



# News Letter 8

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A Special Sun Tracker Application in the Arctic

## Are you the next Kipp & Zonen award winner?

Every year, during the EMS Meeting, we grant the award to an outstanding research paper on Boundary Layer Meteorology by a young aspiring scientist. Go to our newpage on [www.kippzonen.com](http://www.kippzonen.com) for more information.

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## Contact

If you have a news item for the news letter or want to share your experiences with Kipp & Zonen applications and contribute to our next issues, please e-mail the editor: [kelly.dalu@kippzonen.com](mailto:kelly.dalu@kippzonen.com)

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Kipp & Zonen, 2009

## Exciting Things coming up this Spring

Following the article on the development of the new CNR 4 net radiometer in the previous newsletter, I am happy to confirm that it is now available for ordering. The interest from customers is very promising and we have high expectations. Read all about the light weight, optional integrated ventilation, standard PT-100 and thermistor temperature sensors, and other innovative features, on page 3 or the CNR 4 product page at [www.kippzonen.com](http://www.kippzonen.com).

You will have seen our completely new website last year and we are continuing to improve it and add extra functionalities. For example, we recently launched a new tool to speed up product inquiries and quotation requests. Future possibilities include sub-sites focussed on specific markets and language options.

Behind the scenes, we have also made some changes and you may have noticed the benefits already. We have completed the integration of a new ERP system that allows us to plan production and manage logistics better. Many distributors and customers have commented on our improved delivery times, and often the most popular products are available from stock.

Another exciting introduction coming soon is our printed product catalogue. It's been 12 years since the last edition and we believe that it is time once again to give a comprehensive overview of our full range of instruments. The catalogue includes part numbers, options and accessories, but it will not replace our product brochures. These provide more detailed descriptions and specifications and you can always visit our website to download brochures and other product information.

I invite you to visit us at the upcoming General Assembly of the European Geosciences Union (EGU) in Vienna, from 20th to 24th of April 2009, where we will showcase the CNR 4 on booth number 18 ■

Yours sincerely,



Ben Dieterink, President  
Kipp & Zonen BV



## CNR 4 Net Radiometer

We are now accepting orders for the new CNR 4 four-component net radiometer and the first deliveries will be in May 2009. Full product information is available on our website and it replaces the successful CNR 1, which will cease production.



CNR 4 is focused on improving ease of use and operational performance. The upward and downward facing pyranometers for short-wave radiation have glass domes and are integrated directly into the instrument body. The downward facing pyrgeometer for long-wave radiation has a flat silicon window, but the upward facing sensor is fitted with a silicon meniscus dome. This provides a wider field of view and water droplets roll off.

The pyrgeometers are integrated into a module that includes both Pt-100 thermocouple and 10K thermistor temperature sensors. This ensures that the pyrgeometer detectors are at the same temperature, which is accurately measured in order to calculate the long-wave radiation.

The bubble level is visible through the white sun shield and a screw-in mounting rod is included. There are two waterproof connectors with yellow cables, one for the four radiometer outputs and the other for the temperature sensor connections.

A unique feature is the optional CNF 4 ventilation unit. This can be delivered built-in during production, or bought separately to retro-fit at a later date. The ventilation unit has its own waterproof connector with yellow cable for power to the fan and heater. The CNR 4 cables feed through the ventilation unit and the mounting rod screws into the rear. CNF 4 provides efficient clean air-flow over the domes and windows. A replaceable filter is located on the underside of the unit and the heater can be used to melt frost.

CNR 4 is compact, rugged and light and is ideal for field measurements of the radiation balance when used in conjunction with the LOGBOX SD data logger ■

## AMS 2009 in Phoenix

The annual meeting of the American Meteorological Society (AMS) is a major annual event and is visited by scientists from all over the world. Topics on the agenda include meteorology, climatology, hydrology, urban climate, remote sensing and more.

The conference was accompanied by an exhibition, at which Kipp & Zonen is a long-standing participant. It was an opportunity for us to meet our customers and discuss the latest technical requirements and scientific insights. In addition it was a chance for our clients to meet Mr. Victor Cassella and Mr. Rodney Esposito, our new sales managers for the American Scientific and Industrial markets, in person.

During the conference our product manager for Lidar systems, Martin Veenstra, gave a presentation on the application of our scanning Lidar system for air pollution monitoring and this was received with great interest.

Major showcases on the booth were the prototype of the new CNR 4 net radiometer and the MTP 5 temperature profiler. Kipp & Zonen net radiometers have been in high demand in the US for many years, and the MTP 5 is receiving increased attention thanks to its applications in air quality and urban climate programs.

It goes without saying that we at Kipp & Zonen look forward to meeting you again during AMS 2010 in Atlanta ■

## Lidar supplied to Brazil

In February 2009, Kipp & Zonen supplied a Compact Raman Lidar System designed and manufactured by Raymetrics to Brazil. The system will be used to monitor the effects on the atmosphere of the biomass burning of Sugar Cane.

The Lidar system Model LR-101-V-200 emits laser pulses at 532nm (green) and detects both the Elastic and Raman shifted backscatter. The system is supplied built into a compact and portable enclosure. As a result it can easily be deployed at different measurement sites. Thanks to the standard user friendly software suite, performing Lidar measurements has never been easier.

Following this delivery, Kipp & Zonen and our Lidar partner Raymetrics will carry out installation and training on-site. More information will be available on our website ■

## Passion for Precision

# Calibrating the Italian Air Force Brewer Network

One of the products manufactured by Kipp & Zonen is the Brewer spectrophotometer. This instrument measures the concentration of the Ozone layer and can perform high accuracy spectral UV scans. The Brewer is a very complex instrument that requires regular maintenance and calibration. As the manufacturer, Kipp & Zonen, has the knowledge, parts and test equipment to service, repair and calibrate all models of Brewer on site or at the factory in Delft, the Netherlands.



*Brewers being calibrated*

The Italian Air Force has a network of four Mk IV Brewers, which are installed at three sites in northern, central and southern Italy to provide accurate UV and Ozone data. The World Meteorological Organisation (WMO) recommends that Brewers have an Ozone calibration at least every two years, so Kipp & Zonen Brewer service engineers make a bi-annual visit to each site to service and calibrate the four instruments. The most recent visit was in the early autumn of 2008. Thanks to the support of Eurettronica Icas, our Italian distributor, the service and calibration was well organised and planned within an efficient time frame.

After arrival at a site, the first task is to un-pack and set up our reference Brewer. Next we carry out tests and a visual inspection to determine the condition of the Air Force Brewer. Special attention is paid to the mechanical parts, to ensure that all motors and gears are running properly. The tracker is inspected, serviced and levelled to ensure that the Brewer is pointed accurately at the sun at all times.

Humidity is a major threat to the Brewer. Therefore we change the internal desiccant and inspect the seals and gaskets that prevent humid air entering the housing, and replace them if necessary. It may happen that a Brewer is not in perfect operating condition and our technicians are trained to solve problems using a systematic approach. Often this can be done using available test equipment and spare parts, but in the worst case a Brewer may need to be returned to the factory.

Ozone calibration consists of two types of measurement; a 'sun scan' in which the optimal instrument settings are determined, and Ozone measurements compared with our reference Brewer. The UV calibration can be divided into wavelength calibration and UV response calibration. Wavelength calibration is performed using Mercury and Cadmium spectral lamps and the results are computed to give new Brewer configuration files. A 1000 W reference lamp and a computer program are used to calculate the UV response. Finally, timed UV scans are taken to compare the measurements with our reference Brewer. The calibration is complete when all the tests have been passed successfully.

The Italian Air Force can now be confident that the Ozone and UV measurements made by their Brewers are accurate and can be confidently supplied to the World Ozone and Ultraviolet Data Centre (WOUDC) in Canada ■



*Brewers on site in Italy*

# Kipp & Zonen LAS helps to improve Water Management in Australia

Formulating strategies for the efficient use of water in agriculture depends on a sound appreciation of the requirements for the optimal health and productivity of crops. This has to be balanced with the water resources available, the demands of non-agricultural water consumers and the environmental impacts.



The Murray-Darling river Basin (MDB) accounts for most of the land surface in south-eastern Australia, and provides a major part of Australia's water resources. The ongoing drought in the region, combined with climate-change expectations, has heightened and emphasised the need for improved water management at farm-regional scales. The condition of the red gum (Eucalyptus) trees along the rivers is a major political and environmental concern in the area.

Satellite remote sensing methods assist in the evaluation of water use over large areas, in terms of the contributions made by different styles of land use, evapo-transpiration rate, and the water requirements of varying types of vegetation.

Australian scientists are using the Kipp & Zonen Large Aperture Scintillometer (LAS), and other instruments, to make local measurements of the surface energy balance components, including evapo-transpiration (ET). These measurements can then be used to 'ground-truth' energy flux estimates derived from satellite data, at farm-regional scales under the unique conditions experienced in the MDB.

The project is supported by the Australian Government's 'Raising National Water Standards' (RNWS) program of the National Water Commission and the Cooperative Research Centre for Irrigation Futures, with support from the Departments of Primary Industries (DPI) and Sustainability and Environment (DSE).

Managed by Dr. Des Whitfield, Senior Systems Agronomist – Horticulture of the DPI, this project aims to provide tools, information and methods for high agricultural productivity on irrigated farms in the MDB with minimal water wastage. Another objective is to provide an approach to the evaluation of the water requirements of environmental assets in irrigated catchments of the MDB.

Comparisons are underway in a strategic range of land uses of the types encountered in the major irrigation districts of the MDB. These include lucerne, tomatoes, vines, and fallow land. Field validation and testing activities in major farming

districts will facilitate the application of satellite remote sensing ET algorithms to the major irrigated crops of the region and, also benefit the red gum forests.



*LAS measuring over lucerne irrigated by centre pivot sprinklers. The smoke in the background comes from the tragic Black Saturday bushfires in February 2009*

Environmental Systems & Services (ES&S) in Melbourne supplies the tools for more effective environmental monitoring and management, providing DPI three LAS systems for these water resource and agriculture management projects. The projects will be further strengthened by research conducted at a number of Australian Universities also using LAS, including Charles Sturt University, Wagga Wagga and James Cook University, Townsville.

For more information on activities in Australia please contact Tim Cookes, Sales Manager, ES&S, [tim.cookes@esands.com](mailto:tim.cookes@esands.com) ■

*Meet the Australian team. From left; Tim Cookes, Ashtika Chand, Anna Chinnery and Adam Pascale*



Passion for Precision

# A Special Sun Tracker Application in the Arctic

Kipp & Zonen's 2AP Sun Tracker has become an industry standard for longevity and reliability in the measurement of solar radiation. The 2AP's high power motors and precision gear drives were what ProSensing Inc. was looking for when developing a steerable remote radar system to study sea ice.



*Measurement of the physical properties of snow-covered sea ice for geophysical and climate variable inversion estimation. (Photo courtesy of Dr. John Yackel, University of Calgary)*

6 ProSensing Inc. of Amherst, Massachusetts, USA was founded in 1982. During the early 1990's the company began designing and building remote sensing instrumentation for a wide range of environmental research applications. ProSensing, with its highly qualified technical staff, has successfully deployed equipment all over the world.



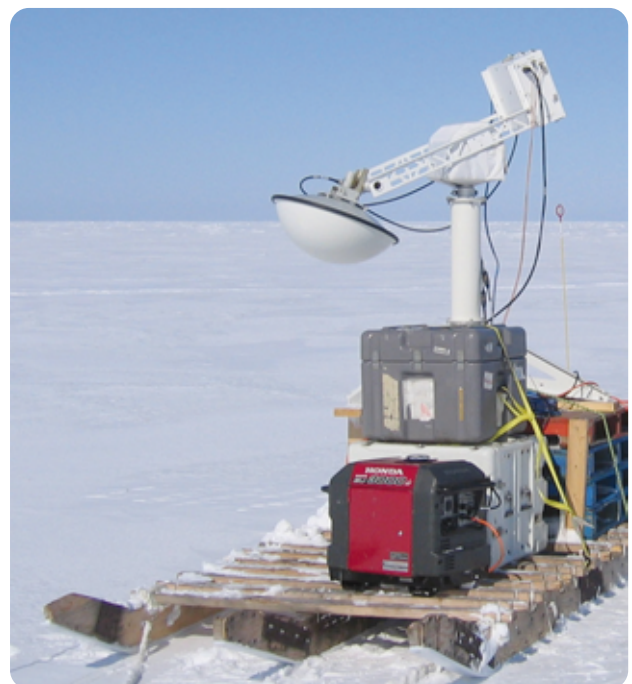
*Each 2AP sun tracker is fitted with a cold weather cover, heater kit, tripod stand and height extension tube.*

In 2003, ProSensing delivered three C-band Scattermeters to the University of Manitoba for studying sea ice. These solid state radars have very fine range resolution (0.3 m) and are used to investigate how changes in ice structure affect radar reflections at various polarization states. Each Scattermeter is mounted on a Kipp & Zonen 2AP Sun Tracker to accurately position the radar beam in all conditions. The data from these surface-based instruments can be used to improve satellite-based remote sensing of first year and multi-year ice in the Arctic.

During the fall of 2008, Kipp & Zonen USA delivered two additional 2AP's to ProSensing Inc. for further Scattermeters.

Whilst touring the facility, James B. Mead, President of the company, showed us many of the environmental research projects under development. One of the original Scattermeter systems had just returned for a service, after 5 years in the field, and the 2AP was found to be still in perfect condition.

For further information please contact ProSensing through [www.prosensing.com](http://www.prosensing.com) ■



# Lite Range Update

Kipp & Zonen is updating its successful Lite Range of products to make installation easier and to add user convenience features.

The SP Lite Silicon Pyranometer is widely used to measure solar radiation in entry-level weather stations, particularly for agriculture and hydrology, and is supplied by well-known system integrators. SP Lite is also popular for routine monitoring of photo-voltaic solar energy installations and in building control systems for lighting and environmental control.

The PAR Lite Photo-Synthetically Active Radiation Sensor monitors the solar radiation that produces chlorophyll and promotes growth in plants and is a key input for horticulture and greenhouse automation.

NR Lite is our single component net radiometer for simple and reliable measurement of the net radiation balance between the sky and the ground. It is used in agriculture and hydrology and in our Large Aperture Scintillometer Evapo-Transpiration Systems.

The present SP Lite and PAR Lite have a base flange with two fixing holes. However, In order to level them it is necessary to buy the CLF 1 levelling fixture. If it is required to mount them to a pole or mast an accessory net radiometer/albedo plate is needed.

SP Lite2 and PAR Lite2 have this functionality built-in. They feature adjustment screws and a bubble level integrated into the mounting flange. A threaded hole in the body of the housing takes the accessory screw-in mounting rod that is used with the CMP 3, CGR 3 and CNR 2. Two instruments can easily be bolted back-to-back and fitted with a mounting rod to make a simple albedometer or net PAR sensor.



SP Lite2, PAR Lite2 and NR Lite2 will all be fitted with the high quality yellow cable used in our other instruments. The overall dimensions and performance remain as before and the new versions are interchangeable with the current products.

The Lite2 range will become available during the second quarter of 2009 and will replace the existing models ■

# New Industrial Grade Wind Sensor Set

Mierij Meteo introduces a new set of wind sensors designed for industrial applications. Wind vane model MW 35 and anemometer model MW 36 are designed for use in all weather conditions, the embedded heater can keep these sensors ice-free down to at least -40 °C!



Wind vane model MW 35 and anemometer model MW 36 are the third generation from Mierij Meteo, replacing the successful models O67 and 660, of which more than 2000 sets have been sold. The new set of wind sensors are shock and vibration proof, robust, accurate and protected against static discharge. A special feature is the mechanical design to protect the bearings against dirt and dust. This ensures a long, maintenance free, operating life.

MW 35 and MW 36 are fitted with magnetic encoders and have no electro-mechanical parts. The internal microcontroller allows a number of universal industrial outputs (digital and analogue) to be user programmable. This unique feature makes MW 35 and MW 36 compatible with a wide range of data acquisition systems.

The sensors have a wide power supply range of 12-24 VDC and can measure in wind speeds up to 75 m/s ■

# Fairs & Events

EGU - Vienna - Austria	19 - 24 April '09
MOCA-09 - Montréal - Canada	19 - 29 July '09

Passion for Precision

# Passion for Precision

Kipp & Zonen is the worldwide authority in measuring solar radiation and atmospheric properties. Our passion for precision has led to the development of a large range of high quality instruments: from all weather radiometers to complete measurement networks.

We promise our customers guaranteed performance and quality in various markets: Meteorology, Climatology, Hydrology, Industry, Renewable Energy, Agriculture and Public Health & Safety. We hope you will join our passion for precision.

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