

Train Tech

Aussie Project Saves Millions

Tyco turned to an Australian company when faced with the seemingly impossible task of replacing four boards with a single unit for an Australian transport management system.

When Tyco, the world's largest pure-play fire and security company, was awarded a contract to manufacture the core units of an Australian public transport management system, they quickly discovered the client's dated hardware was limited.

Tyco put a business case to the client that they could develop something better and cheaper that would return its development expenses by the second order.

When the client agreed, Project Manager Derrick Lenehan's main problem was to find a company able to replace the system's four, off-the-shelf, commercially available boards with a single, purpose-designed board.

Initially unable to find an Australian manufacturer able to meet the tight deadlines and an even tighter budget, he was faced with the prospect of either taking the contract offshore or staying with the existing system and presenting a less than ideal software solution.

When one of his team suggested that Sydney's OEM Technology Solutions had a reputation founded on developing hardware

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for trains worldwide, Derrick wasted no time meeting with OEM founder James McLeod to verify the company's capabilities.

His review of their documentation, designs and processes quickly revealed the standards were well up to Tyco's own.

The original system was made up of four different commercially available boards, a PC104 and power supply encased in a box of interconnecting wires. It had big question marks over its reliability, particularly its ability to withstand vibrations, plus the four different boards from four different manufacturers would



have made the task particularly messy for Tyco.

OEM was charged with eliminating all of the different boards and interconnecting cables and developing a single board in a space efficient package – all within 12 months.

OEM engineers provide world class solutions.

Then, to make the task harder, when the client heard that the re-design could be done they asked for additional features and verifiable hold points.

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When James McLeod and Richard Gobee set up their OEM trade stand in China, the United States, Europe or Asia they are instantly recognised as the people behind technology in countless trains in those countries. For Australian companies they can still come as a surprise...

Train manufacturers and operators alike the world over recognise OEM instantly. From a humble start specialising in HVAC, they have become leaders in condition monitoring.

Today, OEM technology is increasingly finding its way into componentry on some of the worlds most sophisticated new trains.

The Industry Engagement Unit of the Australian arm of France's giant international electronics and systems group, Thales, has identified OEM, as a global partner and the manager of that unit is actively looking to ways OEM can be utilised within Thales supply chain serving defence, aerospace and space, security and transport markets throughout the world.

Similarly, when German manufacturing giant Knorr-Bremse acquired Australia's Sigma Coachair group the company began systematically taking in-house manufacturing that had previously been outsourced. Yet OEM was one of the exceptions.

OEM CEO James McLeod, though, would rather be so recognised at home. He fears that too often local businesses can be seen as only a bespoke Australian alternative rather than being recognised as representing global best practice.

"I suppose it's a grass is greener type of thing," he said.

Few Australians have any idea how many game changing technologies and inventions are of Australian origin.

Such things as Google Maps. Wi Fi, plastic bank notes, the transportable recompression chamber, wine casks, the electric drill, the refrigerator, the ultrasound scanner, the bionic ear, plastic spectacle lenses, race cam and the pacemaker, to name just a few.

James said that the fascinating thing about the situation is that

World Class Australian Technology On Show



James McLeod demonstrating OEM's cloud based live rail network monitoring in Newcastle

once Australian rail people see the technology first hand they are absolutely blown away.

"Recently we exhibited at a major rail conference in Newcastle and the centrepiece of our stand was a live snapshot of the entire rail network of one of our UK customers," he said.

"From the screen showing the network in real time we could pick up condition alerts from individual trains, select the train and then drill right down to the unit sending the report, be it brakes, doors, HVAC, anything," he said.

"We could then bring up its operating condition in real time

or even go back to its total log of reports."

What amazed those who saw this was the realisation that they were looking at a comprehensive, real-time data transmission and analysis system that had actually been retrofitted to a complete fleet of 20-year-old trains.

"There are 150-200 sensors per vehicle for end to end diagnostics, delivering real time information to the customer's Control Centre and their fleet maintenance and operations teams.

"It wasn't lost on the knowledgeable observers that this had been achieved in a deregulated, franchised and penalty driven market with some of the most stringent requirements in the world, a market that sets the lead for Europe and the United States.

"A number of delegates returned to our stand more than once."



OEM's stand at the Newcastle rail conference was an eye-opener for many attendees.

Berlin Brings New Openings

Berlin's bi-annual international trade fair for transport technology, innovative components, vehicles and systems has opened a vast array of doors for Sydney's OEM Technology, not the least of them back in NSW.

A four day event of staggering proportions, InnoTrans attracted 2758 exhibitors from 55 countries and was attended by 138,872 trade visitors from more than 100 countries. All available space on the exhibition grounds at Berlin ExpoCenter City was occupied, with displays covering 102,843 square metres.

Some 145 new rail vehicles featured along with no fewer than 140 products making their world debut, an indication of the importance of this trade fair as a marketing platform and as a force for promoting innovation.

Prof. Dr. Ronald Pörner, Managing Director of the German Railway Industry Association said that worldwide, InnoTrans is undisputedly the main venue for showcasing rail systems and rail transport technology.

OEM Managing Director, Richard Gobe, was delighted with the wide ranging interest in OEM's suite of products.

"We had 168 firm enquiries and among those are four major projects to be explored in depth including one that will potentially open the Canadian market to us," he said.

"The CEO of one major company just wandered onto our stand while he was killing some time. He became so excited that he went away and came back with two of his technical people and now they want to meet with us in Houston.

"That sort of reaction is very gratifying for a small company." Ironically, one of OEM's most

gratifying similar encounters was with the Deputy Director General of Transport for NSW, Chris Lock.

With responsibility for \$9 billion in transport infrastructure investment planned for 2014/15 including the proposed \$2.8 billion next generation train fleet proposed for customers travelling longer distances from the South

When Transport For NSW's Deputy Director General travelled to Berlin looking for rail technology, the last thing he expected were Australian solutions.

Coast, Blue Mountains, Central Coast and Newcastle, Chris was on a fact finding mission as well as leading the Australian contingent of companies in Hall 11.

Although OEM had contributed financially to the Australian presence, the company was apart from them in Hall 6 and had escaped Chris' attention.

"In the first instance he was



OEM's James McLeod (left) and Richard Gobe (right) with Transport for NSW Deputy Director General, Chris Lock, on the OEM stand at InnoTrans, Berlin.

Transport for NSW technical staff contact us to ascertain if there was a role for these systems in the new projects."

Richard said that as his company already had relationships with manufacturers who had expressed interest in the project, it was a positive development.

The proposed new fleet will include about 65 trains, totalling 520 carriages, and will be configured specifically for intercity customers.

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Tyco Praises Design, Manufacturing

The project was intensive, necessitating Derrick working closer with OEM than is usually the case with his engineering and electrical sub-contractors. As a result he rates the company highly.

"They brought to the table some very good designs, particularly with the power supplies and communications. Also, their power supply management software was able to be customised to our exact needs," he said.

OEM's preparedness to throw resources at the project was also a real plus, both in terms of saving money and time.

Derrick said that just having OEM personnel on hand during the testing was an asset as it meant problems could be rectified immediately, saving thousands on re-testing.

As a result of the design and development work between the Tyco and OEM teams, Tyco's client has an on-board computer system with better functionality and higher design quality than any similar system available internationally.

"We did a lot of testing at a level higher than the international standard in order to meet the customer's specifications," he said.

To date some 3500 units have been produced by Tyco at a saving of 40% of what the customer was originally paying for the more cumbersome first model which also had far less functionality. The savings run into the millions of dollars.

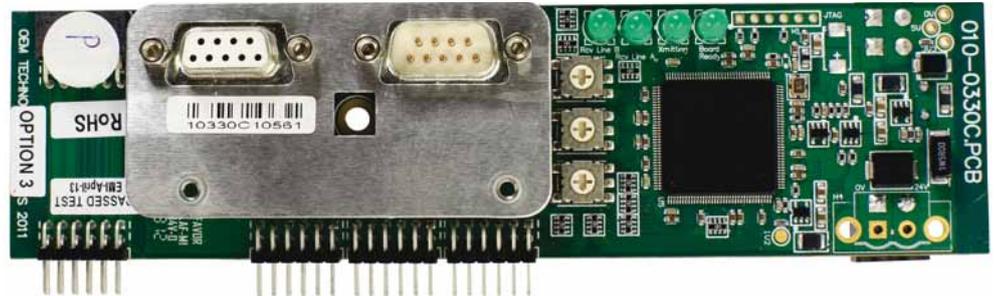
Australia's OEM Technology Solutions has invested more than \$100,000 and "built a better mousetrap" in the form of a new generation Multi Vehicle Bus (MVB).

NEXT GEN MVB

Today the company produces one of the smallest, most sophisticated and cost effective MVB modules in the world, a unit so advanced that train manufacturers, including members of the Alston Bombardier Siemens consortium that developed the standard 30 years ago, are interested in the product.

OEM Managing Director, Richard Gobe, said that from being unable to win MVB jobs some years ago due to the cost of buying the cards from European suppliers, OEM has now won 80% of its jobs in China because of the new card.

"Everything was done in-house from research and development to manufacturing," he said.



OEM's MVB module is the smallest, most sophisticated and cost effective in the world

"We developed the chip, developed the MVB card for our own PC3 series controller and then developed a Field Programmable Gate Array (FPGA) with MVB.

"This has now given us a huge competitive advantage, not only in terms of cost, but quality."

The OEM MVB Card has been tested and certified by all major train manufacturers

and approved for use in their products.

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

Richard said that quite apart from price point, the small footprint of the card is seen as a real advantage as it is smaller than PC104.

"We have also been able to integrate MVB software drivers into our product, allowing our customers to develop their MVB applications themselves on our product range.

"We offer certified function blocks within our development environment and even run training courses to get our customers up and running," he said.

OEM's Sydney engineers have taken space efficiency to new levels, developing I/O Modules compliant with the tough British Rail RIA12 standard that are 30% smaller than anything else on the market.

I/O 30% Smaller

The units are half the size of some competitors' modules. The development will allow the company to push aggressively into the multi-million dollar UK train refurbishment market where it has already won significant contracts.

OEM Managing Director, Richard Gobe, said that much of the intellectual property behind the break-through development showed just how the design team thought outside the box.

Compliance with the British Rail Board's 1984 RIA12 standard for the ability of hardware to handle electrical surges on trains was essential if OEM was to gain a foothold in that market.

The company's challenge was that it had a product with a certain footprint, a product for which its own modules had been purpose designed. To go down the same track of other RIA12 compliant manufacturers would have meant increasing the size of the whole unit to accommodate larger I/O Modules.

"In trains, the ability to save space is one of our biggest advantages. We just didn't want to sacrifice that, so we challenged our designers to come up with a new compliant module," Richard said.

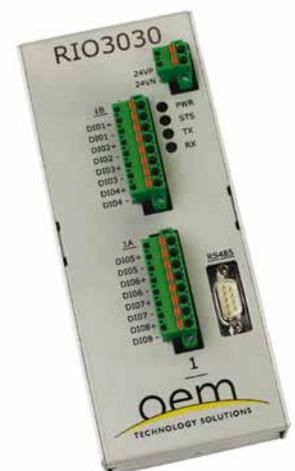
"They came up with some incredibly clever solutions, many of which we are not prepared to reveal.

"However, one very good example of their innovative approach was the way they treated the space between the connectors on the outside of the circuit board.

"Our connectors are separated by a 5mm space but under RIA12 testing conditions, when an 8.4kV current is introduced the gap is too small and a spark jumps pin to pin.

"Rather than increase the gap, they sliced a groove along it, thus increasing the air gap between the pins to reduce arcing."

Richard said that while the United States and Europe have different, less demanding standards than the British train



system, being able to supply these markets with above-standard I/O modules would be an advantage for the Australian manufacturer.



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