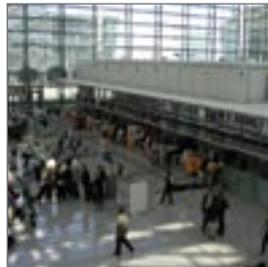


case study



German Standards Agency Confirms LonWorks Delivery of Safe Smoke Extraction

In the interest of public safety, Munich Airport specified an automated fire detection and smoke extraction system for its new Terminal 2. In order to protect its investment, it sought a legally compliant solution that would satisfy current requirements and, with minimal change, accommodate forthcoming operational standards.

Honeywell

Integrated Fire Solution

THE CUSTOMER

Munich International Airport is Europe's eighth-largest airport and the gateway to Bavaria, the heart of Germany's most popular tourist region. Nearly 25 million people travel through it every year, flying on 90 airlines with connections to 207 destinations in 60 countries.



THE ISSUE

Airport management wanted an automated fire detection and smoke extraction system for the new Terminal 2. They sought intelligent technology that would prevent fires and risk of smoke-related disasters. They also wanted a solution that would pre-empt new legal regulations and stand the test of time.

THE HONEYWELL SOLUTION

Honeywell installed a control and monitoring system based on LonWorks®, the size of which is demonstrated by the scope of the component parts:

- 524 smoke extraction and damper coordinators
- 6200 damper modules for fire safety and smoke extraction
- 809 I/O modules for system control and alarm detection
- 20 Fire Department control panels and 43 RDA keyboards (smoke extraction compression systems) with some 1600 keypads for manual interventions
- 404 smart routers with ring and device monitoring
- 134 CBL LON-LWL routers for connection to the fibre optic backbone with ring topology, covering the entire terminal
- 1 million logical functions – all individually programmed by project specification
- Control of external devices including air vents, RWA systems, awnings, sunscreens, emergency exits and fire doors.

All the equipment (except the routers) is from Honeywell's Excel 5000 range, albeit with a few enhancements – secure data transmission for example.

PRE-PLANNING PAYS DIVIDEND

In order to simplify testing and inspection of the smoke extraction systems, some key decisions were made prior to the planning stage. On the strength of Honeywell's proven expertise on other large life safety management projects it was agreed, for example, that it should provide proof of secure and reliable operational safety in accordance with key German standards.*

Subsequent risk analysis of system failure confirmed the requisite certification category (AK3). Compliance with this standard was met with the addition of a few extra measures. This included ring transmission (to avoid communications breakdown in the event of cable breaks). Failures are restricted to LON devices with regular and automatic tests covering anything else untoward.

Separating out the different modules with individually configurable logic functions ensures a flexible and scalable system. The LON-fibre optic backbone also supports extensive expansion over time and distance.

The entire system includes the following functions:

Automatic Smoke Extraction:

In the unlikely event of the fire alarm being triggered, an alert is sent from the Fire Alarm sub-panel to the corresponding extraction co-ordinators (ExCos). Stored logic tables activate the relevant extraction groups, the data being transmitted to the damper coordinators (DCs) via the LON network.

They, in turn, cross reference the allocations for each activated extraction group to determine which dampers/ external systems need commandeering. Fire safety dampers (FSDs) are closed and ventilation systems deactivated so as to seal-off smoke filled zones and, for added precaution, those adjacent to them.

Extraction dampers (EDs) and curtain dampers open to release the extracted smoke and fire ventilators kick-in to speed up the process. Concurrent commands to back-end systems ensure that fire doors are closed and emergency exits disengaged.

All commands (apart from ventilator control) are sent from the damper coordinator to the FISS modules. Deactivation commands for proprietary building systems and the activation commands for the extraction ventilators are sent directly from the ExCo to the corresponding DDC stations. They, in turn, evaluate the extraction ventilator responses – with those of other components – automatically generating alarms against any discrepancies.

* DIN V 19250 'Fundamental safety considerations for MSR protection installations', and DIN V 19251 'Requirements and measures for secured operation'.

The FISS modules comprise bespoke LON devices from Honeywell for controlling fire safety and extraction dampers.

Manual Triggering of Extraction by the Fire Department:

The automated solution can be overridden by the Fire Department using panel keypads. In this instance, alarms from the panel buttons are sent via the fibre optic LON backbone to the corresponding ExCos, the panels pinpointing the location of the alarm. Other than that, manual extraction operates in exactly the same way as for automated control.

System Monitoring and Test Routines:

All equipment, routers and cableways in the LON extraction group are tested cyclically. In the event of a fault, an alarm is sent to the Building Management System (for monitoring and maintenance). Likewise, all LON rings are monitored by routers that can detect/report a break in connection. The LON modules reciprocally monitor each other and, faced with a communications failure, trigger an alarm to the BMS and closure of the associated fire safety damper.

The BMS also monitors transmission between the central and the extraction control equipment. Again, any fault automatically alarms.

Seamless Monitoring and Logging:

With all T2 extraction controls connected to the BMS, alarms, operating cycles, faults and actions are displayed at management level and logged. The option of manual or automatic intervention remains at all times. This is how the BMS controls extraction test programmes. Components important for extraction but not included in a test, are blocked during testing. All test processes and faults are logged.

BUSINESS BENEFITS:

The Honeywell integrated fire detection and smoke extraction solution at Munich T2 protects passengers and staff and mitigates risk.

Inspection by TÜV, the German standards agency, confirmed compliance with its mandatory criterion. It certified that the smoke extraction solution implemented by Honeywell conforms to the requisite level – to AK3 level in compliance with DIN V 19250 and DIN V 19251.

The success of the Munich T2 project underscores the importance of forethought. It shows that life safety-related LonWorks® solutions can be implemented ahead of new standards. Not only does Honeywell technology meet current legal requirements for safe airport operation, it can be mapped, with minimal change, to the new Safety Integrity Level necessitated by the forthcoming EN61508 standard.



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