
Copenhagen Airport

International Airport Measures Critical Runway Conditions Using Sierra Wireless AirLink® MP



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Founded in 1925, Copenhagen Airport has grown to be Scandinavia's center for international air traffic and main transfer point amongst the many national and regional airports in Scandinavia and the area south of the Baltic Sea. Copenhagen Airport also functions as the hub for airlines SAS, Norwegian, Cimber Sterling and members of the Star Alliance, as well as express airfreight carrier DHL.

Over the last 12 months, more than 18.6 million passengers have traveled through Copenhagen Airport. The airport area, approximately 11.8 square kilometers, includes a three runway system with a maximum capacity of 83 operations – take-offs and landings – per hour.

Business Challenge

To ensure maximum safety for all passengers, Copenhagen Airport continuously monitors local weather conditions. In addition, airport operations regularly measures weather-related runway conditions, such as temperature and moisture, in order to store and analyze data and relay status and safety information to incoming flights. One key condition used to determine runway safety is traction. Whereas temperature and humidity can be measured using sensors, determining the force of traction on each runway is a more complicated process.

Since 2001, Copenhagen Airport has been utilizing a Runway Observation System (ROS); the purpose of the system is to transmit the SNOWTAM, the standard message format used by the International Civil Aviation Organization (ICAO) to describe runway conditions, to a central server and to distribute the data to the air traffic controllers. This information is then distributed to local aircrafts using Air Terminal Information Service (ATIS) and then around the world through the Aeronautical Fixed Telecommunication Network (AFTN).

The ROS used a VHF datalink but suffered from having only one receiver, which resulted in poor coverage of the large area where measurements were being taken. For the system to be truly mission critical, the coverage issues needed to be addressed. To resolve the coverage issue, Copenhagen Airport decided to upgrade the existing ROS system, and as part of this a sophisticated solution upgrade consisting of a ruggedized 3G mobile communications gateway.

Sierra Wireless AirLink® Solution The specialized vehicle is based on a standard passenger car, a Saab 95 Combo, loaded with advanced measurement equipment and a fifth wheel that can be lowered down to calculate the traction of the runway. All measurement data is transferred to a central server using a ruggedized, 3G Sierra Wireless AirLink MP880W mobile router operating over broadband HSPA networks.

"We were in need of a product that would work in even harsh conditions," explained Thomas Lantz-Pedersen, project manager for Copenhagen Airport. "The router must be able to work in extreme conditions, including temperatures ranging from minus 30 degrees Celsius all the way up to above 50 degrees, and must be able to absorb shock and vibration. Considering that flight safety relies on correct data being transmitted from the communications gateway, reliability was not something we would compromise."

The MP880W ultra-rugged in-vehicle GPS router comes equipped with an 802.11 b/g Wi-Fi chip to increase flexibility and enable mobile hotspots with enhanced WAP security. The AirLink MP880W also meets US Military and SAE specifications for vibration, shock, drop and more, making the device strong enough for the demands of extreme temperatures and constant movement.

"We contacted Sierra Wireless distributor Daimler Mobile Partner who recommended we use the AirLink MP880W router," Lantz-Pedersen continued. "We are very fond of the product's durability, speed and functions, and it works – as it was supposed to – under even the most difficult conditions. Even the installation, with the PC, was done quickly and easily."

With the specialized Saab 95 Combo driving on the runway at speeds of up to 90 kilometers per hour, the immediacy of data retrieval and processing is critical. The driver must have consistent, reliable broadband connectivity to detect and relay even the smallest details that can affect flight safety, observations such as the presence of snow on runway shoulders. The MP880W is powered by ALEOS® embedded intelligence, which – in conjunction with the AirLink comprehensive set of device management tools – provides remote management and control, quick configuration and advanced device diagnostics to maintain “always on” and “always aware” broadband communications.



Results

The primary purpose of the specialized vehicles is friction management. During winter, with snow on the runway, the friction management process acquires vital data to ensure passenger safety to incoming flights through international Navair systems. The AirLink MP880W router enables steadfast transmission of this mission critical data from the vehicles to a centralized airport server, from there to the airport control tower and into briefing information systems for scheduled flights at the International Airport of Copenhagen.

Copenhagen Airport's specialized measurement vehicle using the Sierra Wireless AirLink MP880W GPS router provided the following benefits:

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- **Reliable connectivity**
 - ALEOS intelligence provides “always-on” and “always-aware” communications required for mobile data applications.
 - **Rugged form factor**
 - Meets US Military and SAE specifications for high performance in the harshest of environmental conditions.
 - **Vehicle management**
 - GPS tracking provides ability to acquire vehicle information, such as location and speed, without interruption.
 - **Ease of use**
 - Quick and easy configuration and automatic system connection every time.
 - **Immediate access**
 - 3G cellular solution with added Wi-Fi support offers immediacy provided by real-time, two-way data transmission available anytime, and accessed from anywhere in the world.
 - **Device portability**
 - Wireless AirLink MP 880W routers allow for re-deployment if runway vehicle is replaced or down for repair or upgrades.

Application: Mobile Data

Customer Critical Challenge:

- Runway conditions to ensure passenger safety cannot be measured using typical sensor solutions
- Needed to upgrade spotty transmission coverage from VHF datalink to ensure mission critical data exchange

Solution:

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- Specialized vehicle with advanced detection instruments and ruggedized, 3G AirLink MP mobile router provide vehicle driver with strong, uninterrupted broadband communication at cars speeds of up to 90 kilometers per hour

Benefits:

- Remote vehicle management with high precision GPS tracking
- Seamless installation and deployment with advanced management tools and automatic connection
- Built to rugged specifications for the harshest environmental conditions