Opengear provides 3G cellular connectivity to locomotive control systems.

SUMMARY

Industry:
Locomotive Control Systems

Customer Profile:
TMV Control Systems designs and produces next generation locomotive control systems. Their Traction and Engine Control Unit (TECU) provides customers with information about the health and location of locomotives. This data helps their customers track the efficiency and overall health of their fleets.

Objectives:
- Deploy serial console access solutions to remote locomotives to automate the retrieval of data being sent by the TECU
- Securely transmit that data using 3G cellular connectivity
- Provide customers with online access to health and location information of their locomotives

Opengear Solution:
- ACM5004-G-I Remote management gateways with 3G wireless connectivity, GPS capabilities & VPN Gateway

Results:
- Fleets are now being monitored 24 hours a day
- Location and operating conditions of locomotives are available regardless of where customer or equipment location
- Equipment managers now have more data opening new possibilities for off-site diagnostics and data analysis
- Support staff are able to begin diagnosis and remediation before operators even report the issue.
- Remote monitoring allows staff to provide fast and seamless support to operators reducing downtime

THE CHALLENGE

TMV Controls is a provider of next generation locomotive control systems and has been delivering innovative control systems for railway applications since 2005. TMV's primary product is the Traction and Engine Control Unit (TECU). The TECU can manage hundreds of digital and analog inputs and outputs for a locomotive. The TECU's modular architecture allows it to be easily modified to suit a variety of different locomotives, including cutting edge multi-engine locomotives, conventional diesel-electric locomotives, and street cars. The staff of TMV Control Systems has many years of locomotive control system design experience and is ideally suited to design this next generation control system.

TMV Controls wanted to expand the TECU solution by offering Cellular Remote Monitoring service to locomotives. The goal was to provide customers immediate access to up-to-date locomotive data, alerts and logs via a secure web-based information hub. TMV needed a flexible but secure method to get the data from the locomotives back to the monitoring server.

Their challenges:

- Automating the process of manually gathering the data from each locomotive reducing the time required from hours to minutes
- Securely transmitting critical data on moving locomotives traveling across diverse geographies
- Providing immediate access to critical data for maintenance and operational staff

Using Opengear's ACM5004-G-I remote management gateway has greatly increased TMV's ability to provide near real-time locomotive monitoring regardless of location.

> "We chose Opengear because of the built-in 3G and OpenVPN support which allowed us to securely transmit data back to our monitoring server. Data that used to take hours to collect is now automatically retrieved every few minutes."
>
> **- Isaac Sutherland**
> Software Developer, TMV Control Systems

THE SOLUTION: TMV Cellular Remote Monitoring

TMV deployed Opengear ACM5004-G-I remote management gateways on locomotives. The ACM5004-G-I has built-in 3G cellular connectivity and transmits locomotive operational data and location data. Customers can access their data from anywhere via the TMV secure, web-based central information hub.

Previously, technicians had to be dispatched to each locomotive to manually download the data within each TECU - a process that could take several hours. With TMV Cellular Remote Monitoring, customers have immediate access to data regardless of the location of the locomotive.

Additional benefits TMV customers enjoy from the Cellular Remote Monitoring include:

- Improved operational efficiency and reduced downtime
- Providing equipment managers off-site diagnostics and data analysis
- GPS enabled tracking equipment
- Data can be delivered to anyone regardless of where they are located
- Fault logs keep staff informed about the health of all their equipment
- Ability to generate reports about the overall health of the fleet
- Management insight into the overall performance of different types of locomotives
- Issues affecting locomotives can be recognized earlier, sometimes before operators are aware there is a concern
- Field service staff also have remote access to remote monitoring data, so any parts can be ordered and brought on site before they visit the locomotive
- Support staff are able to begin diagnosis and remediation before operators even report the issue

ACM5004-G-I Remote Gateway Manager

- Complete remote management solution in one box
- Remote site access over PSTN or cellular with smart failover
- Integrated console server manages router switch and firewall serial & USB consoles
- Deploy in wiring closets, branch offices, communications cabinets and harsh remote sites
- Military-spec security, FIPS 140-2 SSL and SSH, stateful firewall, OpenVPN & IPsec
- Environmental and physical sensor alarm notification via SMS, SNMP or Nagios
- Automatically detect and recover from network outages and repair equipment faults

"Health supervisors, equipment owners and maintenance staff now have online access to data that is just minutes old. Problems can be identified and analyzed as they occur so that remote support staff can provide timely solutions. We at TMV Control Systems appreciate the secure and convenient remote connectivity that Opengear adds to our project."

- Isaac Sutherland
Software Developer,
TMV Control Systems

Key Features:
Opengear ACM5004-G-I

- 3G Cellular Connectivity
- Secure OpenVPN tunneling
- GPS Capabilities
- Ensures mobile infrastructure is accessible even during system or network outages
- Integrates seamlessly with your existing IT & network management systems

About Opengear:
Founded in 2004, Opengear designs, manufacturers and delivers the most feature rich, cost effective, flexible solutions for secure remote infrastructure management. Opengear enables companies to access and manage virtually any electronic device on their network remotely and securely from anywhere, even if the network is down, to improve efficiencies and maximize business continuity. The company is headquartered in Sandy, Utah, has substantial operations in the UK and Australia, and sales partners worldwide. For more information, please visit www.opengear.com.

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