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Rolling Stock

Astronics

The Benefits of a Consolidated Testing System

Astronics Test Systems is a leader in subsystem testing in the rail sector.

We interviewed Jim Curtis, Engineering Fellow – Transit, about the company’s consolidated test system, its benefits to transit operators and the future of equipment testing in the sector.

Keri Allan, Railway-News: What’s unique about your consolidated test system?

Jim Curtis: It’s literally a single test station that can verify and troubleshoot almost every subsystem on a train. It’s unique in that this one platform can address systems from multiple vendors across multiple disciplines from communications subassemblies through to propulsion and electromechanical door systems.

We have a consolidated test station that will test any boards or subassemblies powered by car body voltage. Then there’s our high-voltage test system for anything that uses third rail input voltage. Some customers require both and in these cases we’re able to turn them into one single platform.

KA: How has this been developed to support the mass transit industry?

JC: The latest system is the result of around 15 years of development. Our first exposure to the transit sector was developing a test system for New York City Transit Authority (NYCTA). Since then, we’ve delivered test equipment for just about everything in the industry. As a result, we understand what’s needed to support the

entire range of products a test technician has to deal with on a daily basis.

We take feedback from customers and then tweak our design accordingly. Take interface test adaptors (ITAs). Any test system requires a connection to the unit you’re testing and technicians had difficulty maintaining large numbers of these ITAs.

In response we developed a ‘universal’ ITA utilising our custom switching matrix to greatly increase the number of units under test (UUTs) that can be tested on a single ITA.

KA: Can you tell me a little about rail customers you’ve worked with?

JC: Clients include the Bay Area Rapid Transit (BART), Massachusetts Bay Transportation Authority (MBTA) and Metropolitan Atlanta Rapid Transit Authority (MARTA). NYCTA is one of our biggest customers and we’re currently providing consolidated electronics testing for its R211 railcar upgrade project.

Space is a premium for our customers, so freeing this up through a single consolidated test platform is one of the most obvious benefits. NYCTA had lots of old automatic test equipment (ATE) in its building; pretty difficult to maintain. We’ve helped them consolidate greatly – down to just two or three test systems for large rail contracts, which is a big deal.

Another benefit is that users only need to learn to use one interface for all their testing. That consistency means less time spent on training.



ATS-500 Functional Test System



ATS-500 High Power Test System

KA: What's your engineer-to-engineer ethos?

JC: We use the same process with all our clients, which is to go through the design with the customer in an engineering environment, verifying that what we are designing and delivering will meet their needs.

We'll have many working sessions throughout the lifecycle of the design effort – design reviews, preliminary designs, critical design, etc. – and that's all done on an engineer-to-engineer basis. Our consolidated solutions also mean the involvement of OEM engineers, to ensure we fully understand how their products work.

KA: Astronics Test Systems has a long heritage in the testing world – how have you seen things change?

JC: I think the biggest change I've seen, and one that's here to stay, is testing becoming very software intensive. Circuit board designs for rail are utilising programmable devices and microprocessors with operating systems on board everywhere.

To support testing these designs our testers must provide the tools necessary to update and replace the software and firmware to effectively repair the unit under test.

KA: How are you preparing for the future?

JC: A lot of what we're working on is related to the intensity of software. We're looking at more open architecture for example, not only on the test system itself, but also the operating systems of the units we're testing.

We're developing a Linux-based test system to create an open environment that can be supported for many years. These trains need to be supported for a long time, so obsolescence becomes an issue and we're trying to address this.

Another thing is developing better tools, not just internally at Astronics Test Systems, but ones that customers can use to develop the test programmes themselves. Software development is very labour intensive, so we're putting effort into developing tools to streamline this.

On the high-power side, we're seeing higher voltages, more power, fibreoptics and complex gate drive technologies. Insulated-gate bipolar transistors (IGBTs) are still in mainstream use for propulsion switching, inverters and compressor drives, but I think we'll have to keep up with changes in this area to support interfacing to these enhanced designs to effectively diagnose faults.

Visit our [website](#) to learn more about Astronics Test Systems



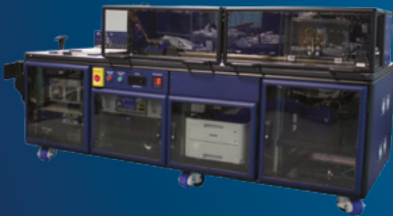
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ATS-500 Functional Test System



High Voltage



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HVAC

Maintain a state of good repair for onboard and wayside assets with universal, consolidated test solutions

The efficient and reliable maintenance of electronic circuits over their long working life is critical to the safe operation of mass transit systems. Test all of your critical electronics systems with our comprehensive solutions, consolidating the work of many testers into one.

Our consolidated solutions cover virtually every critical system on board the train, as well as wayside. From communications and control, to HVAC, to door operation, to high voltage applications, the ATS-500 family is your state-of-the-art choice to ensure optimal performance of your complex electronics.

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Happy passengers.
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