

Report

See in the Dark



See what is hidden to the human eye: the UCM.



The monitor displays the surrounding area.

The new **UCM** thermal imager camera makes invisible infrared radiation visible

A gray-brown blanket seamlessly covers unending grooves and craters. Thick dust absorbs the sunlight. Oversized excavators with their heavy buckets rumble around the mining site like giant toys, scraping off the top layer of rock and freeing the layers of coal. The fossil fuel lies near the surface, making strip mining possible. The world's enormous hunger for coal forces the monster excavators and dump trucks to work non-stop, 24 hours a day, 365 days a year: South Africa is in a rush for resources. More than 28.2 million tons of coal reserves have been verified in the

country, with estimates reaching up to 115 billion tons. South Africa is the world's sixth largest producer of coal and the fourth largest exporter. Mining conditions are favourable: strip mining and shallow depths make the local coal an internationally important export commodity – when the conditions are right. Darkness, dirt, dust and fog rob the sight of the drivers of the giant excavators and 200-ton dump trucks. This is not only dangerous but inefficient. The giant machines must be able to safely maneuver, and excavate and transport the coal. The uncooled **UCM** (uncooled module) thermal imager from Carl Zeiss has been recently integrated into the driver's compartments in a box no larger than a hand to make



visible what the human eye cannot see. The *UCM* detects minute temperature differences and displays them as a visible image. Uncooled in this sense means that the infrared detector in the *UCM* does not have to be cooled and is immediately ready for use.

The miniature camera features thermal resolution of 0.06° C and optionally displays the thermal images in black/white or false color in real time. The high sensitivity of the 200 g device enables it to generate informative images even when normal cameras are blind: at night or under poor lighting and weather conditions. Unlike x-rays that penetrate objects, the infrared radiation used

by the *UCM* captures the spectral region between 7-14 micrometers and thus even the minutest, invisible thermal differences between every object. A meaningless raw image is transformed into a picture and displayed on the screen. The *UCM* uses so little energy that it can be powered by a battery.

More information at:
www.zeiss.com/innovation