TrainTech

High Tech For Older Fleets

A technology partnership between the Irish company Nexala and Australia's OEM Technology Solutions has helped Nexala further develop as an end-to-end provider of remote monitoring systems for older rolling stock.

Working in partnership with Australia's OEM Technology Solutions (OEM), Nexala has grown from being a provider of backend technology and software for train depots and control rooms to an end-to-end provider of turn-key diagnostic systems.

Nexala is a go-to supplier for rail operators with mixed fleets of older rolling stock from a multitude of manufacturers, thanks to its ability to provide system diagnostics across the entire fleet

The Nexala-OEM product partnership came about in 2013 with the start of a project to further enhance an R2M comprehensive real-time data transmission and analysis system already implemented on a UK fleet.

As part of the solution the OEM manufactured Nexala Control Unit (NCU) was retrofitted on 150 older trains on the company's class 321 and 317 fleet.

With the roll out of the Nexala R2M software on the class 90 intercity fleet the results were outstanding. Miles per casualty rates increased by almost 60%, delay minutes were reduced by 40%.

The project also introduced wider benefits in areas such as fleet safety, driver performance,

timetable data, and infrastructure and energy analysis.

With the addition of the OEM produced NCU to the Nexala portfolio the company can now provide complete solutions for rail operators with mixed fleets of older rolling stock that want to access system diagnostics across the entire fleet.

"When Nexala previously looked for on-train electronic systems we examined the offerings of a number of companies but only OEM asked what we wanted and then presented us with exactly that – a modular box that we can provide in different flavours for multiple manufacturers' rolling stock," said Paul Lowry, Nexala's co-founder and Vice President of Sales and Marketing.

The UK rail contract that

The OEM manufactured Nexala Control Unit represents a UK rail industry first with the retrofitting of a comprehensive, real-time data transmission and analysis system to 150 20 year old trains on a flagship service into London.

Even older trains can now be monitored in real time

launched the Nexala Control Unit involved fitting an OEM designed box per vehicle in 150 four-vehicle trains (600 Nexala Control Units) and connecting 150 to 200 sensors per vehicle for end-to-end diagnostics.

Nexala provided everything— design, hardware, software, and approvals.

The system delivered real-time information to the operator's Integrated Control Centre (Operations Control) and to the rest of the fleet maintenance and operations team.

Nexala's solution devised for the project is now regarded as industry best practice in the

Remote Monitoring Delivers Big Benefits

UK where Nexala already provides software solutions for the majority of the franchised rail operators.

An OEM manufactured Nexala control unit is central to a UK rail industy first, retro-fitting a real-time data transmission and analysis system to a complete fleet of 150 20-year-old trains.

Following on from the success of this project Nexala has grown its customer base with customers in the United Kingdom, Ireland, Switzerland, Finland, and France and with strong focus and activity in North America and Australia.

For a business that was already growing on the basis of software expertise alone, the ability to now offer complete end-to-end solutions that include both hardware and software is significant.

Paul acknowledges the expertise of OEM and the part they played in adding to Nexala's offering.

"The OEM guys are smart and we like working with progressive, able and agile companies," he said.

Nexala (a Trimble company) provides an integrated suite of on premise and Software as a Service (SaaS) solutions for large transport operators and global train and component manufacturers.

Their enterprise solutions manage the life cycle of rail transport vehicles from operation through maintenance and repair.

System Attracts Wide Interest In Australia

Australian rolling stock operators have been quick to recognize the benefits of being able to retrofit sophisticated remote monitoring technology into older trains.

OEM Technology is currently working with a number of operators and preparing costings and exploring viability for new opportunities.

OEM Technology Solutions' CEO, James McLeod, said that they are excited at the prospect of introducing Nexala end-to-end solutions to Australia's older fleets which would be ideal candidates for the system to not only improve safety and reduce running costs but significantly extend their service life.

"It is particularly gratifying to think that an Australian company like ours could be key to making local operators world leaders."

Lockheed Martin Chooses OEM

A "safe computer" developed and manufactured by OEM Technology Solutions for Lockheed Martin is now powering the Australian Rail Track Corporation's Advanced Train Management System (ATMS) programme.

The programme's aim is to minimise trackside signalling infrastructure and increase available capacity on the existing network whilst improving the reliability, flexibility and safety of train operations.

ATMS is a train management system designed to communicate via both voice and Telstra's NextG data networks between Network Control Centres and locomotives operating on ARTC's national network.

Central to the system is the Lockheed Martin Authority Management Server Safe Computer. It interfaces with the Network Controller, receives Authority Requests from the Train Controller, validates the requests and controls Trackside Interface Units and the Train Control and Display equipment on-board the locomotives to issue the Authorities.
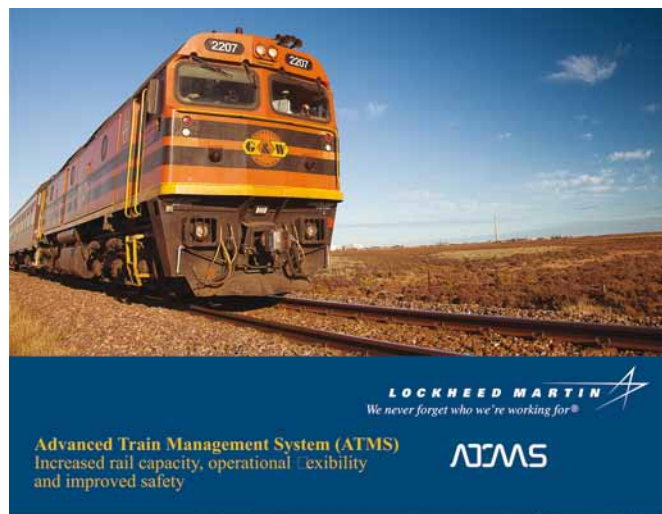
Lockheed Martin had a number of stringent user requirements to satisfy the functional, performance and safety requirements for the AMS Safe Computer.

A number of vendors were approached, with OEM Technology Solutions and their partner, MEN Mikro GmbH, ultimately chosen for the project

"OEM's technological capabilities in railway products and services, their experience in the local railway market, their local presence and the fast turn-around times offered were key to awarding the contract," according to Lockheed Martin's Blaine Groves.

OEM Technology Solutions' CEO, James McLeod, believes MEN Mikro's expertise in safety certification processes, along with its expertise providing tightly integrated solutions, was just as important to Lockheed Martin as OEM's product and turnkey systems engineering expertise in international railway markets.

MEN Mikro is a leading, specialist vendor of safety critical systems

Advanced Train Management System (ATMS)
Increased rail capacity, operational flexibility and improved safety

LOCKHEED MARTIN
We never forget who we're working for®

ATMS Features:
- Advanced digital communications technology using Telstra 4G network
- Remote monitoring and control of trains and control points
- On-train location system accurate to three metres
- Wayside signals rationalised
- Meets Australian regulatory requirements
- Train integrity, fuel management, health monitoring
- Portable configuration for deployment flexibility
- Control centres maintain real-time network situational awareness

to high-profile international clients in avionics and rail environments.

The high integrity AMS solution's Validation Server has three independent CPUs with identical I/O functions using independent backplanes and redundant power supplies.

At least two of the three on board computers must yield identical results to guarantee the correct operation of the complete system.

Along with the Validation Server is the Proposal Server that

has redundant single board computers with RAID hard disks, independent backplanes and redundant power supplies. Communications redundancy is provided via a pair of mirrored network switches. Separate redundant power supplies are provided for the validation and proposal servers.

The system passed due diligence and proof of concept phases and is being rolled out in a series of trials before commissioning for live operations between Port Augusta and Whyalla in 2016.

BACKGROUND

OEM has specialised in the design and development of high technology products since 1993 and has built an international reputation around the in-house provision of services including user requirements analysis, product specification, electronic hardware and software development, mechanical design and manufacture, production and testing, documentation and long term support.

MEN Mikro Elektronik GmbH, is one of many partners with whom OEM has relationships around the world. Founded in 1982, it is renowned for the design and manufacture of fail-safe computer boards and systems for extreme environmental conditions in industrial and safety-critical embedded applications.

ARTC is a company whose shares are owned by the Commonwealth of Australia. ARTC currently has responsibility for the management of more than 10,000km of standard gauge interstate track in South Australia, Victoria, Western Australia and New South Wales.

Headquartered in Bethesda, MD, Lockheed Martin employs about 140,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services.

Australia's OEM Technology Solutions has released a programmable controller to enable cloud based monitoring of older Multi Vehicle Bus (MVB) fleets.

New PC Bus Enables MVB Cloud Monitoring

OEM Techology has taken train fleet management to a whole new level with the release of a programmable controller that will allow older fleets using MVB-EMD to be remotely monitored using cloud based systems.

The PC3036 programmable controller for rail vehicles with MVB-EMD further rounds out OEM's sophisticated suite of remote monitoring products.

These include the company's in-house developed cloud system and a recently released new MVB module regarded as one of the smallest, most sophisticated and cost effective MVB modules in the world.

The card can be supplied with all of the interface types required by the industry and complies with all standards including ESD+ and OGF.

OEM R&D Manager, Phil Solomons, said that like the MVB module, the controller had been entirely developed in house.

"The controller was specifically developed for retrofitting to existing fleets in order that they can enjoy the same benefits of

remote monitoring as new fleets.

"Condition based, real time monitoring and reporting of everything from HVAC to brakes has been proven to generate massive cost savings, not to mention operational and safety improvements," Phil said.

"In Australia alone at the moment there are many retrofit projects at tender stages. The awareness of the benefits here and throughout the world is immense.

"Having the market's only controller designed for cloud based monitoring is a big advantage in today's market where so many operators are seeking the means of introducing improved safety and efficiency into their older fleets," Phil said.


PC3036 Controller with MVB-EMD

New GM To Drive OEM Growth

Aerospace industry engineering and project management skills have been added at OEM Technology Solutions with the appointment of Caroline Ellis to the newly created role of General Manager.

Charged with helping drive the company's global expansion in rail-control devices, data analysis and predictive maintenance for rail transport, Caroline has previously worked for Lockheed Martin and Flight Refuelling Ltd in the UK, and the Royal New Zealand Air Force.

Her brief is to further improve production processes and delivery times to customers at a time when the company is entering an expansion phase, bringing to market new products such as the Linux-programmable PM3003 Processor module for railway applications.

Her appointment will enable CEO James McLeod and Managing Director Richard Gobee to focus on developing and tailoring intelligent systems for controlling train performance and enabling predictive maintenance through condition monitoring of rail networks.
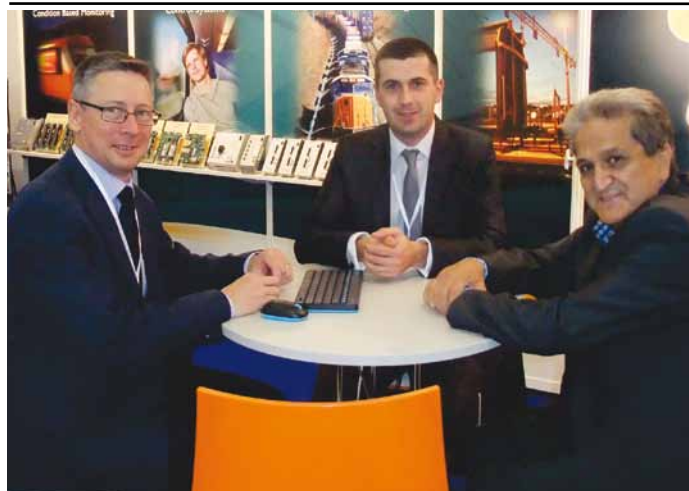
Cloud Monitoring On Show

OEM Technology Solutions cloud based monitoring system is such a game changer for the industry that the company has made it a feature of its trade displays in order that operators can fully grasp the capabilities and advantages.

OEM will have technical people and products available at a number of trade shows throughout the year including:

- October 4-7 – Railway Interchange 2015, Minneapolis, US is a combined trade show and conference event
- November 24-26 – AusRAIL Plus 2015, Melbourne, Australia is the meeting place for anyone operating or looking to do business with Australasia's rail industry. It is shaping up to be the largest AusRAIL ever hosted.

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