IMS4 AWOS

Automated Weather Observation System

IMS4 Automated Weather Observation System is an airport weather observation system for regional, national and international airports.

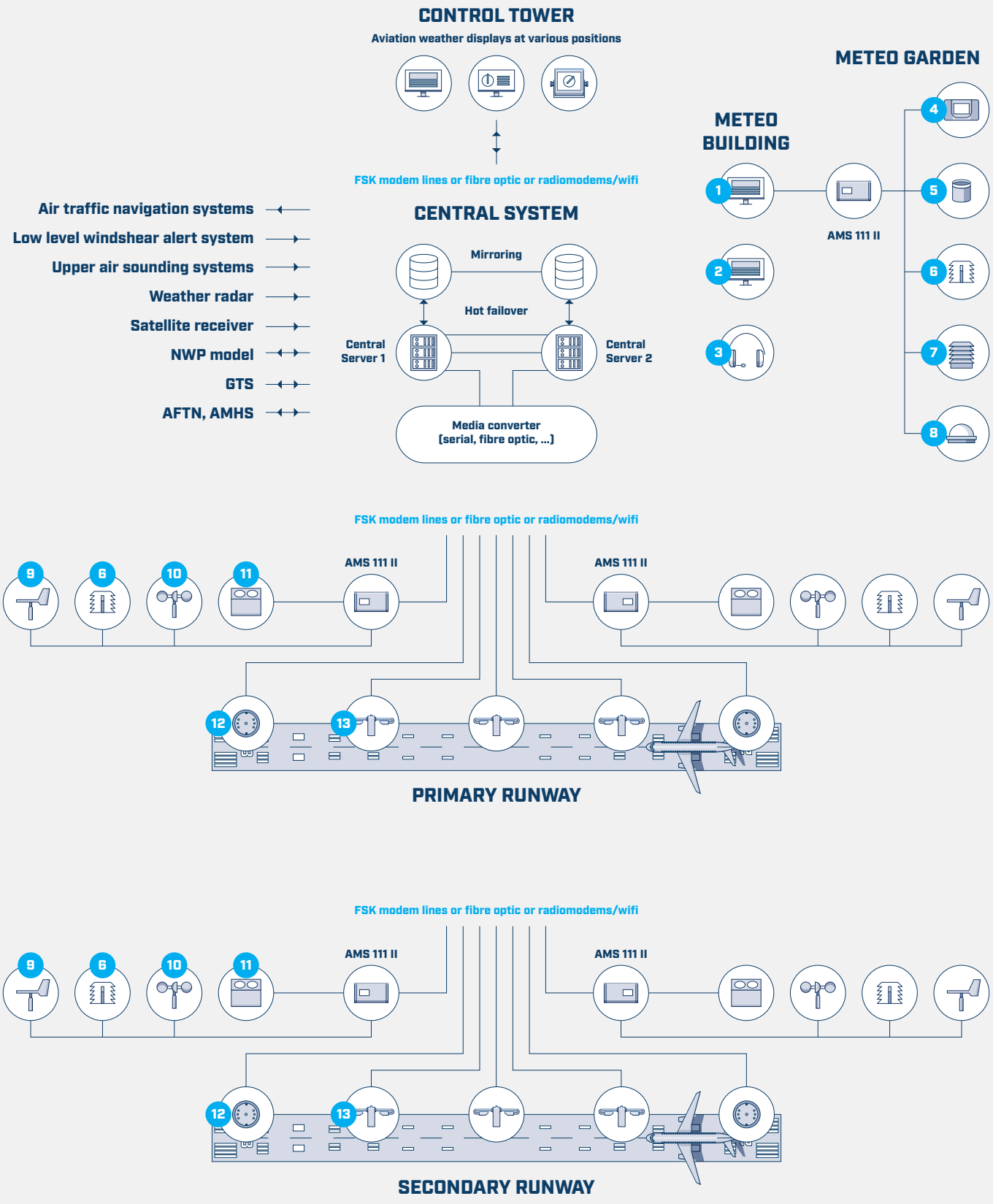
- **Integration of all airport weather data**
- **AWOS data on the Net**
- **Conformity with international regulations and recommendations**
- **Flexibility of system configuration**
- **Customizable according to customer's requirements**

The IMS4 AWOS measures, processes, stores, presents and communicates all meteorological data at the airport such as measurements produced by variety of meteorological sensors, manual observations, WMO codes received from GTS and AFTN. It provides the weather data to observers, air traffic controllers, pilots and other users in form of real-time screens, graphs, WMO codes, alarms and voice reports. It interfaces upper air systems, low level wind shear alert system and radars.

The IMS4 AWOS conforms to all ICAO and WMO recommendations regarding the measurements and reporting. It calculates various derived meteorological data such as QNH, QFE and Runway Visual Range, generates alarms, METAR, SPECI, MET REPORT, SPECIAL, SYNOP reports as well as national codes if required.

Scalable and flexible

The configuration and structure of the system depends on the size and category of the individual airport up to ICAO category CAT III. The modular architecture allows the expansion from single Aviation Weather Display with basic set of sensors up to comprehensive systems for multirunway airport connected



1 Met. observer
2 Forecasting workstation
3 ATIS/VOLMET
4 Barometric pressure
5 Precipitation
6 Air temp., relat. humidity
7 Ground temperature
8 Global radiation
9 Wind direction
10 Wind speed
11 Ceilometer
12 Runway surface status
13 RVR

to GTS and AFTN networks including a dual hot fail-over Central System, several Observer's Workstations, displays and terminals, briefings and ATIS / VOLMET services. The well-developed upgrade programs allow our systems to follow technology progress and adapt to airport expansion and changes in regulations during their lifetime.

Aviation Web Server

Within the same airport, or on the other continent, the IMS4 AWOS provides users with the powerful and efficient web interface. All the user needs in order to view the AWOS data is a standard web browser and Internet connection.

Measurement

The system can interface numerous types of loggers and sensors. It is designed to measure, calculate and process different meteorological quantities as temperature (dry, surface, soil, soil under vegetation), wind speed and direction, pressure (station, QNH, QFE, QFF), relative humidity, precipitation (indicator and amount), runway surface temperature, freezing temperature for different de-icing materials, runway condition (dry/damp/wet/ice, etc.), visibility and RVR, cloud height, sunshine duration, solar and gamma radiation, evaporation, O3 concentration and is open adjust for measuring and processing of other quantities, if needed.

The measurement module offers:

- Interfaces to the various sensors and data loggers: RS-232 / RS-422 / RS-485, TCP/IP (http, ftp and telnet protocols)
- Data collection based on TCP / IP network and / or RS lines, radio, USB
- Numerous input data formats supported (raw text/ binary, XML)
- Quality control, verification of measured data, format validation

Reporting

The IMS4 sends and receives and presents the data on the Internet / Intranet data in the form of meteorological messages via the GTS and/or AFTN network. The system supports creation of standard WMO codes SYNOP, METAR, SPECI, CLIMAT and it is open for other national messages.

- Data processing based on XML and JEP technologies
- Data archiving based on XML2SQL bridge
- Data 2D presentation and manipulation
- Data distribution within GTS, AFTN, AMHS network
- Distributed programming based on Java Web Services
- Automatic / manual creating of standard SYNOP, METAR, SPECI, MET REPORT, SPECIAL, TREND, CLIMAT, SIGMET, TAF, AIRMET, GAMET messages and national code forms with data verification
- Meteorological charts and radar pictures processing, display and printing (T4, BUFR, GRIB)
- Data export to various formats (ASCII, XML, log files, Microsoft® Office formats)

Alarms

IMS4 AWOS allows to configure rich set of alarms including:

- Diagnostics of data logger and sensor errors
- Quality control of measured data (limits, internal consistency)
- Operational alarms (user-defined thresholds and limits)
- Communication errors

Configuration

The user-friendly interface enables configuring the AWOS software to meet the requirements of many different applications, ranging from small airports to CAT III airports with dozens of sensors and communication lines.

- Customization based on XML configuration files
- Station metadata
- Data logger and sensor parameters
- Input / output telegram formats
- Communication line setup

Components

The typical set of IMS4 AWOS field sensors consists of:

- Wind speed and direction sensors
- Pressure sensors
- Temperature and humidity sensors
- Cloud height sensors
- Weather station (AWS 111) with rain gauge, global radiation, ground temperature and other sensors
- Visibility and present weather sensor
- Thunderstorm / lightning sensor
- Runway surface condition sensors

In addition to the standard set of sensors used in the system, any sensor can be interfaced either by the weather station or by the Central System. Communication with the sensor is implemented using copper wire, fibre optic or radiomodems.

Central System

The reliability is essential for the airport weather observing system. In addition to redundancy within a computer (mirrored disks, duplicated power supplies, network card), the IMS4 AWOS includes Central System - dual hot-fail over system designed for airports where uninterrupted operation and hot backup are demanded.

The Central System is used as a central node for all communication networks and interconnects field sensors, displays and individual IMS4-based stations installed on the airport, thus enabling to backup these networks. The Central System makes all preprocessed data available to IMS4 Workstations and remote displays, thick or thin clients.

Observer´s Workstation

Observer's Workstation supports all processes related to collection of local meteorological data on an airport - especially creation and usage of the meteorological messages, namely of the SYNOP, METAR and SPECI - both in TAC form as well as TDCF (BUFR, CREX).

Forecasting Workstation

Forecasting Workstation supports all processes related to making forecasts based on local meteorological data. It mainly supports creation and utilization of meteorological messages as TAF, LONG TAF, WARNING, SIGMET, NOTAM, GAMET, regional QNH and various forecasts for locations and routes. The Observer's and Forecasting Workstations backup their functionality. The system also allows to monitor and forecast conditions on runways.

Aviation Weather Display (LCD)

Aviation Weather Display serves for operators at tower, approach, operations and other places where real-time screen containing local measured data and selected information from national bulletins is necessary to be permanently displayed.

Briefing

Optional Briefing Workstation subsystem provides collection and print of flight documentation for pilots based on the local meteorological data and messages received from the GTS, AFTN, AMHS, SADIS, WAFC FTP backup:

- OPMET text data as the METAR, SPECI, TAF, LONG TAF, WARNING, SIGMET, AIRMET and various forecasts for locations and routes
- SYNOP messages, NOTAM messages
- Wind, temperature, humidity, pressure etc. charts from GRIBs
- Significant weather charts (medium and high levels) from BUFRs
- Binary messages as the PNG or T4 charts, radar BUFR94 pictures and NOAA satellite pictures
- Current weather, locally measured and observed

The user can easily collect and print all necessary flight documentation containing the local conditions, conditions at the target and along the flight route. Having once defined a route in the system, the IMS4 Briefing can master this task only in a few seconds. The IMS4 Briefing handles automatically validity of all data.

IWXXM Support

In order to enable the operational exchanges of meteorological information using the latest ICAO defined standards and methods, the IWXXM module provides the functionality covering all aspects of the IWXXM data processing:

- code validation
- bi-directional conversion between IWXXM and traditional TAC form
- METAR/SPECI,
- TAF, Long TAF
- SIGMET,
- AIRMET,
- Tropical Cyclone Advisory
- Volcanic Ash Advisory
- etc.
- composition of the message bulletins
- data exchange via AMHS and other exchange network

Graphic Presentation Display

Graphic Presentation Display is designed to present userconfigured sequences of images received in form of binary messages from the GTS network or systems like the SADIS or METPRO.

1. Runway selector
2. Menu button
3. Wind display
4. Wind values
5. Runway
6. The selected averaging mode
7. Temperature of air
8. Dew point temperature
9. Atmospheric pressure “reduced” to mean sea level
10. The pressure corrected to the official airfield elevation
11. Runway visual range
12. Lowest cloud base level
13. Crosswind

The most complete configuration for aviation display for ATC TWR

Maintenance Workstation

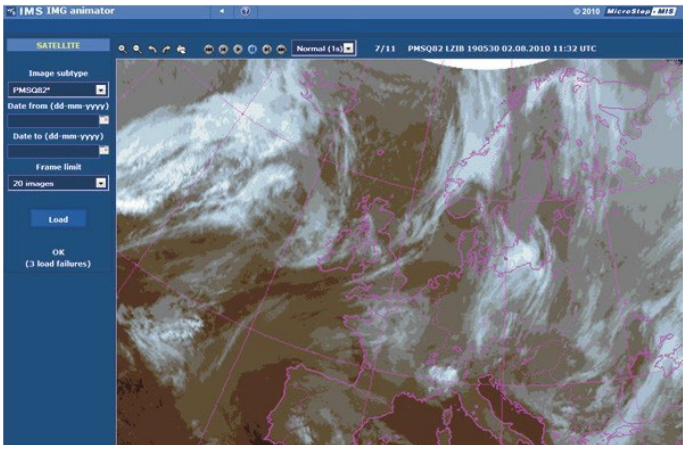
Maintenance terminal is designed to control network of automatic stations and IMS4 workstations. It provides monitoring of operation, upgrading and other support for the installed systems.

Remote Maintenance

All AWOS systems have full remote maintenance capabilities including download of measured data, maintenance of the sensors and data loggers and software upgrade.

Easy-to-use

Graphic user interface is based on web applications. Thus it is easy to use for any user familiar with Internet.



Compliance with standards

- CAA Certified (Type approval, applicable standard)
- ICAO Annex 3 and 10 for Data Processing and Reporting Practices
- ICAO Annex 14 Aerodrome Design and Operations
- ICAO Doc 8896 for Aeronautical Meteorological Practices
- ICAO Doc 9328 for RVR Observing and Reporting Practices
- WMO No 306, Manual on codes
- WMO No 386, Manual on GTS
- ISO 9001: 2015 for quality assurance