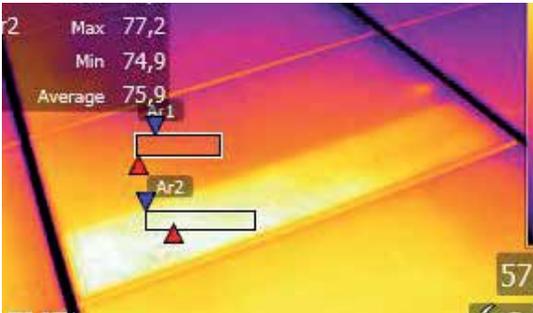
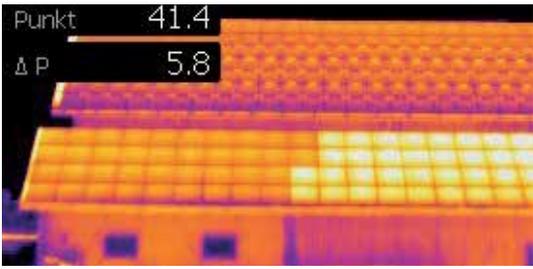


# Thermal News



Swiss solar panel specialist relies on FLIR thermal imaging camera to perform fail-proof inspections.



# Swiss solar panel specialist relies on FLIR thermal imaging camera to perform fail-proof inspections.



**Solar panels have proven to be a wise, future-proof investment in terms of economy and ecology. But just like any other technology, failures may occur. Thermal imaging cameras are an ideal for quick detection of those failures. Heinz Simmler, owner of Swiss photovoltaic inspection company Energie Netzwerk, is an avid supporter of this technology.**



The FLIR T420 has a 320 x 240 pixel resolution and a wide array of functionality that makes a thermographer's job a lot easier.

Thermal imaging can provide owners and installers of solar panels an indispensable look at the interior of solar modules and the construction of the photovoltaic system. Defective cells, junction boxes, cables, inverters or incorrectly connected modules can be localized with high-resolution thermal imaging cameras. Energie Netzwerk, based in Bachenbülach, Switzerland, is specialized in photovoltaic thermography and a certified inspector according to the construction and electrical thermography standard EN ISO 9712.

"After gathering many years of experience with the installation and construction of solar panels for a large company, I decided to start my own company with a partner in 2014," says

Heinz Simmler. "Before that, I had already worked with the company Emitec Messtechnik AG, a consultancy firm and distributor of FLIR cameras. This is how I got acquainted with the power of thermal imaging. And when it was time to buy a thermal imaging camera ourselves, there was no question about it that we needed a FLIR camera."

## **Solar panel inspections**

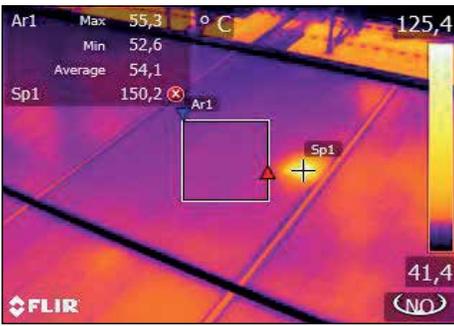
There are usually three situations in which people require thermal imaging inspections, according to Heinz Simmler: "First of all, at the time of installation, people want to be sure that everything works. A fully operational solar panel will allow the installer to provide a quality certificate. Secondly, there can

be a problem with the installation, something that becomes apparent due to reduced output. Thirdly, before the warranty ends, a customer usually wants to know whether everything is still in order."

## **Shadows result in reduced output**

A solar panel consists of several photovoltaic cells. Whenever one or more of these cells are not working properly, a thermal imaging camera will pick this up in the form of temperature differences. This will allow the owner and the installer to become aware of reduced yield and to take the appropriate measures.

"A frequent problem is reduced output as a result of shadows," says Heinz Simmler. "Even a flower that casts a



A thermal imaging camera will pick up cell defects as hot spots, which can cause damage to the solar panel in the long run.



The Bluetooth headset allows you to insert voice comments on a picture. It's so easy to add a comment to a picture, such as 'third row, second panel from the left'.

shadow on various solar cells can result in 30% less output in these cells. The result is also that these solar cells will become hotter, which is not very healthy for the installation in the long run."

When an equal amount of sunlight is cast on all solar cells, they will all produce an equal amount of current. When a certain amount of cells is overshadowed, for example by a chimney, they will produce less current. Still, the current of the neighboring cells that are not overshadowed needs to pass through these less active cells. The current that is pushed through these cells will make them heat up. A thermal imaging camera will pick this up as hot spots, which can cause damage to the solar panel in the long run.

### FLIR T420 camera and lenses

In 2014, Energie Netzwerk purchased a FLIR T420 for use during its photovoltaic inspections. This thermal imaging camera has a 320 x 240 pixel resolution and a wide array of functionality that makes a thermographer's job a lot easier. As a complement to the standard



Heinz Simmler: "When it was time to buy a thermal imaging camera ourselves, there was no question about it that we needed a FLIR camera."

camera outfit, Energie Netzwerk also purchased an additional 15° telescope lens and a 45° field of view lens.

The 15° lens is a popular lens accessory and provides almost 2X magnification compared to the 25° lens. "This lens is ideal to do your thermal inspections from a distance or when you need to inspect a roof from the ground floor," says Heinz Simmler. "The 45° lens is ideal when you are on a roof and you don't have a lot of room to maneuver."

### Multi Spectral Dynamic Imaging (MSX)

FLIR Systems recently added its Multi Spectral Dynamic Imaging (MSX) technology to every camera of its preventative maintenance range. This new feature produces an extremely detail rich image and produces better texture in a thermal image. Thanks to MSX more anomalies can be detected, analyses can be done more detailed and conclusions can be drawn in a split second.

The addition of MSX has also been a success for Heinz Simmler: "MSX lets you see exactly in which cell of the solar panel there is a problem. This is not only important for us; it's also a way for us to show the customer where the problem is and what we need to do about it. I use the MSX functionality a lot. I also include MSX footage in my reports."

### Ease of use

Next to MSX, the FLIR T420 camera also has other useful features that make the job of the solar panel thermographer easier. The annotation functionality for example is something that Heinz Simmler frequently uses. With this feature, it is possible to add voice

comments via a Bluetooth headset.

"This has proven to be a useful feature for me, especially when you are out there on a roof looking a dozens of solar panels. It's so easy to add a comment to a picture, such as 'third row, second panel from the left'. No need to bring an additional paper set or a tablet to make notes."



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