

[Schneider Electric Case Study]



Vanderlande Industries

Marietta, Georgia



First-ever Ethernet-based baggage handling control system brings the industry into the 21st century offering high speed, lower cost

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*—Fred Marten, Manager of Controls Technology,
Vanderlande Industries*



On October 6, 2011, Sacramento County California’s largest-ever capital improvement project — the Sacramento International Airport (SMF) — opened to passengers ahead of schedule and on budget. The \$1.1 billion “Big Build” airport modernization project replaced the aging two-story, 13-gate Terminal B. The new Terminal B is three times the size of the original and consists of a three-story central passenger terminal and a separate 19-gate concourse with an elevated people mover to move passengers between the terminal and concourse areas.

In addition to the \$6 million of public art displayed in the terminal, it also boasts the country’s first IT-based controls for a baggage handling system.

Vanderlande Industries, which is based in the Netherlands with U.S. headquarters in Marietta, Georgia, was the successful bidder for the terminal’s baggage handling system. In the United States, Vanderlande has been designing, building, and servicing baggage handling systems for airports of all sizes since the year 2000. Their belt, tub, and/or track solutions combine operational effectiveness, short connection times, and high conveyability.

Challenge

Globally, Vanderlande Industries is known for its ability to provide innovative material handling systems that address the business challenges of its clients. In the baggage handling industry, the need for high speed data handling has become a paramount challenge as secure tracking of passenger assets grows.

As a result, Vanderlande Industries believed they could offer a decentralized, Ethernet-based architecture that would be faster than traditional proprietary systems, reduce overall maintenance costs and variable costs such as start-up and commissioning time, while still maintaining performance and reliability.

“With the design of baggage security systems at present, the speed limitation is always going to be the baggage screening machine,” said Fred Marten, manager of controls technology, Vanderlande Industries. “However, implementing an Ethernet backbone which has the capability of transferring data at 100 mbps, as opposed to the 12 mbps of a proprietary system, makes it easier to put the next generation machine into place. We’re in the process of establishing 21st century technology, rather than late 20th century.”

Why an open protocol?

In addition to speed, Vanderlande Industries believes that an Ethernet-based architecture will be easier to maintain because commercial, off-the-shelf components are readily available everywhere, and because it’s easier to find technicians who are familiar with an open protocol as opposed to a proprietary one.

“Today everyone is very PC-centric and PC-versed. Ethernet technology allows them to assimilate into industrial control more easily,” said Gaylloyd Dadyala, Technology Development, Vanderlande Industries. “We need to let go of legacy technologies and adopt the current and forward-thinking ones.”

The company also wanted to facilitate start-up and commissioning by creating a decentralized control architecture that pushes communication out to the individual components instead of a centralized network.



“A centralized architecture requires a field technician to mount the drives and manually make all the connections,” Marten said. “With a decentralized architecture, we make all of those components plug and play, and as soon as they’re connected, the system finds them and brings them together. The additional work in the plant reduces the amount of work on the floor, which reduces the variable cost and subsequently, the overall cost of the system.”

With communication at each device, a decentralized architecture also helps to isolate faults and makes maintenance and troubleshooting easier.

The first of its kind

The fact that no other company was offering an open solution did not deter Vanderlande Industries. They turned to longtime partner Schneider Electric — The Global Specialist in Energy Management™ that offers integrated solutions across multiple market segments — to help bring the system to life and prove its effectiveness to the airport consulting companies that are responsible for ensuring designs meet all of the required Transportation Safety Administration (TSA) guidelines.

Since this was a first-of-its-kind solution, Schneider Electric had to first spend six to eight months developing the solution and demonstrating a proof of concept before becoming an approved vendor for the consultant’s specification. Schneider Electric utilized its network specialists in the company’s North Andover Networks/Communications/Automation Support headquarters to configure the best solution.

The end result consisted of the Quantum™ programmable logic controller (PLC) with hot standby, Connexium™ Ethernet switches, Altivar™ 312 drives, TeSys™ U Line starters, and Magelis™ XBTGT human machine interface (HMI) touch screens. The hardware is programmed with Unity™ software. Advantage Industrial Automation in Duluth, Georgia, Vanderlande’s enduring distributor and a Schneider Electric channel partner, assisted with the project from the beginning offering technical, design, and testing support, and project coordination.

“This solution needs to read and store a tremendous amount of data — who you are, where you’re going, when you checked your bag, when your plane is leaving and arriving — it’s all called the ‘bag tag data,’” said Marten. “All of that information needs to be read and saved so that a passenger’s bag can get screened, placed on the correct plane, correctly transferred between planes, and end up at the right baggage terminal.”

Programming the solution to handle all of this data took significant effort. Schneider Electric network specialists helped Vanderlande Industries’ engineers optimize the code to make the best use of the hot standby system. The North Andover Networks/Communications group provided training to company personnel.

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After successfully demonstrating the proof of concept, Vanderlande Industries was able to use the Ethernet-based architecture at SMF.

“It was a big investment by everyone to get to the point where the consultant said ‘I believe in it now,’” Marten said.



Good VIBES

Vanderlande Industries is utilizing the Schneider Electric™ Citect™ SCADA industrial control system to power its maintenance diagnostic system and its baggage execution software, VIBES. VIBES puts complete operational management of an airport's baggage interaction into one hand, ranging from check-in and self-service solutions, to airport system interfaces and baggage reconciliation. VIBES also gives insight into a baggage handling operation's performance, contributing to process transparency and operating cost reduction.

Changing the industry norm

Despite the airport's aggressive schedule, the Ethernet-based baggage handling system was installed efficiently and is performing to specification.

"We have a high tech system that fits with today's workforce," Marten said. "The modularity of the hardware and software components should result in standardized components and reusability that allows for lesser cost in development and future expansion."

Dadyala believes that Vanderlande's Ethernet-based system has changed the norm for the traditionally risk-averse baggage handling industry.

"The baggage handling industry has been stuck on old technology and we wanted to do something that is consistent with our principle of delivering on technology where practical," Dadyala said. "The fact that the Ethernet-based architecture is a successfully working system implemented in a project that was not only on time, but on an accelerated timeline, tells us that it has changed the industry standards."

To learn more about Vanderlande Industries visit their website at www.vanderlande.com.

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Schneider Electric USA

8001 Knightdale Boulevard
Knightdale, NC 27545 USA
Tel: 919-266-3671
www.schneider-electric.com/us

Schneider Electric Canada

5985 McLaughlin Road
Mississauga, ON L5R 1B8
Tel: 416-752-8020
www.schneider-electric.com/ca



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