Princess Elisabeth Antarctic base, Antarctica

MOBOTIX

CASE STUDY

MOBOTIX Camera Helps Researchers On Antarctica

Temperatures ranging between -40°C and -5°C, storm wind speeds of more than 100 km/h, constant daylight during summer and darkness during winter. This must be Antarctica. This is where the Belgian Princess Elisabeth Antarctic base is situated, the first "zero emission" polar research station which was designed, built and operated by the International Polar Foundation (IPF). Since the station went into service on February 15, 2009, it has been already hosting a multiple of scientific projects by Belgian and foreign scientists in geology, geodesy, biology, air chemistry, and climate research.

MOBOTIX Monitors State Of Research Instruments At Zero Emission Station

At this station a MOBOTIX Allround M24 camera helps researchers of the HYDRANT project to monitor the instruments they work with to get comprehensive measurements of the hydrological cycle of Antarctica. The project focuses on studying the atmospheric processes: it looks at the transport of the water vapour, formation of clouds and precipitation, snow accumulation, and meteorological conditions behind. The goal of the HYDRANT project is to have continuous observations of both meteorology and cloud properties, which then will be used to validate regional climate models. Thus cloud instruments were installed for the long-term operation which monitors the cloud and snow fall properties and meteorology all at the same time. "The final goal of the project is to contribute to understanding the current and future evolution of the Antarctic ice sheet and its contribution to sea-level changes," says project scientist Dr. Irina Gorodetskaya of K.U. Leuven. "There is a lack of data on the clouds and precipitation processes in the Antarctic, which are important for the ice sheet surface mass balance. With this project, we want to establish a database that can be used for an in-depth model evaluation".

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Camera Shows Weather Changes

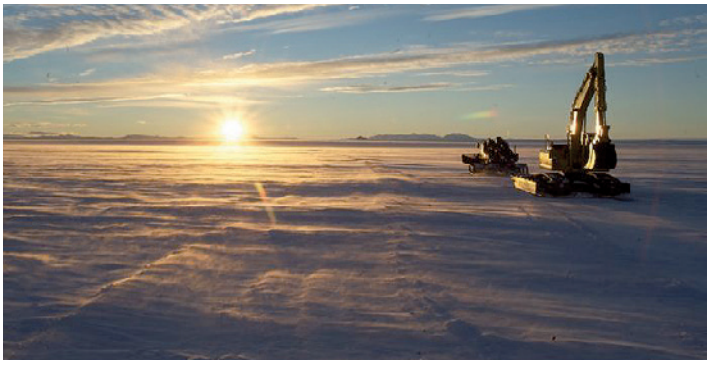
As the Princess Elisabeth Station is a zero emission station Dr. Irina Gorodetskaya was looking for a camera that could work at low cost and low maintenance. Irina Gorodetskaya: "The idea of the station is to do scientific measurements using as low power consumption as possible. Furthermore the station is unmanned during winter. At that time we do the monitoring remotely from Belgium or any other country that is involved. So the instruments have to be working fine during the period when there is no one there. This is when the MOBOTIX camera helps us".

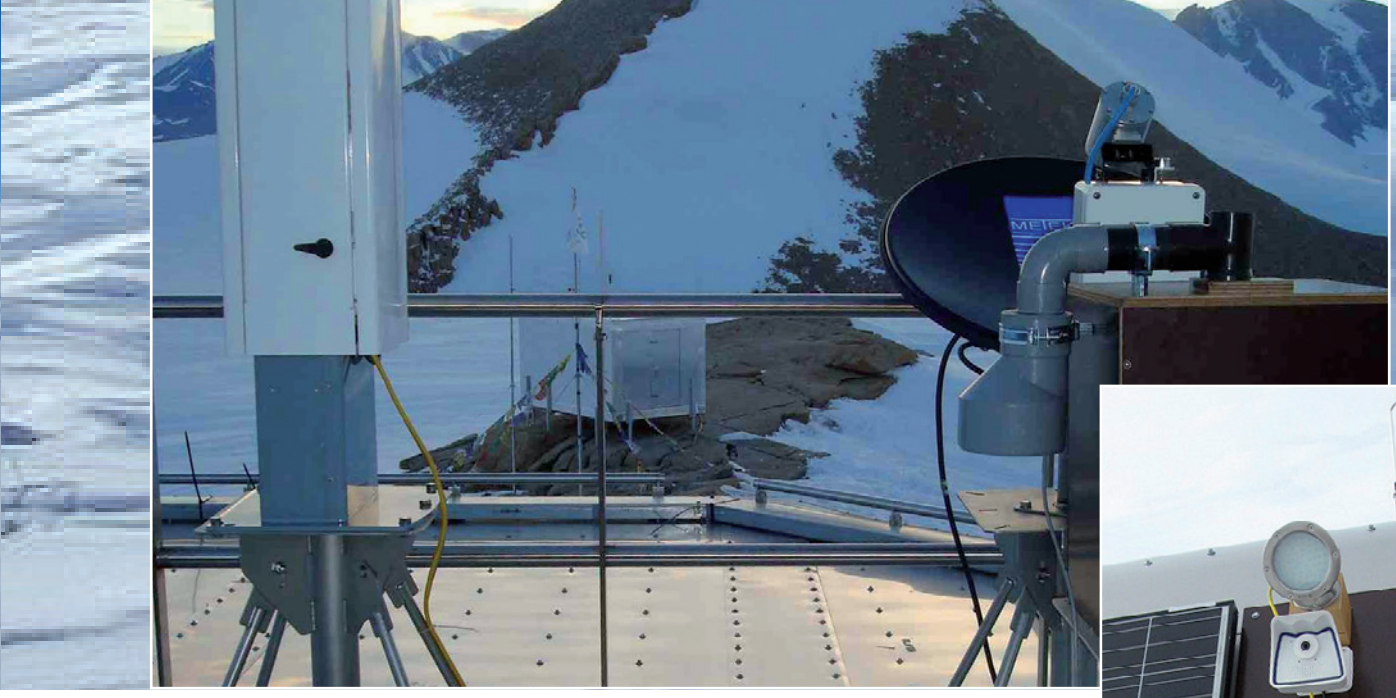
Complimentary Function:
The Camera Shows Weather Changes

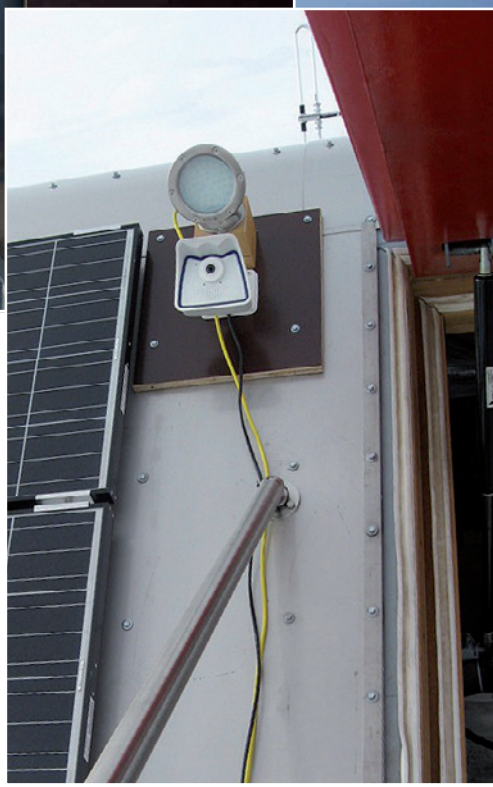
But besides monitoring the instruments and checking the state they are in the MOBOTIX camera also has another function. The camera gives complementary information about the environment. It shows how the weather changes: how the cloud types change, if there is precipitation, if there is blowing snow during clear skies, etc. "From our instruments we can determine the cloud height and cloud temperature but it is difficult to determine the type of clouds. The camera helps us analysing this when we are not there.

"We have wide - 180 degrees - angle images. We can see the sky, the cloud types, the weather, the mountains and then we can also see if the instruments are covered with snow or not. During May-July there is complete darkness at Princess Elisabeth site, the so called polar night. That is why we have installed a spotlight that illuminates the instruments in winter so we can see the state they are in. For example: the radar that is made to detect the snowfall is sometimes covered with snow, which is then blown away by the wind. When snow accumulates on it the signal changes. So if we would not have the camera monitoring we could not check if the strange signal is due to the snow cover or because the radar is damaged. We can also see if there is blowing snow or precipitation as the white snowflakes are illuminated by the spotlight."

In addition to monitoring the instruments and weather the camera also films the beautiful natural phenomenon Aurora australis (also known as the southern lights and southern polar lights) now and then. These are magnificent displays of light that appear in the Antarctic skies in winter. Even though the camera







Stand Up To Extreme Weathers

cannot capture the light of this distant phenomena, it shows spectacular movements (e.g., see http://ees.kuleuven.be/hydrant/results/index.html#animation).

In winter temperatures at the station drop to -40 °C. These extreme temperatures, combined with storms, are a real challenge for people and technology. Here the MOBOTIX cameras can prove their efficiency and skills. MOBOTIX cameras have no mechanical parts for lenses or movements. The absence of mechanically moving parts minimizes maintenance, expands the usable temperature range, improves overall reliability of the total system and operating costs.

"We are really satisfied about the MOBOTIX solution. It is a robust camera with low-maintenance and it is weatherproof", Irina ensures. "This type of camera has been recommended by our colleagues at University of Cologne, who are employing several of such cameras at Zugspitze high mountain observatory. The camera was working perfectly from the beginning of its installation in Antarctica and we receive good quality images. It can also see far enough, when the sky is clear it can reach more than 1 km. Also technical support was satisfying, we ordered the camera very last moment and it was delivered very fast.

The decentralized processing and storage in the MOBOTIX camera also reduce the required bandwidth to a minimum and significantly cuts system costs. The camera is integrated into the station's LAN and provides real-time images. A picture is taken every minute and recorded on a local PC. The images are transferred every 15 minutes to the FTP server of K.U. Leuven. The 1 minute resolution is important to to be able to make high quality videos showing weather conditions and cloud movement.

MOBOTIX – Made in Germany:
Innovative Technology, Reduced Total Costs

The German company MOBOTIX AG is known as the leading pioneer in network camera technology since its founding in 1999, and its decentralized concept has made high-resolution video systems cost-efficient.

Increased Resolution Reduces Amount Of Cameras Needed

1536-line, high-resolution sensors give a better overview and allow users to monitor an entire room with just one camera.

Reduced Installation Costs At Any Distance

Standard Ethernet connection enables the use of common network components such as fiber, copper and wireless (wi-fi).

Intelligent Cameras Reduce The Number Of Recording Devices

The decentralized MOBOTIX concept makes it possible to store data from approximately ten times more cameras to a single storage device than is normally possible.

Event-Controlled Image Format Minimizes Storage Costs

Automatic image adjustment (frame rate, size) based on movement, sound or signal input reduces the bandwidth and storage requirements.

Low Power Costs, No Extra Heating

Anti-fogging without heating allows usage of standard PoE technology to power the system via Ethernet or two-wire cable, saving power cabling costs.

Backup Power Supply Costs Reduced By Over 80 Percent

Low power consumption, approximately four watts, enables year-round PoE (no heating required) with one centralized UPS from installation room using the network cabling.

Robust And Practically Maintenance-Free

Fiberglass-reinforced composite housing with built-in cable protection and no mechanical moving parts (no auto iris) guarantees longevity.

Software For Thousands Of Cameras And Storage Devices Included

The right premium user interface software for every application: MxEasy for compact video solutions, MxControlCenter for professional control centers.

Unlimited Scalability And High Return On Investment

While in use, more cameras and storage can be added at any time; image format, frame rate & recording parameters are camera specific.

Additional Functions And Other Extras Included

Audio support, lens, wall mount and weatherproof housing (-30 to +60 °C; -22 to +140 °F) are included; microphone & speaker available in almost all models.

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