

Mobile Asset Data Collection

Real-time Data



Data collection challenges

Collecting and interpreting information from mobile assets is an essential part of effective operation on a mine site. But the task of manually obtaining data, analyzing it and then using it to inform *timely*, business decisions can feel virtually impossible.

Consider – a typical global mining company uses more than 2,000 machines: trucks, loaders, dozers, drills, excavators, etc. The task of going from machine to machine to collect data, interpret it, and then take action while that data is still relevant is just not feasible.

So, how can a mining company collect and aggregate their data? **Remote monitoring.** But even this solution isn't without its challenges.

Understand what's happening with your mobile assets

Miners struggle to gather real-time performance information from assets and operators

Understanding how your mining vehicles are performing in real time is paramount for equipment efficiency. Sending immediate feedback to operators on areas of improvement leads to less wear and tear, and improved operator performance.

Predictive and preventative maintenance

“Unlocking” data from siloed systems and integrating it in a common platform means historical and real time information can be used together to anticipate problems before they occur. Technologies like condition monitoring, pattern recognition, anomaly detection, machine learning and artificial intelligence can be used to predict, with a high level of confidence, if an event will occur.

Why is it so hard to collect data from mobile assets?

Miners understand the benefits of remote data collection and the power of that information to drive insights – so, why are most of them stuck?

Mining companies struggle to obtain full access to information from their mobile assets. The information is usually stored inside the Engine Control Module (ECM), and then displayed via proprietary software systems. Purchasing access to these applications can be cost-prohibitive, which means many miners just leave the data trapped inside the equipment. If miners do opt to purchase, the mine operations team has to implement and maintain dozens of independent and isolated applications.

Solution

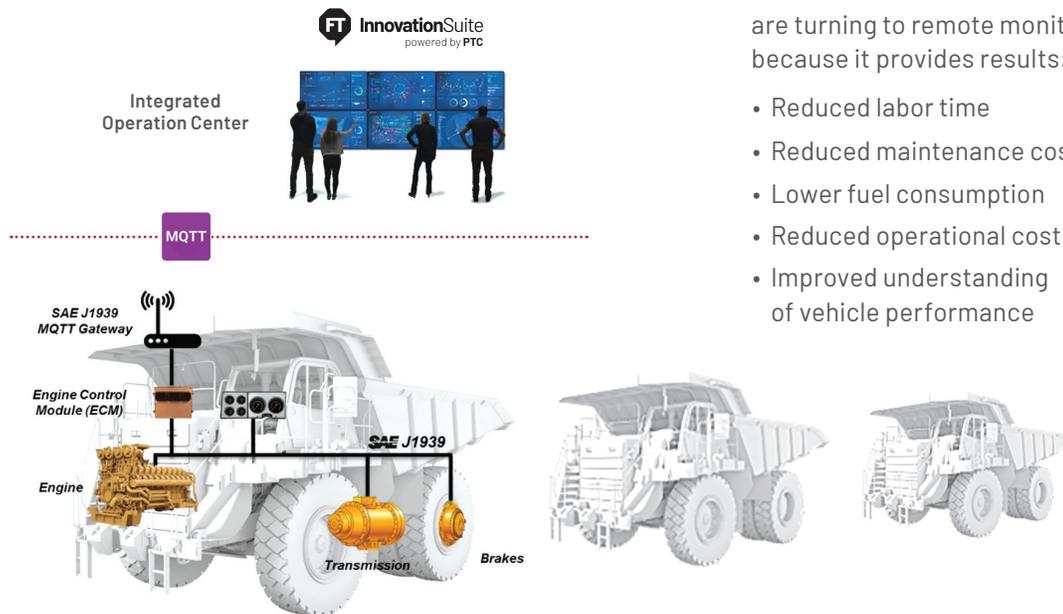
Vehicle onboard communications

The first step to successfully achieving remote monitoring is to simply extract the data from the mobile equipment. Our solution is designed to gather information from the machine ECM – usually based on SAE J1939 (most widely used) or other proprietary protocols.

Wireless transmission via modern IoT technologies

Once the information is available, the machine protocol is converted so it can be transmitted wirelessly using Message Queuing Telemetry Transport (MQTT) protocol. MQTT is a low-power, small-code protocol that's ideal for machine communications in constrained network environments.

Suggested simplified architecture for mobile asset data acquisition in a mine environment



Store-forward capabilities

By nature, mobile assets are on the move all around a mine site, and often struggle to maintain consistent network access. If at any point communication is lost, the device will store data locally until the communication connection is restored.

Powerful data aggregation and visualization with the best-in-class IoT platform

To turn data from the mobile asset (or fleet of assets) into actual insights and visualization tools, we use Rockwell Automation FactoryTalk® InnovationSuite. This powerful software solution gathers the data, aggregates it, and displays it so decision makers can leverage information and make smart business decisions. With an open platform design, you can use the same tool across the entire mine operation, from mine to port. That means one software system to implement and maintain instead of dozens.

Results

In addition to better data visibility, mining companies are turning to remote monitoring for their mobile assets because it provides results:

- Reduced labor time
- Reduced maintenance costs
- Lower fuel consumption
- Reduced operational costs
- Improved understanding of vehicle performance
- Ability to analyze driver performance and take action like adding targeted training or goals
- Maximized equipment productivity
- Maximized equipment uptime
- Improved safety

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