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KIPP & ZONEN
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Contact

If you have a news item for the newsletter or want to share your experiences with Kipp & Zonen applications and contribute to our next issues, please e-mail the editor: miguel.cotino@kippzonen.com

Quality is the Key

Welcome to our first Newsletter of 2013. I hope you have enjoyed the seasonal holidays and the year has started in a good way. I wish all of you a healthy and prosperous 2013.

2012 was a very successful year for Kipp & Zonen with new products and many good projects in countries around the world. These projects show very well how our instruments can be integrated with other systems to satisfy the requirements for true turn-key solutions. We will tell you more about them in future Newsletters.

Kipp & Zonen will continue to expand our range of integrated solutions. Today we offer these for solar energy budget assessment, energy forecasting and the integrated system for evapotranspiration monitoring based on our new LAS MKII.

In 2013 Kipp & Zonen will participate in the major national and international conferences and exhibitions for our markets. These events give you a real opportunity to meet Kipp & Zonen staff and have a personal discussion about products, projects, technology and science.

In 2012 we have delivered thousands of instruments and we are very proud of maintaining a high level of performance and quality. We see it as our responsibility to maintain this level of quality over time and a key part of this is regular, traceable calibration to factory standards. We are expanding our calibration capacity with regional facilities in Singapore, France and the USA, to allow shorter turn-around times and lower shipping costs.

To start the year I have a great reading recommendation. CRC Press has just published 'Solar and Infrared Radiation Measurements' by well-known authors Frank Vignola, Joseph Michalsky and Thomas Stoffel. The topics covered include radiometer design and performance, equipment calibration, installation, operation, maintenance, data quality assessment and methods to use the data for various applications.

I hope you will enjoy reading our first Newsletter of 2013.

Ben Dieterink, President
Kipp & Zonen B.V.

SUV5, the Smart Total UV Radiometer

Continuing our roll-out of intelligent instruments we introduce SUV5, the Smart Total UV Radiometer.

SUV5 is based on the well-established CUV 5 model and measures UV radiation in the range from 280 to 400 nm. It is a general-purpose instrument for applications in meteorology, for monitoring of lamps and for use in materials testing. Please note that separate UVA or UVB information cannot be extracted from the SUV5 or CUV 5 measurements, for this the UVS series is required.

Whereas the CUV 5 is optimized for use under natural sunlight in meteorology and outdoor material testing, the Smart abilities of the SUV5 make it especially suitable for use monitoring the high power lamps used in environmental chambers for material ageing and degradation tests, and in solar simulators.

As with our other Smart instruments, the SUV5 comes with the RS-485 Modbus® interface and a choice of 0 to 1 V (SUV5-V) or 4 to 20 mA (SUV5-A) amplified analogue output. The wide power supply range from 5 to 30 V DC makes integration into industrial applications easy. The SUV5 is protected against over voltage, reversed polarity and short circuiting.

Advantages of the SUV5 over the CUV 5 are temperature compensation within ±2 % from -40 °C to +70 °C and linearisation within ±1.5 % over the standard measurement range of 0 to 400 W/m² of UV irradiance. All SUV5's the same output range, making the exchange of instruments for recalibration simple.

Windows™ software for data logging on a computer, display of real-time data and Modbus® address setting is included as standard and the SUV5 can be used in combination with our Smart Sensor Starter Set to make a direct connection to a computer USB port for testing and evaluation of the new SUV5 ■

The Weather Observer's Handbook, featuring Kipp & Zonen

An impressive new book has been published; The Weather Observer's Handbook, which features a chapter dedicated to solar radiation measurement. We were delighted to be contacted by the author Stephen Burt, who informed us of the many references to Kipp & Zonen instruments. A great, comprehensive book for anyone who is interested to learn more about accurate meteorological observations.

The Weather Observer's Handbook by Stephen Burt has just been published by the Cambridge University Press, ISBN 9781107026810 and more details can be found at **www.cambridge.org** and **http://measuringtheweather.com**

This new book provides a comprehensive, practical and independent guide to all aspects of making weather observations. Automatic weather stations and logged electronics-based sensors today form the mainstay of both amateur and professional weather observing networks around the world and yet, prior to this book, there existed no independent guide to their selection and use.

From amateur observers looking for help in choosing their first weather instruments on a tight budget, to professional observers looking for a comprehensive and up-to-date guide covering World Meteorological Organization recommendations on observing methods and practices, all will welcome this handbook.

Author Stephen Burt comments: "My new book is a guide to the use of a wide range of meteorological sensors and instrument systems. As far as possible, the content was based upon personal hands-on experience using the instruments described in the book. When it came to the chapter on solar radiation, Kipp & Zonen was the obvious choice as I've been using Kipp & Zonen solar radiation instruments in my own meteorological observatory for almost two decades. I've always found them to be well-documented, robust, accurate, consistent and, above all, beautifully engineered.

Meteorological instruments need to perform reliably and accurately with minimal maintenance for years on end, very often in the hands of non-specialist operators, and quality engineering makes Kipp & Zonen stand out from the crowd. Kipp & Zonen solar radiation sensors function exactly as they are supposed to, year in and year out." He also adds: "It's a pleasure to be able to acknowledge the first-class technical reference and research material found on the Kipp & Zonen web site, which was a great help in preparing the solar radiation chapter" ■

Setting Up a SOLYS 2 in Braşov, Romania

On 24th October 2012 experts from Echipot S.R.L., our distributor for Romania, together with researchers from the Transylvania University of Braşov, installed and set up a solar radiation measurement system supplied by Kipp & Zonen.

The solar station is based on a SOLYS 2 sun tracker and monitors global, diffuse and direct solar radiation in the short wavelength range, as well as atmospheric radiation in the far infrared. To optimise performance the pyranometers and the pyrgeometer are ventilated.

With this system, complex monitoring of solar radiation will be performed for the first time in Romania at world-class level, using the best instruments available.

The SOLYS 2 system operats within the Centre for Renewable Energy and Recycling Systems of Transylvania University Braşov. It will provide precise solar radiation data for research concerning development, simulation and comparison between solar energy conversion systems (photovoltaic and thermal) in real weather conditions.

Precise solar radiation data play an important role in designing solar arrays and farms; as well as in developing the software to control the orientation of the panels, which means programming the control system of the stepper motors. Solar radiation is the main input parameter both in designing systems that convert solar energy into thermal and electrical energy, and in building management systems.

The data recorded by the solar station can be used to precisely calculate the solar energy available at a given location for thermal and photovoltaic panels. The solar database obtained in this way becomes the best starting point for predicting the output of thermal and PV solar systems in the area of Braşov city.

The same data will be of great use in calculating the true price/performance ratio of solar energy conversion systems.

We wish the Centre success in their research work performed with these high-end instruments!

The Echipot website is at **www.echipot.ro** and you can find out more about the Transylvania University of Braşov at **www.unitbv.ro/en/home.aspx** ■

Private Energy Solar Boat

By Gerard van der Schaar

Races for solar-powered cars are well-known, but did you know that there are also races for solar boats? The Private Energy Solar Boat Team is based in Friesland, in the North of the Netherlands, and develops craft to participate in various solar boat races. The objective is to demonstrate publicly what is possible with solar energy.

In June 2007, during our graduation party in the pub, we discussed the first Frisian Solar Challenge (FSC), which took place in 2006. This has since become a biennial World Championship where boats powered by the sun come from many countries to race over the course of the famous ice-skating Eleven Cities Tour. Due to climate change the ice has not been thick enough for many years, so zero-emission boats are a fitting substitute.

The idea came quickly for a group of friends to build a solar boat and to enter the FSC in 2008. After the initial meeting the 'Furia One Foundation' was established. This includes all activities related to the development of solar boats. The next step was to find sponsors for development. This resulted in the Furia 1. Furia 1 had a length of 8 meters and a width (beam) of 2.4 meters. The maximum speed was 20 km/h and it weighed 146 kg.

In the Frisian Solar Challenge of 2008, we finished in a very encouraging 4th place. After further development of the Furia One, the team was the winner of the Dutch Open Solar Boat Challenge in 2009. This is another solar boat race, which is held in the south of the Netherlands.

For 2010 Furia 2 was developed, with the top speed increased to 32 km/h. This resulted in coming 1st in the Frisian Solar Challenge and winning the world title.

June 2012 was the fourth running of the event, the Dong Energy Solar Challenge **www.dongenergysolarchallenge.nl**, sailed again in Frisian waters. In this race the Private Energy Solar Boat Team participated with both Furia 2 and the new Furia 3. With these two solar boats, the team was placed 1st and 2nd and retained the World Championship.

Furia 3 is the newest solar boat developed by the team and incorporates the latest techniques in the fields of composite construction, solar cells, battery technology, drive technology and hydrodynamics. All the components of this boat have been developed by the team itself. For example, the hull and deck structure is made of carbon fibre to maximise mechanical rigidity with low weight. The battery was specially developed by MG Electronics, **www.mgelectronics.nl**

This battery is based on 1 kWh lithium-ion cells and uses an advanced Battery Management System. In addition, the team has developed its own solar panels in a thin laminate which are highly efficient, lightweight and semi-flexible. To develop the solar panels we purchased a flash tester to measure efficiency. This tester uses the Kipp & Zonen SP Lite2 to measure the radiation during the testing of a solar panel. In this way, the efficiency of the solar panels is measured and specific improvements developed to optimise performance.

Furia 3 also uses a hydrofoil system. Above a certain speed the boat is lifted out of the water to minimise drag and resistance. This has resulted in the achievement of a new speed record of 38 km/h.

If you want to know more about the team, please visit **www.furiaone.nl** or contact Gerard van der Schaar by phone +31 615 44 33 42 ■

Specifications Furia 3

Topspeed:	38 km/h
Weight:	115 kg
Battery:	1 kWh Li-Ion
Solar panel:	1750 Wp
Dimensions:	7.3 x 1.6 x 0.5 m
Remarks:	Hydrofoil system

Energy Yield Studies and Optimisation of Solar Farms

Measuring the actual potential energy yield at a location is now standard in the wind power industry and is becoming more and more common in the solar industry. For this purpose Ge:Net GmbH of Clausthal-Zellerfeld in Germany has developed a solar measurement station to precisely measure the solar radiation available on site.

High quality measurements during the planning phase of a solar farm significantly reduce the investment risk. In turn, a lower risk leads to improved conditions for project funding or, in extreme cases, makes funding possible at all! In any case the banks will have a very close look at the project, the potential energy yield, and how it was measured.

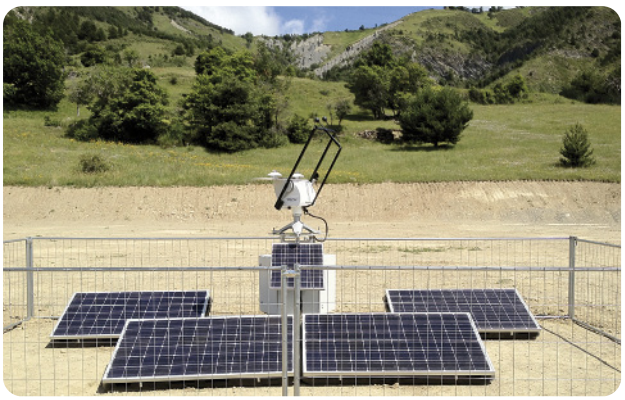
Also, at existing solar farms, accurate measurements can be an asset. Comparing the actual performance of the solar farm with the potential power output of the actual available solar irradiation indicates ways to optimise the performance of the generating system.

Ge:Net has already installed 12 new solar stations at different sites in Italy and France. They measure global radiation, diffuse radiation, albedo and additional weather data such as wind speed, wind direction, temperature, air pressure and humidity. Only high quality sensors are used, such as pyranometers and albedometers from Kipp & Zonen.

Stations with regular access for adjustment use the CM 121 Shadow Ring for the diffuse radiation pyranometer, as shown in the picture. Direct irradiance can be calculated from high quality diffuse and global radiation measurements with a good level of uncertainty.

Station with global, diffuse and reflected radiation measurements and albedo

For stations where the shadow ring cannot be regularly adjusted a special highlight is the SOLYS 2 sun tracker from Kipp & Zonen fitted with a pyrheliometer, which automatically follows the position of the sun, measures the direct radiation and precisely shades a pyranometer.



Station with solar-powered SOLYS 2 for direct, global and diffuse radiation

It is mainly the special characteristics of photovoltaic cells which call for such effort and accuracy in measurement, because of their wide field of view they can use both direct radiation and diffuse radiation to produce energy. Direct radiation is the proportion of the radiation from the sun that reaches the Earth's surface without diffraction, diffusion or reflection; whereas diffuse radiation is reflected and scattered from particles in the air and is distributed all over the sky. The blue of the sky on a sunny day is diffuse radiation, as is the grey of the clouds.

Direct and diffuse radiations differ not only in intensity but in direction. As the performance of a photovoltaic cell is highly dependent upon the angle at which the radiation hits the cell it is most important to know the ratio of direct and diffuse radiation to find the ideal orientation for the solar modules.

Now, with the new solar stations from Ge:Net and the high quality equipment from Kipp & Zonen, the performance of a solar farm can be optimised by adjusting the angle of the solar modules, and financial risks can be minimised.

Ge:Net has specialised in wind energy resource measurement since 2001 and has now expended into the solar energy resource market. Find out more at **www.genetworld.com** ■

We Proudly Introduce our 3 Newest Staff Members

Kipp & Zonen is pleased to announce that Remco de Mik, Paulien Adema and Dmytro Podolskyy have joined our team in Delft.

Dmytro Podolskyy

Kipp & Zonen is pleased to announce that Dmytro Podolskyy has joined us in the Sales and Marketing team at our Delft office, with the objective of taking our business to the next level.

Dmytro has a Master of Science in Applied Physics obtained in Ukraine. He then obtained a MSc in Nanotechnology at the Delft University of Technology in the Netherlands. Nanotechnology makes it possible to make miniature devices in the order of magnitude of nanometers (nm, one billionth of a meter).

Subsequent to these studies, he worked as a researcher at the Kavli Institute of Nanoscience in Delft. After a few years, he decided to leave the research work partly behind to concentrate on the business of a company and worked as a Sales Engineer for maritime equipment at VAF Instruments.

Kipp & Zonen is the ideal choice to apply the unique combination of Dmytro's scientific background and ambitions to develop in business management. He will work in collaboration with other professionals within Kipp & Zonen to further develop the business in existing and new markets.

Remco de Mik

After many years at Kipp & Zonen our Quality Manager, Rob Snoep, has retired. Fortunately, we have found an excellent replacement in Remco de Mik.

"As the Quality Manager, I am responsible for the development, maintenance and continual improvement of the quality management system at Kipp & Zonen. My main tasks are conducting internal audits and organizing management system reviews with the top management. I register complaints received from our customers and handle non-conformities resulting from monitoring our production processes. Being unbiased is a key requirement to be able to keep a structured overall view.

I have a business improvement background, but also a technical background. I missed the technical part in my last job, with the result that I have been working at Kipp & Zonen since the 1st of November 2012.

My objective is to move the company and its products to an even higher quality level, naturally together with the help of all my colleagues at Kipp & Zonen."

Paulien Adema

Please join us in welcoming another new member to our Sales & Marketing Team, Paulien Adema.

"As a Business Manager, I am responsible for supporting our distributors, to understand their markets and to help them sell Kipp & Zonen products. I report into Foeke Kuik, our Business Development Manager, and work together mostly with Ruud Ringoir, Clive Lee and Nil Ozyilmaz.

Before I joined Kipp & Zonen, I worked in logistics, supply chain consultancy and management. My degree, a MSc in Industrial Engineering & Management Science, was the start of an interest in both technology and the business processes required to bring that technology to the market in a successful manner.

Sometimes it is the process, rather than the technology, which needs improvement. Sometimes it is the technology itself, which can do with a revamp. Sometimes it is both, and you are in for a lot of work!

I am really looking forward to the new challenges at Kipp & Zonen and I have already started meeting distributors and the people at our sales offices" ■

Dmytro Podolskyy, Paulien Adema and Remco de Mik

Fairs & Events

ENR Renewable Energy Expo Lyon, France	19 - 22 February 2013
EGU General Assembly Vienna, Austria	7 - 12 April 2013

Passion for Precision

Kipp & Zonen is the leading company 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 systems.

We promise our customers guaranteed performance and quality in; Meteorology, Climatology, Hydrology, Industry, Renewable Energy, Agriculture and Public Health.

We hope you will join our passion for precision.

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