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# An investment in safety and operating efficiency

## Vaisala AviMet® LLWAS Low Level Wind Shear Alert System

Low-level wind shear is a hazard to aircraft during take-off and final approach. Microbursts are the greatest danger. With a Vaisala AviMet® Low-Level Wind Shear Alert System (LLWAS) in place, ATC personnel can warn pilots when low-level wind shear penetrates the runway corridors so they can take appropriate evasive action. At airports that are known to experience low-level horizontal wind shear, the system can be fundamental to improving safety and operating efficiency.

The Vaisala AviMet® LLWAS is a ground-based system that:

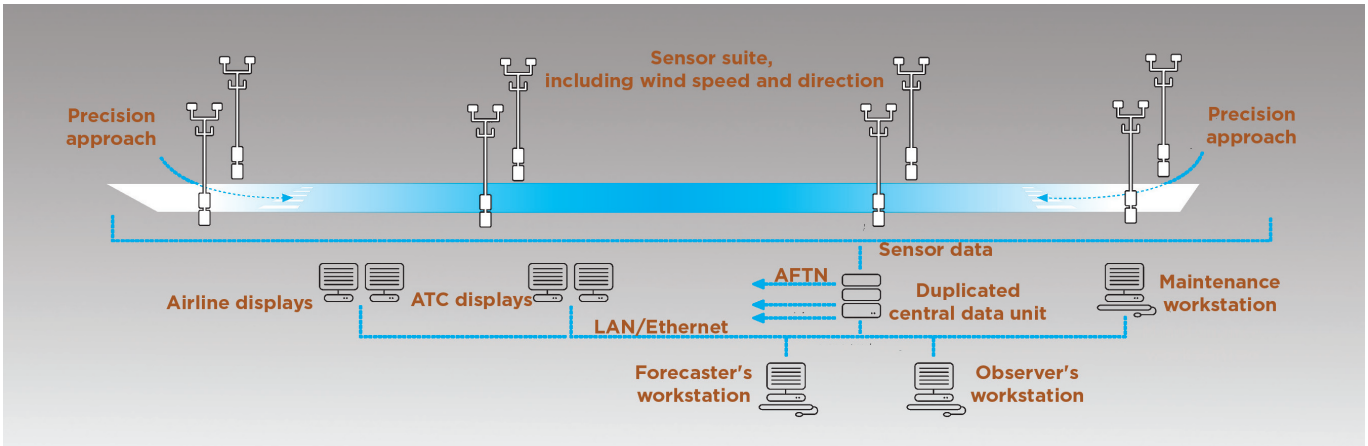
- Detects low-level wind shear and microburst events in the runway corridors,
- Gives visual and audio alerts on wind shear and microburst events to ATC and other airport personnel.

The LLWAS can be easily upgraded to a full-scale AviMet AWOS system. The system can also be fully integrated into an existing AviMet AWOS.


*Alert screen displays the threshold windshear alerts and wind speed and direction. It also displays the center field wind speed and direction and system status.*

## Features / Benefits

- Timely detection of wind shear in runway corridor
- Timely identification of microbursts
- Accurate estimation of headwind loss or gain associated with wind shear
- Accurate localization of wind shear
- Probability of microburst detection better than 90%
- Probability of false alerts under 10%
- Uses NCAR Phase-3 LLWAS algorithm
- Compliant to ICAO standards and recommendations as well as WMO regulations
- Is fully configurable and modular
- Contains a flexible display package with configurable layout options
- Has an open software and system architecture
- Provides superior data accuracy and consistency
- Designed to interface by various output formats and to follow various communications standards and conventions
- Part of AviMet technology platform




*A typical Vaisala AviMet LLWAS consists of the field sensors, central data unit(s), communication interfaces and different workstation types.*

## LLWAS algorithm and regulatory compliances

LLWAS collects and processes the wind data using Phase-3 LLWAS algorithm. The algorithm was developed for the U.S.Federal Aviation Administration (FAA) by the National Center for Atmospheric Research (NCAR) and patented by the University Corporation for Atmospheric Research Foundation (UCAR). Vaisala is an accredited licensee of the algorithm and can prove compliance with Phase-3 performance. AviMet LLWAS is also tested with NCAR test sets.

The AviMet LLWAS software runs on the Windows® and Linux environments

## System overview

Components of a typical AviMet LLWAS:

- Wind sites, comprising wind speed and wind direction sensors, typically solar-powered and with radio-modem communication
- One or two central data units (CDU)
- LAN
- Workstations
- Data output to external systems
- Printers
- UPS for the central data unit(s)

All critical functions of the system can be duplicated to ensure uninterrupted flow of data.

## Software architecture

The AviMet LLWAS software consists of the CDU software and workstation software. The CDU software monitors and controls the system's operation. The workstation software is an easy-to-use interface for end-user applications.

## Central data unit

The central data unit is the main computer of the AviMet LLWAS system. It collects data from the sensors, performs calculations, and carries out continuous diagnostics of the incoming data and the entire system. The CDU also stores the measured and calculated data. The CDU software processes the data and forwards it to other services or end-user applications. There can also be input from the user interface. The Input/Output system controls the data flow from the runway sensors and monitors the sensor operation. The LLWAS algorithm service does wind shear calculations, and the alarm processing services provide the wind and alarm data to the user interfaces.

## Workstations

The system configuration defines the number of workstations and their types, which have pre-configured environments and differing sets of software applications.

The commonly used workstation types are Weather View, Forecaster, Observer, and Remote Control and Maintenance workstations.

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