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 centerfor international air traffic and main transfer point amongst the many nationaland 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 traveledthrough Copenhagen Airport. The airport area, approximately 11.8 squarekilometers, includes a three runway system with a maximum capacity of 83operations – take-offs and landings – per hour.

Business Challenge

To ensure maximum safety for all passengers, Copenhagen Airportcontinuously monitors local weather conditions. In addition, airportoperations regularly measures weather-related runway conditions, suchas temperature and moisture, in order to store and analyze data and relaystatus and safety information to incoming flights. One key condition usedto determine runway safety is traction. Whereas temperature and humiditycan be measured using sensors, determining the force of traction on eachrunway is a more complicated process.

Since 2001, Copenhagen Airport has been utilizing a Runway ObservationSystem (ROS); the purpose of the system is to transmit the SNOWTAM,the standard message format used by the International Civil AviationOrganization (ICAO) to describe runway conditions, to a central server andto distribute the data to the air traffic controllers. This information is thendistributed to local aircrafts using Air Terminal Information Service (ATIS) andthen 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 measurementswere being taken. For the system to be truly mission critical, the coverageissues needed to be addressed. To resolve the coverage issue, CopenhagenAirport decided to upgrade the existing ROS system, and as part of thisa sophisticated solution upgrade consisting of a ruggedized 3G mobilecommunications gateway.

Sierra Wireless AirLink™ SolutionThe specialized vehicle is based on a standard passenger car, a Saab95 Combo, loaded with advanced measurement equipment and a fifthwheel that can be lowered down to calculate the traction of the runway. Allmeasurement data is transferred to a central server using a ruggedized, 3GSierra Wireless AirLink MP880W mobile router operating over broadband HSUPA networks.

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

The MP880W ultra-rugged in-vehicle GPS router comes equipped with an802.11 b/g

Wi-Fi chip to increase flexibility and enable mobile hotspots withenhanced WAP security. The AirLink MP880W also meets US Military andSAE specifications for vibration, shock, drop and more, making the devicestrong enough for the demands of extreme temperatures and constant movement.

“We contacted Sierra Wireless distributor Daimler Mobile Partner whorecommended we use the AirLink MP880W router,” Lantz-Pedersencontinued. “We are very fond of the product’s durability, speed andfunctions, and it works – as it was supposed to – under even the mostdifficult 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 upto 90 kilometers per hour, the immediacy of data retrieval and processingis critical. The driver must have consistent, reliable broadband connectivityto detect and relay even the smallest details that can affect flight safety,observations such as the presence of snow on runway shoulders. TheMP880W is powered by ALEOS™ embedded intelligence, which – inconjunction with the AirLink comprehensive set of device managementtools – provides remote management and control, quick configuration andadvanced 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 processacquires vital data to ensure passenger safety to incoming flights throughinternational Navair systems. The AirLink MP880W router enables steadfasttransmission of this mission critical data from the vehicles to a centralizedairport server, from there to the airport control tower and into briefinginformation systems for scheduled flights at the International Airport ofCopenhagen.

Copenhagen Airport’s specialized measurement vehicle using the SierraWireless AirLink MP880W GPS router provided the following benefits:

- ***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 highperformance in the harshest of environmental conditions.

- ***Vehicle management***
  – GPS tracking provides ability to acquire vehicleinformation, such as location and speed, without interruption.

- ***Ease of use***
  – Quick and easy configuration and automatic systemconnection every time.

- ***Immediate access***
  – 3G cellular solution with added Wi-Fi support offersimmediacy provided by real-time, two-way data transmission availableanytime, and accessed from anywhere in the world.

- ***Device portability***
  – Wireless AirLink MP 880W routers allow forre-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:

- Specialized vehicle with advanced detection instruments and ruggedized, 3G AirLink MP mobile router provide vehicle driver with strong, uninterruptedbroadband 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