



APPLICATION STORY



Aptomar's SECurus detects oils spills, saves lives and protects ships

FLIR MCT 3000 thermal imaging core crucial component

As the world leader for thermal imaging cameras, FLIR Systems produces a wide variety of thermal imaging cameras that can be used for the most diverse applications. But there's more: FLIR Systems also has a wide range of thermal imaging cores.

Manufacturers of a wide variety of products who want to incorporate FLIR Systems' powerful thermal imaging technology in their own products use FLIR thermal imaging cores. These powerful subsystems provide similar features and functions to those found in some of FLIR Systems' camera products, but with the added advantage that they can be easily integrated into any possible system.

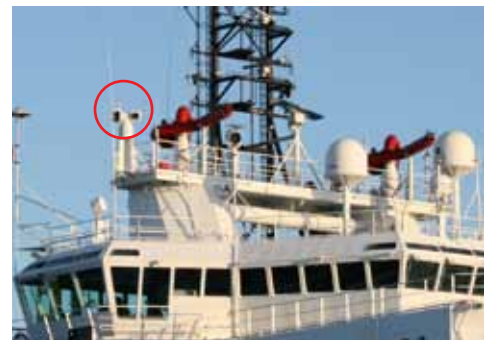
One of the many companies that integrate FLIR thermal imaging cores into their own systems is the Norwegian company Aptomar AS. The Trondheim based company incorporated a cooled FLIR thermal imaging core in its main product: the SECurus system, a high-end situation awareness tool. It is unmatched in the field of oil-spill detection and can also be used for navigation, firefighting, search and rescue operations and for security.

The SECurus system is even mandatory on NOFO class vessels for use on the Norwegian Continental Shelf.

Easy and intuitive

The SECurus system combines advanced stabilized long range and highly sensitive imaging with a unique Electronic Chart System (ECS). For shipboard deployment SECurus provides an interactive touch screen display on the bridge. The SECurus

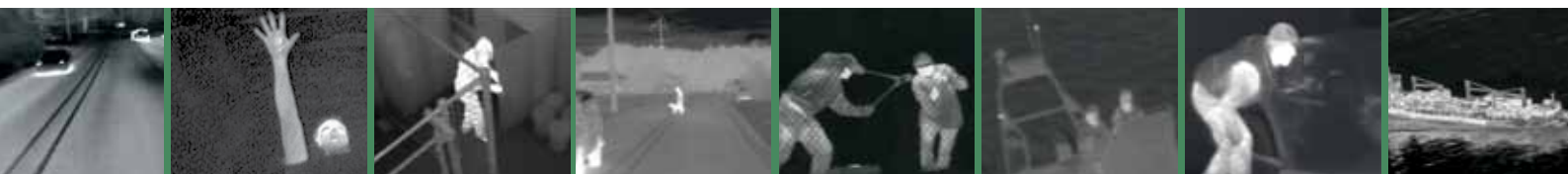
The FLIR MCT 3000 has a cooled, Mercury Cadmium Telluride (MCT) detector that provides highly detailed thermal images.



The SECurus Pointing unit is usually mounted as high as possible for maximum unobstructed view.



The information SECurus collects and integrates is displayed on an interactive touch screen on the bridge.





Lars Solberg, CEO of Aptomar AS, and Jonas Moræus, Chief Research and Development Officer.

Department of Engineering Cybernetics of the Norwegian University of Science and Technology (NTNU) the current CEO of Aptomar, Lars Solberg, designed a platform for a mobile searchlight. That platform formed the basis of the SECurus. "When I had finished the master's thesis I thought that it would be great if I found a way to commercialize my design. Together with some friends we set out to develop a commercial product. Thus both Aptomar AS and the SECurus system were born", explains Solberg.

One of Solberg's friends that co-founded Aptomar AS was Jonas Moræus, currently the Chief Research and Development Officer at Aptomar AS. "We spent two years raising funds and speaking with people in the field that we saw as potential customers. We asked them what type of product they wanted and it soon became apparent that the system needed to work as well at night as during the day."

sea chart integrates many layers of information and presents it on a single display. The touch screen user interface is designed to be very intuitive and easy to use.



The interactive touch screen control unit is very intuitive and easy to use, which allows the user to quickly assess the situation and react.

The system knows the exact geographic position of every pixel in the pictures from both cameras and can project the image onto the map for easy navigation or object recovery. The Aptomar SECurus system has successfully been deployed on the bridges of offshore vessels, floating production units and fixed platforms.

Searchlight platform

Founded in 2005, Aptomar AS actually started out as a master's thesis. For his engineering MSc at the

Advantages of thermal imaging

After comparing several nighttime vision systems, the freshly graduated engineers went for a thermal imaging nighttime vision system. "Thermal imaging has several advantages: it needs no light whatsoever to operate and it's effective at extremely long ranges. As the development of our product proceeded, the thermal camera grew more and more important. Now it's actually the most important sensor in the entire system."

Preexisting radar and AIS data is combined with input from the SECurus stabilized sensor. Standard SECurus sensors include a daylight video camera, a long-range thermal imaging camera and a searchlight. The systems can also integrate input from other devices such as radar-based oil spill monitors, sonic cannons and man-overboard radar beacons.





Even the smallest of details show up on the high resolution thermal images the FLIR MCT 3000 thermal imaging core produces, even at long ranges.



The FLIR MCT 3000 can detect small vessels at a distance of no less than 12 kilometers.

‘FLIR: a good long term partner’

But in the decision it wasn't just the core's performance that's important, according to Moræus. "Before we started doing business with FLIR systems we compared several suppliers. Some of the other suppliers were very reluctant to give us the documentation we required, but FLIR Systems immediately gave us all the documentation we needed. Every detail of the core was well documented; it really was an open book."

"The technical support we received was also very good", continues Moræus. "During the entire integration process we received

all the support we needed. If you combine that with the fact that any new cores that are released in the future will be about 90% compatible with our system, and therefore very easy to integrate, it's not surprising that we see FLIR Systems as a very good long-term partner."

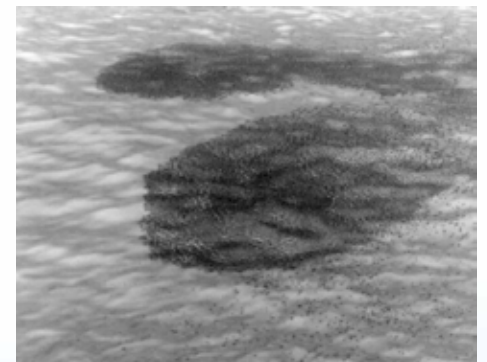
Core performance

But although the reliability of FLIR Systems as a long term partner was very important for their decision, it was the performance of the FLIR MCT 3000 thermal imaging core that in the end persuaded Moræus and his colleagues. "The conversation with potential customers had revealed that oil detection would be a very important market for us, so we needed a thermal imaging camera sensitive enough to be used for oil detection."

Seeing oil film thickness

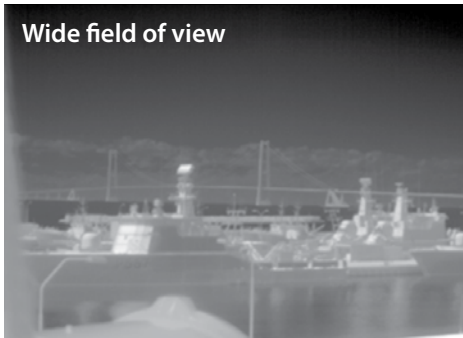
"Thermal imaging cameras create an image based on minute temperature differences", explains Moræus. "The FLIR MCT 3000 detects temperature differences as small as 18 mK (0,018 °C). Thanks to this

high sensitivity the SECurus system can not only be used to detect oil spill, but also to estimate the oil film's thickness. That's very important because you have a very limited amount of time to collect the oil", continues Moræus. "To be able to recover as much as possible in a short amount of time it is very important to detect the thickest parts in the oil, because that information allows

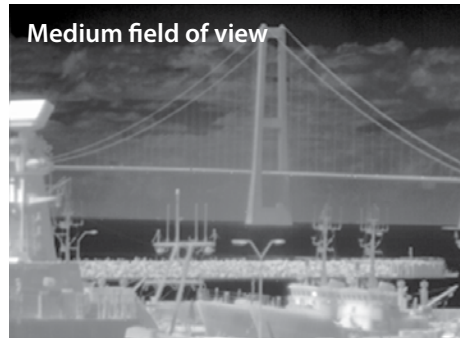


The highly sensitive FLIR MCT 3000 allows the SECurus to detect oil film thickness.

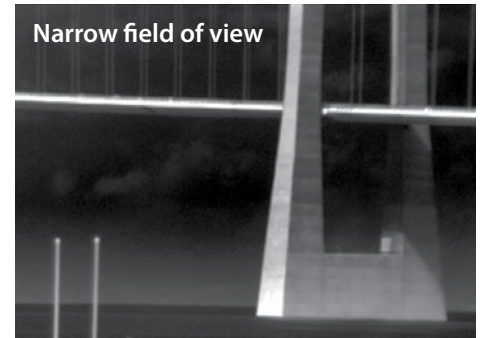




Wide field of view



Medium field of view



Narrow field of view

The MCT 3000 switches between 3 different fields of view within a fraction of a second.

you to prioritize. The rule of thumb is that 90% of the oil volume takes up 10% of the visible area. Thanks to the highly sensitive FLIR MCT 3000 thermal imaging core the SECurus system is the only system on the market that can locate that 90% oil volume."

With the high resolution and sensitivity of the FLIR MCT 3000 thermal imaging core the SECurus system can detect oil from a distance of 4 kilometers and the fact that it needs no light whatsoever to function allows the oil recovery to continue during the night.

The MCT 3000 produces crisp thermal images of 640 x 480 pixels on which the smallest of details can be seen. The MCT 3000 is equipped with three different fields of view. This offers excellent situational awareness while also giving the possibility to have a closer look at suspect activities once they are detected. The MCT thermal imaging core produces a clear image in total darkness. Unlike other technologies thermal imaging cameras do not need any light whatsoever to produce a crisp image. The MCT 3000 can also see through smoke, dust and light fog.

Thermal imaging camera is crucial

"But important as oil detection might be, it is but one of the many possible applications of the SECurus system", continues Moræus. "It can also be used for firefighting, search and rescue operations, security and anti-piracy. But in all of these applications the thermal imaging camera plays a crucial role."

Extremely good range performance

Due to the very good long range performance of the FLIR MCT 3000 thermal imaging core the SECurus system can pick up a person floating in the water at a distance of over 3 kilometer. Other vessels can be detected at extremely long ranges. A small 2.3 x 2.3 m vessel can be detected at a distance of no less than 12 kilometers.



Integrated thermal images and GPS data allow the oil recovery teams to plan their actions quickly and effectively.



The SECurus' built-in search and rescue patterns can take wind, current and vessel speeds into account.

The FLIR MCT 3000 thermal imaging core used in the SECurus system is equipped with a cooled, highly sensitive Mercury Cadmium Telluride (MCT) detector. A thermal imaging core with a cooled detector offers the advantage that it can see and detect potential hazards much further away than an uncooled detector. But there is more. Objects which are at a close distance can be seen with much more detail.

Since the launch Aptomar AS has sold 25 SECurus systems to enterprises including Edison Chouest, Siem Offshore and Simon Møkster Shipping with their rescue vessels in national and international waters, as well as to the seismic services provider PGS for operations off the west coast of Africa.

For more information about thermal imaging cameras or about this application, please contact:

FLIR Commercial Systems B.V.
 Charles Petitweg 21
 4847 NW Breda - Netherlands
 Phone : +31 (0) 765 79 41 94
 Fax : +31 (0) 765 79 41 99
 e-mail : flir@flir.com
 www.flir.com