



TECHNICAL NOTE—Image Enhancements

CAPTURING RICH IMAGE DETAILS WITH FLIR CAMERAS

FLIR PATENTED MSX® TECHNOLOGY ALLOWS FASTER AND MORE DETAILED THERMAL INSPECTIONS

Being able to share camera images with your customers or coworkers is a great benefit of thermal imaging technology. However, a thermal image alone is not always enough to help them understand what they are seeing. For that reason, FLIR Systems developed the MSX® Multi-Spectral Dynamic image mode. MSX imaging brings together both the visual and thermal spectrums in a striking, innovative way. The technology is now onboard most of FLIR's thermal cameras for the industrial and building market. MSX instantaneously generates a definitive, all-in-one thermal picture that easily orients you to the location of the problem as soon as you see it on the screen or in a report. With the FLIR format you'll save all images (MSX, thermal and visual) in one push of a button.

Key details apparent to the naked eye like numbers, labels, signage, and structural features can get lost in a regular thermal image, often requiring a separate digital photo to reference the location of the temperature issue you have found. A regular thermal image only displays heat signatures, which can cause details to get lost in the haze if they present a similar temperature. To overcome this, FLIR cameras with MSX use an internal digital camera to enhance the thermal image. The high-contrast skeletonized visual image allows for key aspects of the visible spectrum to be overlaid on top of the thermal output, while still keeping the important thermal information prominent. Consider the elbow connectors (images at the right) for example. Through the thermal camera you can see that one of the connectors is hot, and with your own eyes you can see a label identifying each connection on the panel. But the ink on those labels is going to have the exact same temperature as the sticker they are printed on, so your thermal imager will not differentiate between them. With MSX on the other hand this is clearly visible in the image.

THERMAL IMAGE PLUS HIGH-CONTRAST VISUAL DETAILS

MSX technology extracts high-contrast details from the images taken by an onboard visible light camera, and etches or superimposes them onto the thermal images that the camera is taking. This all happens in real time, so what you see onscreen is a super sharp image that allows you to make out unprecedented details in the image.

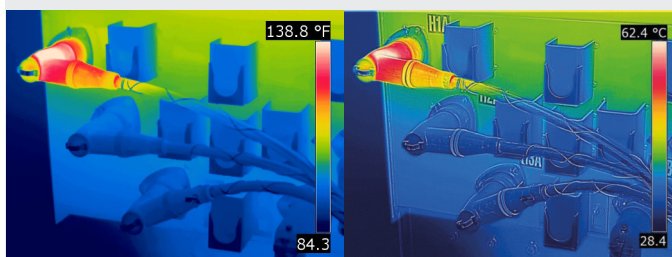
MSX uses visual data from a digital camera built into several models of thermal cameras for the industrial and building markets. Internal software then analyzes the image from the cameras to super-impose the key aspects of that visual world onto the thermal image. The visual spectrum never blots out the thermal side of things, making sure that all information is still at the highest level of accuracy.

MSX BENEFITS

MSX ensures easier target identification without compromising

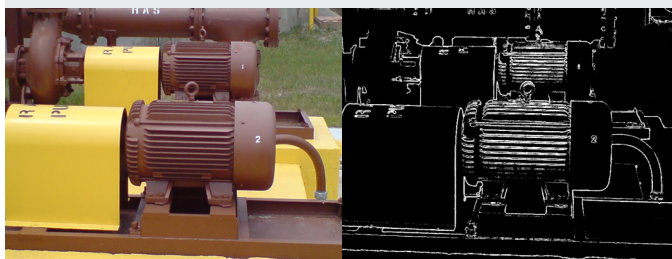


The FLIR E85 with the innovative Multi Spectral Dynamic Imaging (MSX) feature.



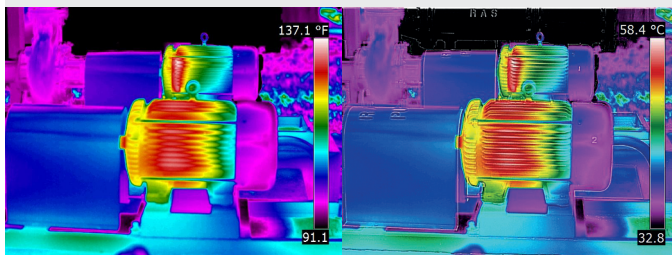
Thermal image without MSX

Thermal image with MSX: As compared to standard thermal images, MSX technology allows for the additional detection of important details.



Visual image

Visible detail extracted



Thermal image

Thermal image with MSX. Note the legible motor numbers.

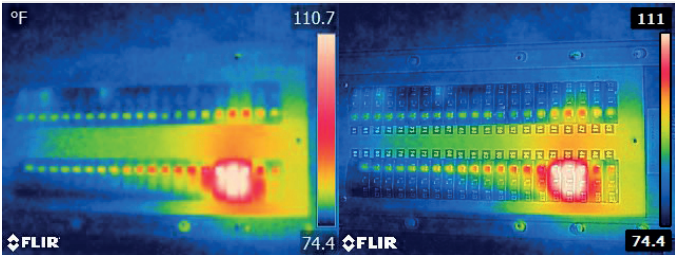
radiometric data and the quality of the thermal images is excellent. Thanks to MSX, thermal images look sharper, the orientation of the target will be done quicker, the reports are clutter-free and ensure a faster route to solutions. Users can see the results of MSX technology directly on the touch screen of the camera, in real time.

Whether it's presented in person, on a smartphone, or delivered in a report, stunning and convincing MSX images give industrial and building professionals an extra edge to help them tell a much better story, get a faster yes for repairs, and save customers' and companies' money.

MSX TRUMPS TRADITIONAL VIDEO BLENDING, OVERLAY & FUSION

Thermal imaging cameras of the past have featured ways to blend, overlay or fuse a portion of a thermal image into a visible light picture. But these modes have only provided a partial solution and typically take extra time to dial in and interpret. They also tend to limit or obscure the thermal view of the scene.

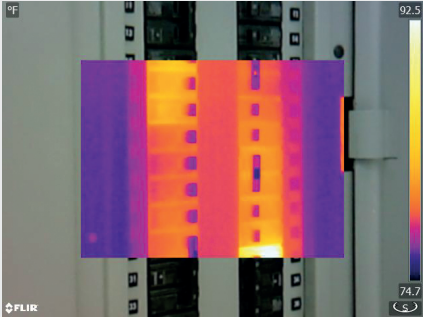
MSX is completely different. MSX technology embosses digital camera detail onto thermal video and stills. Therefore, MSX delivers much better, visible results than traditional methods, which can dilute the thermal image.



Thermal image without MSX Thermal image with MSX, showing more detail.



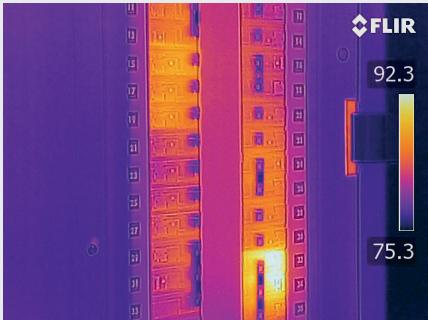
Blending



Overlay (Picture-in-Picture)



Thermal Fusion



FLIR MSX