



REMOTE MONITORING SYSTEMS AN OVERVIEW OF OPERATIONS

Remote monitoring systems are becoming an increasingly common and progressively more integrated feature across the range of earthmoving machines arriving to market, designed to deliver an overview of worksite operations, potentially including real-time insight into workflows and allowing for more efficient and effective vehicle management and maintenance.

From a single vehicle, or across a fleet in its entirety, the data provided by these systems is growing in concert with an ever-evolving range of on-board sensors, and in turn becoming increasingly detailed, variously allowing for remote monitoring of where vehicles are, what operations are being undertaken and how these operations are being carried out. Utilising this information, users can make more informed decisions to promote greater productivity, adopting more efficient work practices, cutting operational expenses and potentially reducing vehicle downtime.

Remote monitoring systems may encompass a broad range of often interconnected features, from GPS tracking to security systems, and in line with businesses' increasing requirements for anywhere and anytime connectivity, are being designed to be accessible across a range of devices, from personal computers to tablets and smartphones, providing on-the-go access.

REMOTE MONITORING SOFTWARE APPLICATIONS

Remote monitoring is undertaken via a software application (also sometimes referred to as an interface or dashboard), such as a web-based application, which collates the data acquired from a vehicle or fleet, and then presents this information in a consolidated and interpretative format.

The capabilities of an application will, of course, to a large part depend upon the sort of data being acquired, with intuitive interfaces able to present data in an accessible, understandable and actionable format. Applications may allow for both performance tracking and assessment, assisting with both short-term and long-term operational decision-making. For instance, an application equipped with warning alerts related to varied aspects of machine operations and health could assist decision-making that will allow

efficient, short-term coordination of workflows and boost long-term productivity, preventing machine downtime.

An application may convey information via a variety of means – for instance, daily, weekly or monthly reports, potentially represented in graphs, tables and other charts. Users may be able to access historical information, while customisation may allow for specific data to be accessed. Of course, ease of use and an intuitive design are important components of an application, with both desktop and mobile functionality a focus for manufacturers.

PRODUCTIVITY

Remote monitoring systems can be employed to boost productivity in a variety of ways, potentially allowing for a more economical coordination of operations, ensuring that vehicles or a fleet are being used to full effect and operating at full capacity. This will, of course, depend upon how data is acted upon, with intuitive systems providing the basis for analytical and predictive decision-making over the course of a project. A system may, for example, be able to record a vehicle's operating hours spent in each work mode, or provide detailed information on fuel consumption, recording consumption over the course of the day and across different operations, and in turn potentially allowing for an adjustment of operations to promote greater fuel efficiency. Across a fleet, it may be possible to assess the respective workloads of different earthmoving machines, and ensure that under-utilised machines are reassigned, efficiently coordinating vehicles and evening the spread of work.

MAINTENANCE

Ongoing maintenance is, of course, critical to ensuring vehicle reliability, underscoring productive and efficient operations with remote monitoring reminders and

notifications helping to determine how best to utilise vehicles and when to schedule necessary maintenance.

Remote monitoring systems may also provide regular vehicle performance updates, allowing for ongoing assessment of maintenance requirements, with this type of data, potentially delivered in real-time allowing for monitoring of different components of machinery (dependent upon the type of on-board sensors being utilised), detecting wear and fatigue, and providing users insight into critical functions. Importantly, this data could also be employed to undertake predictive maintenance, reducing the potential for future malfunctions. In the event of malfunctioning equipment, remote monitoring systems may issue warning alerts, delivering immediate performance information and feedback, and thereby allowing for preventative action to be taken in a timely manner.

SECURITY

Remote monitoring systems can be configured to deliver an additional layer of security on top of traditional security methods, with GPS-enabled systems providing a means by which to track and geographically pinpoint the location of vehicles. Systems may also allow for remote locking of vehicles, and provide for vehicles to be automatically locked at predetermined times during a day (such as at the end of each working day), or for extended periods of time between projects. Meanwhile, systems may provide for an alarm to be configured to sound in the event of a machine being started either outside of designated operating hours or outside of an authorised location. Similarly, geofencing allows for virtual geographic boundaries to be established within which vehicles can operate, with an alert issued if a vehicle is moved beyond the prescribed area. *///E*