

Train Tech

Cloud Monitoring To Slash Costs

The expertise of Minneapolis based tech giant Digi International and Australian rail technology specialist OEM Technology Solutions is set to save millions of dollars for operators of older rail fleets worldwide.

OEM, which has a 23 year history of rail innovation, providing technology solutions to original equipment manufacturers and rail operators alike, has launched a completely automatic, cloud based, condition monitoring system that can be retro-fitted to any passenger train set.

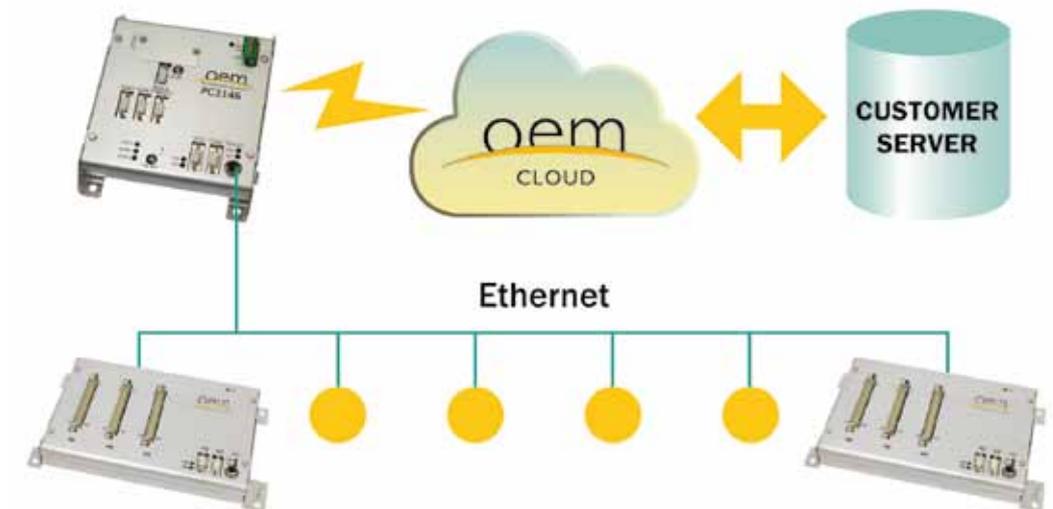
Just as a F1 team's technicians get real time data from their cars on the track, so too can the operator of any train.

The system does not have to be interrogated by the operator, it continuously and automatically reports 24/7, monitoring systems throughout the train from air conditioning and heating to door opening and closing times, fire detection, lighting, speed, brake performance, reservoir pressure, traction, pantograph, alternators and turbo speed.

Function blocks submit data, events and alarms including automatic alerts with a GPS and time stamp.

The data can be filtered based on controllers, trains and fleets and can even be extracted for use in other business systems.

The launch of the cloud based condition monitoring system ties



together all of the proprietary OEM train monitors that have been developed over 23 years and power 30,000 systems in rail cars in more than 20 countries around the world.

OEM MD, Richard Gobee, said that while OEM's range of wireless monitoring and control equipment for essential train sub-systems has been highly regarded and is used as original equipment by most of the world's leading manufacturers, until now rail operators have had to manually query individually the various onboard systems.

"Now the system reports automatically in real time and



the operators only has to look at the screen to see which systems are working within their operational parameters and any

that are flagged outside those parameters," Richard said.

CEO Lives And Breathes His Company's Cloud Solution

As we speak about the growth of OEM from a designer and manufacturer of quality individual monitoring components used worldwide to the entity behind a remote monitoring solution for complete fleets, the OEM CEO can't help but keep glancing at the screen.

"It's just fascinating," he explains, apologising for the distraction.

"We have lived with this project for many years and never tire of the power of it.

"Here is a fleet of very old passenger rail cars on the other side of the world and I am getting real time feedback on the vital componentry of every carriage and locomotive.

"I can not only tell where a particular set is, but can look at the opening and closing times of the doors, the efficiency of the air conditioning, the effectiveness of the brakes – and so much more."

As he speaks a small audible alarm goes off on the computer.

"There, look at that," he says with almost childish delight, as he follows the prompts and drills through the various screens.

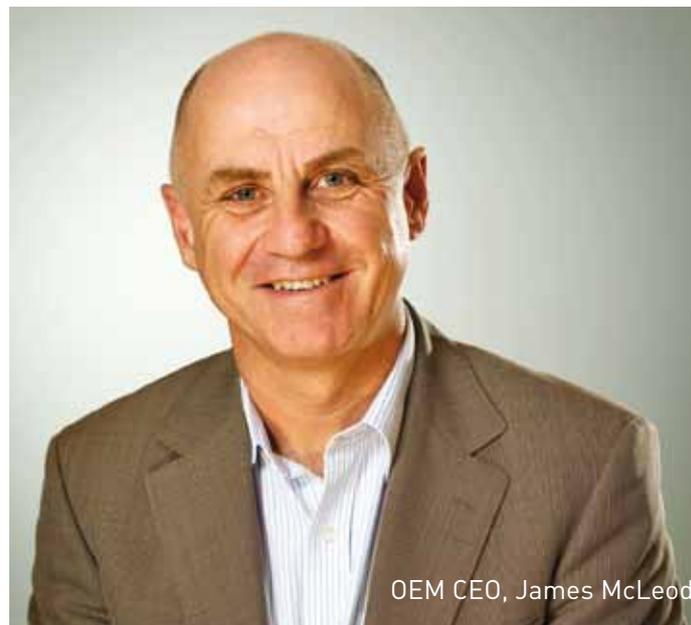
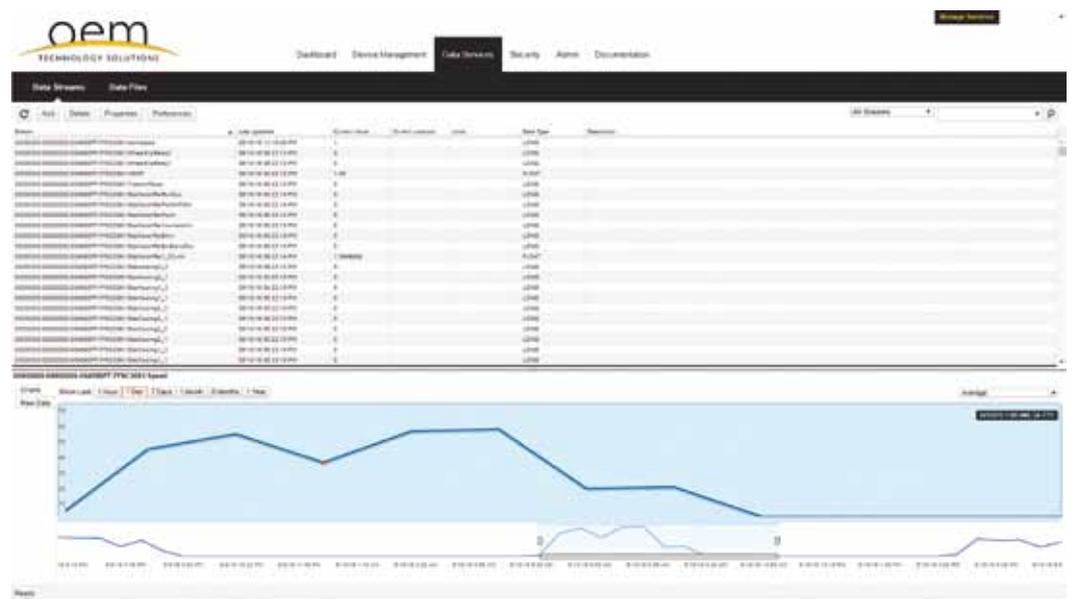
"There's a brake unit operating outside the pre-set parameters. As we speak a controller in another country has received the same alert and is logging that unit for attention at the next opportunity.

"That's the real power of this system. Without it that unit may well fail before the next scheduled maintenance period, possibly blocking a line and, at the very least, throwing a timetable into disarray.

"But now they know something is wrong and they can fix it before it fails."

James says that one of the real advantages of the system is not so much the faults it flags, but those it doesn't.

James McLeod lives and breathes his company's cloud solution for railway pre-emptive maintenance, so much so that on his desk is a computer wholly dedicated to monitoring a particular European passenger train network.



OEM CEO, James McLeod

"Until now rail operators have had to have regular scheduled maintenance and checks because they did not know what was going wrong.

"It was a case of lubrication, tightening and then laborious checking throughout the train

looking for possible faults.

"It is time and money consuming. "But with this system they know what systems are operating normally and do not have to waste time manually checking them. So, regular maintenance downtime is reduced to just

lubrication, adjustments and fixing only those systems requiring it.

"This can also translate to reducing the needs for stock levels of parts as operators know what is required and when.

"When first developed in Japan in the 1970s, the idea of just-in-time (JIT) marked a radical new approach to the manufacturing process. It cut waste by supplying parts only as and when the process required them.

"We've now introduced this system into rail operations.

"One study found that American firms that introduced JIT gained over the following five years (on average) a 70% reduction in inventory, a 50% reduction in labour costs and an 80% reduction in space requirements.

"We are very confident we can show greater savings because we are eliminating unnecessary labour at the maintenance end of the process."

System Reports In

Continued from P1

At A Glance
Reports

Real Time

OEM's cloud solution is a generational development providing a completely connected remote rail solution on which operators can base pre-emptive maintenance.

OEM CEO, James McLeod, said that until now this type of technology has only been available on new train sets – and even then it hasn't covered as many reporting areas.

"Our ability to retrofit complete systems to existing, older rail sets represents a multi-million dollar saving for these operators.

"On the one hand it means they can defer new train acquisitions while, on the other hand, their downtime and hence their costs will be greatly reduced for larger profits.

"It really is an exciting win win for these operators," he said.

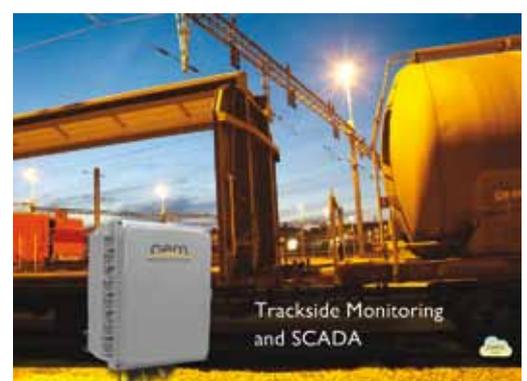
James said that OEM's North American office, which is headed by rail veteran Eric Schook, is already fielding inquiries. Eric, who has 20 years' experience in rail, has a Bachelor's Degree from the University of Alabama and is a member of both the APTA and NRC Safety Committees.

Both James and Richard are personally spending more and more time in the United States, such is the interest the dramatic cost saving potential of their system is generating among operators of older train systems throughout the country.

"The longer they look at it, the more savings and improvements that they are able to identify.

"For example, one operator said that the system would enable them to introduce a just in time order system for spare parts, dramatically freeing cash reserves that are so often tied up in stocks.

"Another estimated a labour cost reduction that could be as high as 30% - a saving in time wasted chasing down ghost faults."



No More Time Wasted Tracking, Diagnosing Faults ...

Condition Monitoring Automated

“No Fault Found” could be a thing of the past for rail maintenance crews around the world thanks to a cloud based, automatic monitoring system that reports faults via the web in real time.

A high proportion of US train sets are more than 28 years old. Finding faults can, at best, be a hit and miss affair where No Fault Found is too often the frustrating answer when tracking down problems in anything from traction control to air conditioning.

Even when a fleet is fitted with data recorders to monitor certain signals, obtaining the data can be challenging and rarely does it suit the context of the failure being investigated. As a result the information is used to manage repairs and train condition on an ad hoc basis.

It is not uncommon for operators to be unable to reproduce ongoing traction control problems in a static environment, with more than 50% of all traction faults reported as No Fault Found.

OEM Technology solutions has put an end to these time consuming, expensive and, often, dangerous problems with a machine to machine cloud based network operating platform that can be retrofitted to any vintage train set.

Like all good ideas, the concept is simplicity itself – a simplicity that belies the 23 years of development work behind its state of the art component parts.

In a nutshell, a network of OEM monitors data constantly via an OEM data logger to the cloud. The system reports automatically via a web-based interface and provides a two-way information flow that allows remote control of operating parameters.

Data is sent continuously from the data logger that directly interfaces to analogue and digital inputs and onboard train communications networks. This data from I/O and events is transmitted using either 3G cellular or other internet connections such as Ethernet or WiFi.

The device cloud stores the information as data points and data streams - data points being individual values stored at specific times and data streams the containers of data points.

The data streams service is a RESTful API for storing and accessing the time series data in the cloud.



System The Result Of 23 Years In Rail Technology

By provisioning this API, the client can not only query the time series but configure it to automatically send alerts to key personnel via SMS or email.

The OEM Cloud's web based user interface has a dashboard that displays automatically

when an operator logs into their account, showing device health and status at-a-glance.

Within the data streams page of the OEM Cloud, operators can view a list of all your data streams.

They can select a data stream from the list and view a chart of that data stream's data points based on several options and using several pre-defined time periods, or simply view the raw data associated with a data stream.

These streams could be showing anything from braking efficiency to temperature variations in the HVAC or the opening and closing times of an individual door.



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