

Alliance Partner & Schneider Electric Solutions Deliver Critical Upgrade to Help Keep the Planes on Schedule



PROJECT AT A GLANCE

Project Type

Transportation

Location

United Kingdom

Applications

Automation & control

System Components

- M340 PAC
- Advantys I/O
- Magelis HMI
- SCADA

CUSTOMER BENEFITS

- Greater system reliability
- Increased operator safety and efficiency
- Minimal disruption to operations during upgrade



This client is the busiest single-runway airport in the world. With more than 660 aircraft movements daily, the efficiency of all aircraft fuelling systems is critical. The airports storage and hydrant company was faced with the critical challenge of maintaining a constant hydrant pressure of 7.5 to 9 bar. The pressure of the fuelling pumps, however, is directly affected by the number of aircraft being fuelled simultaneously. If the pressure in the fuelling pumps drops, flights are delayed.

An ageing bespoke pump controller was producing spurious faults so to ensure minimal aircraft delay, the client decided to upgrade this element of the control system for fuelling and storage. One of Schneider Electric's Alliance Partners, Cougar Automation, was employed to complete this vital upgrade.

Cougar Automation has been operating in the UK for the past quarter century and partnering with Schneider Electric for the last seven years. They have been expanding beyond their initial specialization in the Water segment to expertise in other industries such as Oil & Gas, Food & Beverage, Pharmaceuticals and Power Generation.

“Schneider Electric Alliance Partner Cougar Automation has proved to be an inspired choice as system integrator. The project has achieved all expectations and aspirations — reliable engineering, reliable equipment, reliable and real people, with round-the-clock support. Having established client confidence, Cougar Automation helped design a cost effective solution that could be installed with minimum risk to operations. No small feat given the constraints and limitations of a very busy international airport.”

Clients Consulting Engineer.

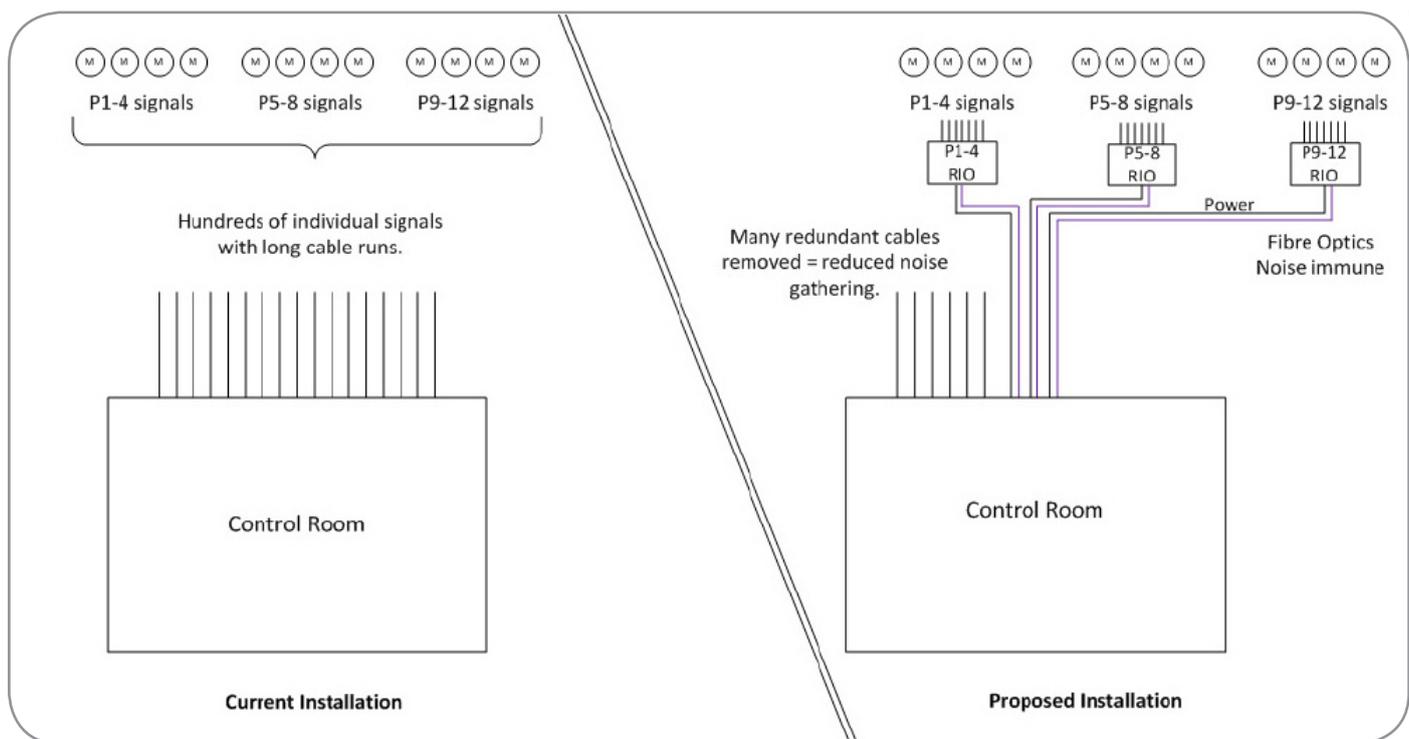
The Challenge

There were several key challenges to the upgrade, not least of which was the requirement to keep the fuel flowing during the changeover. Electrical noise was identified as a potential problem affecting the system. With multiple aircraft requiring simultaneous refuelling, a spurious response caused by electrical noise would affect the pump control.

The control system was successfully upgraded using the M340 PAC, Magelis HMI and SCADA system. The upgrade reduced the manual demands on operators. The new PAC

and SCADA system provide them with all the information they require, improving monitoring and control for optimum pump performance and, consequently, on-time flights.

As initially suspected, however, the presence of electrical noise meant that optimal performance was still not achieved so further changes were required. The added visualization and trending from the HMI and SCADA made it easier to clearly identify the noisy flow signals that were upsetting the control algorithm.



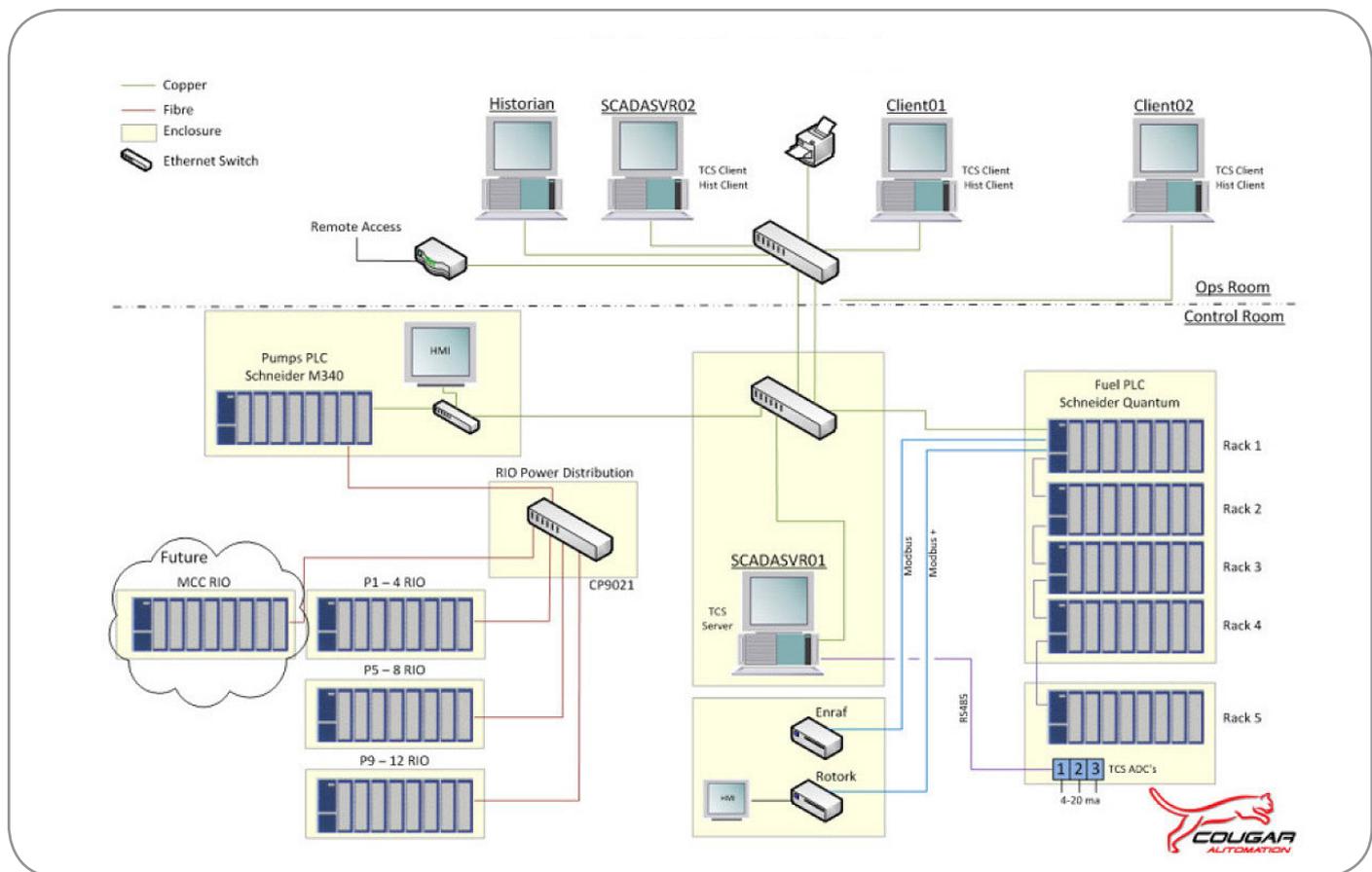
The Solution

Twelve pumps feed a common hydrant header and each pump has an inline flow meter. These flow meters (turbine type) were also at the end of their reliable life and behaved erratically at lower flows. Upgrading these was on the cards but being modern electronics, they would potentially be more susceptible to electrical noise. It was therefore imperative that the complete solution not only improve the flow signals but also eliminate the spurious responses caused by noise and mechanical stiction.

As often happens over time and with continued expansion, the cable installation and containment had become overwhelmed, and the signal earthing appeared to have some cross wiring with other systems. This was seen as the primary factor contributing to the electrical noise. Remote I/O with fibre optic connections were implemented to resolve this issue. Due to the hazardous area classification Zone 2, it was decided to use Schneider Electric's Advantys I/O (rated Ex II 3G). Advantys I/O

is simple, open and versatile to use, ensuring the pressure and flow measurements are efficiently transmitted to the controller. It has the added benefit of prefabricated cables for harsh environments and is well equipped to deal with the explosive atmosphere of the airport fuelling system.

The original design simply replaced the ageing pumps controller, with all field signals terminating in the equipment room. With the installation of the Advantys I/O, however, shorter signal cables were run to remote I/O islands near the pumps and fibre optic connections back to the M340. This provided the isolation required to eliminate the noise observed on the pump flow signals. Furthermore, using remote I/O had the added benefit of reducing the customer's cabling costs.



“There was no doubt in my mind that Cougar Automation, a Schneider Electric Alliance Partner, was the right company to take on the challenge of upgrading our obsolete pump control panel.

From the outset, the project was full of challenges: keeping an international airport fuel system online to meet demand as well as providing the client with the confidence and reliability of a new pump control system.

The team at Cougar Automation developed a systematic approach, integrating the new pump control system and providing the reassurance of the reliable Schneider Electric equipment, all with minimal operational impact to the airport fuel system. The system has now been operational for over a year with no issues, which is testament to the quality and reliability of the Schneider Electric equipment and the design, engineering and support of Cougar Automation.”

Operations Supervisor.

The Benefits

Improved operator efficiency and safety

Upgrading to the M340 PAC and Advantys remote I/O has eliminated the need for the operations team to physically visit the equipment room for manual pump sequence and control changes. They can now remain at the control desk for all fuel storage and pumping operations, improving their personal safety and operational efficiency.

Minimal disruption to operations

During the changeover, there was no interruption of the fuel supply to aircraft. This was attributed to thorough preparation and planning, as well as to the ease of use of the M340 programming environment, Unity.

Greater system reliability

By upgrading to M340 PAC, the client can now gather and present reliable signals which, in turn, has resulted in predictable control system response. Controller anomalies that used to result in occasional losses in pressure have been completely eliminated.

For added peace of mind and breakdown assistance, Cougar Automation provides the client with 24/7 emergency callout in conjunction with Schneider Electric's Alliance Program.