedy transmission.

## Lanner Solution

Lanner's LVC-5770 was eventually selected as the ideal solution for these evidence collecting vans. The LVC-5770 features a powerful Intel® Core i7 processor, 2 SSD drives and 8 LAN ports with PoE support, collectively enabling multi-channels real-time video recording and data storage. The built-in suspension kit and E13 certification are a testament to the extensive vibration and shock testing the LVC-5770 has undergone, demonstrating its reliability for continuous video recording on even the roughest terrains. The LVC-5770's functionality is enhanced by the custom USB 3.0 support, allowing plug-n-play function for fast data retrieval from the SSD storage.

## Key Applications

- Law Enforcement
- Mobile Communication Gateway to Headquarters
- Speed Detector & Recording
- Prisoner Transport Video Monitoring System
- Unmanned Surveillance Operation
- Cyber Crimes Investigation

# Using the LVC-5770 as In-vehicle Recorder for Evidence Collection Vans



## Power Ignition Control

A user-friendly Power Ignition Control is programmed to start and shut down the vehicle computer when the engine is started or turned off respectively.



## Onboard GPS & G-sensor

Offer an on-board GPS receiver for location tracking and a G-Sensor for driver alerts.



## Wireless Connectivity

Support Wi-Fi, 3G, 4G/LTE modules and antenna for wireless network connectivity.



## Wide Voltage Input Range

Offer compatibility with mostly adopted voltages, including 9~36 VDC, +12 V and 24V, ensuring compatible operations and reducing overheads.



## Multiple PoE Ports

The design of multiple PoE ports enables our systems to function as mobile NVRs when connected with IP surveillance cameras for real-time recording.



## Military Standard Vibration & Shock Test

The LVC series is compliant with MIL-STD-810G and has passed vibration and shock tests. A suspension kit is also included in some models to assist in vibration resistance.



## Fanless Design

Without the most frequently replaced part, the systems can be widely deployed in various environments.

## Featured Product



LVC-5770

### Fanless x86 In-Vehicle Computer with Intel® Core™ i7-3517UE

- Mobile NVR with 8x PoE Ports
- 2 x Swappable 2.5" Drive Bays
- Built-in Suspension Kit
- E13 Mark Certification