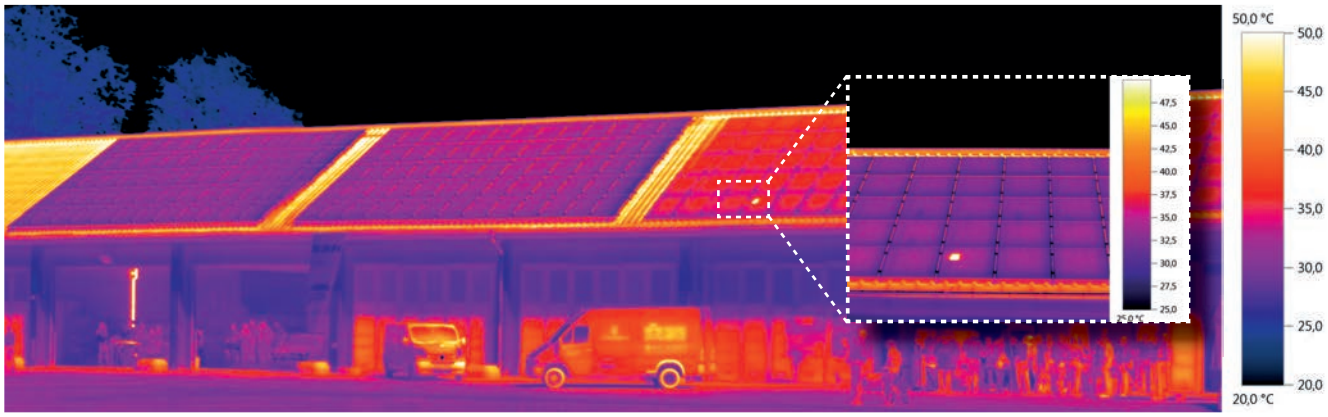
Testo Solution
Example application

We measure it. testo

Ensuring the efficiency of solar parks with thermal imagers from Testo.

In order for large photovoltaic plants such as solar parks to break even quickly, it is important that they work with as few malfunctions, and with as optimum a degree of effectivity as possible. Even the smallest malfunctions can have dramatic mid- and long-term consequences. For this reason, an efficient and through servicing of these systems, and also maintenance as a service, take on particular significance. In order to guarantee this, those responsible on site are reliant on suitable tools.

A thermal imager is a non-contact measuring instrument, and is ideal for testing solar modules. If a cell in a solar module ceases to function, it can no longer convert the sun's energy into electrical current, and therefore heats up disproportionately due to solar irradiation. The thermal imager visualizes these anomalies quickly and easily thanks to so-called hot spots. This allows the malfunction to be remedied as quickly as possible.



Panorama image of the photovoltaic system and detailed analysis with the telephoto lens.

The challenge.

Monitoring large photovoltaic systems is very time-consuming, as these can often cover several hundred square metres. One possibility for solving this problem would be to simply make thermographic measurements of the system from a greater distance. However, there is then a danger of missing smaller anomalies because the resolution of simpler thermal imagers is insufficient for the chosen distance. This makes it difficult to subsequently carry out a reliable detailed analysis of the thermal images.

A further challenge is the intensity of the solar irradiation. If the radiation is too low, (e.g. 500 W/m^2), a malfunctioning cell is hardly visible as a hot spot in the thermal image. In addition to this, thermal images in which the same object was recorded at different times, are extremely difficult to compare when the respective solar irradiation intensity is unknown.

It is often also necessary to measure directly on the module. Under certain circumstances, it is necessary to record a large number of images. A result of this is a considerable administrative effort for the management of the measurement results and the creation of reports. it is therefore all the more important to find a solution which allows fast, secure and thorough work.

The solution.

Thanks to the visualization function in the thermal imagers testo 885 and testo 890 in practical camcorder design, with a large rotatable display, hot spots can be quickly and easily identified on site. The large field of vision of the imagers allows larger system components to be recorded thermographically at once. A further practical benefit for large-scale measurement objects is the panorama image function. It allows the creation of a coherent thermogram consisting of up to 3 horizontal and 3 vertical thermal images for the purposes of an overview measurement. Thanks to the good detector resolution of the two imagers (testo 885: 320 x 240 pixels / testo 890: 640 x 480 pixels), you can record objects thermographically even from a great distance. For example individual cells of a solar module. These have a size of 10 x 10 cm and can be measured accurately and reliably at a distance of 30 metres by the testo 890 with a wide-angle lens. Hot spots are already identifiable at this distance from a size of approx. 34 mm. In order to be able to examine the measurement object in even more detail, we recommend the use of the telephoto lens. This allows defects such as cracks or contamination to be detected, since anomalies are already identifiable from a size of approx. 12.8 mm. This enables reliable detailed analysis and fast localization of the source of the malfunction.

SuperResolution: Four times more measurement values

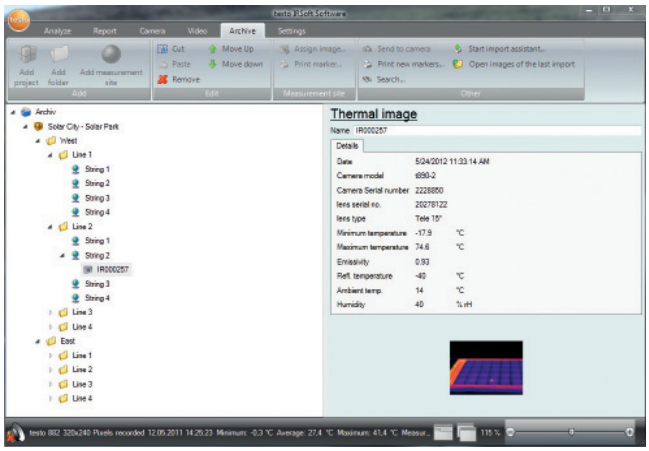
With the SuperResolution technology, you improve the resolution of your Testo thermal imager by one class. The patent-pending innovation from Testo uses the natural movement of your hand, and records several images, slightly offset to each other, one after the other in the shortest possible time. These are then calculated into one image using an algorithm. This produces a thermal image with four times as many measurement values. In the subsequent analysis using the professional analysis software IRSoft developed by Testo, thermal images in sharper focus are then available to you. This means you never miss a thermal anomaly. If you would like to learn more about Testo SuperResolution technology, simply order the brochure.

Solar mode: Easy comparison of thermal images

In regular inspections or when contrasting different thermal images of the same object in order to identify malfunctions, it is important that the recorded thermal images are comparable. Above all, the comparability of the respective solar irradiation intensity is crucial. There is a considerable difference whether a photovoltaic module is recorded thermographically at 500 W/m² or at 700 W/m². The imager's integrated solar mode offers the possibility of storing this value directly together with the image, and integrating it into the analysis with the IRSoft. This saves you troublesome report creation with paper and pencil, and you also have the certainty that none of the values is confused or lost.

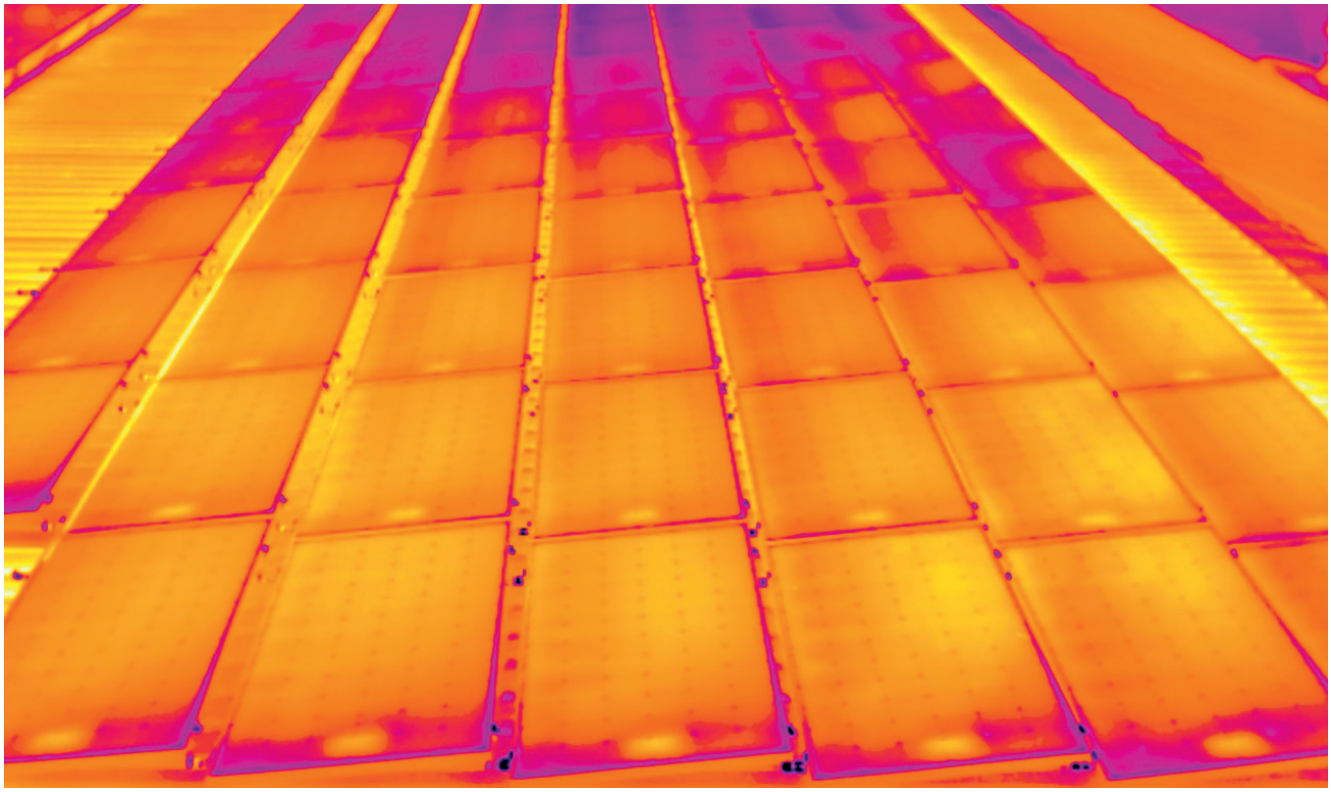
IRSoft: Analyzing thermal images professionally

The analysis software IRSoft is included in delivery with every Testo thermal imager, and allows the fast and easy analysis and processing of thermal images, as well as the convenient creation of professional thermography reports. These reports are ideal not only for your own documentation. Your customers, to whom you are providing photovoltaic system testing as a service, also appreciate them as a useful benefit.



SiteRecognition: Measurement site recognition with automatic thermal image management

In order to support you in regular measurements directly at the module, Testo offers the innovative function SiteRecognition. You can use it to create a measurement site archive in the IRSoft software which serves as a database for your thermal images. For every measurement site stored in the archive (e.g. mounting systems or strings), you can create markers (small symbols similar to QR codes), and attach them on site. In the next inspection, you simply record this marker with the SiteRecognition assistant of the imager, the measurement site and the corresponding information are then automatically stored together with the thermal imager. When you transfer these thermal images to the analysis software after the measurement, they are then fully automatically sorted into the archive. There is no longer any need for time-consuming adminstration and archiving. You can then conveniently open the images from the archive, and analyze and process them in reports.



With testo thermal imagers, you can:

- Efficiently ensure the operational security and best possible degree of effectivity of solar parks
- Quickly and easily administer thermal images
- Carry out not only overview maintenance, but also detailed inspections precisely and securely.

More information.

More information and answers to all your questions concerning thermography at www.testo.com.

Thermal imager testo 885

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