



Vaisala Weather Radar available now!

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Vaisala C-band weather radar is now available to all customers. It complements Vaisala's full offering of remote and in-situ sensing products and provides superior data quality, more accurate measurements and high availability for different applications, such as:

- Weather surveillance
- Severe weather monitoring
- Hydrometeorological applications, such as flood forecasting
- Airport wind shear detection
- Hurricane/Typhoon/Cyclone tracking
- Hail detection
- Weather modification
- Meteorological research
- Launch support systems

Significant reduction in infrastructure costs

A new concept for antenna-pedestal design in a semi-yoke style dramatically reduces the momentum of inertia required for antenna movement. This

allows faster and more accurate positioning of the antenna. Also, the total weight of the antenna with pedestal is only 1500 kg - allowing significant reduction in infrastructure costs and easier mounting.

Two models currently available

The Vaisala Weather Radar family starts with two C-band weather radar models: WRM100 and WRM200. WRM200 is a dual polarization Doppler weather radar with magnetron transmitter and proven applications like HydroClass™ - a real-time operational hydrometeor classification software. This software is the first COTS product that uses real-time polarization measurements for classifying targets into categories like hail, graupel, rain, snow, etc. WRM100 is a single polarization magnetron Doppler weather radar with upgrade possibility to dual polarization.

Complete offering of services


Vaisala is also the first meteorological hardware provider that has a complete

offering of services in its product portfolio. Vaisala Weather Radar services start from maintenance, training, support, extended warranty and on-site repairs, and extend to even operating the radar, if that is what our customers want. Vaisala is capable of providing easy access to professional support, and can guarantee that your equipment is kept up to date with the latest technology in applications, software and hardware.

50 years of weather radars

Weather radars have been used to observe precipitation for over 50 years. In the last couple of decades the emphasis has shifted from qualitative rainfall estimation to quantitative rainfall measurement. Potential areas of applications have also increased due to the outstanding temporal and spatial resolution of radar data and a new generation of dual polarization radars.

The quality and usefulness of radar data has increased for various applications, but radar system requirements have become more demanding as well.



The quality and usefulness of the radar data is often compared to gauge data; the present consensus is that they are not competitive but complementary instruments. The best results are achieved by a combination of the information from both measurement systems.

The Vaisala Weather Radar

Vaisala performed a market study in early 2000 to see if there is a market for a newcomer and a new concept for the weather radar. In 2002 the decision was made to develop the Vaisala Weather Radar. In cooperation with the University of Helsinki, Colorado State University, Sigmet Inc. and various research institutions and customers, Vaisala developed a high-performance dual polarization C-Band Doppler weather radar. This prototype radar with klystron transmitter was installed at Helsinki University in Kumpula in late 2004 to focus on testing and world-class mid-latitude

weather research and education using dual polarization weather radar.

The acquisition of Sigmet Inc. at the beginning of 2006 was very important for developing the Vaisala Weather Radar competences and helping us in the weather radar market entry. Sigmet is the world's leading weather radar signal processor and application software maker. It has over 400 installations of the latest signal processor model, RVP-8, all over the world and over 26 years of experience in weather radar data and signal processing performance. The signal processor, radar controller and radar application software IRIS™ are made under the Sigmet brand and sold, beside our own radars, for OEM users worldwide. The user-friendly IRIS™ software package was specially designed for weather radar applications, and is an ever-evolving concept with a strengthened software team improving and adding features based on the feedback from our customers on a continuous

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basis. Unlike research organization-based programs, we provide product support, maintenance and timely updates for our support contract customers for the lifetime of the product.

Vaisala makes significant innovations

Ever since the development project started, Vaisala's goal was to make new innovations in weather radar measurements, especially in dual polarization. The first very obvious innovation was to apply dual polarization measurements to classify hydrometeors.

HydroClass™ was developed in 2005. It is the world's first real-time automatic hydrometeor classification software package suitable for operational use. It was introduced in more detail in Vaisala News issue 174.

The success of hydrometeor classification is dependent on data quality. The data quality starts from the antenna and pedestal that are specifically designed for dual polarization measurements. The pedestal drive mechanisms for azimuth and elevation movements are driven by smart software, providing quick acceleration and deceleration to pinpoint the antenna without overshooting or long settling times. The azimuth and elevation

motors are brushless, requiring no regular maintenance.

Dual polarization radar applications can improve accuracy of Quantitative Precipitation Estimation (QPE). This can be inaccurate in heavy rainfall due to three problems associated with hail, attenuation and absolute calibration of the radar. In cold climates where we do not have that much very heavy rainfall, a more important problem in estimating QPE is anomalous propagation, which can lead to data contamination by ground and sea clutter over large areas. Doppler filtering is effective in ground clutter cancellation, but for moving targets, such as sea surface and bird flocks, dual polarization parameters are the key. As dual polarization radars spread from the research community to operational use, data quality in all kinds of environments is attracting more attention than before.

High data availability and comprehensive remote control

Vaisala meteorological systems and sensors have always met the operational requirements of the most severe weather conditions in the world. The Vaisala Weather Radar continues this heritage. The Vaisala Weather Radar system is a cost-effective solution for most weather

applications. High radar data availability is achieved through active online remote monitoring and control, and through the use of sophisticated data processing algorithms.

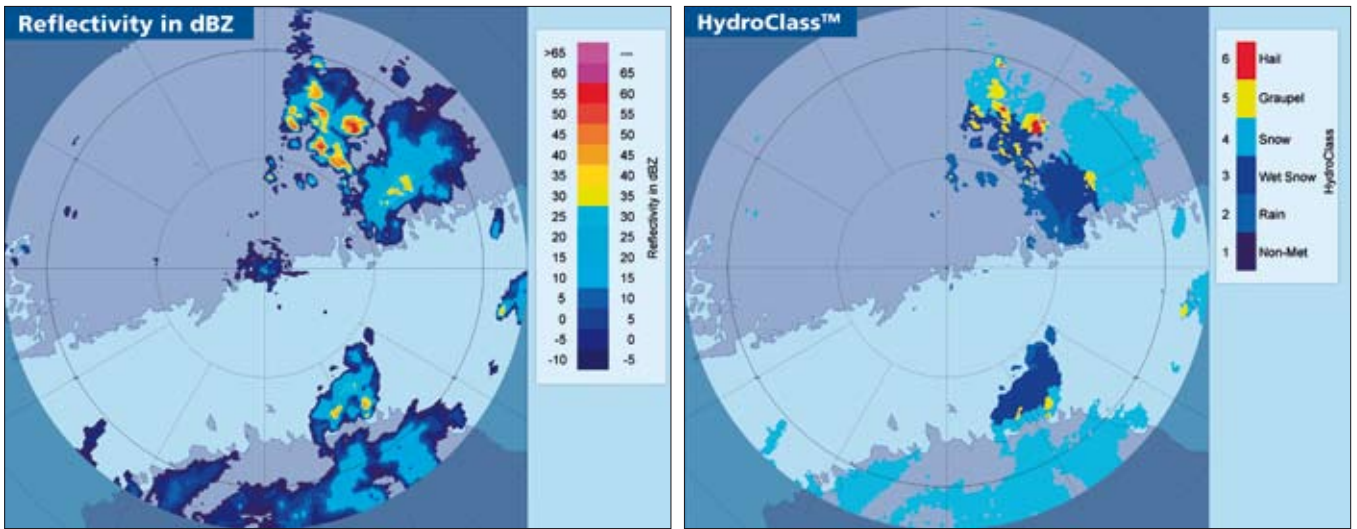
A key objective in creating the new family of weather radars was to lower maintenance costs through the use of active remote monitoring and control. Weather radars are very often installed in remote unmanned locations that are hard to reach. The Vaisala Weather Radars have comprehensive remote control and the systems can be accessed from anywhere in the world, reducing the number of site trips and lowering Mean Time To Repair (MTR). Also single-seat network administration, testing, upgrade and maintenance means less need for site visits. Quality components and an integrated compact mechanical system design are crucial to achieving high Mean Time Between Failures (MTBF). Vaisala's antenna, pedestal, transmitter and other suppliers are proven and strategic partners who contribute decades of experience and know-how to the total solution. ■

Further information:

www.vaisala.com/weather/products/weatherradar

*Vaisala Weather Radar at Kumpula, Helsinki 16-Jun-06.
Alto cumulus clouds at 2700m in the background.*





Weather radar images from the Helsinki area in Finland. In the left panel conventional reflectivity image and in the right panel HydroClass™ hydrometeor classification result in the same severe weather event. On the right panel hail and graupel are shown in red and yellow respectively. Rain, wet snow and snow are shown in blue, dark blue and light blue.



Vaisala Weather Radar cabinet