Lanner

Intelligent Transportation

Rugged Platforms for Vehicles and Railway Computing

Innovating Transportation Solutions for a Connected World

Over the past ten years, Lanner has dedicated itself in supplying the state-of-the-art hardware solutions for IoT applications and millions of Lanner hardware platforms have been deployed worldwide. Strengthening this momentum, Lanner is expanding its technological fields by innovating transportation solutions for a connected world.

Built on our already established expertise and reliability in our vehicle computing systems, including fleet management, in-vehicle surveillance and infotainment, Lanner has founded its Intelligent Transportation Solution Business Unit, a newly established division dedicating in rolling stock and rail gateway systems. These systems will deliver robust operability to be deployed for train, high-speed rail, MRT (Mass Rapid Transit), and other public transit applications.

Lanner has rich expertise and experience through customization services for our clients in China, Europe, North America and Asia. We focus on developing intelligent platforms that can help our clients reduce their development efforts and cost. Our sole mission is to deliver a wide selection of platforms and gateways to meet your application demands.

Spencer Chou
Senior Director, Product Development Division

Who is Lanner?

Lanner Electronics Inc. (TAIEX 6245) is a world-leading hardware provider in design, engineering, and manufacturing services for advanced network appliances and rugged industrial computers. With 30-year experiences, Lanner provides reliable and cost-effective computing platforms with high quality and performance. Today, Lanner has a large and dynamic manpower of over 1000 well-experienced employees worldwide with the headquarters in Taipei, Taiwan and subsidiaries in the US, Canada, and China.

Global Manufacturing Capabilities

Taipei, Taiwan
- Area 30,000 m²
- 3 x SMT, DIP and assembly lines
- Production capacity: 30,000 system units/month

Beijing and Dongguang, China
- Area 15,200 m²
- 5 x Assembly lines
- Production capacity: 8,000 system units/month

Service Capabilities
- Custom design and production in board, chassis and system
- High mix low volume manufacturing
- Quality assurance services
- Global order fulfillment services

Certifications
- ISO 9001:2008
- ISO 14001:2004
- ISO 28000:2007
- QC 080000:2012
- OHSAS 18001:2007
- TL 9000:R5.5

Contents

Why Lanner?

Lanner designs and manufactures a wide range of embedded computing systems for diversified applications. Our vehicle computers feature compact form factor, ruggedness, shock/vibration resistance, wireless connectivity and rich I/O connectors. We are committed to bringing reliability and high-performance intelligent transportation systems to meet today's strict demands for IoT applications.

Strong Allies

Intel®
Lanner Electronics is an Associate Member of the Intel IoT Solutions Alliance. This alliance is committed to developing scalable and interoperable platforms to reduce deployment efforts and costs. By leveraging processor architectures, services and technological benefits from Intel, Lanner provides reliable hardware and software solutions in meeting the rise of IoT applications.

Axis
Lanner is a member of Axis Technology Partner Program, a community of videosurveillance developers, embedded developers and solution providers committed to the development of video surveillance solutions from Axis Communications. The alliance encourages its members to supply the market the products with enhanced performance, greater scalability, and maximum flexibility.

Milestone Systems
Lanner is a member of the Milestone Solution Partner Program, a community of video surveillance developers, embedded developers and solution providers committed to the development of video surveillance solutions on Milestone technologies.

Gemalto
Gemalto offers a broad portfolio of solutions, services and platforms that enable M2M and IoTapplications and allow enterprises and people to trust in our connected world. We offer the technology bricks customers need to simplify and speed development and ensure the security, reliability and long life of M2M and IoT solutions.

Microsoft
As a Windows Embedded Partner, Lanner is given early access to product plans, Microsoft events and the latest embedded operating system developments. In 2011 and 2012, Lanner was awarded the Windows Embedded Partner of the Year.
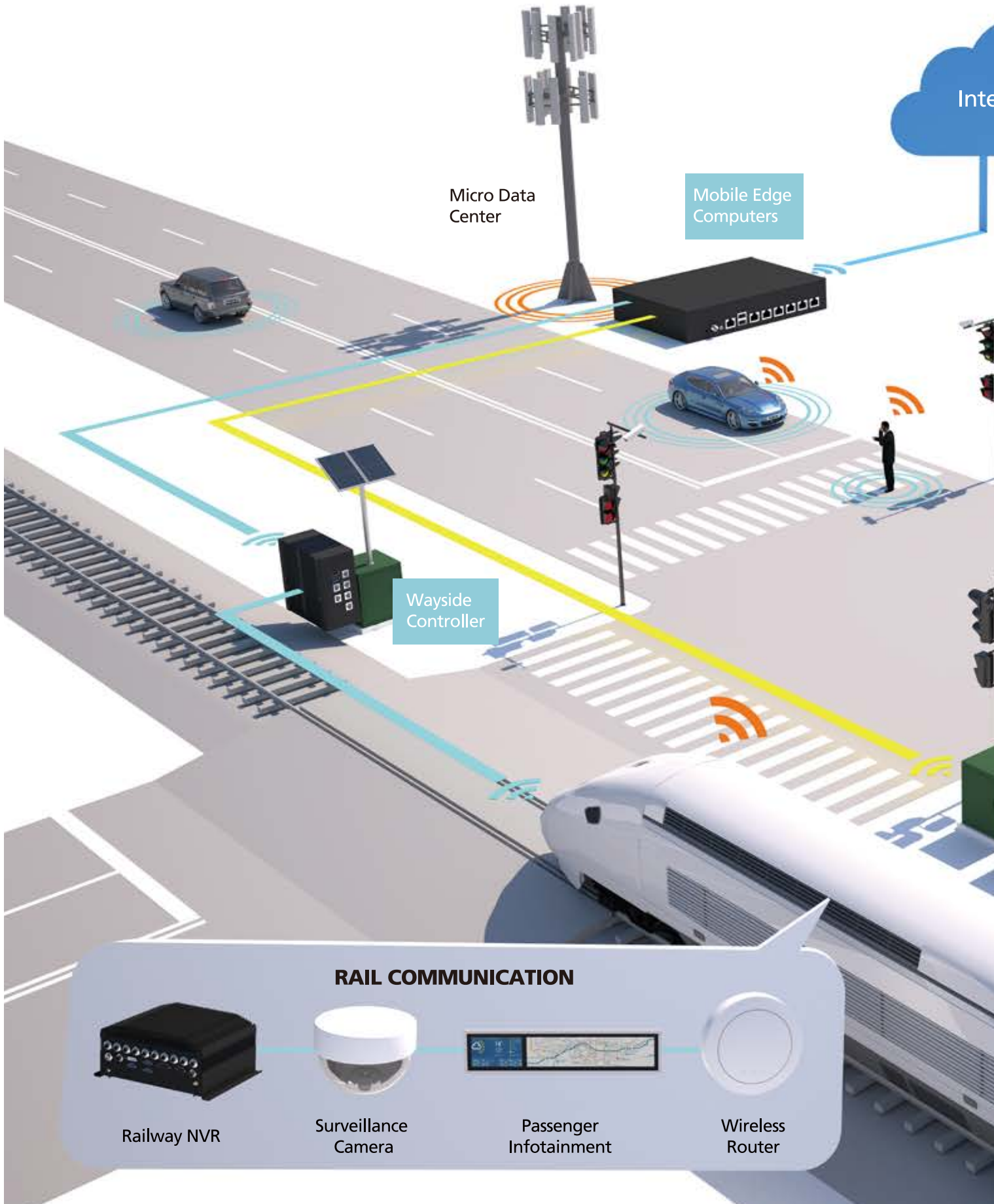
Sierra Wireless
Sierra Wireless is building the Internet of Things (IoT) with intelligent wireless solutions that empower organizations to innovate in the connected world.

u-blox
u-blox is a global leader in embedded wireless communications and positioning for industrial, automotive and consumer applications. u-blox delivers compact, low-power, high-performance chips and modules for consumer, professional and industrial machine-to-machine (M2M) applications.

Empowering Computing and Co[...]

Micro Data Center

Mobile Edge Computers

Inte[...]

Wayside Controller

RAIL COMMUNICATION

Railway NVR

Surveillance Camera

Passenger Infotainment

Wireless Router

nnectivity in Transportation

erent

Traffic
Control Center

Traffic
Controller

INTELLIGENT BUS

Vehicle NVR | Surveillance Camera | Passenger Infotainment | Wireless Router

Roadside
Controller
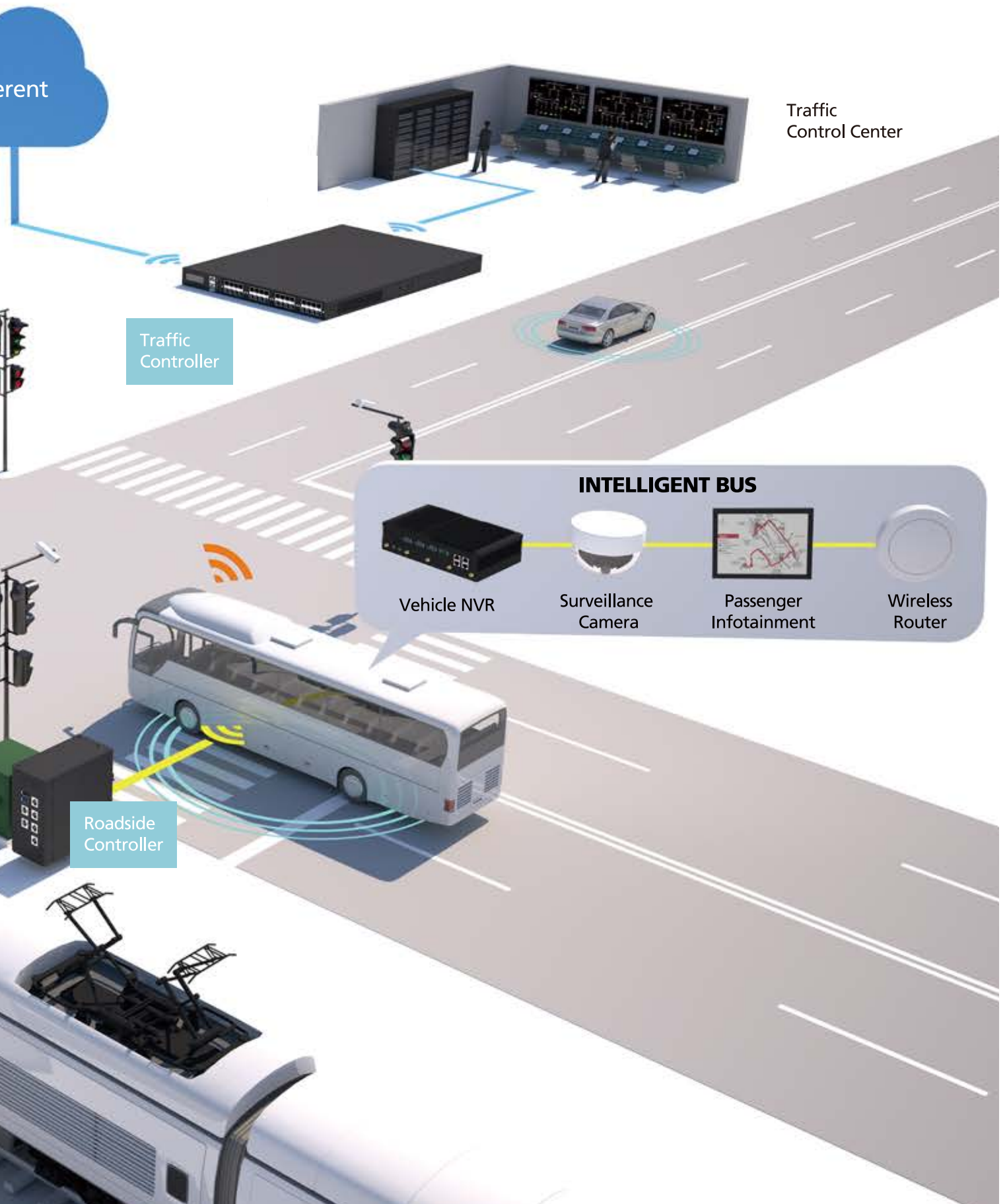
Vehicle & Rolling Stock Box PCs

Lanner's vehicle and rolling stock computers are specifically designed for versatile deployments in transportation vehicles, offering high levels of stability and reliability, as well as well-rounded balance of size, cost, performance and power consumption.

Lanner's vehicle and rolling stock computer line is consisted of the V Series and the R Series and their key features are listed below.

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

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.

Vehicle Standards Certified
All the V Series vehicle computers are designed to meet the requirements of the E-Mark(E13) and SAE J1455 Certification.

Wide Voltage Input Range
Offer compatibility with mostly adopted voltages, including 9~36 VDC for vehicle application and 14.4~154 VDC for railway application, ensuring compatible operations and reducing overheads.

Onboard GPS+GLONASS & G-sensor
Offer an on-board GPS+GLONASS receiver for location tracking and a G-Sensor for driver alerts.

TAIWAN EXCELLENCE 2018

V6S

R6S

M12 Connectors

Lanner R Series come with M12 connectors for robust vibration-proof and reliable connections.

CAN Bus Support

Designed in J1939 and J1708 protocols, the CAN Bus module allows external devices to analyze driving behaviors for future references.

Wireless Communication

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

Up to 16x 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.

Rolling Stock Certified

EN50155, EN50121, EN50125 and EN45545 are international standards regulating electronic equipment used in rolling stock for railway applications. The R Series is verified with above certifications and covers aspects of standards including temperature, humidity, shock, vibration and other parameters.

Military Standard Vibration & Shock Certified

The V 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.

Introducing the V and R Series

The V Series is designed for uses in public transit buses, commercial trucks, law enforcement and emergency vehicles, truly ideal for applications such as on-road tracking and monitoring, mobile video surveillance and passenger infotainment.

Built with the extreme ruggedness to meet EN50155, EN50121, EN50125 and EN45545, the R Series is engineered to fulfill rail system applications deployed in trains, massive rapid transit or high speed rail.

Fleet Management

Lanner V3G provides a total solution for truck fleet management, featuring rich I/O and expansion capability to connect various devices, such as front/rear IP Camera, RFID scanner, temperature sensor, monitor, TPMS receiver, anti-doze / alcohol detector and Wi-Fi/3G/4G interface cards. By establishing real-time communications between trucks and operation centers, Lanner V3G improves service fleet productivity with enhancements in driver safety, fuel-efficiency, usage-optimizations, and asset monitoring.
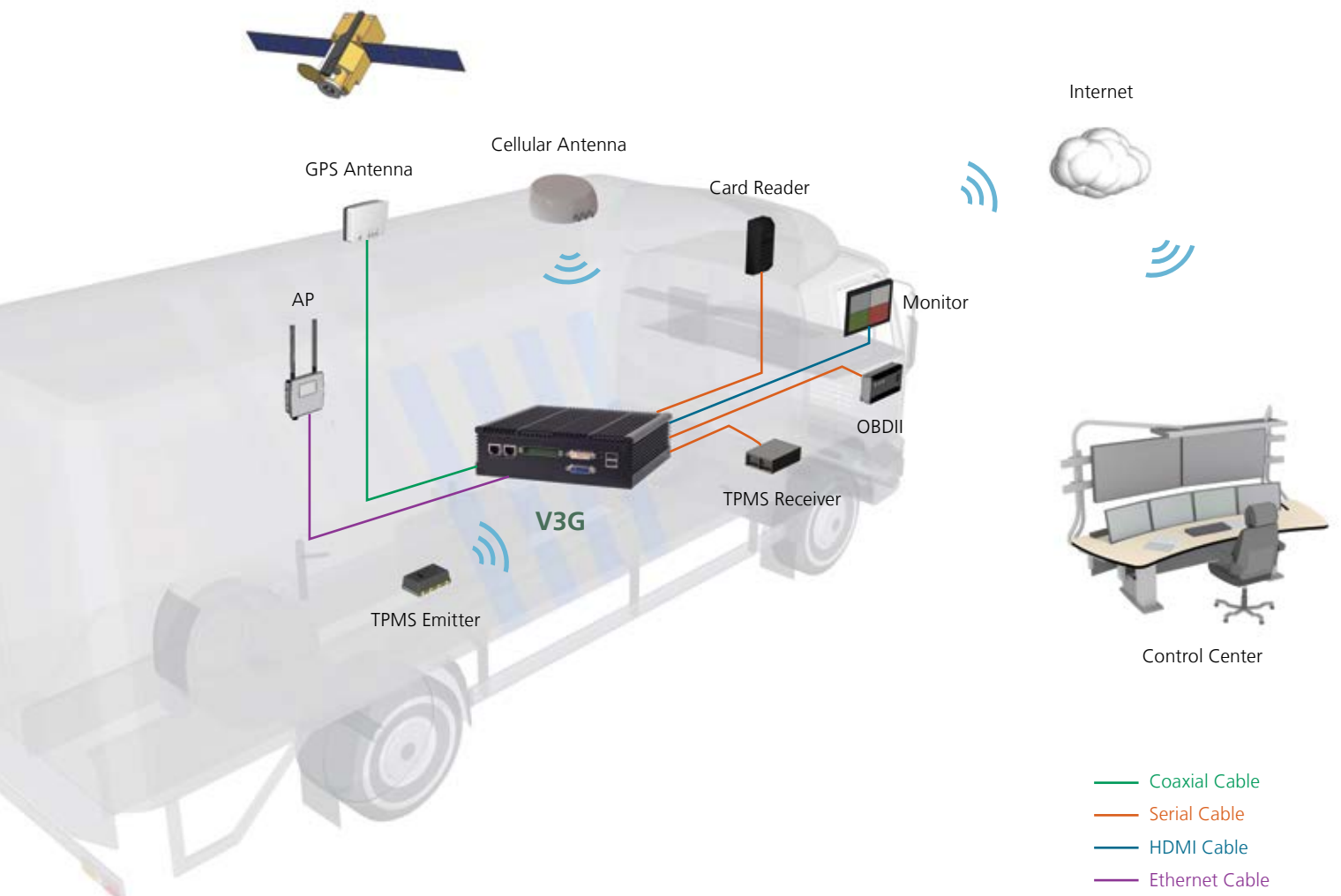
Target Applications:

- Digital Logistics / Fleet Management
- Dispatch / Route Optimization
- Audio Intercom
- GPS Tracking
- Emergency Alarm System
- Driver Advisor System

V3G

- Fanless Vehicle Gateway Controller
- Intel® Atom™ x7-E3950 CPU
- Support DVI-D x2 & 2 x RJ45 GbE Ports
- Optional CAN Bus Support
- E-13 and SAE J1455 Certification

Internet

GPS Antenna

Cellular Antenna

Card Reader

AP

Monitor

OBDII

V3G

TPMS Receiver

TPMS Emitter

Control Center

—— Coaxial Cable
—— Serial Cable
—— HDMI Cable
—— Ethernet Cable

Vehicle Gateway

Vehicle Gateway Controller

Vehicle Gateway Controller

Vehicle Gateway Controller

Vehicle Gateway		V3G NEW	LVC-2000	LVC-2001
Chassis	Dimension (W x H x D)	198 x 60 x 185 mm (7.8"x 2.36"x 7.28")	198 x 52 x 165 mm (7.8"x 2"x 6.5")	198 x 52 x 185 mm (7.8"x 2"x 7.28")
	IP Rated	IP30	IP30	IP30
System	Processor Number	Intel Atom x7-E3950 1.6 GHz	Intel Atom E3845 1.91 GHz	Intel Atom E3845 1.91 GHz
	Chipset	N/A	N/A	N/A
	Processor Graphics	Intel HD Graphics 505	Intel HD Graphics	Intel HD Graphics
System Memory	Technology	DDR3L SO-DIMM x 1	DDR3L SO-DIMM x 1	DDR3L SO-DIMM x 1
	Max. Capacity	Up to 8 GB	Up to 8 GB	Up to 8 GB
Storage	CF/ Onboard SSD	mSATA x 1	mSATA x 1	mSATA x 1
	HDD/SSD	Internal 2.5" 15 mm drive bay x 1	Internal 2.5" 15 mm drive bay x 1	Internal 2.5" 15 mm drive bay x 1
Ethernet Controller		Intel i210IT x2	Intel i210IT x1	Intel i210IT x 2
Audio Controller		Realtek ALC886 HD codec	Realtek ALC886 HD codec	Realtek ALC886 HD codec
I/O	LAN	GbE RJ45 x 2	GbE RJ45 x 1	GbE RJ45 x 2
	PoE	N/A	N/A	N/A
	Display	DVI-D x 2, resolution up to 1920x1200	VGA x 1, HDMI x 1	VGA x 1, HDMI x 1
	Audio	Line-in and Line-out by HD Audio	Internal Mic-in and line-out pin-header	Mic-in x1 and line-out x1 3.5mm phone jack
	Serial I/O	RS-232/422/485 x2	COM1/COM2: RS-232/422/485 with RI/5V/12V	COM1/COM2: RS-232/422/485 with RI/5V/12V
	GPS	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band
	G-sensor	ADXL 345	ADXL 345	ADXL 345
	CAN	Optional CAN Bus J1939 / J1708 x1	Optional support 2x J1939 / J1708	CAN Bus J1939 / J1708 x1
	Digital I/O	8x DI 5V Level TTL and 8x DO 12V Level TTL 2x DI (from MCU) 3.3V Level TTL 1x 12V with 1A dry relay	4x DI/5V and 4x DO with 12V 2x DI (from MCU) 3.3V level 2x 12V with 2A dry relay	4x DI/5V and 4x DO with 12V 2x DI (from MCU) 3.3V level 2x 12V with 2A dry relay
	USB	USB 2.0 Type A x2 with 500 mA	USB 3.0 Type A x 1	USB 3.0 Type A x 1, USB 2.0 Type A x 1
	Expansion	1x Full-size Mini-PCIe Socket with dual SIM readers & 1x Half-size Mini-PCIe Socket	1x Full-size Mini-PCIe Socket with dual SIM readers & 1x Half-size Mini-PCIe Socket	2x full-size mini-PCIe socket (1x USB+ PCIe+2x SIM; 1x USB+2 x SIM) 1x half-size mini-PCIe socket (USB+PCIe) ; 4x SIM card readers
	Antenna	SMA antenna hole x5 (includes GPS+GLONASS x1)	SMA antenna hole x5 (includes GPS+GLONASS x1)	SMA antenna hole x4 (includes GPS+GLONASS x1)
	Power Input	Supports DC 9~36V level, ATX mode support ignition delay on/ off control	3-pin terminal block (+,-,ignition), +9~36VDC, ATX mode support ignition delay on/ off control	3-pin terminal block (+,-,ignition), +9~36VDC, ATX mode support ignition delay on/ off control
	Power Output	N/A	N/A	12V/1A DC out
Hardware Monitoring		Fintek F81866AD-I integrated watchdog timer 1~255 level	Fintek F81865 integrated watchdog timer 1~255 level	Fintek F81865 integrated watchdog timer 1~255 level
OS Support		Windows: Win10 IoT Linux: Redhat Enterprise 5, Fedora 14, Linux Kernel 2.6.18 or later	Windows: FES WES7 (WS7E) / W7 Pro SP1 / WE8 STD, Linux: Redhat Enterprise 5, Fedora 14, Linux Kernel 2.6.18 or later	Windows: FES WES7 (WS7E) / W7 Pro SP1 / WE8 STD, Linux: Redhat Enterprise 5, Fedora 14, Linux Kernel 2.6.18 or later
Certifications	EMC	CE, FCC Class A, RoHS	CE, FCC Class A, RoHS, E13, SAE J1455	CE, FCC Class A, RoHS
	Safety	E13 include ISO 7637-2, SAE J1455& J1113-11	E13 include ISO 7637-2, SAE J1455	E13
	Vibration	MIL-STD-810G, Method 514.6	MIL-STD-810G, Method 514.6	MIL-STD-810G, Method 514.6
	Shock	MIL-STD-810G, Method 516.6	MIL-STD-810G, Method 516.6	MIL-STD-810G, Method 516.6
Environmental	Operating Temperature	-40~70°C / -40~158°F	-20~60°C / -4~140°F	-20~60°C / -4~140°F
	Storage Temperature	-40~85°C / -40~185°F	-5~45°C / 23~113°F	-5~45°C / 23~113°F
	Humidity	5%~95% @ 40°C / 104°F (Storage Level)	5%~95% @ 40°C / 104°F (Storage Level)	5%~95% @ 40°C / 104°F (Storage Level)
Net Weight (Kg)		3	1.5	3

Transportation Surveillance

As a central control computer for buses, V6S connects various devices to form intelligent services to drivers/passengers and communicate with head offices. Through V6S's rich I/O connection, including GPS/G-sensor, CAN bus, COM, 10 x RJ-45 PoE ports for IP camera connection and multiple display outputs, it can perform digital signage infotainment, fleet management, surveillance, event recording, Wi-Fi hot spot, TPMS (Tire Pressure Measurement System) emitter, e-ticketing, audio intercom, door control and people counting, to provide a secure and comfortable journey for bus transportation.
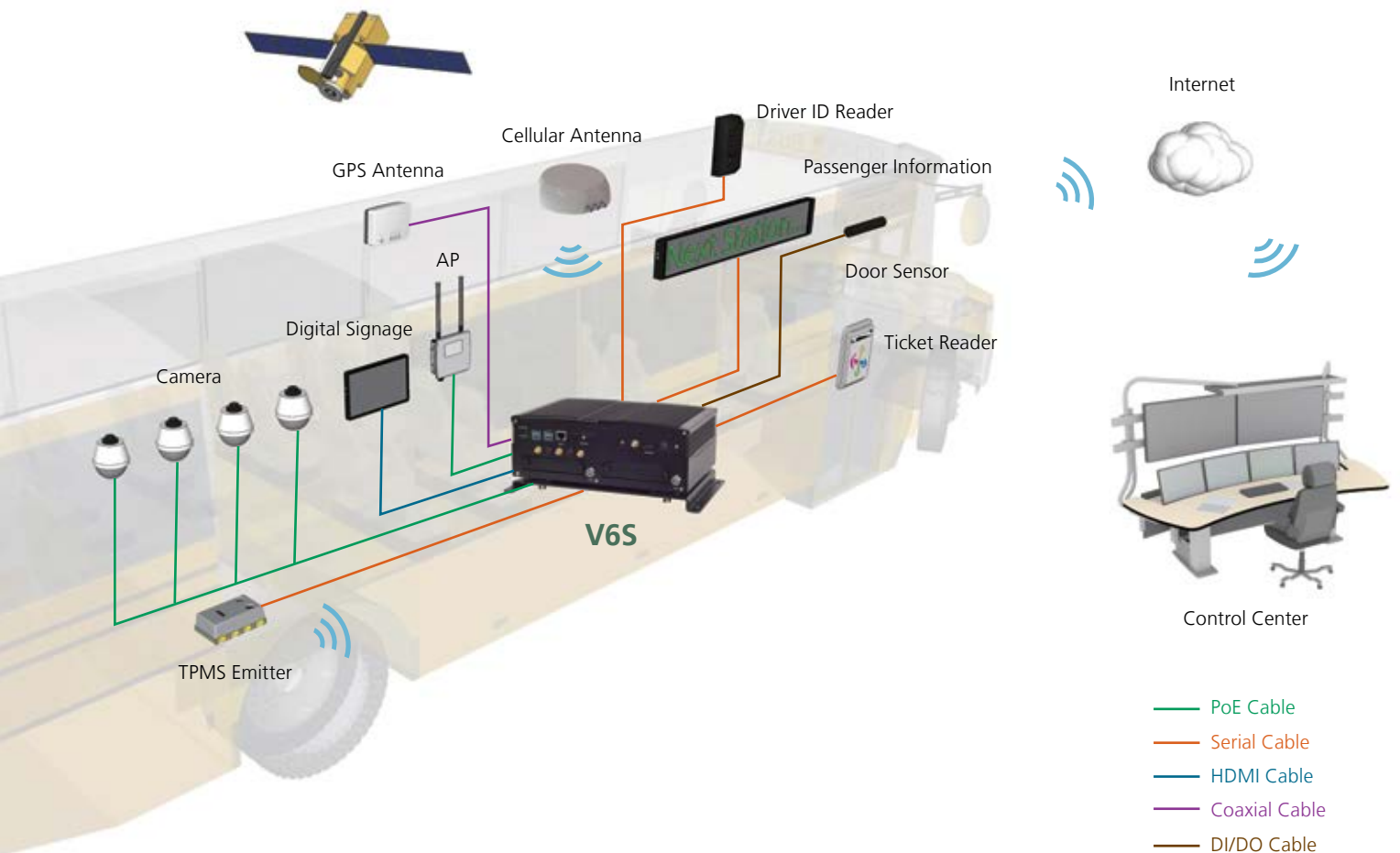
Target Applications:

- Passenger Information
- Digital Signage
- Wi-Fi Hot Spot
- Dispatch
- GPS Tracking
- Emergency Alarm System
- Driver Advisor System
- TPMS
- E-ticketing

V6S

- Multi-purpose Vehicle Computer
- Intel® Core i7-7600U CPU
- Mobile NVR with 10 x PoE Ports
- Removable Mini-PCIe x1 with 2 SIM sockets for 4G/LTE
- 1 x Removable 2.5" Drive Bay
- Suspension Kit
- E13 Certification

GPS Antenna

Cellular Antenna

Driver ID Reader

Passenger Information

Internet

AP

Door Sensor

Digital Signage

Ticket Reader

Camera

V6S

Control Center

TPMS Emitter

—— PoE Cable
—— Serial Cable
—— HDMI Cable
—— Coaxial Cable
—— DI/DO Cable

Vehicle NVR

4ch Vehicle Surveillance NVR   **8ch Vehicle Surveillance NVR**   **4ch Vehicle Surveillance NVR**   **10ch Vehicle Surveillance NVR**

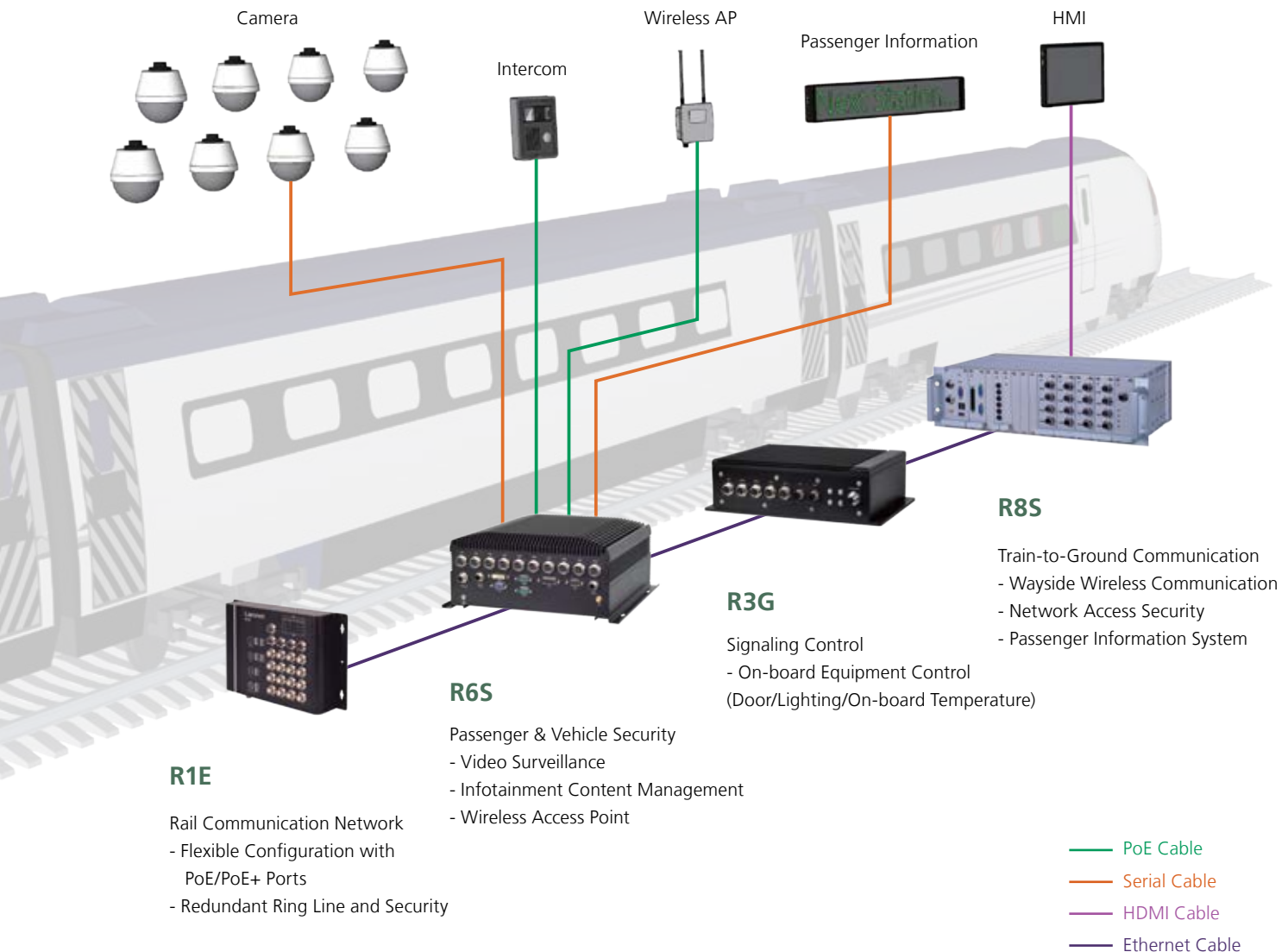| Vehicle Surveillance		LVC-5000-B3	LVC-5770-7D	V3S	V6S
Chassis	Dimension (W x H x D)	273.8 x 72 x 190 mm (10.78" x 2.83" x 7.48")	276.4 x 190 x 95mm (10.88" x 7.5" x 3.7")	273.8 x 73 x 185 mm (10.78" x 2.87" x 7.28")	273.8 x 92 x 219 mm (10.78" x 3.62" x 8.62")
	IP Rated	IP30	IP30	IP30	IP50
System	Processor	Intel Core i7-3517UE 1.7GHz	Intel Core i7-3517UE 1.7GHz	Intel Atom x7-E3950 1.6 GHz	Intel® Core™ i7-7600U Processor
	Chipset	Intel HM65	Intel HM65	N/A	N/A
	Graphics	Intel integrated HD graphics 4000	Intel integrated HD graphics 4000	Intel HD Graphics 505	Intel® integrated HD Graphics 620
System Memory	Technology	DDR3 SO-DIMM x 1 (Factory default: 4 GB module pre-installed)	DDR3 SO-DIMM x2	DDR3L SO-DIMM x 1	DDR4 2133 SO-DIMM Socket x2
	Max. Capacity	Up to 8 GB	Up to 16 GB	Up to 8 GB	Up to 32 GB
Storage	CF/ mSATA	CF socket Type I/II x 1, mSATA x1	mSATA x 1	mSATA x 1	mSATA x 1
	HDD/SSD	Removable 2.5" 15mm HDD drive bay x1	Removable 2.5" 15mm HDD drive bay x2	Removable 2.5" 15 mm drive bay x 1	Removable 2.5" 15mm HDD drive bay x2
Ethernet Controller		Intel 82583V x5	Intel 82574L x2, 82583V x8	Intel i210IT x3	Intel i210IT x4
Audio Controller		Realtek ALC886 HD codec	Realtek ALC886 HD codec	Realtek ALC886 HD codec	Realtek ALC886 HD codec
I/O	LAN	GbE RJ45 x5	GbE RJ45 x2, GbE RJ45 x 8 with PoE	GbE RJ45 x2	GbE RJ45 x1
	PoE	IEEE 802.3af PoE port x4, Internal PoE Adapter with power on/off software controllable	GbE RJ45 x2, GbE RJ45 x 8 with PoE	IEEE 802.3af PoE ports RJ45 x4	IEEE 802.3af PoE ports RJ45 x10
	Display	DVI-D x 1, VGA x 1, HDMI x 1	DVI-D x 1, VGA x 1, HDMI x 1	DVI-D x 2, resolution up to 1920x1200	VGA x 1, resolution up to 2048x1536 DVI-D x 1, resolution up to 1920x1200
	Audio	Mic-in and Line-out with 2 watt by terminal block MIO connector	DB9 female x 1 for Mic-in and Line-out	Internal Mic-in and line-out pin-header	Line-in and Line-out by HD Audio
	Serial I/O	1x RS-232/422/485 with RI/5V/12V 1x RS-232 with RI/5V/12V	2x RS-232/422/485 with RI/5V/12V	2x RS-232/422/485	2x RS232/422/485 with RI/5V
	GPS	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band
	G-sensor	ADXL 345	ADXL 345	ADXL 345	ADXL 345
	CAN	Optional CAN Bus J1939 / J1708 x1	N/A	Optional CAN Bus J1939 / J1708 x1	Optional CAN Bus J1939 / J1708 x1
	Digital I/O	4x DI/5V and 4x DO/12V 2x DI (from MCU) 3.3V Level 2x 12V with 2A dry relay	4x DI 5V Level 3x DO 5V Level 2x DI (from MCU) 3.3V Level 9V~36V with 10A dry relay	8x DI 5V Level TTL and 8x DO 12V Level TTL 2x DI (from MCU) 3.3V Level TTL 1x 12V with 1A dry relay	6x DI 5V or 12V TTL selectable 6x DO 12V TTL, Max. 100mA 2x IGN-DI of ignition control to MCU
	USB	USB 2.0 Type A x4	USB 2.0 Type A x6	USB 2.0 Type A x2 with 500 mA	USB 2.0 Type A x2; USB 3.0 Type A x2
	Expansion	Mini-PCIe x2 with 2 SIM card readers	Mini-PCIex2 with 1 SIM card reader	1x Full Size Mini-PCIe with dual SIM card reader, 1x Half Size Mini-PCIe, 1x External Mini-PCIe 3.0 with dual SIM card readers	Full-size Mini-PCIe Socket x2 with dual SIM readers on each, Full-size Mini-PCIe Socket x1 for WiFi
	Antenna	5x SMA antenna holes	6x SMA antenna holes	7x SMA antenna hole (includes GPS+-GLONASS x1)	7x SMA antenna holes (includes GPS+-GLONASS x1)
	Power Input	3-pin terminal block (+, -, ignition), support +12V and +24V vehicle power (+9~36VDC), ATX mode support ignition on/off and delay Power-on/off	3-pin terminal block (+, -, ignition), support +12V and +24V vehicle power (+9~36VDC), ATX mode support ignition on/off and delay Power-on/off	3-pin terminal block (+, -, ignition), support +12V and +24V vehicle power (+9~36VDC), ATX mode support ignition on/off and delay Power-on/off	3-pin terminal block (+, -, ignition), support +12V and +24V vehicle power (+9~36VDC), ATX mode support ignition on/off and delay Power-on/off
	Power Output	12V/1A DC out	Bypass 9~36V, 10A DC out software on/off controllable	N/A	12V/1A DC out
Hardware Monitoring		Fintek F81865 integrated watchdog timer 1~255 level	Fintek F81865 integrated watchdog timer 1~255 level	Fintek F81866AD-I integrated watchdog timer 1~255 level	Fintek F81866AD-I integrated watchdog timer 1~255 level
OS Support		Windows: WES2009 / XP Pro FES WES7 (WS7E) / W7 Pro SP1/ WE8 STD,Linux: Redhat Enterprise 5,Fedora 14, Linux Kernel 2.6.18 or later	Windows: WES2009 / XP Pro FES WES7 (WS7E) / W7 Pro SP1/ WE8 STD,Linux: Redhat Enterprise 5,Fedora 14, Linux Kernel 2.6.18 or later	Windows: Win10 IoT Linux: Redhat Enterprise 5, Fedora 14, Linux Kernel 2.6.18 or later	Windows: Win10 IoT Linux: Redhat Enterprise 5, Fedora 14, Linux Kernel 2.6.18 or later
Certifications	EMC	CE, FCC Class A, RoHS	CE, FCC Class A, RoHS	CE, FCC Class A, RoHS	CE, FCC Class A, RoHS
	Safety	E13 include ISO 7637-2	E13 include ISO 7637-2	E13 include ISO 7637-2, SAE J1455& J1113-11	E13 include ISO 7637-2
	Vibration	MIL-STD-810G, Method 514.6	MIL-STD-810G, Method 514.6	MIL-STD-810G, Method 514.6	MIL-STD-810G, Method 514.6
	Shock	MIL-STD-810G, Method 516.6	MIL-STD-810G, Method 516.6	MIL-STD-810G, Method 516.6	MIL-STD-810G, Method 516.6
Environmental	Operating Temperature	-20~60°C/-22~140°F	-20~60°C/-22~140°F	-40~70°C / -40~158°F	-20~60°C / -4~140°F
	Storage Temperature	-40~85°C / -40~185°F	-40~85°C / -40~185°F	-40~85°C / -40~185°F	-20~85°C / -4~185°F
	Humidity	5%~95% @ 40°C / 104°F (Storage Level)	5%~95% @ 40°C / 104°F (Storage Level)	5%~95% @ 40°C / 104°F (Storage Level)	5%~95% @ 40°C / 104°F (Storage Level)
Net Weight (Kg)		3	4	4	5.5

NEW   NEW

Rolling Stock Computing

Lanner's newly launched rolling stock computing systems are purposely built for the increasing demand of today's digitalized and networked railway transportation systems. Through well-experienced custom design services, Lanner R series product lines, all certified with EN50155, EN50121, EN50125 and EN45545 and military standard endurance, are ideal for signaling control, vehicle surveillance, and real-time train-to-ground communication in railway environments.

Target 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
- Communication Network

Camera   Wireless AP   HMI

Intercom   Passenger Information

R8S

Train-to-Ground Communication
- Wayside Wireless Communication
- Network Access Security
- Passenger Information System

R3G

Signaling Control
- On-board Equipment Control
(Door/Lighting/On-board Temperature)

R6S

Passenger & Vehicle Security
- Video Surveillance
- Infotainment Content Management
- Wireless Access Point

R1E

Rail Communication Network
- Flexible Configuration with
  PoE/PoE+ Ports
- Redundant Ring Line and Security

——— PoE Cable
——— Serial Cable
——— HDMI Cable
——— Ethernet Cable

R1E Rugged Design

Wide Range Power Input
Support DC 9~154V Power Input

IP54 Protection Design
Ensures limited dust ingress and water spray from any direction.

Up to 16x IEEE 802.3af PoE Ports
Multiple PoE ports allow R1E to function as railway switch if connected with IP cameras or wireless AP for real-time communications.

R1E Rugged Ethernet Switch

M12 Rugged Connectors
All R1E I/Os are in rugged M12 connectors like console port, 4x GbE Uplink port and 16x IEEE 802.3af PoE Ports.

Wide Operating Temperature
R1E is built to support wide temperature range, from -40 to 70°C (following EN50155 TX) for rolling stock environments.

Rolling Stock Certification
Certified with EN50155/EN50121/EN50125/EN45545 international standards in regulating electronic equipment used in rolling stock for railway applications.

System	IP Rated	IP54
	Memory	SDRAM, 32MB
	Storage	Flash, 16MB
Technology	IEEE Standards	IEEE 802.3, IEEE 802.3u, IEEE802.3ab IEEE802.3x IEEE802.1p IEEE802.1Q IEEE 802.1X IEEE802.1d IEEE802.1w IEEE802.1s IEEE 802.3ad IEEE 802.1AB IEEE802.3ad, IEEE802.3at/af, IEEE802.3z
Switch Properties	MAC Address Table	16K MAC Address
	Transfer Rate	14,880pps for Ethernet Port 148,800pps for Fast Ethernet Port 1,488,000pps for Gigabit Ethernet Port
	Jumbo Frame	Up to 16 KB (full-duplex) on all ports
	Wake-on-LAN (WoL)	Magic packet and notify the sleeping system to wake up
	LED	Power: (Green) Ethernet Port: Link/ Active (Green/ Orange)
	Network Cable	Robust operation over up to 140 meters of CAT5 cable
	Priority Queues	4
	Max. Number of Available VLANs	64
	VLAN ID Range	VID 1 to 4094
	IGMP Groups	256
I/O	Gigabit Ethernet	10/100/1000T: 4x ports M12 8-pole X-coded with Auto MDI/MDI-X function

I/O	Fast Ethernet	10/100TX: 16x ports M12 4-pole D-coded with Auto MDI/MDI-X function
	Console Port	1x port M12 8-pole A-coded
	Power	1x port M12 5-pole K-coded
Power Requirements	Power Input	Supports 14.4~154 VDC ATX mode
	PoE Budget	150W intotal
Environments	Operating Temperature	-40~70°C/-40~158°F
	Storage Temperature	-40~85°C / -40~185°F
	Relative Humidity	5%~95% @ 40°C / 104°F (Storage Level)
Mechanical	Dimension (W x H x D)	304 x 69 x 190 mm (11.97" x 2.72" x 7.48")
	Weight	3.2 kg
	Mounting	wall mount kit & DIN rail
Certification	EMC	CE Class A, FCC Class A, RoHS, EN 50121
	Ambient Internal Temperature	EN 50155 Tx (-40 ~ 70°C), EN 50125
	Vibration, Shock	EN 61373 / MIL-STD-810G
	Interruptions of Voltage Supply	EN 50155 Class S1
	Supply Over Change	EN 50155 Class C1
	Fire & Smoke	EN 45545

Railway Gateway

Rugged IP67 Railway Control Unit

Rugged IP67 Railway Control Unit

Railway Solution		R3GA	R3GB
Chassis	Dimensions (W x H x D)	268 x 86 x 210 mm (10.55" x 3.4" x 8.27")	268 x 86 x 210 mm (10.55" x 3.4" x 8.27")
	IP Rated	IP67	IP67
System	Processor Number	Intel Atom x7-E3950 Processor	Intel Atom x5-E3940 Processor
	Chipset	N/A	N/A
	Processor Graphics	Intel integrated HD Graphics 505	Intel integrated HD Graphics 505
Memory	Technology	LPDDR4 1600 MHz Memory Down Up to 8GB	LPDDR4 1600 MHz Memory Down Up to 8GB
	Max. Capacity	Up to 8GB (Factory default: 2GB pre-installed)	Up to 8GB (Factory default: 2GB pre-installed)
Storage	CF/ SD / mSATA Socket	mSATA socket x 1	mSATA socket x 1
	2.5" Drive Bay	Internal 2.5" drive bay x 1	Internal 2.5" drive bay x 1
Ethernet Controller		Intel i210-IT x 3	Intel i210-IT x 2
Audio Controller		Realtek ALC886 HD codec	Realtek ALC886 HD codec
I/O	Display	HDMI x 2, resolution up to 3840x2160	HDMI x 2, resolution up to 3840x2160
	LAN	GbE RJ45 x 2	GbE RJ45 x 2
	PoE	IEEE 802.3at POE ports M12 A-coded x4	N/A
	Audio	Mic-in and Line-out with 2-watt by HD Audio	Mic-in and Line-out with 2-watt by HD Audio
	Serial I/O	COM_A: RS232/422/485 x2 COM_B: RS232/422/485 x2 COM_C: RS232 (TX-RX only) x6	COM_A: RS232/422/485 x2 COM_B: RS232/422/485 x2 COM_C: RS232 (TX-RX only) x6
	GPS	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band
	G-sensor	ADXL 345	ADXL 345
	CAN	Optional CAN Bus J1939 / J1708 x1	Optional CAN Bus J1939 / J1708 x1
	Digital I/O	4x DI 5V Level TTL and 4x DO 12V Level TTL 2x DI (from MCU) 3.3V Level TTL 2x 12V with 2A dry relay	4x DI 5V Level TTL and 4x DO 12V Level TTL 2x DI (from MCU) 3.3V Level TTL 2x 12V with 2A dry relay
	USB	USB 2.0 Type A x4 with 500 mA	USB 2.0 Type A x4 with 500 mA
	Expansion	Full-size Mini-PCIe Socket x3, 2 of 3 with dual SIM card readers on each	Full-size Mini-PCIe Socket x3, 2 of 3 with dual SIM card readers on each
	Antenna	SMA antenna hole x13 (includes GPS+GLONASS x1)	SMA antenna hole x13 (includes GPS+GLONASS x1)
	Power Input	Supports DC 14.4~154V level, ATX mode support ignition delay on/ off control	Supports DC 14.4~154V level, ATX mode support ignition delay on/ off control
	Power Output	12V/2A DC out	12V/2A DC out
Hardware Monitoring / WDT		Fintek F81866AD-I integrated watchdog timer 1~255 level	Fintek F81866AD-I integrated watchdog timer 1~255 level
OS / Standards Support		Windows: Win10 IOT Linux: Redhat Enterprise 5, Fedora 14. Linux Kernel 2.6.18 or later	Windows: Win10 IOT Linux: Redhat Enterprise 5, Fedora 14. Linux Kernel 2.6.18 or later
Certifications	EMC	CE, FCC Class A, RoHS, EN 50121-3-2, EN 50121-4	CE, FCC Class A, RoHS, EN 50121-3-2, EN 50121-4
	Safety	E13 include ISO 7637-2	E13 include ISO 7637-2
Compliance	Ambient Internal Temperature	EN 50155 Tx (-40 ~ 70°C), EN 50125-3	EN 50155 Tx (-40 ~ 70°C), EN 50125-3
	Shock and Vibration	EN 61373 / MIL-STD-810G	EN 61373 / MIL-STD-810G
	Interruptions of Voltage Supply	EN 50155 Class S1	EN 50155 Class S1
	Supply Over Change	EN 50155 Class C1	EN 50155 Class C1
	Fire & Smoke	EN 45545-2	EN 45545-2
Environmental	Operating Temperature	-40~70°C / -40~158°F	-40~70°C / -40~158°F
	Storage Temperature	-40~85°C / -40~185°F	-40~85°C / -40~185°F
	Humidity	5%~95% @ 40°C / 104°F (Storage Level)	5%~95% @ 40°C / 104°F (Storage Level)
Net Weight (kg)		4	4

Railway Computer

Railway Surveillance NVR   Railway Surveillance NVR   Rackmount Railway Computer

Railway Solution		R3S Series	R6S Series	R8S Series
Chassis	Dimensions (W x H x D)	268 x 86 x 210 mm (10.55" x 3.4" x 8.27")	272.4 x 121.3 x 228 mm (10.72" x 4.77" x 8.97")	482.6 x 132 x 282 mm (19" x 5.2" x 15.7")
	IP Rated	IP50	IP50	IP20
System	Processor Number	Intel Atom x7-E3950 Processor	Intel Core i7-7600U 2.8GHz Processor	Intel Core i7-7600U 2.8GHz Processor
	Chipset	N/A	N/A	N/A
	Processor Graphics	Intel integrated HD Graphics 505	Intel integrated HD Graphics 620	Intel integrated HD Graphics 620
Memory	Technology	LPDDR4 1600 MHz Memory Down Up to 8GB	DDR4 1866/2133 SODIMM Socket x 1	DDR4 1866/2133 SODIMM Socket x 1
	Max. Capacity	Up to 8 GB (Factory default: 4GB pre-installed)	Up to 16 GB (Factory default: 8 GB module pre-installed)	Up to 16 GB (Factory default: 8 GB module pre-installed)
Storage	CF/ SD / mSATA Socket	mSATA socket x 1	mSATA socket x 1, SDXC Socket x 1	mSATA socket x 1
	2.5" Drive Bay	Internal 2.5" drive bay x 1	Removable 2.5" drive bay x 1 for 2x storages	Removable 2.5" drive bay x 4 for 4x storages
Ethernet Controller		Intel i210-IT x 6	Intel i210-IT x 4	Intel i210-IT x 3
Audio Controller		Realtek ALC886 HD codec	Realtek ALC886 HD codec	N/A
I/O	Display	HDMI x 2, resolution up to 3840x2160	VGA x 1, resolution up to 2048 x 1536 DVI-D x 1, resolution up to 1920 x 1200	DVI-D x 2, resolution up to 1920 x 1200
	LAN	N/A	GbE RJ45 x1	GbE M12 X-coded xx 2
	PoE	IEEE 802.3at POE ports M12 A-coded x 6	IEEE 802.3af standard PoE ports x 10	IEEE 802.3af POE ports M12 D-coded x 12 IEEE 802.3af POE ports M12 X-coded x 4
	Audio	Mic-in and Line-out with 2-watt by HD Audio	Mic-in and Line-out with 2-watt by HD Audio	N/A
	Serial I/O	COM_A: RS232/422/485 x2 COM_B: RS232/422/485 x2 COM_C: RS232 (TX-RX only) x6	RS-232/422/485 x2 with RI/5V/12V	RS-232/422/485 x2 with RI/5V/12V
	GPS	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band	u-blox NEO-M8N; 3 GNSS (GPS, Galileo, GLONASS, BeiDou), default @ GPS + GLONASS dual band
	G-sensor	ADXL 345	ADXL 345	ADXL 345
	CAN	Optional CAN Bus J1939 / J1708 x1	Optional CAN Bus J1939 / J1708 x1	N/A
	Digital I/O	4x DI 5V Level TTL and 4x DO 12V Level TTL 2x DI (from MCU) 3.3V Level TTL 2x 12V with 2A dry relay	7x DI 12V TTL selectable 7x DO 24V TTL, Max. 100mA 2x IGN-DI of ignition control to MCU	8x isolated DIO 5V/ 12V TTL selectable 2x relay out
	USB	USB 2.0 Type A x4 with 500 mA	USB 2.0 Type A x1 USB 3.0 Type A x4	USB 3.0 Type A x2
	Expansion	Full-size Mini-PCIe Socket x3, 2 of 3 with dual SIM card readers on each	Full-size Mini-PCIe Socket x2 with dual SIM card readers on each	Full-size Mini-PCIe Socket x6 with 12x SIM card readers
	Antenna	SMA antenna hole x6 (includes GPS+GLONASS x1)	SMA antenna hole x6 (includes GPS+GLONASS x1)	SMA antenna hole x13 (includes GPS+GLONASS x1)
	Power Input	Supports DC 14.4~154V level, ATX mode support ignition delay on/ off control	Supports DC 14.4~154V level, ATX mode support ignition delay on/ off control	Supports DC 14.4~154V level, ATX mode support ignition delay on/ off control
	Power Output	12V/2A DC out	12V/2A DC out	N/A
Hardware Monitoring / WDT		Fintek F81866AD-I integrated watchdog timer 1~255 level	Fintek F81866AD-1 integrated watchdog timer 1~255 level	Fintek F81866AD-1 integrated watchdog timer 1~255 level
OS Support		Windows: Win10 IOT Linux: Redhat Enterprise 5, Fedora 14. Linux Kernel 2.6.18 or later	Windows: Win10 IOT Linux: Redhat Enterprise 5, Fedora 14. Linux Kernel 2.6.18 or later	Windows: Win10 IOT Linux: Redhat Enterprise 5, Fedora 14. Linux Kernel 2.6.18 or later
Certifications	EMC	CE, FCC Class A, RoHS, EN 50121-3-2, EN 50121-4	CE, FCC Class A, RoHS, EN 50121-3-2, EN 50121-4	CE, FCC Class A, RoHS, EN 50121-3-2, EN 50121-4
	Safety	E13 include ISO 7637-2	E13 include ISO 7637-2	N/A
Compliance	Ambient Internal Temperature	EN 50155 Tx (-40 ~ 70°C), EN 50125-3	EN 50155 Tx (-40 ~ 70°C), EN 50125-3	EN 50155 Tx (-40 ~ 70°C), EN 50125-3
	Shock and Vibration	EN 61373 / MIL-STD-810G	EN 61373 / MIL-STD-810G	EN 61373
	Interruptions of Voltage Supply	EN 50155 Class S1	EN 50155 Class S2	EN 50155 Class S1
	Supply Over Change	EN 50155 Class C1	EN 50155 Class C2	EN 50155 Class C1
	Fire & Smoke	EN 45545-2	EN 45545-2	EN 45545-2
Environmental	Operating Temperature	-40~70°C / -40~158°F	-40~70°C / -40~158°F	-40~70°C / -40~158°F
	Storage Temperature	-40~85°C / -40~185°F	-40~85°C / -40~185°F	-40~85°C / -40~185°F
	Humidity	5%~95% @ 40°C / 104°F (Storage Level)	5%~95% @ 40°C / 104°F (Storage Level)	5%~95% @ 40°C / 104°F (Storage Level)
Net Weight (kg)		4	5.5	9.5

Enhance Subway Security for Tokyo Olympic 2020 with Mobile NVR Surveillance Platforms

Background

Mobile video surveillance is forecasted to grow with continuous momentum, triggered by the rising demands for public security and safety. In fact, this technology has been widely adopted by both public and private sectors to protect them from crime. Apparently, the surveillance market has shifted from cable-based CCTV structures to go wireless by adopting network technology. For instance, Tokyo Metro Co. will install IP surveillance cameras in over 3,000 subway vehicles, starting in 2018 or 2019, as an initiative to improve passenger safety for the 2020 Tokyo Olympics and Paralympics. TOEI Transportation, the authority of transportation in Tokyo, has launched plans to install surveillance cameras in the ceiling of each subway vehicle to collect video footage for evidence use.

Lanner Solution

Lanner's rolling stock computers are highly capable of train automation and mobile NVR applications by offering rich I/O connectivity and modular design. The rolling stock series are customizable and designed to be rugged in railway applications with wide operating temperature range (-40 to 70°C) and EN50155 compliance. Besides, all Lanner's rolling stock products are built in open architecture for high flexibility and wide interoperability. For instance, Lanner's rolling stock computer R3G Series is designed as a cost effective embedded system empowered by Intel® Atom™ x7-E3950 Processor providing quality performance with low power consumption for rolling stock computing application. Designed for rolling stock settings, R3G has gone through extensive vibration and shock testing to comply with parameters specified in EN50155.

Featured Product

R3G

EN50155 Certified & IP67-Rated Railway Embedded PC

- Intel® Atom™ x7-E3950 Processor
- Compliant with EN50155 and MIL-STD-810G standard
- Rolling stock computer with IP67-rated M12 connectors
- IEEE 802.3at POE ports M12 A-coded x5
- 3 x Mini-PCIe slots with 2 x SIM card readers
- Wide range operating temperature from -40 to 70°C
- Onboard GPS receiver module and G-sensor

Enabling Intelligence in Train Control and Management

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, EN50121, EN50125 & EN45545 Certified

- Digitalized Serviceability

- Modular Flexibility and Scalability

- Convenient Maintenance

Lanner Solution

Lanner's R8S is a highly-integrated 3U rail system packing high-processing CPU, sixteen M12 PoE ports, rolling stock certified endurance and multiple modular expansions to operate as the brain of intelligent rail systems.

R8S is built with a high-processing, 6th/7th Generation Intel® Core™ i7 Skylake U / Kaby Lake U CPU. 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.

R8S 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, R8S's Ethernet ports can function reliably in rail environments.

R8S has been rolling stock certified for protections against shock, vibration, temperature, humidity and surge. Regarding hardware component reliability, R8S is designed with open-standard architecture and hardware monitoring capability for convenient diagnose and maintenance

R8S is a highly scalable system with multiple modular expansions providing I/O functions including serial COM ports, GPIO, NVR, SATA/mSATA storage space, and the mini-PCIe sockets with SIM card readers for WiFi/3G/4G connectivity. This high-scalability nature allows R8S to be adapted in various rolling stock environments, simply by applying function-specific modules.

Featured Product

R8S

High Performance Fanless Rackmount Railway Computer with Intel Core™ i7 Skylake U / Kaby Lake U CPU

Onboard Vehicle Computers Enhance Waste Logistics Efficiencies

Background

In recent years, there are some waste collection companies beginning the adoption of digital technology to optimize their assets and investments. Since fleets and drivers are critical for the success of such business, it is essential to equip them with an onboard vehicle computer that can maximize route planning, ensure safety on roads, and help perform collections punctually. The implementation of such device is meant to replace manual routing so that the locations for dispatch can be automated to reduce unnecessary mileage, lower carbon footprint and improve customer satisfaction.

Lanner Solution

To assist drivers in maximizing efficiencies, Lanner presents V3G as the onboard solutions that can function as the in-vehicle controller to manage and control all the components of a waste logistic fleet. V3G comes with multiple I/O ports like USB, DIO and COM interfaces to connect with mainstream sensor devices, particularly RFID-based hardware. With RFID sensor and detection, collection volume thus becomes measurable. If a collecting truck is reaching its full capacity, as measured by RFID sensors, the driver can inform the control center to dispatch another truck for collection. Notably, V3G offers even more variety of I/O connectivity, such as two serial COM ports, 4x4 Digital I/O, PoE RJ-45 ports and 4 USB ports, if more sensors are connected for real-world applications. For instance, V3G can connect up to 4 sensors around the vehicle.

Featured Product

V3G

Fanless Vehicle Gateway Computer

- Intel® Atom™ x7-E3950

- Vehicle Gateway Computer with 2x RJ-45 ports

- DIO,Optional CAN bus, 2x COM, 2x USB and 2x DVI-D

- Wide range operating temperature from -40 to 70°C

- Internal 2.5" Drive Bay for HDD/SSD

- Compliant with E13 standard

- 1x full size external Mini-PCIe slot with dual SIM card readers, 1x half size Mini-PCIe

Securing Cash-In-Transit with Access Control, Remote Tracking and Video Monitoring

Background

The largest private security company with over 400 armored vehicles in UAE came to Lanner's system integrator in the Middle East region regarding in-vehicle mobile surveillance system due to unexpected hijackings previously. They decided on an integrated mobile gateway with fleet management and NVR solutions to be installed in the armored vehicle. Essential functions like IP camera connections, visioning technology, fingerprint identification access control and anti-tailing detection are incorporated and enabled by the in-vehicle gateway to improve the safety and security of cash-in-transit jobs.

Lanner Solution

By taking security and safety into considerations, Lanner's V6S is applied in this case as a top-notch mobile NVR to work seamlessly with cash-in-transit vehicles for the private company in UAE.

V6S is a state-of-the-art hardware gateway that comes with multiple PoE LAN ports for mobile surveillance. With proper installation of V6S, each armored vehicle is equipped with 10 IP cameras on board.

For long recording period, V6S provides two 2.5" swappable disk drive bays that support up to 4TB storage capacity. With huge storage volume, the gateway can keep a large number of high-resolution 1080p video footages without being overwritten in just couple days.

Regarding the physical characteristics, V6S is built in fanless form factor, ideal for in-vehicle setting. On the other hand, the hardware gateway is MIL-STD-810G compliant to resist shock and vibration that may occur during missions.

To integrate various critical control functions, V6S is built with diversified I/O including Digital Input/Output, Serial COM connection, GPS module and CAN bus to connect with devices or instruments for fingerprint identification, access control, speed limit, location tracking and anti-tailing Door A/B systems.

Integrated with V6S, the armored cash-in-transit is capable of intelligent control and surveillance to transport valuables.

Featured Product

V6S

Fanless Vehicle NVR with 10x PoE Ports

- Intel® Core™ i7-7600U Dual Cores Processor
- MIL-STD-810G and E-mark certified
- Removable Mini-PCIe x1 with 2 SIM sockets for 4G/LTE
- 2 x Swappable 2.5" HDD drive bays
- External power adapter with Li-ion battery for 15 min. backup (SKU A1)
- 2x COM, 4x USB, 7x DI/DO, optional CAN bus, Audio, DVI, VGA
- 10x PoE ports with Intel i210IT, 1x GbE RJ45 with i210IT

Accessories

4G-LTE Modules

0TAW000136000 0TAW000137000	Gemalto LM_PLS8-E/US

GEMALTO PLS8-E PCI EXPRESS MNI CARD LTE/UMTS MODULE for EU
GEMALTO PLS8-US PCI EXPRESS MNI CARD LTE/UMTS MODULE for US

0TAW000163000 0TAW000094000	Sierra MC7455/MC7430

WIRELESS CARD MC7455 SIERRA PCI-E MINI CARD AIRPRIME LTE/CDMA/HSPA+MODULE For North and South America Europe, Middle East, Africa
WIRELESS CARD MC7430 SIERRA PCI-E MINI CARD AIRPRIME LTE/CDMA/HSPA+MODULE <FOR JAPAN AREA>

0TAW000147000 0TAW000139000	Sierra EM7430/EM7455

WIRELESS CARD EM7430 SIERRA 4G LTE CA Based on the PCI Express M.2
WIRELESS CARD EM7455 SIERRA 3G/LTE CAT.6 M.2 3042 SIZE MODULES

3G Modules

0TAW000138000	Gemalto LX-EHS6

WIRELESS CARD EHS6 CINTERION 3G/LTE/HSPA+/EDGE/GPRS/GSM Module
GSM/GPRS/EDGE 850/ 900/ 1800/ 1900/
HSPA/UMTS 800/ 850/ 900/ 1900/ 2100

0TAWMC8705Z01	Sierra MC8705

SIERRA AirPrime MC8705 PCI Express Mini Card offers high performance to the user on 3.75G, Quad-band GSM/EDGE/UMTS/HSDPA networks
- Coverage: 850/1900/2100 MHz
- Interface: PCI Express   - Form Factor: Mini PCIe Card Full Size

Wi-Fi/Bluetooth Modules

0TAW000084000	WPEA-252NI 802.11a/b/g/n Industrial-grade Mini Card

Dual band 802.11a/b/g/n 2.4G + 5GHz 2T2R Industrial-grade Mini PCIe module (-40~85°C)

0TAW000165000	WPEQ-261ACN(BT) 802.11a/b/g/n+Bluetooth Half Mini Card

Dual band, 802.11ac/a/b/g/n Wi-Fi+Bluetooth Half Mini PCIe Module, Qualcomm Atheros QCA6174A-5, 2T2R

External Antennas

0TZW000100000	3G/4G LTE External Antenna

ANTENNA GY115HT0064-001 WIESON LTE antenna 698~2700 MHz

0TZW000101000	WiFi External Antenna

ANTENNA GY121HT0064-001 WIESON WiFi dual band antenna 2400~2500/5150~5850 MHz

0TZW000097000	WiFi External Antenna

ANTENNA PH14-2458-B3MA-SMA-M ANJIE WiFi dual band 3M cable antenna

0TZW000098000	3G/4G LTE External Antenna

ANTENNA PH14-6927-B3MA-SMA-M ANJIE LTE full band 3M cable antenna

0TZW000099000	GPS+GLONASS+Bei-Dou

ANTENNA PH07-GPSGNS-B3M-SMA-M ANJIE GPS/GNS 3M cable antenna

Internal Antenna Cables

10, 15, 20, 30, 35cm	3G/4G LTE/ WiFi/ GPS Antenna Cables

P/N 080W000391000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 5CM 180°-180° G9851HT0064-005

P/N 080W000393000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 10CM 180°-180° G9851C0064-003

P/N 080W000394000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 15CM 180°-180° G9851C0064-004

P/N 080W000404000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 10CM 180°-180° [Ipex4]

P/N 080W000405000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 15CM 180°-180° [Ipex4]

P/N 080W000395000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 20CM 180°-180° G9851C0064-001[Ipex4]

P/N 080W000396000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 25CM 180°-180° G9851C0064-002[Ipex4]

P/N 080W000397000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 20CM 180°-180° G9851HT0064-009

P/N 080W000398000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 25CM 180°-180° G9851HT0064-010

P/N 080W000402000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 30CM 180°-180° BSJJP1-B0300
                   [Conductive fabric tape]

P/N 080W000403000: ANTENNA CABLE IPEX 1.13 SMA FEMALE 30CM 180°-180° BSJJP1-B0300A
                   [Conductive fabric tape]

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