AVIATION WEATHER

30 YEARS
OF EXPERIENCE

AUTOMATED WEATHER OBSERVATION SYSTEM

ATIS/VOLMET

Datalink

VHF Transmitter

Central System

Forecasting Workstation

Meteo Observer's Workstation

Maintenance Workstation

Runway State
Sensors

Media
Converter

All sensors'
Data to Media
Converter

Aviation Weather
Displays

Radar Wind
Profiler

◄ ► Air Traffic Navigation Systems
◄ Low Level Windshear Alert System
◄ Upper Air Sounding Systems
◄ Satellite receiver
◄ Lightning system
► NWP model
► GTS
◄ ► AFTN/AMHS

EXPERTS IN AVIATION METEOROLOGY

Aviation weather solutions constitute the majority and the most remarkable part of MicroStep-MIS product portfolio. The company has officialy been certified as an air navigation service provider by Civil Aviation Authority of the Slovak Republic (accredited by the European Aviation Safety Agency).

The company's aviation systems are suitable for civil regional, national, international airports scalable up to ICAO CAT III category, as well as military airports and NATO airbases. The systems are ICAO and WMO compliant and adaptive to various climatic conditions and local practices of each region.

IMS4 integrated monitoring system is a complex multipurpose software that has been in development since 1993. The system is designed for nonstop unattended operation and it has already been installed in various countries all over the world.

High level of customization allows each of our systems to adapt to the individual requirements and needs of each client. Due to the constant development of standards and technological progress the upgrades and system actualization form an integral part of MicroStep-MIS activities.

CONTENTS

HIGH LEVEL OF CUSTOMIZATION

Individual approach allows us to adapt the system and its components to the individual requirements and needs of the client.

200 mil+
served passengers annually

350+
aviation systems since 1995

30
supplied countries worldwide

FIELD MEASUREMENT SYSTEM

MicroStep-MIS aviation weather systems are designed to interface various types of sensors and data loggers. In-house development and production of hardware components as well as long lasting relationships with our suppliers allow us to deliver tailored solutions to our clients.

Top class among barometers

Digital Barometer MSB780 is designed for use in professional meteorological and aviation applications that require reliable and highly accurate measurement, fast dynamic response and advanced long-term stability. The barometer is built to withstand the most challenging environmental conditions, which are often faced in various environmental monitoring applications.

It is a low power consumption microprocessor controlled sensor suitable also for solar and battery powered applications. The sensor is operable in temperature range from -50 °C to +80 °C. The excitation range is from 5 to 35 V DC. This robust product is made of durable hardware components enclosed in heavy-duty metal IP 66 enclosure. It comes factory calibrated with a manufacturer calibration certificate.
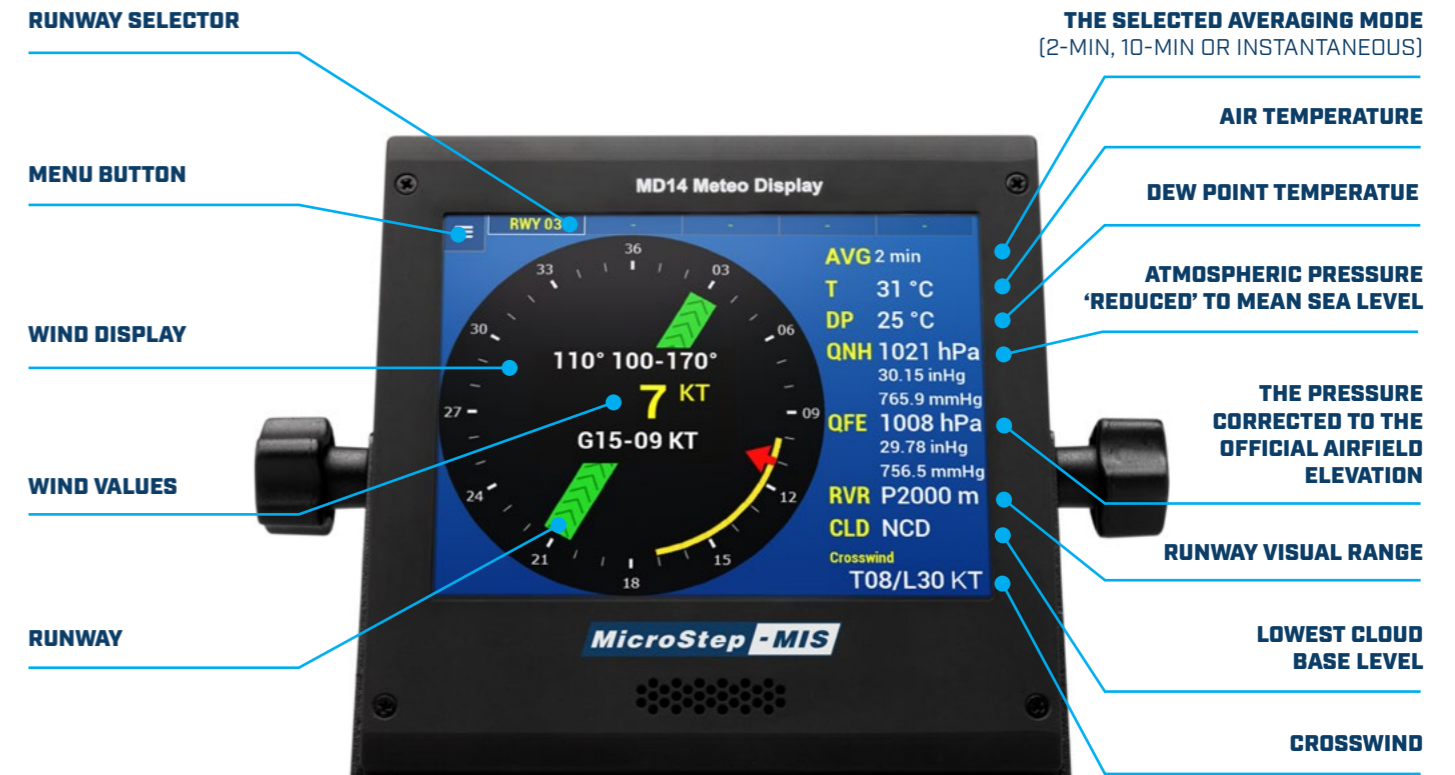
Universal meteorological display

MD14 is a universal display for professional meteorology use designed for airports and industry as well as for meteorological stations as a lightweight replacement of the observer's screen or redundant backup to it.

The LCD display MD14 presents real time meteorological data as well as data calculated according to WMO and ICAO standards and recommendations. It supports configuration of up to 5 information tabs – typically used for 4 runways and a meteorological garden. MD14 comes preconfigured to one of the standard configurations; however, additional configurations can be ordered as per client's requirements.

Meteorological mast for wind measurement | *installed in Jakarta as a part of IMS4 Low Level Windshear Alert System*

AIR TEMPERATURE AND RELATIVE HUMIDITY

ATMOSPHERIC PRESSURE

DATA LOGGER

LIGHTNING DETECTION

CAMERA

X-BAND WEATHER RADAR

LIDAR

WIND SPEED AND DIRECTION

VISIBILITY AND PRESENT WEATHER

CLOUD COVERAGE

PRECIPITATION

SOLAR RADIATION

RUNWAY SURFACE CONDITION

METEOROLOGICAL DISPLAY

RUNWAY SELECTOR

MENU BUTTON

WIND DISPLAY

WIND VALUES

RUNWAY

THE SELECTED AVERAGING MODE (2-MIN, 10-MIN OR INSTANTANEOUS)

AIR TEMPERATURE

DEW POINT TEMPERATUE

ATMOSPHERIC PRESSURE 'REDUCED' TO MEAN SEA LEVEL

THE PRESSURE CORRECTED TO THE OFFICIAL AIRFIELD ELEVATION

RUNWAY VISUAL RANGE

LOWEST CLOUD BASE LEVEL

CROSSWIND

Universal Meteorological Display MD14 | *The most complete configuration of aviation display for ATC TWR*

IMS4 AUTOMATED WEATHER OBSERVATION SYSTEM

IMS4 Automated Weather Observation System is an airport weather observation system for regional, national and international airports. The IMS4 AWOS measures, processes, stores, presents and communicates all meteorological data at the airport.

The system integrates and provides 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 Windshear 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, SYNOP reports as well as national codes if required.

The system can interface numerous types of data loggers and sensors. It is designed to measure, calculate and process different meteorological quantities such 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 deicing materials, runway condition (dry / damp / wet / ice, etc.), visibility and RVR, cloud height, sunshine duration, solar and gamma radiation, evaporation, O3 concentration and it is open for adjustments and addition of any other quantities if needed.

The Central System is used as a central node for all communication networks and interconnects field sensors, displays and individual 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.

THE COMPLETE HARDWARE AND SOFTWARE SOLUTION
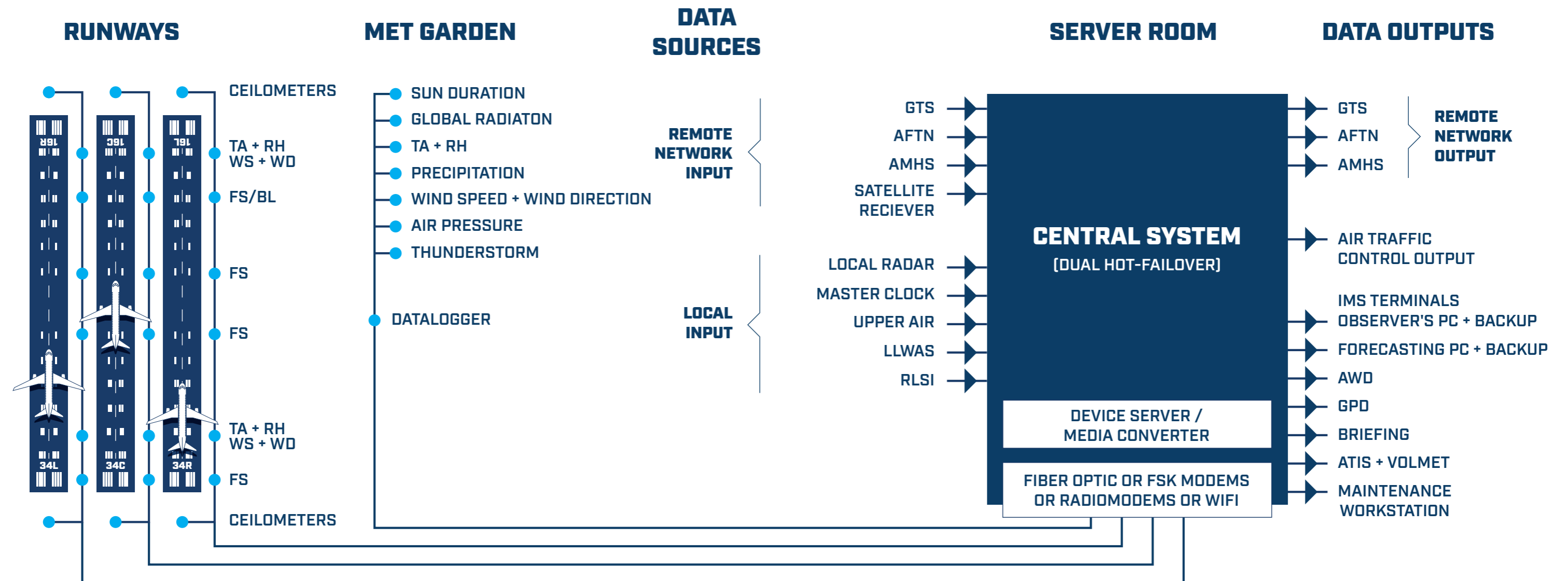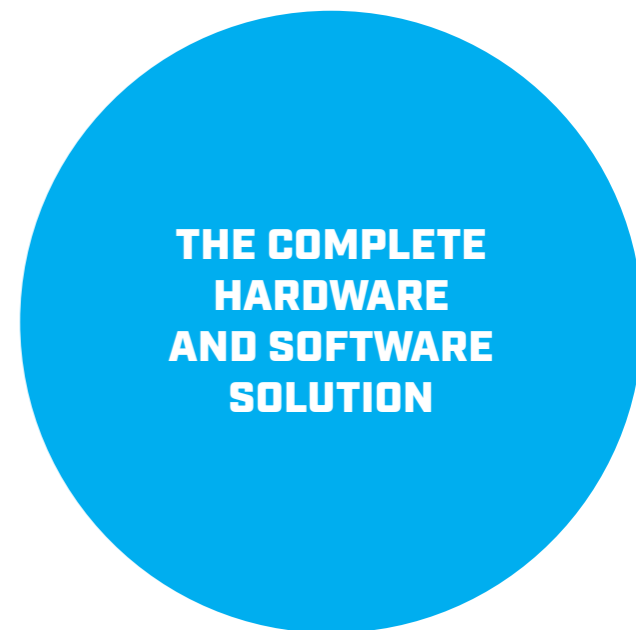
IMS4 AWOS scheme example for CAT II or CAT III airport

*MicroStep-MIS' **IMS4 AWOS** has been installed at Oecusse International Airport of East Timor*

FROM SMALL REGIONAL AIRPORTS OR HELIPORTS SCALABLE UP TO ICAO CAT III MULTIRUNWAY OR MULTI-AIRPORT SYSTEMS

***12 airports of Chinese Yunan Airport Group** integrated into virtual multi-runway Automated Weather Observation System*

The configuration and structure of a respective AWOS system depends on size and category of the individual airport. The modular architecture allows expansion from single Aviation Weather Display with basic set of sensors up to comprehensive system for multirunway airport connected to GTS and AFTN networks including a dual hot fail-over Central System, several Observer's Workstations, displays, 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 its lifetime. The IMS4 application software is capable to build the virtual multirunway Automated Weather Observation System collecting real-time raw or processed AWOS data from several regional airports and presenting them to the operators in the form of the virtual multirunway AWOS system with multiple runways.

Within the same airport, or on the other continent, 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.

***Example of multi-runway aviation weather display** designed and customized according to customer's requirements. Parameter tendencies are marked by colors - deterioration is marked by red and improvement by green color.*
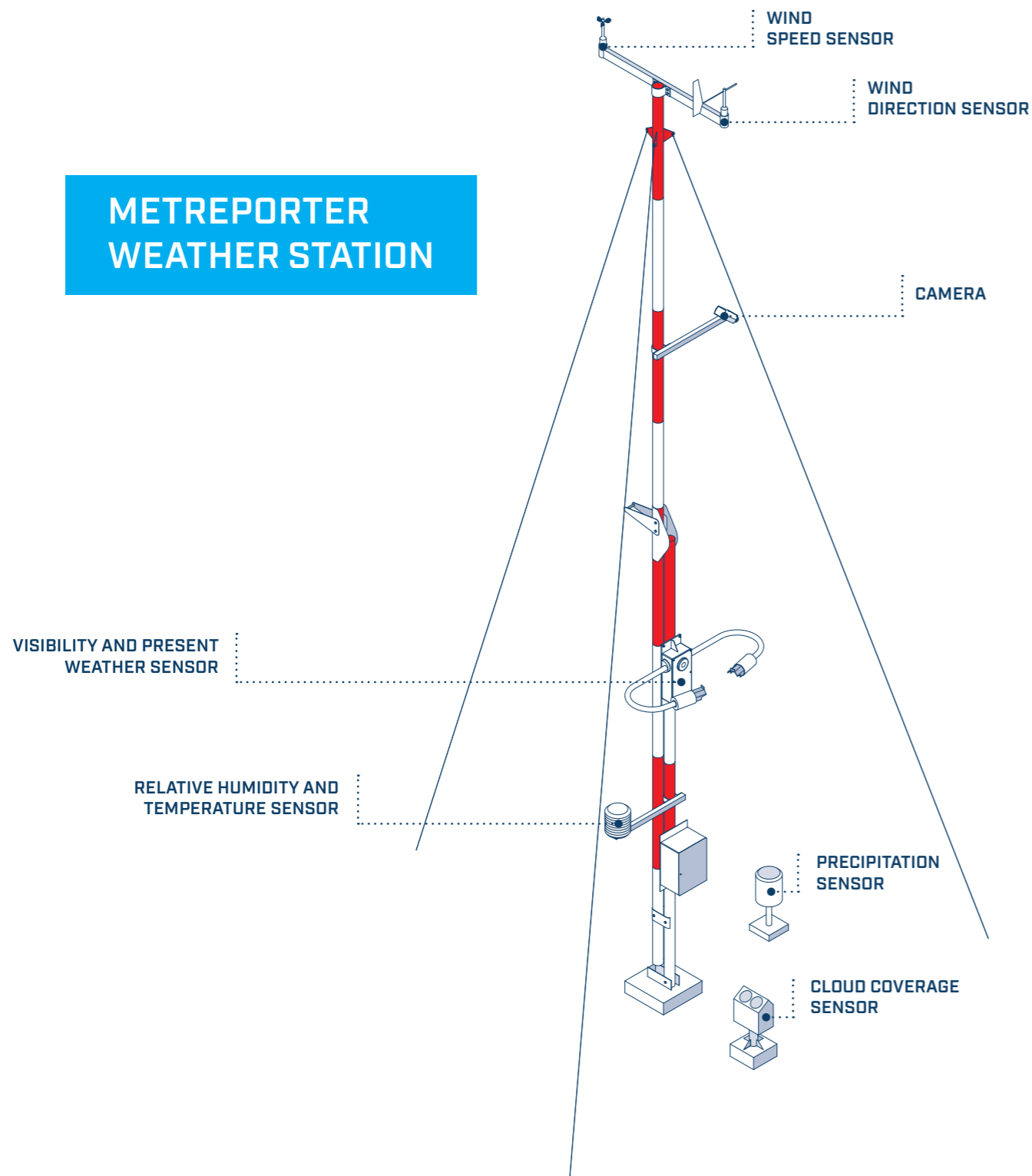
IMS4 METREPORTER

IMS4 MetReporter is built on a modular IMS4 AWOS platform and it is an autonomous, easy-to-deploy and maintain fully automated weather observation system for general aviation, non-ICAO airports and heliports.
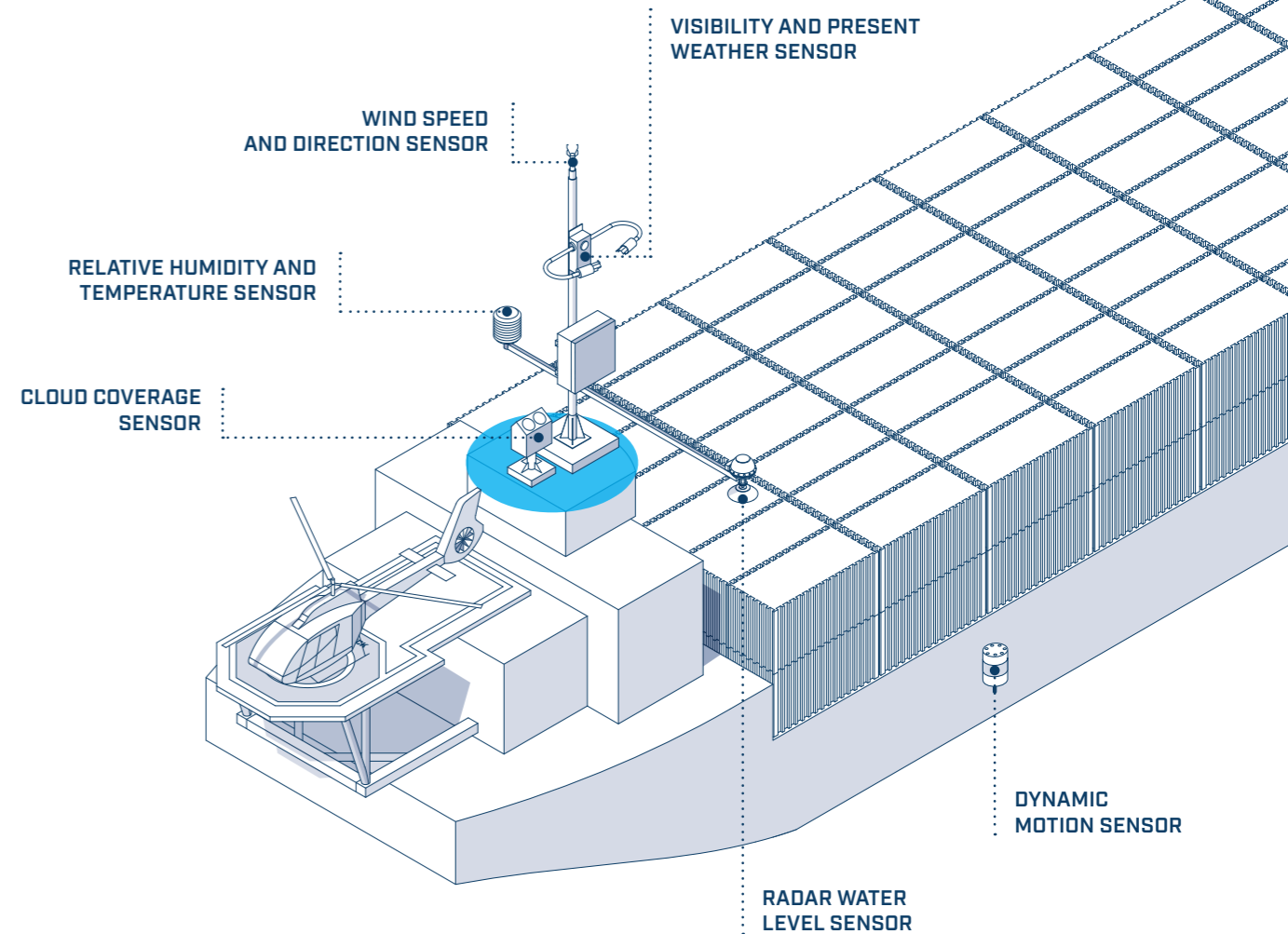
The system consists of:
- Embedded VHF Automated Terminal Information Service
- Embedded Automated Weather Observation Service

- Remote telemetry and control from local workstation over WiFi or GPRS VPN
- Optional computer based IMS4 Aviation Weather Display or full featured IMS4 Observer Workstation
- Optional data reporting to the upper system for flight planning (i.e. via cloud computing provider)
- Meets or exceeds applicable ICAO, WMO, EASA, CAAC regulations and recommendations

HELIDECK
WEATHER STATION

VISIBILITY AND PRESENT
WEATHER SENSOR

WIND SPEED
AND DIRECTION SENSOR

RELATIVE HUMIDITY AND
TEMPERATURE SENSOR

CLOUD COVERAGE
SENSOR

DYNAMIC
MOTION SENSOR

RADAR WATER
LEVEL SENSOR

WIND
SPEED SENSOR

WIND
DIRECTION SENSOR

METREPORTER
WEATHER STATION

CAMERA

VISIBILITY AND PRESENT
WEATHER SENSOR

RELATIVE HUMIDITY AND
TEMPERATURE SENSOR

PRECIPITATION
SENSOR

CLOUD COVERAGE
SENSOR

IMS4 HELIDECK

IMS4 Helideck Monitoring System is optimized to provide real-time weather conditions and monitoring of the helideck motion, thus ensuring the flight and passenger safety.

The monitored weather parameters include wind speed and direction, air and sea temperature, relative humidity, barometric pressure, visibility and present weather, cloud height and wave height. In addition, the IMS4 Helideck monitors the helideck's heave, heave velocity, roll, pitch and inclination in real-time. The automatically generated helideck reports can be disseminated through various communication channels or optionally broadcast to pilots via VHF transceiver.

IMS4 LOW LEVEL WIND SHEAR ALERT SYSTEM

IMS4 LLWAS is the top-quality, automatic and reliable product considerably approaching technology to mitigate the riskiness of crucial flight phases of take-off and landing. The system is used by controllers to warn pilots of existing or impending windshear conditions.

Network of wind stations installed and situated near and along the airport runways measures average surface wind speed and direction. The system collects the measurements, performs the validations and recalculations, runs the algorithm to detect wind shear, generates the alerts and distributes the data and alerts to displays and 3rd party systems. Selection of proper sites and optimization of the algorithm are crucial for the site surveying teams.

System integration with IMS4 AWOS system is available and possibly bringing even more comprehensive, relevant, and highly useful data to the airport teams allowing them to significantly decrease the risk of a sudden disaster.

Soekarno-Hatta International Airport, Jakarta | MicroStep-MIS IMS4 LLWAS assists the operations at 20th businest airport worldwide, serving more than 63 million passengers annually (2019).
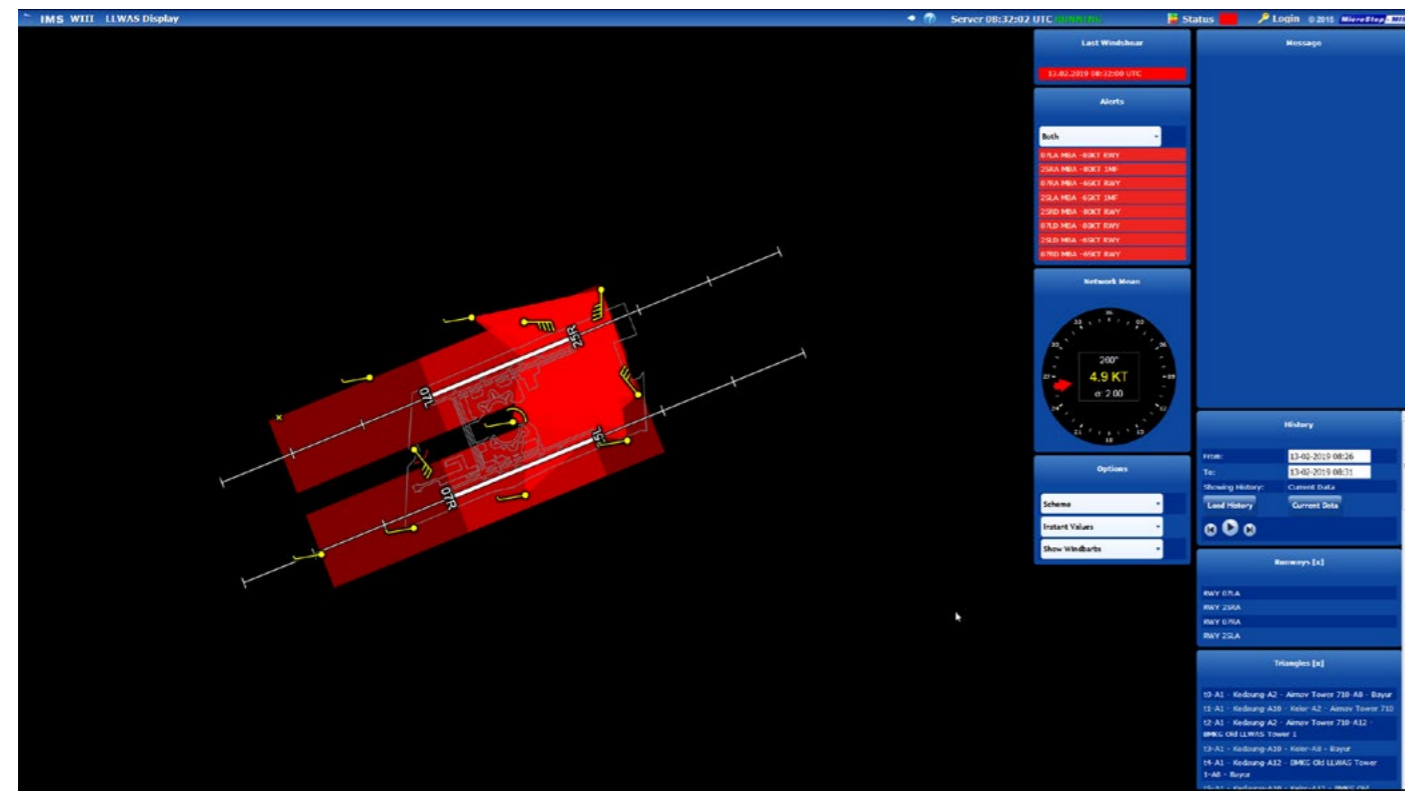
LLWAS Expert Display | *It contains schematic view of runways, wind shear alert system measuring sites in the surroundings and wind shear alerts. There are also computing triangles and detail messages that are inter-results of computing of wind shear alert system. It is intended for LLWAS experts to inspect the situation.*
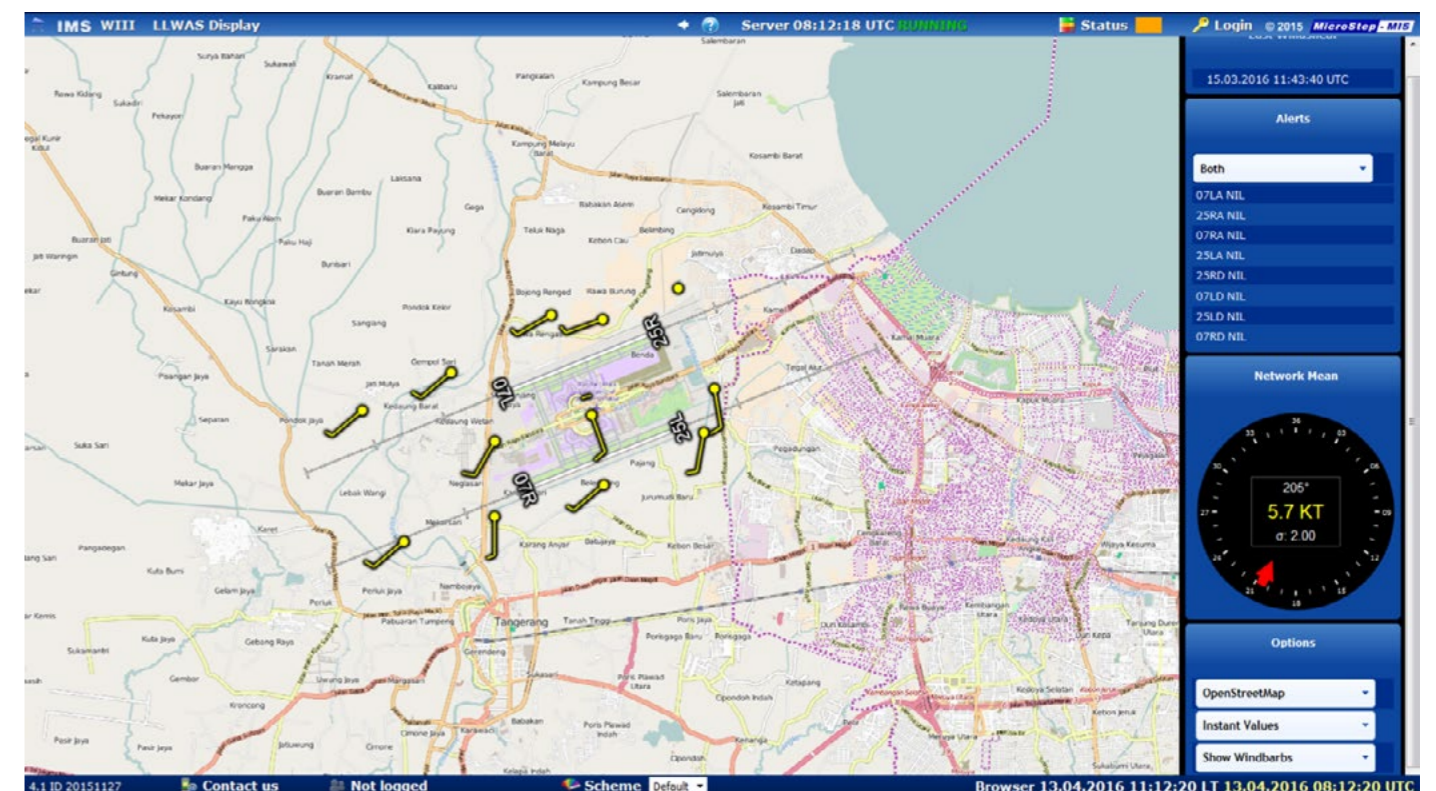
IMS4 LLWAS Total Screen | *Airport visualization - map, actual warnings, wind data (digits or wind barbs), active alerts marked on the map by red color.*

LIDAR FOR DETECTION OF LOW LEVEL WIND SHEAR

Detection of low level wind shear and timely automated warnings on it play a key role in the aviation safety, mostly in the phase of landing or take-off. Rapid advancement of new technologies based on lidars and / or small weather radars and their penetration into operational practice worldwide result in the fact that the detection of low level wind shear is being transformed into an integration and evaluation of multi-platform observations.

Besides the traditional technology of low level wind shear detection (based on synchronized wind observation by anemometers) MicroStep-MIS upgrades the alerting system by having a lidar-based technology integrated.

Within the research project A Novel Method for Low-level Wind Shear Alert Calculation from Data Measured by LIDAR (2016 – 2020) and with a financial support from

the Slovak Research and Development Agency, MicroStep-MIS purchased a lidar and installed it at Bratislava airport.

The target destination, M. R. Štefánik Airport in Bratislava, had been selected mostly on the basis of being the largest and the busiest one among the airports in Slovakia, and as well due to the orography and the climatological settings of the target area forming adequate circumstances for a (frequent) birth of hazardous meteorological phenomena such as wind shear.

The aim of the research project is to collect and analyze large number of synoptic situations with wind shear, and to develop our own, automatic, lidar-based low level wind shear alert system.

THE 1ST LIDAR IN CENTRAL EUROPE

~3 nm

~1000 ft

AEROSOLS

MOVEMENT OF AEROSOLS BY WIND

PPI 3°

LASER PULSE REFLECTED FROM AEROSOLS

EMITTED LASER PULSE

RUNWAY SURFACE
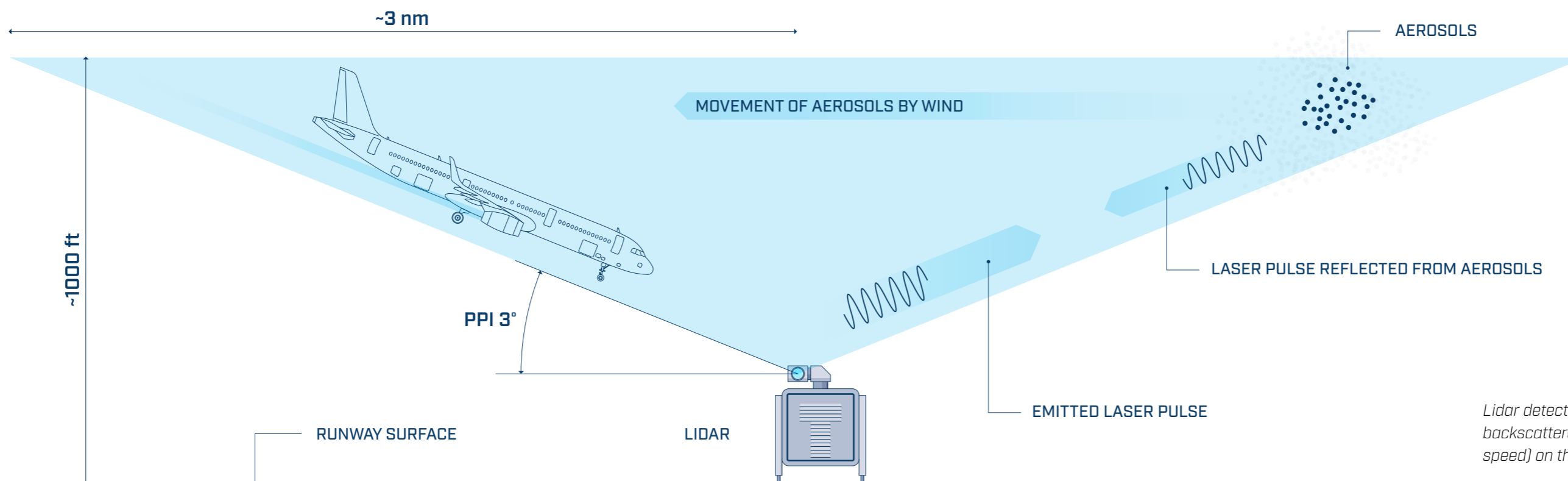
LIDAR

Lidar detects the frequency change of the backscattered pulse (hence, the radial wind speed) on the basis of the Doppler effect

IMS4 AIRPORT RUNWAY WEATHER INFORMATION SYSTEM

Using the real-time collected measurements from the field sensors as well as the data from the integrated model, the IMS4 ARWIS provides the airport authorities with the essential runway surface condition data. Generated early warnings contribute to air traffic safety and assist the maintenance service with planning the runway maintenance activities.

The system interfaces numerous types of sensors and data loggers. The active / passive intrusive runway surface and subsurface sensors or non-intrusive optical sensors provide runway and subsurface temperature, freezing point, water film thickness and runway condition (dry, damp, wet, snow, ice, etc.).

The optional Atomatic Weather Stations measure atmospheric pressure, wind speed and direction, temperature / dew point, present weather, precipitation, snow depth and the system is open for measurement and processing of the other quantities.

READY FOR NEW GLOBAL REPORTING FORMAT

Airport Runway Condition Display

RECENT IMPROVEMENTS

Being involved in the SESAR research projects, MicroStep-MIS has significantly improved and upgraded the IMS4 ARWIS within the Solution PJ03b-06 - Safety support tools for runway excursions.

The system is now fully compliant with the new ICAO regulation introducing new Global Reporting Format (Annex 14 and Doc 9981), all applicable from November 2021.

AQUAPLANING ASSESSMENT AND NOWCASTING

The newly featured IMS4 ARWIS has recently been deployed and integrated at Malta Luqa Airport. Integration of aquaplaning into the system, compliant with current ICAO regulations (implementation of Runway Condition Report) and additional integration with radar-based nowcasting enable the system to provide and generate more precise RWY condition assessment.

Moreover, implementation of prediction model is beneficial in order to access better quality of consolidated data necessary for winter runway maintenance. Graphical user interface can be customized according to the particular requirements of the customer.

Meteorological radar

Aquaplaning / precipitation display shortly after the storm

Runway surface measurement sensor

Precipitation sensor

Laser precipitation monitor

Temperature and relative humidity sensor
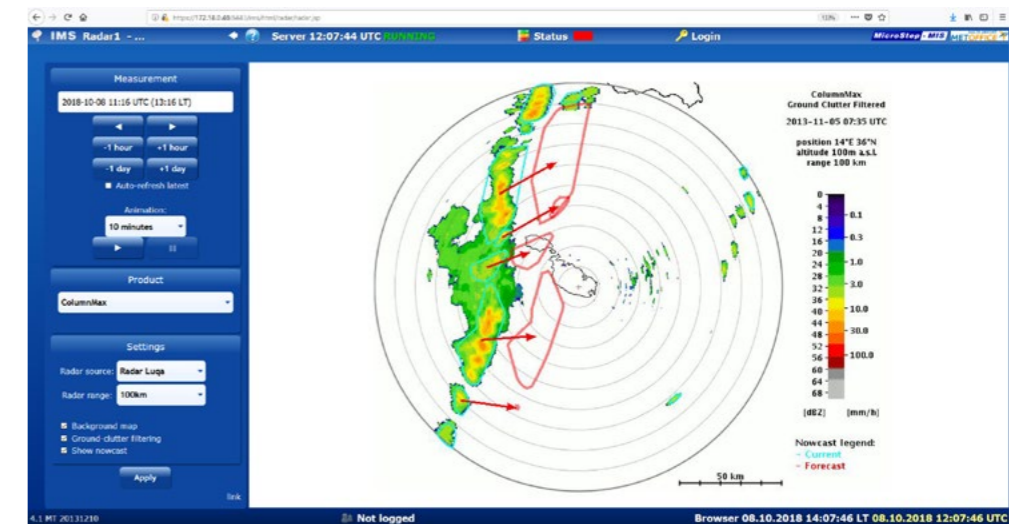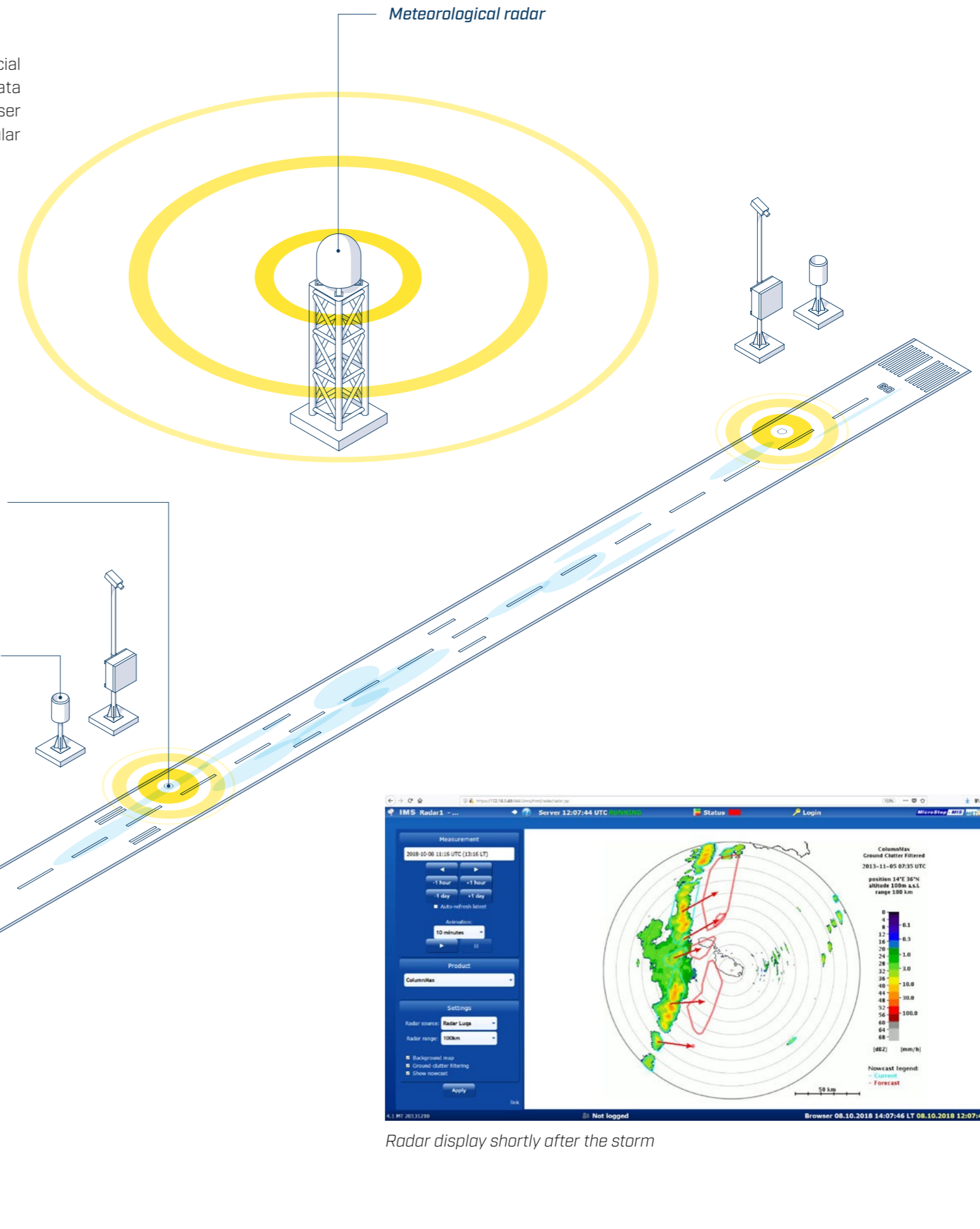
Radar display shortly after the storm

IMS4 ATIS / VOLMET

The IMS4 ATIS / VOLMET system benefiting from more than 27 years of MicroStep-MIS' experience in the field of meteorological service for civil aviation provides arrival, departure or combined ATIS and VOLMET broadcast and datalink services for airports from regional up to major international airports.

The system can be installed as a standalone or as an integrated part of the company's IMS4 AWOS with permanent access to the AWOS data.

The open architecture allows easy expansion from the basic single channel system (combined departure and arrival ATIS service) up to the multi-channel ATIS / VOLMET system (separate broadcasting channels for airport with multiple runways, multichannel service for group of airports etc.).

Variety of system options include but are not limited to:

- Multiple channels and / or multiple languages
- Dual hot-failover configuration and / or redundant transmitter equipment as a guaranty of the highest possible system reliability
- Remote operator and control positions for convenient authorized access to the system
- Telephone interface for the preview of current broadcasted reports
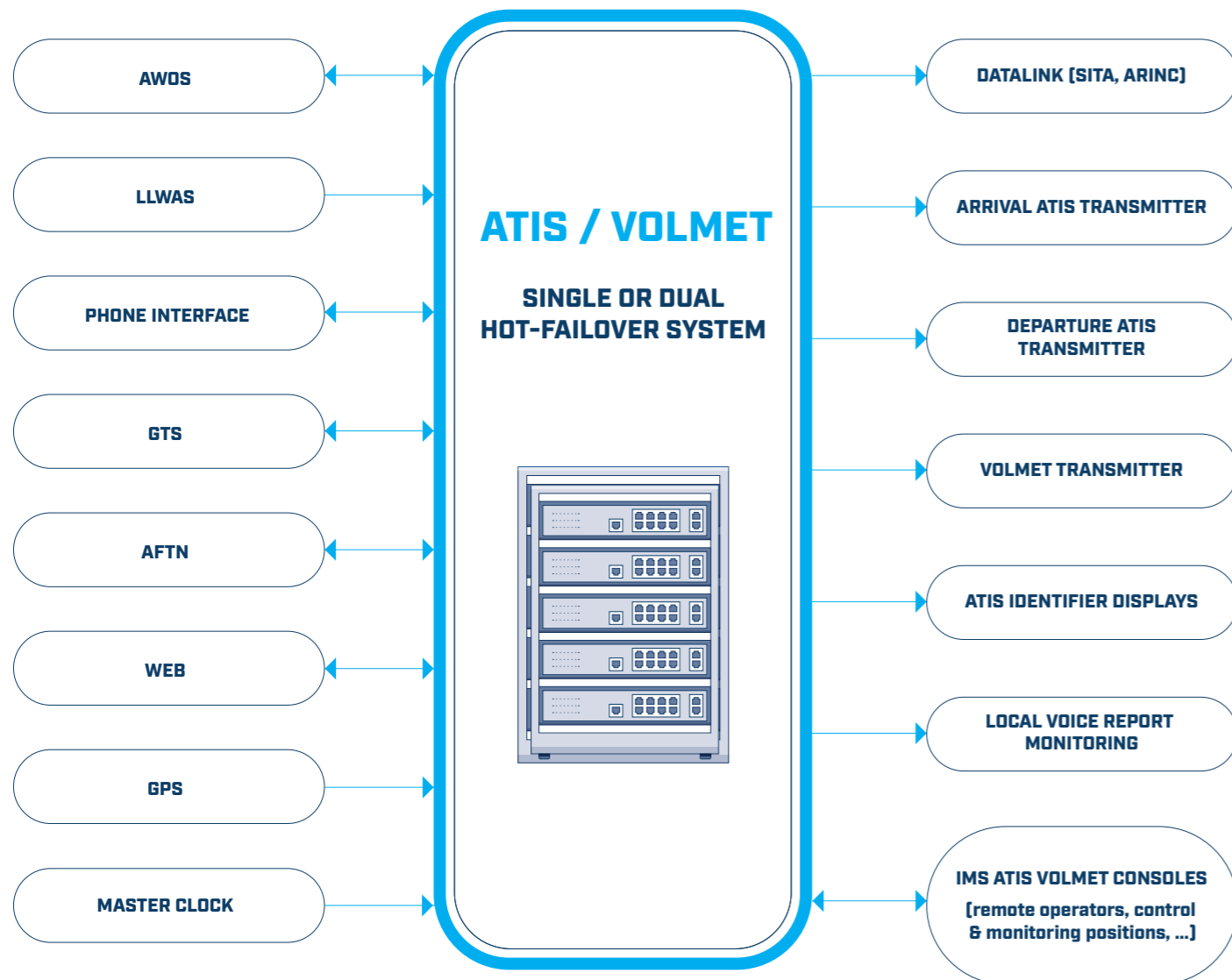
The semi automated or manual mode can be also configured for specific channels, if required, with visual and audible warnings announcing new data availability and new report compilation.

Diagram

Inputs:
- AWOS
- LLWAS
- PHONE INTERFACE
- GTS
- AFTN
- WEB
- GPS
- MASTER CLOCK

ATIS / VOLMET
SINGLE OR DUAL HOT-FAILOVER SYSTEM

Outputs:
- DATALINK (SITA, ARINC)
- ARRIVAL ATIS TRANSMITTER
- DEPARTURE ATIS TRANSMITTER
- VOLMET TRANSMITTER
- ATIS IDENTIFIER DISPLAYS
- LOCAL VOICE REPORT MONITORING
- IMS ATIS VOLMET CONSOLES (remote operators, control & monitoring positions, ...)

IMS4 PILOT BRIEFING

IMS4 Pilot Briefing supplies meteorological information to aviation users in order to ensure the safety and regularity of air navigation.

The workstation facilitates collecting and printing of flight documentation for pilots based on the local meteorological data and messages received from GTS or AFTN networks. The system integrates automatic handling of data validation. The users can easily collect and print all necessary flight documentation containing the local conditions, conditions at the destination and along the flight route. A single definition of the flight route into the system is sufficient for the system to master this task in a few seconds time.

The system also warns users about all received meteorological or operational warnings like volcanic ash or tropical cyclone advisories as well as other warnings and administrative messages.

IMS4 RUNWAY VISUAL RANGE SYSTEM

The IMS4 Runway Visual Range System performs the automated runway visual range assessment and reporting for the airports.

The typical set of IMS4 RVR field measurement system consists of forward scatter meters, background luminance sensors as well as interfaces to runway lights systems.

The data processing software enables any standard or non standard combination of sensor positions along the runways, hot backup of the sensor values and manual data entry. For each sensor type, the evaluation and visualization of the sensor status as well as remote maintenance are provided.

Besides collection of the visibility data from the field and calculation of runway visual range, the server distributes the data and alerts to displays as well as third parties.

Customizable displays report touchdown, midpoint and rollout RVR and / or MOR current values or trends, in accordance both with the ICAO regulations as well as respective ATC authority requirements. The built-in aviation web server provides the local airport controllers and remote users with the powerful and efficient web interface.

Forward Scatter Meter | VPF 700 series supplied by Biral

FOG MONITORING AND FORECASTING

Measuring stations are of a great importance. They are used in machine learning of data mining models, provide real-time data for operative modeling and instant data for decision-making.

In addition to the airport meteorological station, one or more local stations covering the area around airport can supplement the system in order to serve other additional purposes such as road service.

All the data are available frequently, every 2 minutes, excluding the camera data. Camera images provide additional visual information for users of sensor data. They have proven to be useful for the verification of visibility conditions.

The fog prediction is a product based on IMS4 Model Suite models and tools as follows:

· 3D regional weather prediction model
· 1D fog prediction model
· Data mining models
· Satellite images

IMS4 AIRPORT LIGHTNING ALERT SYSTEM

IMS4 Airport Lightning Alert System addresses the top severe weather threat of the airport operations. The system can operate independently or integrated within IMS4 Automated Weather Observation System.

The IMS4 Airport Lightning Alert System represents the combination of the standalone lightning detector and the lightning detection network data, thus benefiting from the both technologies. The system provides:

- detection of electrostatic field and / or charged precipitation providing an early warning even before the overhead clouds develop,
- detection of in-cloud and cloud-to-ground lightnings, storm cells identification and nowcasting.
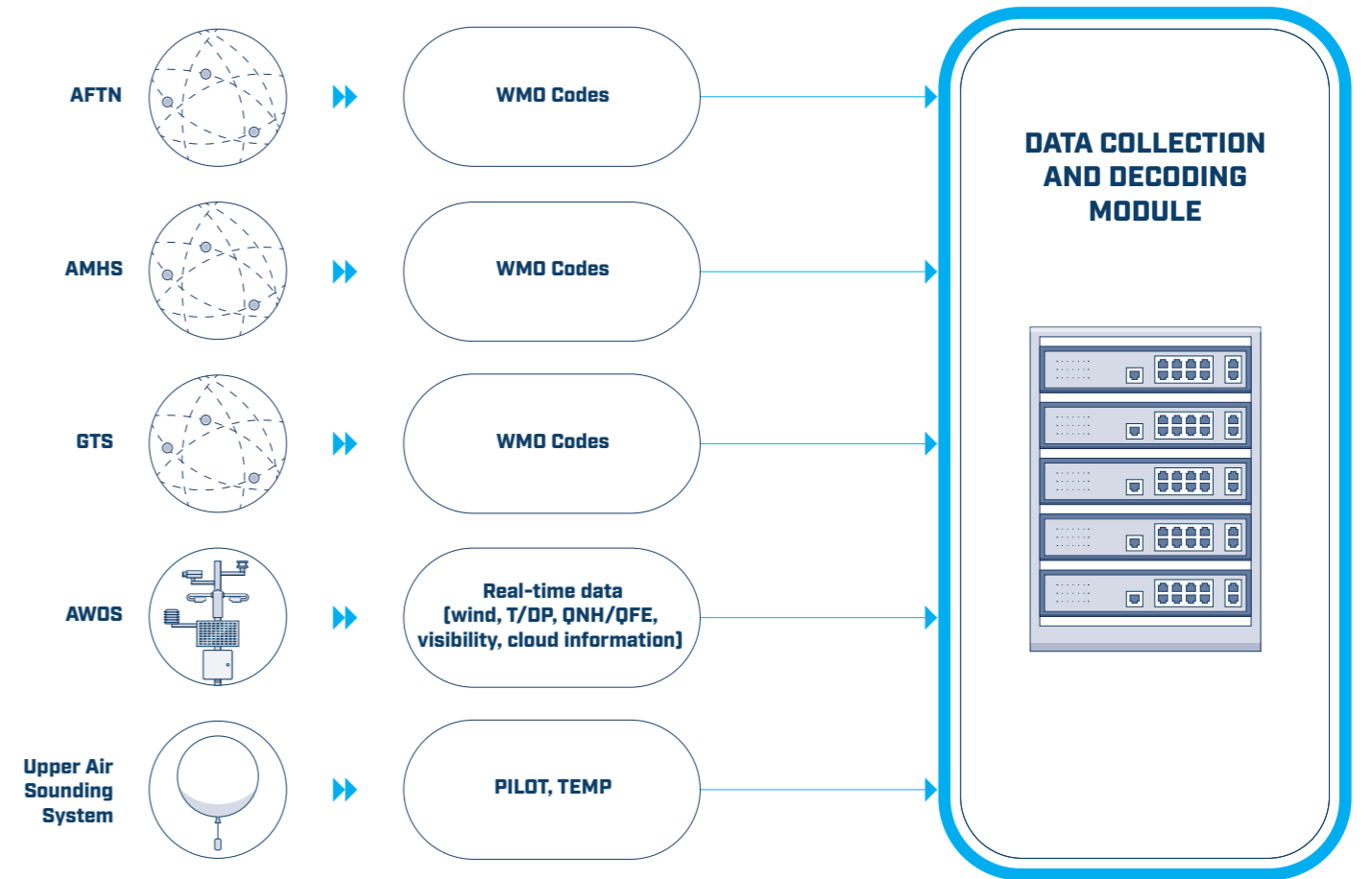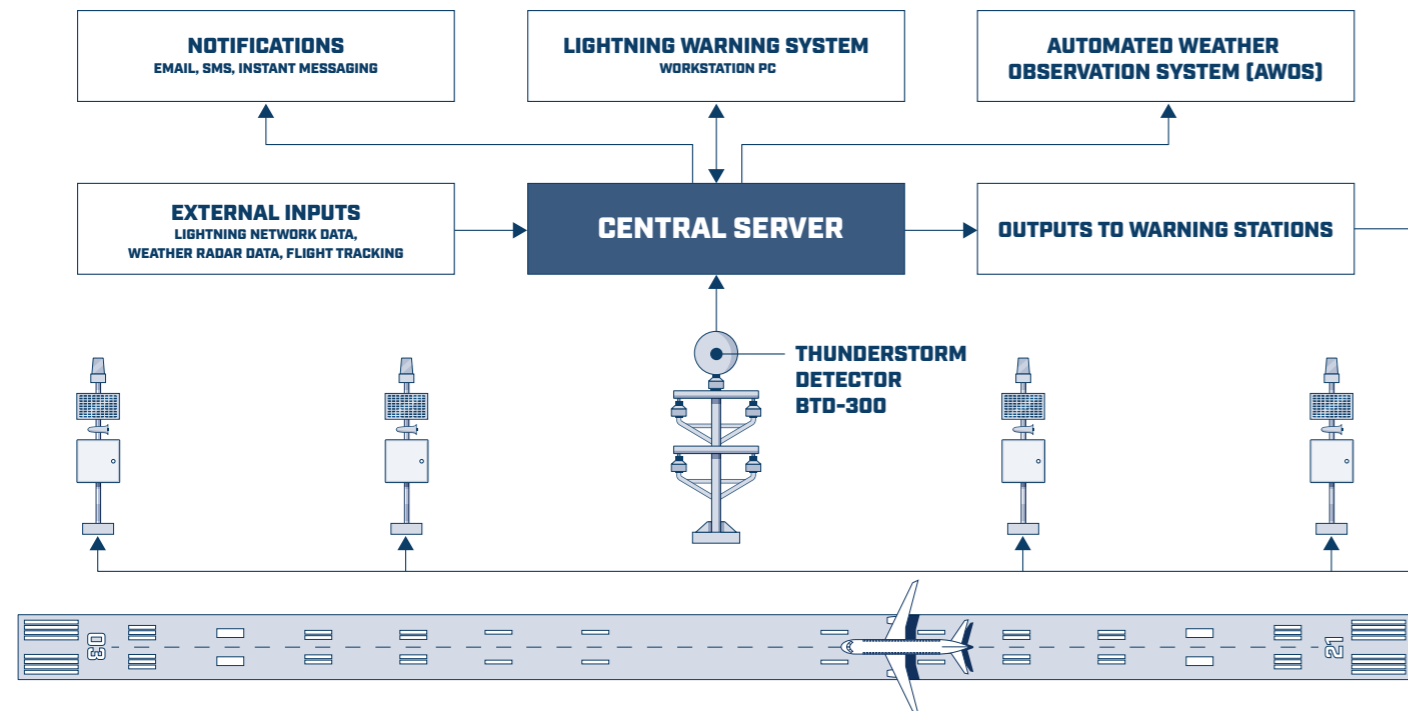
AERONAUTICAL CLIMATOLOGICAL DATABASE

Climatological Database (CLDB) is a database system addressing the needs of the metstore the high-volume long-term meteorological, climatological and environmental data.

The CLDB stores all collected data in one unified structure, thus avoiding data inconsistencies and discrepancies and enabling standard comfortable data access for all users and other software systems. No additional storage and no different and confusing data formats are needed. Within the Climatological Database the mentioned structure is based on SQL Database Server and the standard data access is based on SQL language.

CLDB is based on WMO recommended practices for climatological data processing (WMO Guide No. 100) and it follows the WMO suggestion of a RDBMS (Relation Database Management System) application with wide use in climatology (World Climate Program efforts concerning new Climate Data Management Systems - CDMSs).

The Aeronautical Climatological Database (Aero CLDB) is a CLDB variant fully compliant with the ICAO / WMO requirements related to the preparation of the Aerodrome Climatological Summaries.

In addition, the database is an ideal tool for the advanced statistical data post processing and with the incorporated sophisticated quality control modules it is ready to serve for the evaluation of the quality of service indicators for the particular MET service provider.

Having been integrated into the IMS4 Aviation Weather Decision Support System, the Aero CLDB serves as the data source for the data mining models (fog detection and forecasting, cloud coverage, etc.).

IMS4 AVIATION WEATHER DECISION SUPPORT SYSTEM

IMS4 AWDSS integrates all existing weather information in order to generate a collaborative, net-centric and combined picture incorporating seamlessly all aviation relevant weather sources.

In order to provide the air traffic controllers and meteorologists with the accurate operational information the IMS4 AWDSS processes the real-time data from various sources: local AWOS, ARWIS and LLWAS systems, weather radars, surface observations from the WMO / ICAO exchange networks, meteorological satellites, profilers, etc.

The collaborative, net-centric and combined picture incorporating seamlessly all aviation relevant weather sources, enables various users at the airport to have access to all essential information needed for tactical decision support during the flight phases: take off, departure, metering / descent, final approach and landing.

Having employed the state-of-the-art algorithms and forecast models, the system evaluates the general situation, area, airport specific and runway oriented alerts, using the color status signalization to visualize the hazards, if any.

The current as well as anticipated operational situation may be characterized by the alerts of the hazardous phenomena, current / anticipated airport / runway operational category, NATO color code or in the other way compliant with the operational procedures of the particular airport.

RUNWAY SELECTION

FORECAST TIME HORIZON SELECTION

ATCO OR CONCERNED STAKEHOLDER SELECTION

MAIN TABLE WITH EVALUATED FORECAST AGAINST AIRPORT SPECIFIC CONFIGURABLE THRESHOLDS

IMS ZZ   AAWDSS   Server 11:18:52 UTC RUNNING   Status   Logout

3 selected of 4

ATCO relevant phenomena | AO/GH relevant phenomena

Current operations | Short term plan | Long term plan

SHORT TERM PLAN

UTC	13.2 12:00	13.2 13:00	13.2 14:00	13.2 15:00	13.2 16:00	13.2 17:00	13.2 18:00	13.2 19:00	13.2 20:00	13.2 21:00	13.2 22:00	13.2 23:00	14.2 00:00	14.2 01:00	14.2 02:00	14.2 03:00	14.2 04:00	14.2 05:00	14.2 06:00	14.2 07:00	14.2 08:00
Wind shear																					
Volcanic ash																					
CB/TS			TEMPO CB																	TEMPO C / TEMPO TS	
Turbulence																					
Temperature [°C]	5.0	5.8	6.4	5.8	5.2	4.8	4.5	4.1	3.7	3.2	2.7	2.3		2.2		2.3	2.5	2.6		2.9	4.3
Dew point [°C]	3.4	3.3	2.9	2.4	2.1	1.8	1.4	0.9	0.7	0.5	0.2		-0.0			0.1	0.3	0.4	0.5	0.8	1.7
Snow			TEMPO +SHSN																		
VFR	VFR	VFR TEMPO ZVFR			VFR						VFR BECMG IFR		IFR						IFR BECMG VFR	VFR TEMPO ZV	
Prevailing Visibility [m]	10000	10000 TEMPO 2400			10000						10000 BECMG 100		100						100 BECMG 8000	8000 TEMPO 40	
Base BKN, OVC [ft]	5000	5000 TEMPO 1500			5000																
Tail wind RWY 31 [kt]								10.0 (34.5) TEMPO 14.8 (34.5)	10.0					1.0							
Cross wind RWY 31 [kt]	1.1R		0.5R		0.7R		1.4R		1.1R		2.0R		1.7R	1.6R	0.3R						
LVP RWY 31		No LVP								No LVP BECMG Operation Phase		Operation Phase			CLOSED BECMG No LVP		No LVP				
RVR RWY 31 [m]		2000								2000 BECMG 350		350		250	175 BECMG 2000		2000				
Cloud Base RWY 31 [ft]	4000	4000 TEMPO 1500			4000					BECMG 100 (VV) 4000		100 (VV)					100 (VV) TEMPO 53				
Tail wind RWY 22 [kt]	0.0 (0.0)	0.0 (0.0) TEMPO 4.3 (0.0)			0.0 (0.0)			0.0 (6.1) TEMPO 2.6 (6.1)			0.0			1.8	1.7	1.3	0.8	1.2		2.7	
Cross wind RWY 22 [kt]	9.0L		8.6L	8.1L		7.0L		7.1L	10.0R TEMPO 14.8R (34.5R)		10.0R				1.0R						
LVP RWY 22		No LVP								No LVP BECMG Operation Phase		Operation Phase			CLOSED BECMG No LVP		No LVP				
RVR RWY 22 [m]		2000								2000 BECMG 350		350		250	175 BECMG 2000		2000				
Cloud Base RWY 22 [ft]	4000	4000 TEMPO 1500			4000					BECMG 100 (VV) 4000		100 (VV)					100 (VV) TEMPO 53				
Tail wind RWY 04 [kt]	1.1		0.5		0.7		1.4		1.1		2.0		1.7	1.6	0.3			0.0			

4.1 MIS 20170321   Contact us   admin   Scheme Black   Browser 13.02.2019 12:19:18 LT 13.02.

ATC Forecast Screen | The screen layout can be customized as per particular ATC / CAA requirements. Different levels of MET-based alerts are recognized according to intensity / impact on airport operations.

SESAR | FROM RESEARCH TO INNOVATIONS

As the technological pillar of Europe's ambitious Single European Sky initiative, SESAR is the mechanism which coordinates and concentrates all EU research and development activities with the objective to develop the new generation of Air Traffic Management.

Today, SESAR unites around 3 000 experts in Europe and beyond. MicroStep-MIS brings the expertise and experience as a linked third party to Polish ANS provider PANSA in fields of scientific research and concept developments. PANSA is a member of B4 Consortium representing medium and small-sized European Air Navigation Service Providers from Poland, Czech Republic, Slovak Republic, and Lithuania.

MicroStep-MIS participated in the program SESAR2020 Wave 1 on four industrial research projects. In particular we focused on providing safety support tools for runway excursions, enhanced collaborative airport performance management, advanced automated aviation meteorology systems, and tools for managing and sharing trajectory data.

At the end of 2019 MicroStep-MIS together with PANSA and WARSAW University launched the preparation for a second wave of this prestigious program. The Wave2 projects build on the completed first phase of the program and their aim is further enhancement and increase of maturity level of the ATM Solutions. MicroStep-MIS is participating on two projects.

1 Solution PJ.02-W2-25 Safety support tools for avoiding runway excursions

Runway excursions represent one of the most frequent accident category for worldwide accidents. Safety support tools for avoiding runway excursions aim at detecting, preventing, and alerting risks of runway excursions by synchronizing air-ground information exchange about runway surface condition.
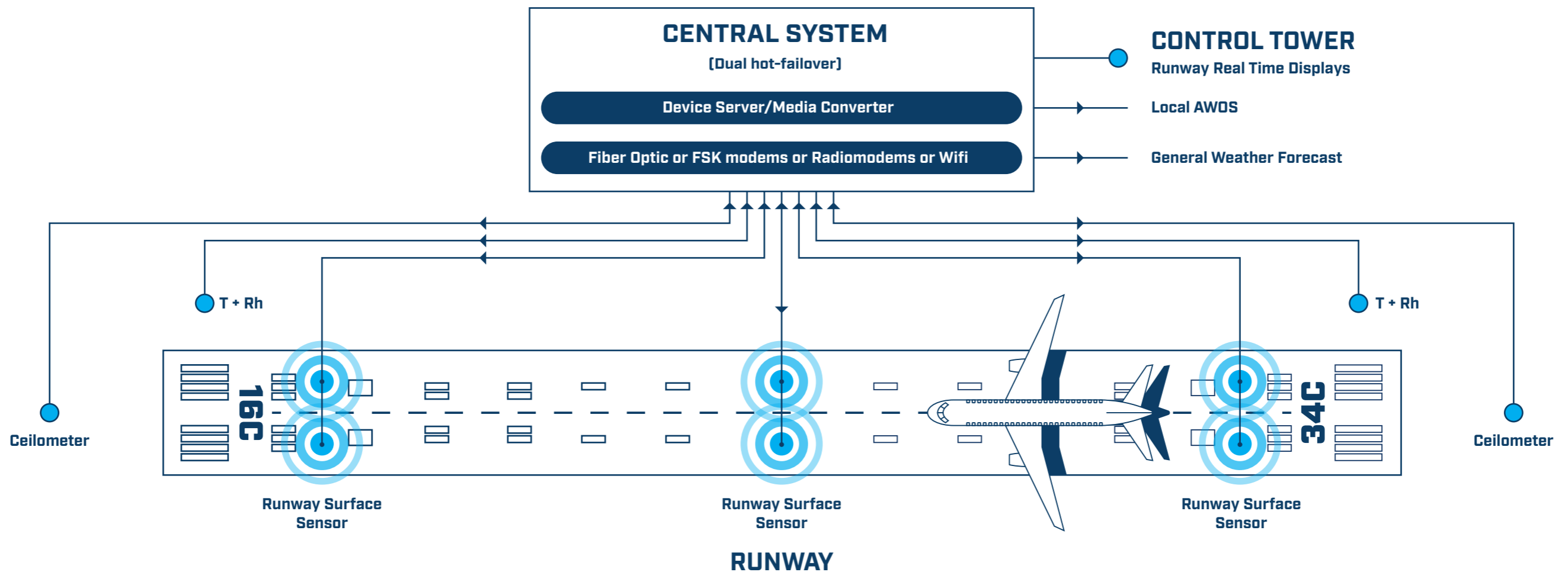
The Solution Safety support tools for avoiding runway excursions is part of the project PjO2-W2 Airport airside and runway throughput. The objective of this SESAR Solution is the mitigation of the runway excursion risk at any airport operational environment, based in particular on the ICAO Global Reporting Format relating to runway surface conditions.

MicroStep-MIS intends to contribute by providing its knowledge and expertise in aviation meteorology through the work on technical and partially operational aspects of the Solution. MicroStep-MIS continues in the work done in SESAR Wave 1 project PjO3b-06 on the development of the ground system for estimation, reporting, and dissemination of current and predicted runway conditions (model integrating available input data, dedicated HMIs, RCR editor, etc.), compliant with GRF. We participate on an integrated shadow mode V3 validation exercise at Gdansk Airport led by PANSA with support of Airbus and Dassault (onboard systems) and the University of Warsaw supplemented by RTS of rare and non-nominal situation.

2 Solution PJ.04-W2-29 Digital Smart Airports

The need for European airports to become more operationally efficient is fundamental. This SESAR project will develop concepts, tools and procedures to increase the predictability and resilience of airport operations, improving the punctuality of flights in a safe and environmentally sustainable manner.

CENTRAL SYSTEM (Dual hot-failover)
- Device Server/Media Converter
- Fiber Optic or FSK modems or Radiomodems or Wifi

CONTROL TOWER
- Runway Real Time Displays
- Local AWOS
- General Weather Forecast

T + Rh

Ceilometer

Runway Surface Sensor

16C   34C

Runway Surface Sensor

Runway Surface Sensor

T + Rh

Ceilometer

RUNWAY

The Solution Digital smart airports is part of the project Pj04-W2 Total Airport Management. It consists of three parts (subsolutions):

• Airside/Landside performance management
• MET performance management
• ENV performance management

The subsolution MET performance management aim at Pro-active management of MET impacts on the AOP (Airport Operation Plan). Meteorological impacts on the AOP are pro-actively managed by decision support functionalities that can assess the impact of key meteorological conditions on airport performance and that can propose pre-defined solution scenarios.

MicroStep-MIS intends to contribute by providing its knowledge and expertise in aviation meteorology through the work on technical and partially operational aspects of the Solution. MicroStep-MIS continues in the work done in SESAR Wave 1 project Pj04-02 on development of the advanced aviation weather decision support system (AAWDSS) including the observation as well as forecasts of hazard weather phenomena for management of its impacts. We participate on RTS V3 validation exercise led by PANSA with support of University of Warsaw and DLR (thunderstorm niwcasting). That includes also integration of AAWDSS with PANSA Advanced Tower system (for prediction of TTOT, TSAT and taxi times).

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