New ASI-16 All-Sky Imager

An advanced observation tool for cloud monitoring.

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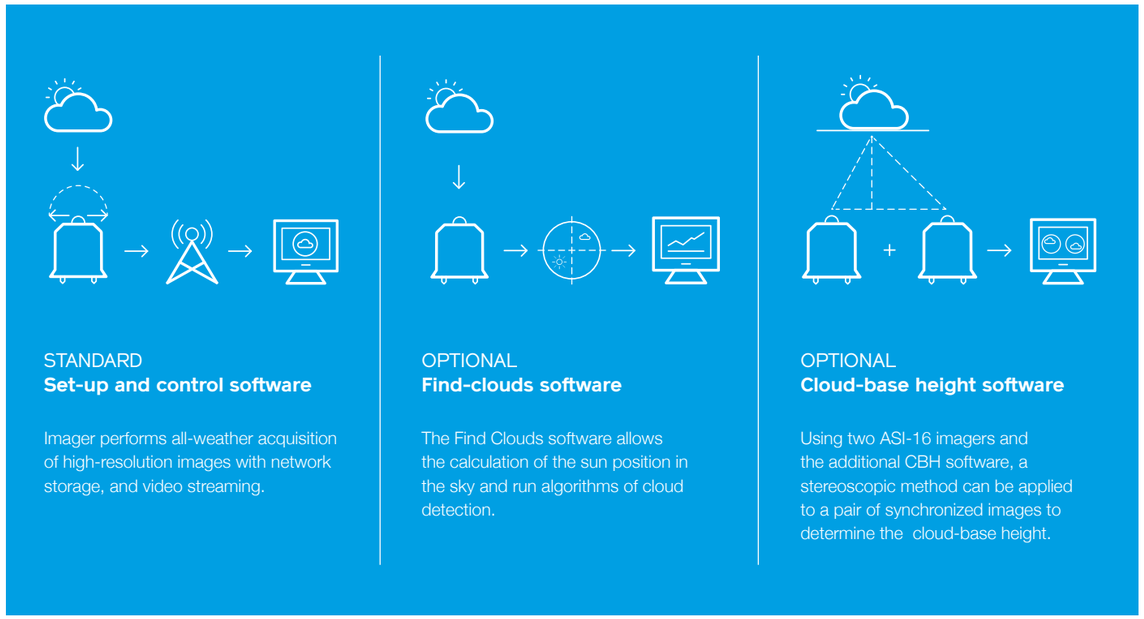
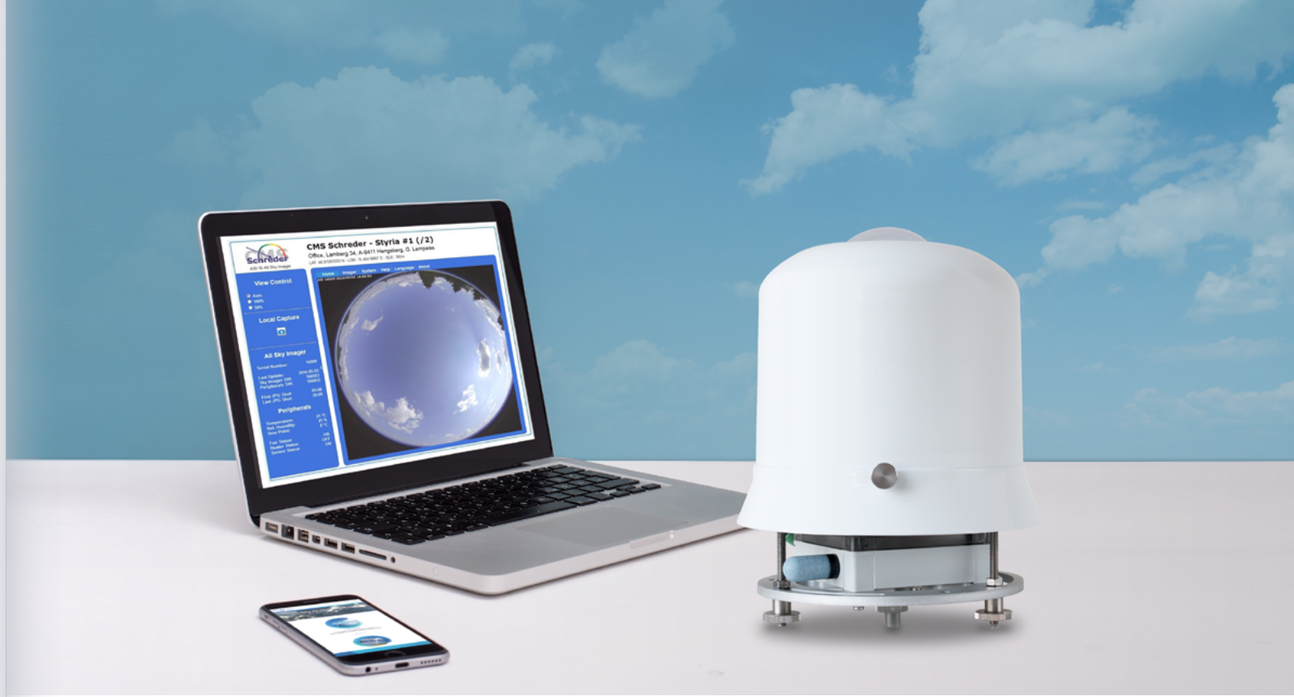
Beyond Accuracy.

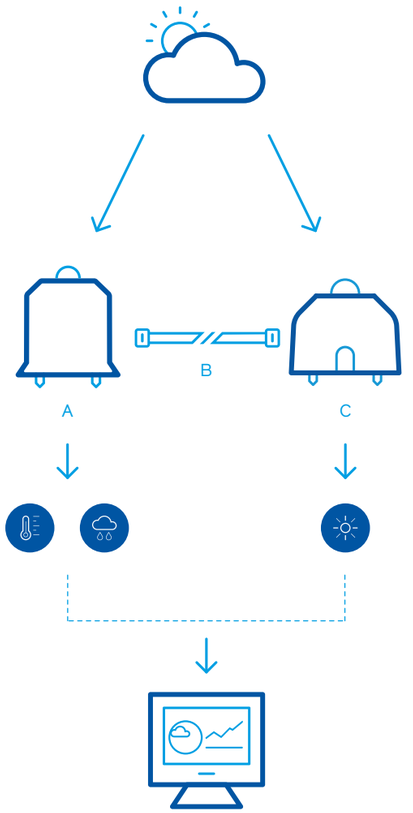
New eyes on the sky are in demand in order to optimize and forecast the energy output from solar power plants.

All weather solutions to monitor clouds are becoming one of the most desirable solutions for many environmental and energy applications. Solar irradiance monitoring is commonly performed in installations for solar PV performance evaluation, however, to forecast the amount of energy that solar plants will produce in the short term, more advanced monitoring tools are needed. With the new ASI-16 All Sky Imager, EKO offers an advanced solution for cloud monitoring. Designed to withstand all weather conditions, the ASI-16 All Sky Imager features a digital camera and fish-eye optics with a 180° field of view assembled under a robust coated quartz dome, avoiding sensor degradation due to direct exposure to the sun and allowing the automated acquisition of high dynamic range (HDR) images of the hemispherical sky. Different environmental conditions can be experienced depending on the site location. The standard ASI-16 Sky Imager is capable of operating under harsh environments from temperatures as low as -40°C up to 50°C, with an integrated ventilation and heating system, which also prevent condensation on the dome surface and promote the fast removal of raindrops and snow. Furthermore, the imager is powered over ethernet (POE), with a durable and waterproof cable.
Environment temperature and humidity sensors are also incorporated in the device, and with the possibility of connecting an irradiance sensor via Modbus communication protocol, the synchronous data acquisition of several weather parameters is simplified, removing the need of having an independent datalogging system, facilitating the instrument deployment on site.
The users can have full control of the imager to perform settings, data acquisition, visualization, and storage, with a web browser-based manager with live video stream and network storage.
The Sky imager is complemented with the Find Clouds software, in which the images acquired with can be processed to classify cloudiness. Using different algorithms to calculate cloudiness, the cloud analysis software, allows the calculation of the sun position in the image as well as to run algorithms such as the blue/red and blue/green channels ratio (BRBG), and the cloud detection and opacity classification (CDOC), to quantify cloudiness on the image set. Further characterization of the clouds can be achieved by determining the clouds base height (CBH), allowing the possibility of estimating the shadows casted by the passing clouds. Using a stereoscopic method, the CBH can be measured with two ASI-16 Sky imagers, where an additional Cloud Base Height software is available to process time synchronized images of two imagers set up at nearby locations.
The features and tools provided with the ASI-16 All Sky Imager make it an innovative solution for cloud monitoring. As additional software tools are under development, more features for this imager are coming soon.

Below: The ASI-16 comes with a standard camera-control software and two optional integrations.







On the left : the new ASI-16 imager can now be connected to the compact MS-80, combining measurements of temperature, humidity and irradiance.

A. ASI-16 all-sky imager
B. MODBUS communication
C. MS-80 Pyranometer

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