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Innovative Texas Instruments TIRIS(tm)-Based Solution Saves Swissair Time, Money

If you fly Swissair out of Zürich Kloten, Switzerland's biggest international airport, your plane has an even better chance of being on time than in any other airport in the world. Why? Look out the window of your plane at the luggage wagons. Now, thanks to innovative radio frequency identification (RFID) technology from Texas Instruments TIRIS and DIGI SENS, a Swiss firm specializing in weighing systems, these luggage trains are no longer the reason for holding up your plane.

A Balancing Act

Balancing an airplane's cargo is critical to flight performance, safety and fuel consumption. Like many airlines, Swissair labels its freight containers as well as the small luggage wagons with the destination, flight number and net weight. Until recently the tagging process involved stopping each wagon in the train on a conventional scale set flush with the floor. After identifying the type of wagon and its associated standardized tare weight, an employee had to manually key in that weight. Then the tare weight was deducted from the total weight shown on the scale to determine the net weight. Determining the tare weight was particularly difficult for repaired wagons whose weight may have changed after parts were replaced.

During peak hours, this procedure ensured a backlog for Swissair. Wagons queued up, while planes and passengers sat on the tarmac waiting for the ground crew to load luggage and cargo.

Swissair, A Consistent Top Performer

Every year international airlines are rated by the International Air Transport Association (IATA) Every year Swissair ranks in the top 10 for providing exceptional customer service and consistently wows the airline industry with its ability to deliver outstanding service, while

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maintaining high technical standards. And this, despite being headquartered in a country with a high cost of living and tough environmental laws, two factors that make Swissair's overhead high for the industry.

A Forward-Looking Solution

Not to disappoint industry pundits who closely monitor the airline for innovative management techniques, Swissair took action. Well aware that its freight weighing system

created backlogs and stressed on-time records, Swissair was also unhappy with the small but consistent rate of inaccuracy inherent in its weighing system. The airline sought an innovative solution to eliminate inaccuracies and to speed up the process.

Together TIRIS, DIGI SENS AG, and Swissair replaced the existing weighing system with an automated, hands-free RFID system that is unique in the airline industry.

DIGI SENS installed a dynamic drive-over-scale to replace the conventional scales. Now, without stopping, luggage wagons are pulled over the scales and the weight is automatically registered. The process of establishing the tare weight and deducting it from the total weight is automatically computed. The wagon driver does not have to stop and go for each wagon in his train. The scale operator only has to pay attention to a small overhead light to ensure the reads have been made and the system is not offline.

For the wagon to be “read” as it goes over the scales, an RFID tag is placed on each wagon. The tag is a passive, battery-free transponder programmed with a unique ID number and other data. An antenna embedded in the flooring along with the scales reads the RFID signal emitted by the transponder as the wagon approaches the scales. As the wagon moves over the scales, the weight of a single axis can be determined exactly. The computer matches the axis weight with the appropriate tare weight. The net weight is then determined and printed on the ticket. The flight number and gate are added later.

The weighing and identification system, called DYWA (pronounced diva, like the granddame singer), is connected to Swissair’s LAN. The portable object-oriented code also permits special situations, such as when a wagon is hand-pulled in an emergency situation. The weighing technology is based on a vibrating gauge with a transducer that directly digitizes for faster measurement.

The weighing system’s computer is based on a Motorola 60832 chip that can quickly make calculations. It has a serial interface to the PC which sits at the weighing station.

The overhead light notifies the operator when the system is ready for another wagon or when there is a problem. Swissair’s printers, placed throughout the terminal for immediate access by ground crew continue to output the latest information on luggage and plane assignments.

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Why Swissair's Innovation Will Spread Throughout the Industry

Initially, the new system was going to replace the "extra" system used for redundancy and peak work hours. But when the older system broke down in need of repairs, Swissair decided to install another of the new TIRIS-DIGI SENS systems because the first one worked so well.

With the new systems in place, Swissair is weighing and identifying cargo at a tremendous pace. Backlogs no longer exist and improvements are planned for loading and removing freight from the wagons to keep up with the speed of the new weighing system. Swissair officials are ecstatic about how smoothly the new systems run, especially during rush hours.

Time Savings Means Other Savings

The savings in personnel costs alone was sufficient to pay back Swissair's investment in only one fiscal quarter. Three of the ground crew originally assigned to the weighing stations have been reassigned to other tasks. Because data entry is automated, data does not have to be re-entered, again saving personnel for more intellectually demanding tasks.

Reduced Investment and Overhead

The DIGI SENS system is one-fifth the size of the older weighing system. Because space is at such a premium, especially in larger international airports, any space savings is automatically a plus on the balance sheet. But it also means that less concrete has to be torn up to install and maintain the drive-over scales. The fact that the scales are digitized also means less maintenance costs associated with calibrating the weights.

Other Applications

DIGI SENS AG, located in Meyriez, Switzerland, plans to demonstrate the new weighing and ID system at Airport 97, the international airport supplier fair in Frankfurt, Germany to be held in September.

Besides this new system and airline check-in scales, DIGI SENS has equipped a variety of vehicles, machines and automatic systems with its weighing systems. The DIGI SENS drive-over scale that uses TIRIS RFID technology is also being used for truck scales, especially in waste management.

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Note to editor: TIRIS (Texas Instruments Registration and Identification System) is an advanced radio frequency ID technology that includes both passive, low frequency transponders, active, high frequency transponders, reader equipment and software. Applications include automotive antitheft systems, vehicle identification, security access, and automatic logistics management, and electronic toll collection systems.

DIGI SENS AG, a young innovative Swiss firm, develops, produces and sells digital measuring systems for industrial purposes.