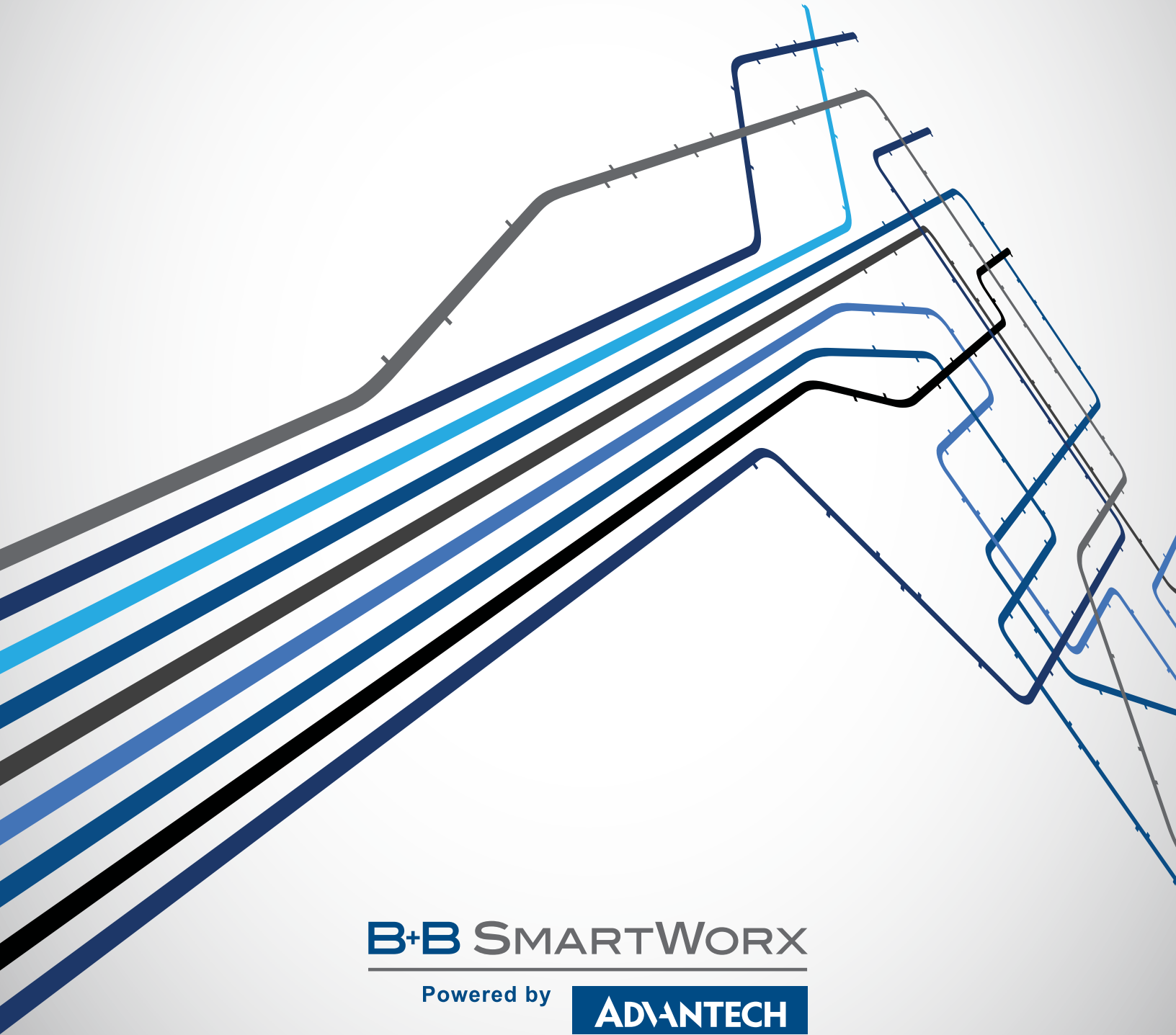# **+** intelligent transportation systems

superior solutions with smart technology

B+B SmartWorx

Powered by **ADVANTECH**

+intelligent transportation systems

ITS success hinges on implementing the right technology

The goal of "intelligent transportation" is to create a safer, more efficient, maintainable, accessible transportation environment. With the help of advanced networking technology, smart sensors, innovative engineered solutions and more, real-time data and monitoring is making this goal a reality. Intelligent transportation systems (ITS) can include everything from traditional traffic management to advanced traveler information systems to public transportation. No matter the application, a successful ITS system comes down to utilizing the right data and network communication solutions. Many answers to improving what we already have can be found in new technologies. How do you know what technology is right for your application? Here we explore several ITS applications and the reliable, rugged networking technologies that help them run in top condition.

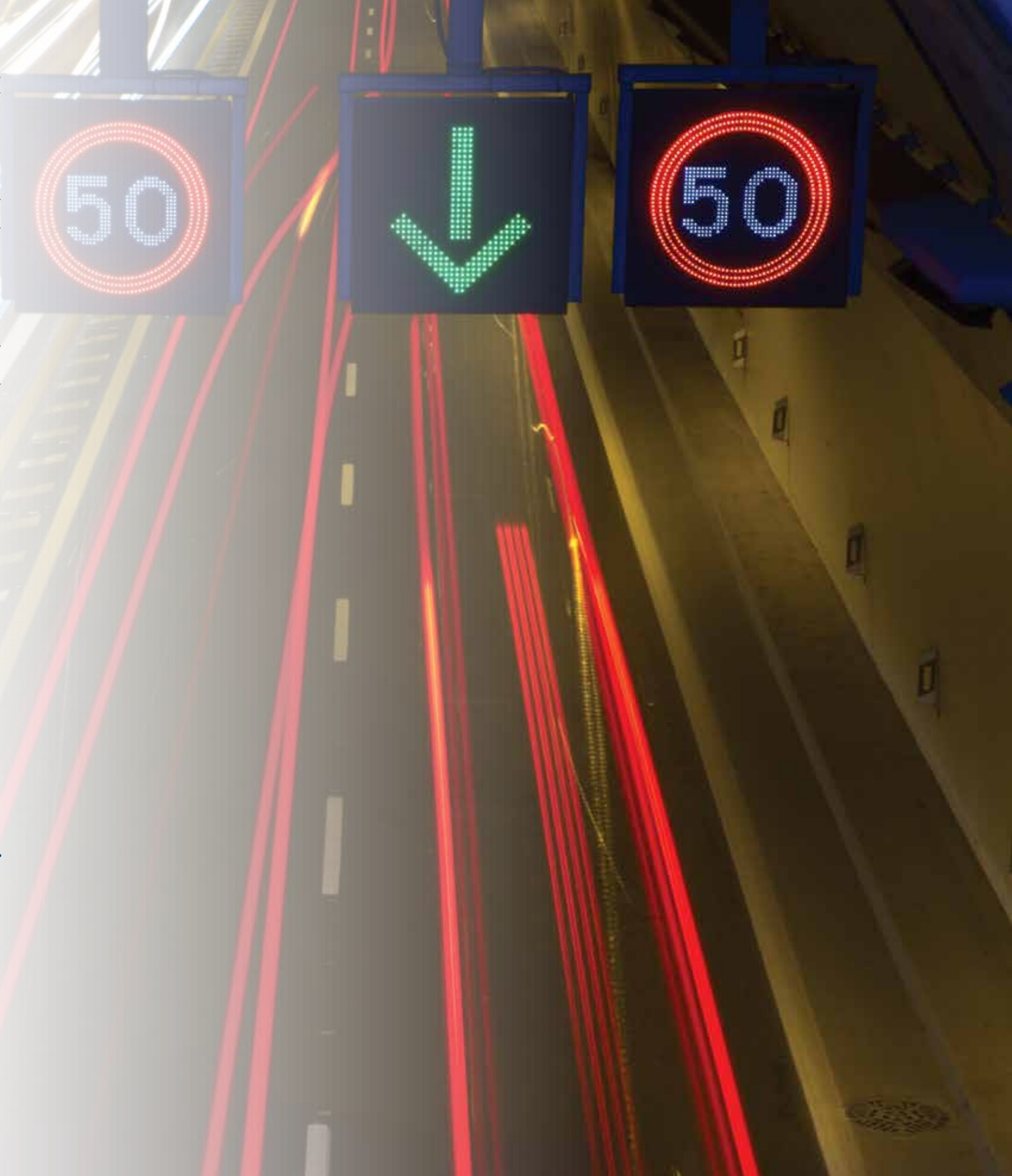## ✚ B+B SmartWorx is at the heart of greater efficiency in data-driven transportation applications.

B+B SmartWorx offers the following M2M (machine-to-machine) transportation solutions for trouble-free connectivity and data communications:

- NEMA TS1/TS2-rated products
- Cellular routers
- Wireless radio modems and remote I/O
- WiFi routers, bridges, serial servers, embedded modules, access points
- Telematics fleet management
- Ethernet switches, routers, extenders
- Ethernet serial servers, gateways
- Ethernet media converters, chassis products
- Serial converters and protectors, repeaters, isolators, cards
- USB converters, hubs, isolators, surge protectors
- Turn-key and custom engineered solutions

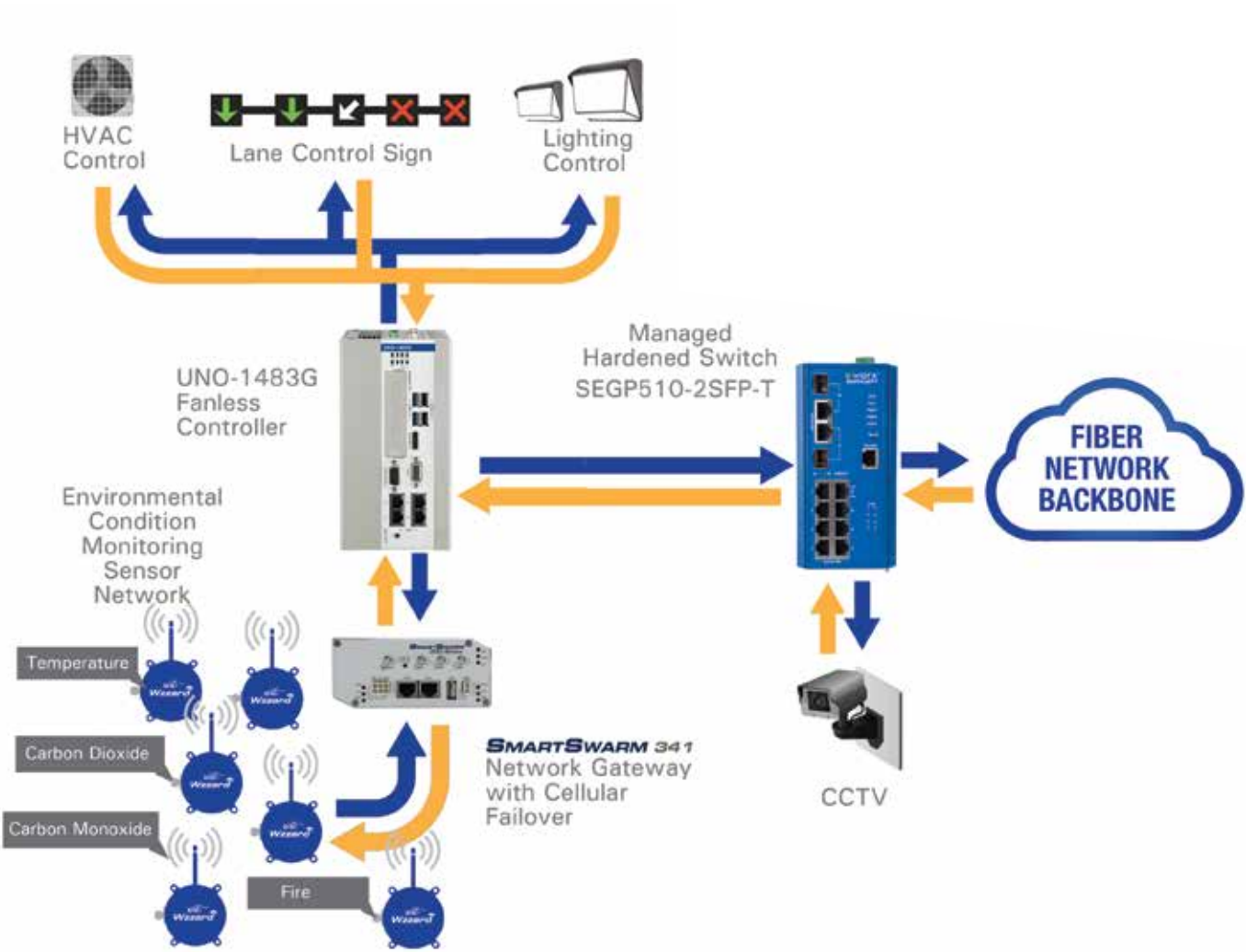**+** keep motorists safe with real-time data

solving high bandwidth & power issues

Tunnels are one of the most dangerous traffic environments for motorists, and tunnel monitoring and incident management systems are only as good as the network infrastructure used to collect and send critically-important data. A leading tunnel constructor recently needed help implementing a reliable, safe and robust network — a solution came from B+B SmartWorx powered by Advantech. The non-stop tunnel surveillance, in combination with the operating environment, demanded an innovative and intelligent system of networking devices. To meet the many challenges of the application, the system integrator chose networking technologies and devices from B+B SmartWorx for a complete solution.

tunnel network management solution

managed, hardened eWorx switch SEGP510-2SFP-T

To meet application challenges, the system integrator chose B+B SmartWorx eWorx SE500 switches. The switches' interface includes eight 10/100 RJ-45 ports, and supports IEEE 802.3 af/at PoE ports and two Gigabit Copper/SFP fiber combo ports. The industrial-grade switches are fully-managed, have a wide operating temperature and support 802.1x authentication processes. With Gigabit bandwidth, the SE500 has the built-in intelligence to transform with the network.

For mass deployment issues, the switches use IXM™ Technology. With IXM, administrators can upgrade firmware and deploy and restore configurations to groups of switches quickly and efficiently.

UNO-1483G fan-less controller

B+B SmartWorx selected these fan-less controllers to control various systems, such as the tunnel HVAC. The UNO-1483G is an Intel 4th generation Core i3 DIN-Rail controller that features dual-power inputs, general purpose input/output ports, a PCIe slot and Advantech iDoor technology. iDoor Technology gives customers the flexibility to configure various I/O requirements based on different applications. iDoor modules include: Fieldbus protocol; digital, analog and expansion I/O; smart sensor; communication; and memory. The UNO-1483G ports include 4 x GbE, 4 x USB 2.0/3.0, 1 x RS-232, 2 x RS-422/485, 1 x VGA, 1 x DP, and 1 Audio. Certifications include CE, FCC, UL, CCC, and BSMI.

Wzzard wireless sensor platform

B+B SmartWorx provided its Wzzard Wireless Sensor platform to monitor environmental parameters like temperature, carbon dioxide, carbon monoxide and more. The platform uses Intelligent Edge Nodes to provide wireless mesh network connectivity for industry-standard sensors. The network carries the data to the Spectre Network Gateway, which provides the network connection. The Intelligent Edge Nodes can be externally powered, if needed, but will remain in service for many years on battery power alone.

Each node can collect data from up to three attached sensors and transmit it across the wireless mesh network. As each node has routing capabilities, the mesh network is self-forming and self-healing. This means individual nodes don't need to be within range of the gateway — the data will simply travel from node to node until it reaches the destination. Nodes are available with an integrated or longer range external antenna, allowing for distances up to 500m outdoors and 200m indoors.

+ advance the railway passenger experience

smart EN 50155 rail solutions

A B+B SmartWorx powered by Advantech customer needed a railroad management system that could stand up to difficult environmental conditions, such as heavy vibration, while simultaneously providing rail travelers with reliable in-car WiFi. They also needed the ability to provide top security through features like CCTV surveillance and public address systems. The system needed to successfully unite disparate data networking interfaces and protocols in an a single, seamless system.

ITA-5000 EN50155 fan-less controller

B+B SmartWorx powered by Advantech provided the customer with the EN50155 fan-less controller, an extremely reliable computing system with the right features and certifications needed to handle multiple software scenarios in rolling stock applications. This was used to control in-car systems.

IMCV-LIM 10/100Mbps media converter

B+B SmartWorx selected this hardened, full Gigabit managed media converter to provide the high-bandwidth connection needed for dynamic passenger messaging and sign management within a multiple-control system.
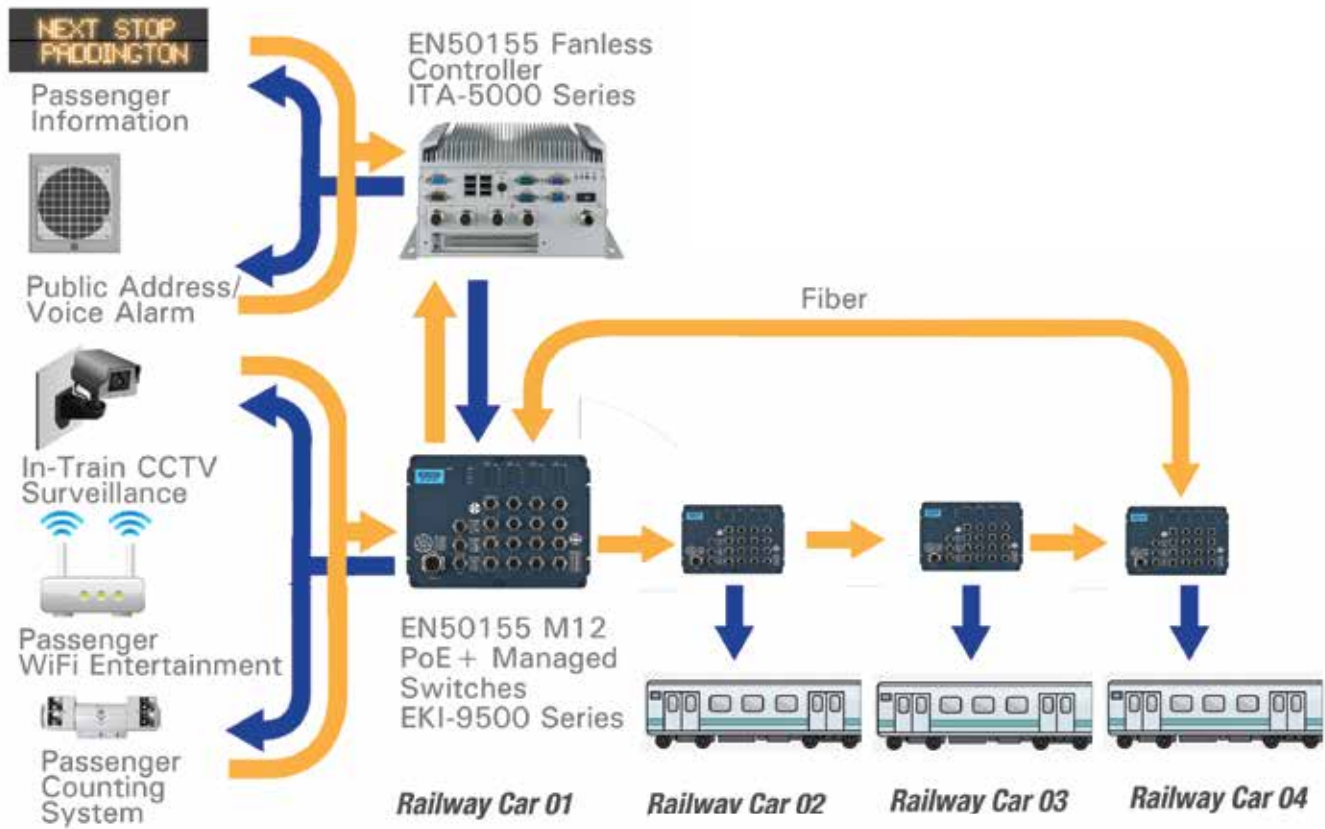

EN50155 M12 PoE+ managed switches

B+B SmartWorx supplied the customer with the EN50155 PoE+ Gigabit Managed switch to help create a reliable network backbone with the high bandwidth needed for efficient network traffic management between multiple systems.
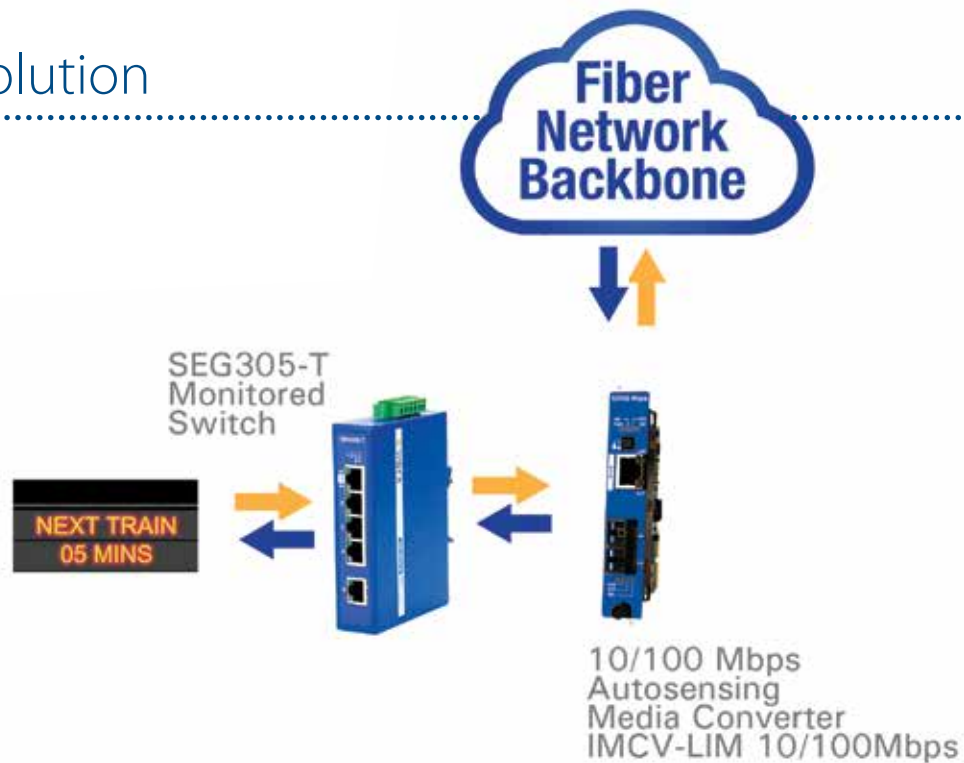
SEG305-T monitored switch

Installing the iView² Network Management Software gives the switches basic monitoring and management capabilities. They bridge the gap between unmanaged switches and fully-managed solutions. They are IEEE802.3az-compliant Energy Ethernet switches that cut power usage up to 60%.

rolling stock solution

NEXT STOP PADDINGTON

Passenger Information

Public Address/ Voice Alarm

In-Train CCTV Surveillance

Passenger WiFi Entertainment

Passenger Counting System

EN50155 Fanless Controller ITA-5000 Series

Fiber

EN50155 M12 PoE+ Managed Switches EKI-9500 Series

Railway Car 01   Railwav Car 02   Railway Car 03   Railway Car 04

rail station solution

Fiber Network Backbone

SEG305-T Monitored Switch

NEXT TRAIN 05 MINS

10/100 Mbps Autosensing Media Converter IMCV-LIM 10/100Mbps

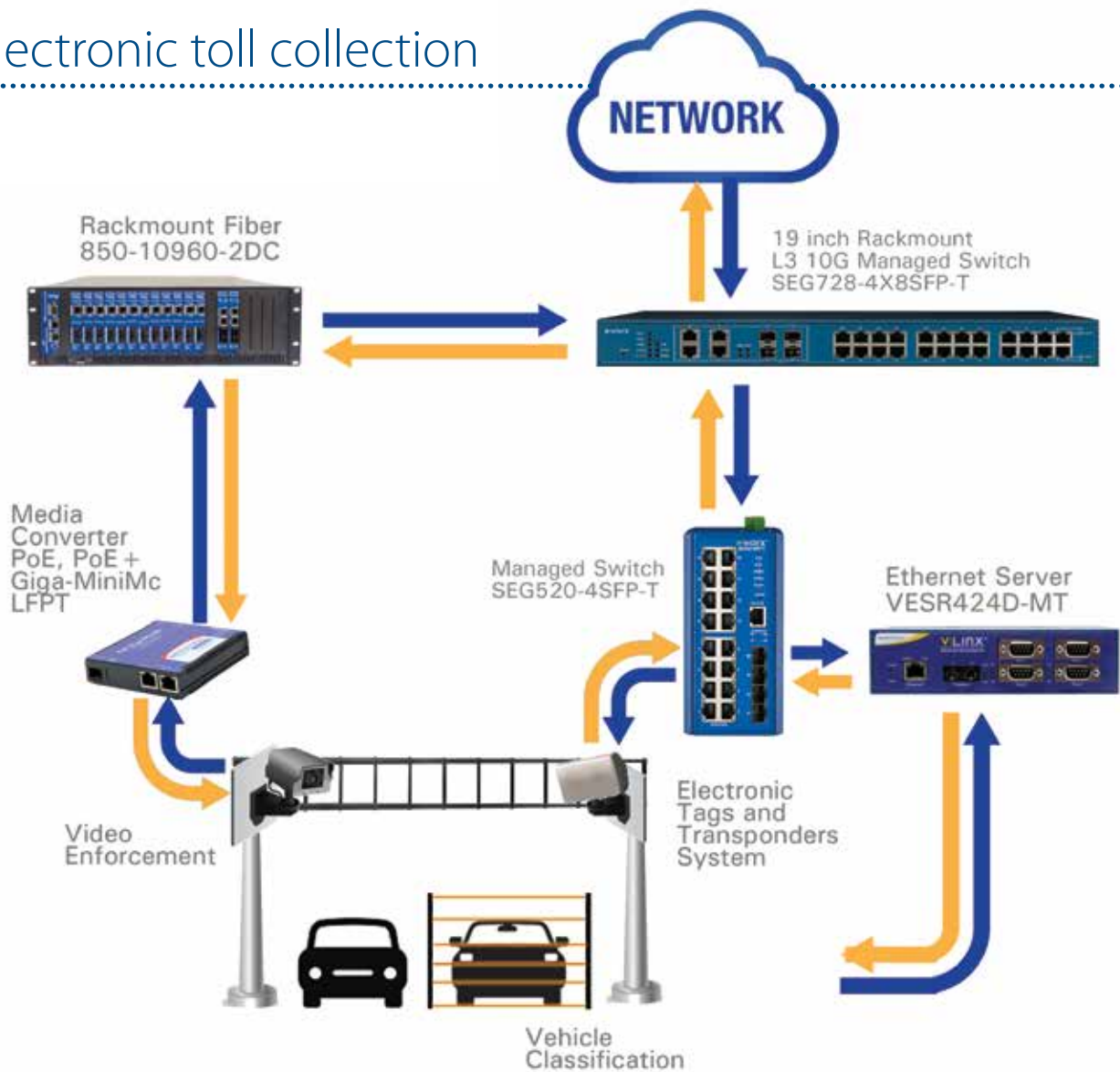**+** apply smart technology for efficient tolling

a successful toll road network

With a growing demand for effective and intelligent tolling systems — to avoid numerous operation and implementation challenges of traditional toll collection systems — a recent B+B SmartWorx powered by Advantech customer needed help with its own electronic toll collection system. The system had to be able to stand up to difficult environmental conditions while simultaneously collecting tolls, monitoring violations and collecting vehicle information for accurate enforcement. It also needed to incorporate speed cameras, red-light cameras, vehicle identification equipment and more.

electronic toll collection

Rackmount Fiber
850-10960-2DC

19 inch Rackmount
L3 10G Managed Switch
SEG728-4X8SFP-T

Media
Converter
PoE, PoE +
Giga-MiniMc
LFPT

NETWORK

Managed Switch
SEG520-4SFP-T

Ethernet Server
VESR424D-MT

Video
Enforcement

Electronic
Tags and
Transponders
System

Vehicle
Classification

managed, hardened switch SEG520-4SFP-T

B+B SmartWorx supplied fully-managed eWorx SE500 Ethernet switches to aggregate vital data. The series utilizes compact sizes, the ability to connect multiple network layers and unique port combination options, such as up to 28 ports for Gigabit in 19-inch rackmount and a 20-port Gigabit in DIN-Rail option. The full gigabit option offers speeds up to 10 times greater than previous generations. With rugged features, these switches provide the basic functions you need in a managed switch and more. The SE500 Series also includes IXM™ technology, a user-friendly, built-in intelligence system for cross management and deployment functions.

rackmount L3 10G managed switch SEG728-4X8SFP-T

The B+B SmartWorx SEG728-4X8SFP-T is an industrial-class, Layer 3, fully-managed switch that includes 16 Gigabit ports, 8 Gigabit combo ports and 4 10G ports. It's designed for rack-mount installation and offers high-bandwidth. The switch also integrates Layer 3 routing capabilities for multiple network segmentation and IXM technology, which offers mass switch configuration.

ethernet/serial server VESR424

B+B SmartWorx Vlinx™ VESR424 series Serial Servers connect serial devices (RS-232, RS-422 or RS-485) to Ethernet networks, allowing the serial device to become a node on the network. Serial ports can be accessed over a LAN/WAN using Direct IP Mode, Virtual COM Port or Paired Mode connections.

copper/fiber media converter PoE/PoE+ Giga-MiniMc/LFPT

The B+B SmartWorx PoE and PoE+ Giga-MiniMc/LFPT is a low-cost, compact, multi-port media converter that supports both PoE and PoE+ standards. It features two 10/100/1000Base-T copper UTP ports and one SFP uplink port that supports either a copper or fiber SFP.

fiber chassis iMediaChassis/20 model 850-10960-2DC

The B+B SmartWorx iMediaChassis/20 is an intelligent, carrier-class optical access platform. It supports modules that convert Ethernet to fiber and a variety of other telecom networking technologies, such as VDSL, T1/E1, DS3/E3/STS-1 and WD.
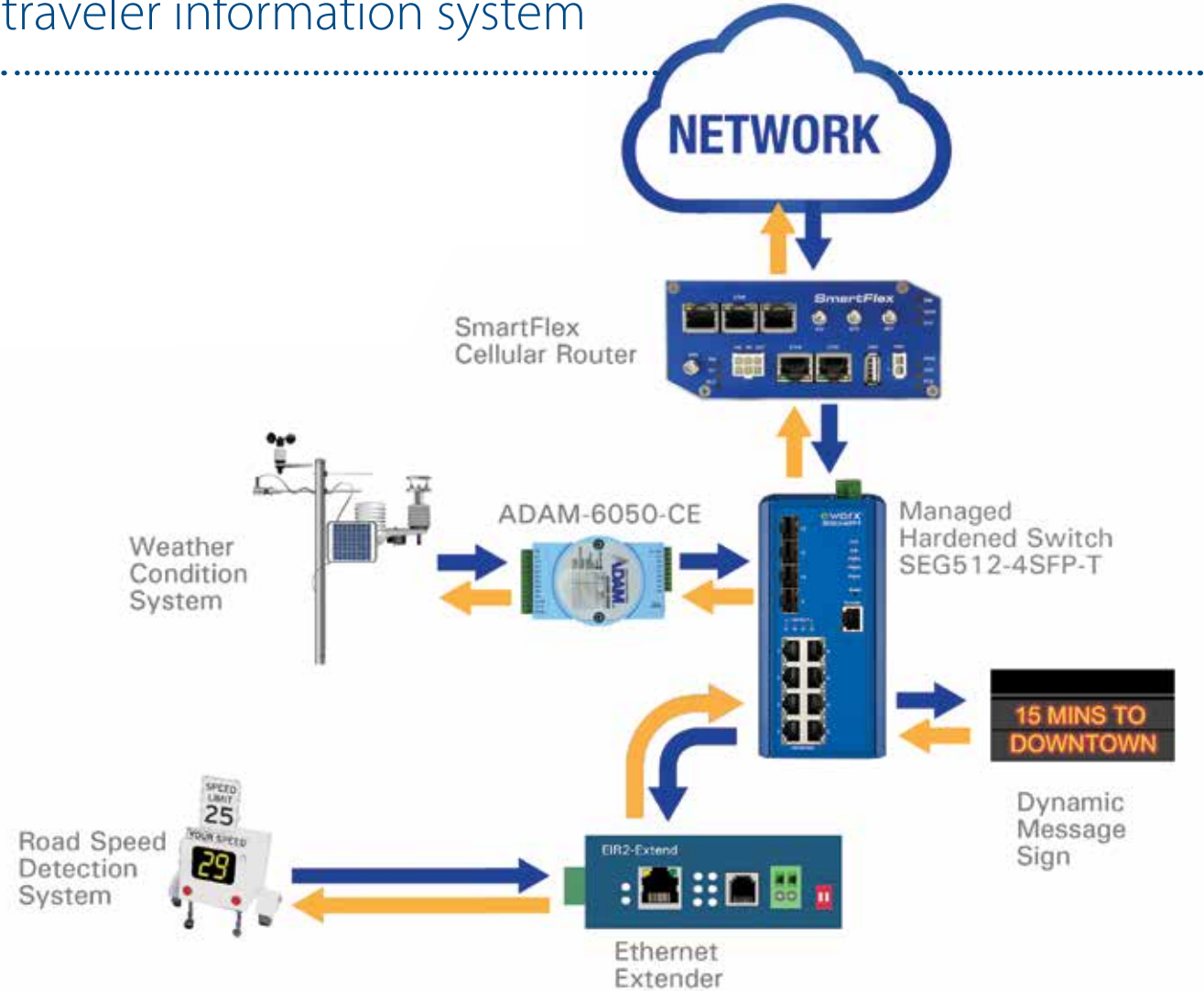
+ inform travelers with intelligent systems

smart connectivity for informed travelers

A B+B SmartWorx powered by Advantech customer needed a traveler information system that could stand up to rugged environmental conditions while simultaneously providing travelers with timely information, such as speed limit variables, incident detection, traffic alerts, road conditions, weather status and more. It needed to incorporate dynamic signage, exit signal controls, roadside weather stations and numerous other systems. To be successful, it had to unite disparate data networking interfaces and protocols in an a single, seamless network, bridging the gaps between a variety of data networking technologies.

With its broad portofolio of networking technologies and devices, B+B SmartWorx was able to provide a complete solution.

traveler information system

ethernet extender
EIR2-EXTEND

The B+B SmartWorx EIR2-EXTEND is perfect for connecting remote devices for applications, such as speed tracking installations. The EIR2 extends copper Ethernet connections up to 2,200 meters (7,218 feet) over a twisted copper pair. It can also make use of legacy cabling infrastructure. It fully complies with IEEE 802.3 10BaseT and IEEE 802.3u 100BaseTX standards.

managed gigabit switch
SEG512-4SFP-T

The SE500 Series of smart switches are designed and built to work in harsh and/or high-bandwidth application environments, and include all the features you want in a managed switch — plus much more. The B+B SmartWorx SEG512-4SFP-T is a fully managed Gigabit Ethernet switch with 4 Up-link fiber channels to handle the multiple redundant data patch. Additionally, they support comprehensive network security features, such as SSH, HTTPS/SSL, TLS, TTLS, PEAP and Radius. The SE500 Series also features IXM™ cross management technology with an auto synchronization function to make deployment of multiple switches efficient and easy.

18-ch isolated digital I/O
modbus TCP module
ADAM-6050-CE

The B+B SmartWorx ADAM-6000 simplifies the integration of automation and enterprise systems because users don't need to change the architecture of the control system. ADAM-6000 modules are equipped with peer-to-peer (P2P) and Graphic Condition Logic (GCL), and can perform as standalone products for measurement, control and automation. They eliminate the need for additional controllers or programming, and system configurations can be done quickly with the easy-to-use and intuitive graphic utility.

smart, secure SmartFlex routers

B+B SmartWorx SmartFlex routers are configured to meet your specific application needs. The standard configuration includes two Ethernet 10/100 ports, one USB 2.0 Host port, two binary inputs and one output (I/O connector). The device also has twin readers for 3 V and 1.8 V SIM cards and a microSD card port.

SmartFlex can also be configured with a wide variety of expansion port options. These can be 3-switched Ethernet ports, an RS-232 port, or even a combination of separated RS-232 and RS-485 ports. Configuration may be done via a password-protected Web interface. The router supports the creation of VPN tunnels using IPsec, OpenVPN and L2TP.

✚ CONNECTED PLANET
ENABLING SOLUTIONS

Our lives are networked like never before, supported by the machine and information networks working to gather, manage and transform operational data into better living.

We are B+B SmartWorx powered by Advantech. We enable solutions that add new layers of sophistication to existing machine data networks and provide dramatic new capabilities that ultimately improve a network's efficiency and productivity. Our specialty is advancing secure connectivity at the Network Edge through the use of intelligent wireless and wired communication technologies.

Explore your opportunity with us. Working together to enable a connected planet.

B+B SMARTWORX

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