

Flexible and universal: from building automation to jetway control to waste disposal

PC-based control helps operations at Kuala Lumpur International Airport Terminal 2 run smoothly

Bustling with over 28 million passengers annually, Kuala Lumpur International Airport (KLIA) is the 18th-largest in the world. And with a height of 133.8 meters, the control tower for the KLIA2 terminal of the Malaysian capital's airport complex is the tallest in the world. B&I, a Malaysian trade publication for building automation, talked with three representatives of companies that were involved in the construction of KLIA2 and employed Beckhoff control solutions for their implementation of major operations from jetway controls to waste disposal.



Mr. Patrick Chong, your company, Perkasa Jauhari had the contract for building the control tower for KLIA2. How long have you been using building automation technology from Beckhoff?

Patrick Chong: We started working with Beckhoff in 2012 when we bid for the KLIA2 tower project and sought a capable supplier of advanced building management systems. Our choice to use Beckhoff control systems was based on the company's convincing references in the building automation field. Beckhoff also provided us with excellent technical support. In the area of free-way construction and maintenance (one of our core competencies), we have our own M&E teams, but for these building automation applications, we wanted to work with an experienced partner.

What challenges did you face during the construction of the KLIA2 tower?

Patrick Chong: With an extreme height of 133.8 meters, the KLIA2 tower is the tallest in the world at this time. The construction alone was an ambitious project in itself, but the difficulty was exacerbated by the aggressive 10-month construction deadline. We also had to meet very high safety requirements and pass extensive tests with regard to the tower's wind and earthquake resistance.

For its building management system, we employed Beckhoff Bus Terminals and an Industrial PC as a server. We also installed eight control panels, linked directly to the PC.

Mr. Pak Muhamad Asfar, your company specializes in jetways. What did C Two Engineering supply for KLIA2?

Pak Muhamad Asfar: C Two Engineering is a subsidiary of Indonesian jetway manufacturer, Bukaka. At the moment, we are retrofitting jetways at KLIA that Bukaka delivered in the late 1990s to Malaysia Airport Holdings Berhad (MAHB). Their control and automation systems have become so obsolete over the years that getting replacement parts was very difficult and expensive. That is why we proposed a new control solution to the airport, based on a Beckhoff Industrial PC, EtherCAT I/O Terminals, and TwinCAT automation software.

When did the cooperation between C Two Engineering and Beckhoff begin? And what is your experience with PC-based control technology?

Pak Muhamad Asfar: We began working with Beckhoff in 2010. For us, the greatest benefit of the company's PC-based control solution is its openness. It



Patrick Chong, General Manager of
Perkasa Jauhari



Pak Muhamad Asfar, General Manager
of C Two Engineering



Magesh Kumar Suppu, Senior Manager at Stream Environment, and Daniel Tay,
General Manager of Beckhoff Malaysia. (left to right)

allows us to integrate virtually any device or program. Our previous solution, on the other hand, was based on a hardware PLC and offered very limited connectivity to other devices. Another strategic consideration was the fact that the jetways from JBT Corporation, which are currently in use at KLIA, also feature Beckhoff control technology. By standardizing the control platform, MAHB eliminated the need to hire any additional subcontractors for maintenance and repairs in the future. At this time, we are in the process of building a total of 30 jetways for KLIA2; six of them have already been delivered, and the feedback we have received from MAHB is very good thus far. The speed of signals and alarms between the jetway controller and the tower, for things such as usage time, operator ID, and availability, is much higher than before.

Are there any other advantages of the Beckhoff solutions, for example, with regard to system cost?

Pak Muhamad Asfar: The old PLC system used six I/O units per card. Now we are using EtherCAT Terminals with up to 16 channels in a 12 mm housing – a space-saving solution that costs less and reduces maintenance. It also requires less time for installation and wiring. Another advantage is its overall user-friendliness.

Mr. Daniel Tay, where else is the Beckhoff control system being used in addition to KLIA?

Daniel Tay: You can find our control technology in a number of current jetway applications, for example, at Penang International Airport or in Terminal 2 of Changi Airport in Singapore, where 32 jetways are equipped with Beckhoff control units. We deliver the control components and provide local support, while the program for the control system is developed in the USA and shipped directly from there.

Mr. Magesh Kumar Suppu, you are a Senior Manager at Stream Environment, a company that specializes in automated waste disposal systems for buildings. The references of Stream Environment include such renowned projects as Terminal 3 of Changi Airport in Singapore.

Magesh Kumar Suppu: We make automated waste disposal systems where a vacuum is used to transport solid waste to a central disposal facility through pipes installed in the floor. The system is controlled with a Beckhoff PC running TwinCAT automation software. As soon as a waste collection point is full, it sends a signal to the controller, which starts a fan that sucks the waste through the pipes and delivers it to a container where it is compressed. When the container is full, the system automatically sends a text message to a truck driver, who picks up the waste and takes it to a disposal site. In some cases, such as KLIA2, we operate a system with two containers that are switched out automatically, so the system is never interrupted.

You used a different control system in the past. What technical advantages do you see after your switch to Beckhoff?

Magesh Kumar Suppu: The excellent technical support provided by Beckhoff springs immediately to mind. Since their system works with a programming platform that was totally new to us, it was important for us to reach their technical support around the clock to get help in case something malfunctioned or stopped working. The most important reason for our choice to implement Beckhoff technology, however, was system flexibility. The open interfaces allow us to simply link it with other systems, for example, for building management or fire protection. This enables us to configure our waste disposal systems in accordance with the customer's exact wishes. And since the Beckhoff controls platform is Windows-based, we can write our own programs and easily combine them with TwinCAT. We can also use the PC to communicate with third-party providers. With hardware-based controllers, this always required an extra PC. The Beckhoff system enables changes in the type and scope of the waste processing system with simple software modifications. Monitoring functionality has been increased, as well, since the PC-based controller enables remote access from anywhere using standard Internet connectivity.

Does Stream Environment have plans for any future projects with Beckhoff equipment?

Magesh Kumar Suppu: We have several applications in the works: a district project in Qatar, several restaurant centers, as well as a number of residential projects. In 2014 alone, we used Beckhoff technology in waste disposal systems for 16 residential projects with 3-story and 4-story complexes.

Originally published in Building & Investment | www.b-i.biz

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