Delivering Data On Demand

For a safer, more efficient Freight Rail Experience

The ability to reliably and securely send and receive data in real-time to and from a moving vehicle, along with the capacity to handle and respond to that information appropriately, is key to safer and more profitable freight rail operations.

The Challenges:

- Multiple, disparate, onboard sensors and systems requiring multiple routers and antenna setups are competing for limited real estate inside and on top of the rail vehicle
- On-demand access to the data generated by these sensors and systems is hampered by the lack of connectivity in large parts of North America, particularly in rural areas, where the trains operate

Introducing Icomera's Wireless Internet Connectivity and Application Platform

Icomera provides a high-quality, cost-effective and easy to install solution by deploying a single, integrated hardware and software platform combining powerful onboard computing with secure, reliable high-speed train to ground communications.

- **Powerful Edge Computing Platform**: Our EN50155 certified hardware has a small physical footprint but it packs the computer processing power and storage needed to support multiple, resource-intensive operational and safety applications in parallel. Additionally, it can replace the need for some other hardware through the hosting of virtual machines.
- **Centralized Connectivity Solution:** Supports the wireless connectivity requirements of other onboard hardware such as cameras and sensors, without interfering with their functionality.
- **Connected Everywhere:** The Icomera platform delivers a secure data connection to and from a moving vehicle, maximizing the stability, uptime and data throughput of a connection by intelligently utilizing all available cellular communications (including CBRS and Band 14), satellite, Wi-Fi, and trackside to provide the fastest, most reliable, ubiquitous connectivity wherever the vehicle travels.
- **Least Cost Routing:** By setting priorities on different networks, the Icomera platform prioritizes data transfer over lower cost links (e.g. rail yard Wi-Fi) when such links come into play.
- **Secure Solutions as Standard:** Icomera systems are installed with a broad range of robust cyber-defences delivered as standard. We are ISO 27001 certified for information security management and Icomera onboard networks are designed with security front of mind, supporting VPN connectivity, segregated VLANs, Layer 2 isolation, and the capability to add further cybersecurity applications onboard.

Protect Rail Workers and Cargo

Safety is the number one priority throughout the rail industry. Icomera's digital video surveillance solution can be utilized to monitor the interior and exterior of the vehicle. IP video sensors (cameras) are placed on the front of the vehicle, inside the cab to cover the engineer, and on the sides to monitor the area around the train when it is stopped.

In the event of an incident, high-definition surveillance footage from the vehicle can be streamed or retrieved remotely, no matter where the train is located, allowing the operator to make a fast and appropriate response, protecting its engineers and cargo, and to resume normal service with minimal disruption.

The system can be configured to automatically offload footage when connected to specified low cost communications channels such as the Wi-Fi network in a rail yard, or when connected to a dedicated trackside network.

Sharing the Driver's Perspective

The Icomera platform delivers the connectivity required to provide access to and visibility of data feeds from multiple devices and systems installed on board vehicles in real time to both the engineer and the company's operations center. This way both the engineer and the operations center can intelligently use these feeds to derive considerable operational and safety benefits as well as manage costs.

For example, temperature, vibration and other sensors are used by the engineer to monitor the health of the locomotive, but even greater benefits can be delivered when that data and more is shared in real time with operations, mechanical and engineering departments. Maintenance needs can be more reliably predicted and parts and labor can be positioned so that when the train reaches the next yard, downtime is kept to a minimum. Safety critical data such as issues on the track can be identified through sensors and relayed immediately without engineer involvement.

Edge Computing

Not all data needs to be transmitted in real time or while the locomotive is in motion. Doing so, particularly with video data would be extremely expensive. Onboard data processing, analytics and storage reduces data transmission costs and ensures that only the necessary information relating to identified issues alert the engineer and are sent back to the operations center immediately. The latest generation of Icomera hardware is equipped with the high-performance computer processing power and hosting capabilities necessary to run multiple concurrent third-party analytics software and virtualized application onboard the vehicle. For example, video data can be recorded from a camera mounted at the front of the locomotive or geometry car, and analyzed onboard. Then, only the relevant data is sent to the operations center when issues have been identified. When the locomotive reaches a yard with Wi-Fi, where the cost of data transmission is effectively zero, the entire video can then be offloaded for archival purposes.

Additionally, video analytics can be used to identify distracted engineers, the number of people in the cab, and relay that information back to an operations center without the need for the video stream to be monitored manually or to be streaming data constantly off the vehicle.

Wireless Hotspots

The same wireless Internet connectivity that connects onboard operational and safety systems can be utilized by engineers and maintenance crews when the vehicle is stationary, who regularly need to send data back to base. This is made possible via a dedicated Wi-Fi hotspot.

While these rail workers are typically issued with smart devices that connect to a single cellular network, the Icomera Wi-Fi hotspot expands this connectivity to all available cellular networks, and can even be augmented by satellite in remote locations where the cellular coverage is weak or unavailable.

The emerging trend of using drones for track and bridge inspections is also supported by the Icomera solution, as the drones can also connect to the vehicle's Wi-Fi hotspot, allowing them to be deployed in situations where the lack of connectivity was previously a barrier and to either process onboard or send data back to an operations center from the field.

Get in Touch Today...

At Icomera, we work with other industry leaders to build long-term relationships. We listen to your needs and advise you on the solutions that fit your requirements, with room to grow in the future. We are with you through the installation process and over the entirety of a solution's service life. We can point to our proven track record of successful projects, providing relevant case studies on request.

Unrivalled Service and Support

As the world leader in wireless connectivity solutions for the rail industry, we:

- Use our scale and reach to work closely with clients
- Provide reliable and dedicated 24/7365 proactive monitoring and support to detect, prevent and resolve issues
- Guarantee uptime with high service level agreements

About Icomera

Icomera, a subsidiary of ENGIE Solutions, is the world's leading provider of mobile Internet connectivity for rail. Our award-winning technology serves tens of thousands of vehicles across the globe daily. We work with leading consultants to innovate and meet the growing data demands presented by the advent of 5G and IoT technology.