

Siemens Doubles Test Coverage and Reduces Time by 30 Percent

DIT-MCO demonstrates the benefits of automated wire testing

When you promise customers “state-of-the-art safety, reliability, flexibility, speed, and economy,” you must deliver. And so it is with Siemens Transportation Systems. Since 1975, the company has delivered more than 600 electric rail vehicles to urban mass transit systems in North America, making Siemens the largest supplier on the continent. In fact, the Vehicle Division provided cars for more than half of the cities that have initiated light rail revenue service operations in North America.

With manufacturing economy in mind, Siemens’ management continually explores ways to achieve long-term cost savings in building electric rail vehicles. With this goal in mind, Siemens turned to DIT-MCO for an automated electrical test solution that projected significant time savings and met the company’s cost-benefit requirements.

Shifting from Manual to Automatic

For years, Siemens performed labor-intensive, manual connectivity tests to build highly reliable electrical systems in its light rail vehicles. In terms of equipment and set-up, such testing is inexpensive, accurate, and mobile, according to Paul Harvey, Supervisor Factory Testing in Siemens Transportation Systems’ Sacramento, California, facility.

The downside of manual testing is the time required. It could take days for two or three technicians to identify and repair miswires in a single vehicle.

For the past year, Harvey’s group validated all the wiring in each railcar Siemens is building for Tren Urbano in San Juan, Puerto Rico, (Siemens’ first project to use

automated testing). Their car shop uses a 5,000-point Model 2508, which features high-density switching, runs continuity tests on all wiring, and integrates a latching matrix (LM) to energize and run point-to-point tests of relays.

Siemens realizes additional savings by using a DIT-MCO 2500.MBA (multi-bus architecture) in the sub-assembly department to test an electronic control box (ECB) that integrates 60 to 70 relays, some of which are multiple contact relays.

“When you figure the various states and combinations of all those relays, it would be a monumental task to manually test and troubleshoot that ECB,” observes Scott Kendrick, Programming Specialist, DIT-MCO Special Products Group (SPG).

Kendrick wrote a program for Siemens’ 2500.MBA to test each relay at rest, pick one relay at a time, and then use the MBA’s LM to energize each relay, test it, and disengage it. The analyzer’s random access, multi-bus architecture design eliminates special interfaces, saving set-up time and costs. “The 2500.MBA has addressed wiring quality concerns related to the ECB and made the test technicians’ lives much easier,” says Kendrick.

Proven Results

A year later, Siemens’ production numbers prove the point.

“We have experienced a 30 percent reduction in overall testing time by utilizing DIT-MCO test systems,” says Harvey. The primary savings, he says, comes from using the 2508 to identify mis-wires in the vehicle before they power up the fully assembled car to perform static functional tests.

“When we used to hand ring the vehicles, often we would still have miss wires when we started running functional tests,” Harvey says. “Now we have a perfectly wired vehicles coming into the functional test area.”

In addition, he says, “A big challenge is proving – really proving – to the customer that we are delivering a product that meets our stringent requirements for the testing of vehicle hardware.. Customers are frequently on-site during product testing, looking over our shoulders. The fact that we can run these tests, save time, *and* produce paperwork with ‘CERTIFIED’ printed on it is a huge plus.”

In fact, a Siemens car must pass electrical tests 100 percent in order to continue through production.

“DIT-MCO absolutely shines in terms of test speed – fast product throughput at a very high quality,” says Harvey.

It’s a good fit for a company that delivers “state-of-the-art safety, reliability, flexibility, speed, and economy” to its customers.

DIT-MCO's Special Products Group (SPG)

As Siemens prepared to implement automated electrical testing in production of its light rail vehicles, it contracted with DIT-MCO's Special Products Group to write test programs as well as design and build custom interface cables.

Members of the Special Products Group applied their expertise to design, manufacture, test, and deliver a complete turnkey solution. The integration services group also provided test programming services using Siemens' schematics and engineering wiring data.

In addition to writing programs for the 2508 and 2500.MBA, DIT-MCO's Scott Kendrick designed the interface cables and connectors. "We needed to pack as much as possible into those 5,000 test points, and we also wanted to give Siemens flexibility for new projects," says Kendrick.

By hiring DIT-MCO's Special Products Group, Siemens shortened the pre-test phase of the electrical test process and facilitated an easy transition from manual to automatic testing.