Biral visibly better

AVIATION

Visibility and Present Weather sensors you can trust...

METEOROLOGICAL SENSORS

Meteorological Sensors for Aviation Ground Use

With air traffic volumes set to increase year on year airport operators are under increasing pressure to expand services whilst maintaining or improving safety and customer satisfaction. Many of the challenges this brings can be addressed by careful planning, adopting best practice and investment in new infrastructure and technology. However, the weather will always remain outside of our control with an ability to cause major disruption. Accepting that we cannot control the weather, having accurate information about current conditions is vital for allowing operations to continue with minimum disruption whilst ensuring that safety is never compromised. Meteorological sensors therefore should be seen as an important part of any airport, whether it is a simple grass strip or a major international hub.

Visibility Measurement for Runway Visual Range (RVR) and METAR

Knowledge of visibility along the runway is of vital importance to pilots during landing and take-off which is why the estimation of Runway Visual Range or RVR is perhaps the most common use for visibility sensors in aviation. Visibility is also an integral part of METAR and SPECI reports provided by airports as part of their air traffic management responsibilities. In larger airports visibility measurement on taxi ways is increasingly used to improve the safety of ground movements.

Transmissometer or Forward Scatter?

Transmissometers were once the sensor of choice on airfields due to their direct measurement of extinction coefficient. However, their limited measurement range and high costs has seen more capable and cost effective forward scatter meters (FSM's) become widely used.

Advantages of Biral Forward Scatter Meters

- much more compact
- require little maintenance
- report visibilities from 10m to 75km
- performance proven to be comparable to that of transmissometers

All Biral visibility and present weather sensors meet the requirements of ICAO and WMO for use in aviation systems including RVR. Calibration is in accordance with ICAO 9328 and is traceable to a reference standard transmissometer. Declarations of Suitability for Use as per EU Regulation 552/2004 on the interoperability of the European Air Traffic Management network are available for all sensors.

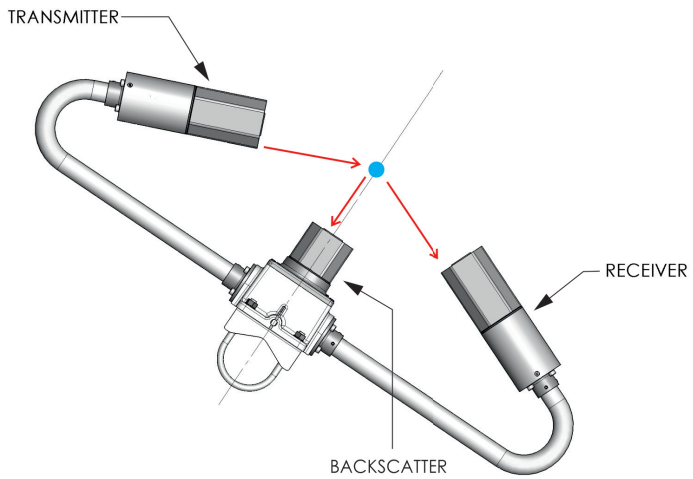
Present Weather Sensors and Measurement

The term present weather is used to describe the current conditions which might include anything from tornados to blizzards. When applied to a sensor the term covers a more limited set of conditions which generally include visibility and both liquid and frozen precipitation. In aviation present weather sensors provide information for the formulation of METAR and SPECI reports as well as airfield and regional forecasts.

Forward scatter present weather sensors can struggle to distinguish between liquid and frozen precipitation; an important capability in aviation where icing on aircraft and runways is a serious safety concern. Biral sensors are the only ones to reliably solve this problem by using a backscatter receiver.

Advantages of Biral Forward Scatter Meters

- uses a unique backscatter receiver to improve classification accuracy
- reports the correct precipitation code reliably even in the most difficult conditions



Ambient Light Sensor for RVR

When calculating Runway Visual Range three pieces of information are required; visibility, ambient light level and runway light intensity. Whilst runway light intensity is often directly available to an integrated control system both visibility and ambient light levels must be measured at the runway. The ALS-2 ambient light sensor connects directly to VPF or SWS sensors providing visibility and ambient light measurements in a single data message.

The ALS-2 ambient light sensor is fully compliant with ICAO, WMO and FAA specifications.

Airfield Installations

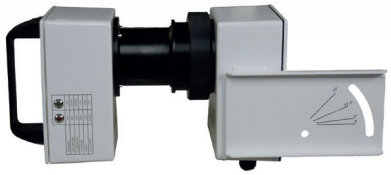
Due to the wide variation in airfield size and complexity there is no standard configuration of meteorological sensors that suits all needs. Smaller airfields without the need for RVR may cluster a set of sensors around a met-tower whilst larger more complex airports have sensors at both ends of a runway. The largest applications can have three sets of sensors per runway in addition to a dedicated set for meteorological observation and forecasting. The extensive Biral sensor range is perfectly suited to the varying needs of all these installations.

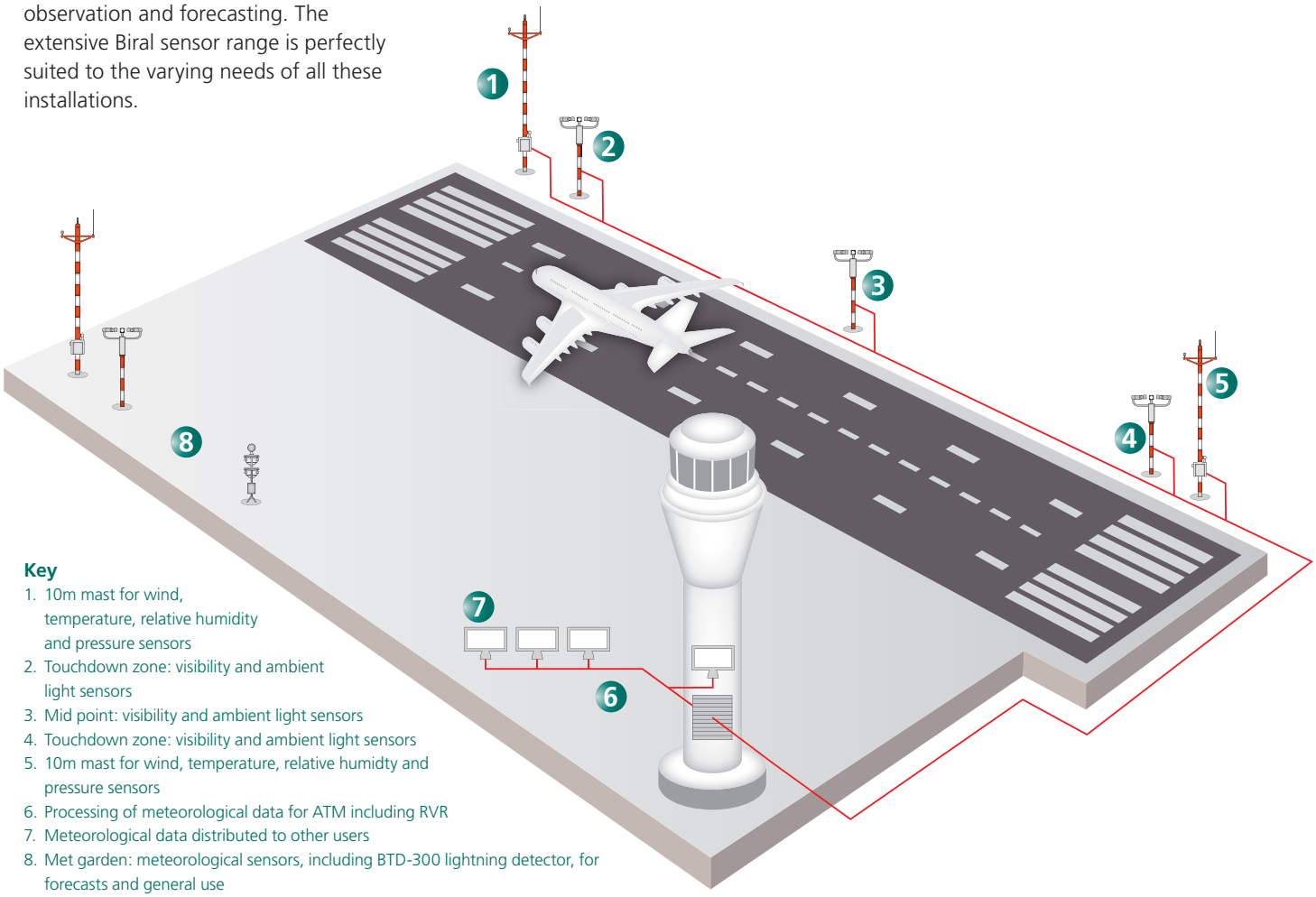
Operation and Maintenance

Meteorological sensors for aviation must be highly reliable and require the minimum of maintenance to ensure long term costs and disruption is kept to a minimum. All Biral sensors are designed for reliability and backed by the longest warranties currently available. Many VPF sensors are still in full operational service after more than twenty years.

All equipment requires routine maintenance to maintain accuracy, avoid unexpected failures and extend overall life. However, if the maintenance demands are excessive higher costs and service disruptions will occur. Biral visibility and present weather sensors have a range of features that reduce maintenance to a minimum, whilst allowing it to be performed flexibly.

All Biral sensors have simple to use field test and calibration kits allowing the operator to maintain a high degree of confidence in the measurements without the disruption and expense of removal for offsite calibration.





Key

1. 10m mast for wind, temperature, relative humidity and pressure sensors
2. Touchdown zone: visibility and ambient light sensors
3. Mid point: visibility and ambient light sensors
4. Touchdown zone: visibility and ambient light sensors
5. 10m mast for wind, temperature, relative humidty and pressure sensors
6. Processing of meteorological data for ATM including RVR
7. Meteorological data distributed to other users
8. Met garden: meteorological sensors, including BTD-300 lightning detector, for forecasts and general use

Biral Visibility & Present Weather Sensors

Airports vary in size and complexity from grass strips serving isolated communities to multi runway international hubs serving capital cities. Weather conditions will also vary with location, so it is important to offer a range of sensors to match the clients' requirements and budgets.

The VPF Sensor Range

The VPF range offers outstanding reliability and corrosion resistance combined with the most accurate measurements and greatest number of reported present weather codes. They have been proven in use over 20 years and remain at the forefront of visibility and present weather technology. VPF series sensors are widely used in aviation and were the first forward scatter sensors to be used in a UK CAA approved RVR system on a CAT III runway.

Sensor	Visibility Range	Present Weather Codes	
VPF-750	10m to 75km	50 WMO	45 METAR
VPF-730	10m to 75km	15 WMO	17 METAR
VPF-710	10m to 75km	Visibility only	

The SWS Sensor Range

The SWS sensor series was introduced in 2009 and shares much of the advanced technology used in the VPF range. With a powder coated, all metal enclosure, the sensors are proven to be reliable for extended periods of operation. All SWS series visibility and present weather sensors meet ICAO and WMO requirements for use in aviation including RVR systems.

Sensor	Visibility Range	Present Weather Codes	
SWS-250	10m to 75km	42 WMO	36 METAR
SWS-200	10m to 75km	14 WMO	0 METAR
SWS-100	10m to 75km	Precipitation type only	
SWS-050	10m to 40km	Visibility only	

Manufactured by:

Biral
PO Box 2, Portishead
Bristol BS20 7JB, UK

T: +44 (0)1275 847787
E: enquiries@biral.com
W: www.biral.com

Distributed by:

Visit our website for further details including specifications, application notes and white papers.

www.biral.com