Thanks largely to the convergence of PC and infrared technology, engineers and scientists now can inexpensively integrate thermal imaging measurements into computer-based measurement and automation systems.

Traditionally, thermal image measurements have been valuable to research and development departments needing exact temperature measurements. Now, with National Instruments software for LabVIEW™ and IMAQ™ Vision, you can easily take thermal measurements on the manufacturing floor.

Infrared Cameras Make Your Application Easier

Infrared cameras measure the reflection of thermal, or infrared, energy that the naked eye cannot detect. Hotter temperatures reflect or radiate more infrared energy, and the cameras measure these differences and display them in varying colors.

Infrared cameras today are well suited to the production line because they have the look and feel of traditional visible light cameras but do not need complicated lighting schemes. They are especially useful in quality control applications. On the production line, you can use them to measure and evaluate products inside opaque packaging or other materials. With National Instruments LabVIEW, you can use a computer to automatically measure thermal images. You can then use IMAQ Vision software tools, such as edge detection, pattern matching, and blob analysis, to test for quality and consistency. For example, if the thermal image of oil inside a compressor (reflecting a darker color than its surrounding material because it has a cooler temperature) does not match a template image stored by IMAQ Vision, the compressor fails and the production line rejects it.

In anticipation of the growing demand for thermal imaging in process control applications, National Instruments offers software for performing thermal imaging with LabVIEW. National Instruments and FLIR Systems Inc., a major infrared camera vendor based in Portland, Oregon, offer thermal imaging add-on software for use with LabVIEW. FLIR Systems cameras work with National Instruments image acquisition hardware, and the appropriate software can be downloaded from `ni.com/vision`

Glossary of Vision Terminology

Analog Camera	A camera that transforms light information into pixels and then outputs an analog video signal.
Blob	Binary large object. A connected region or grouping of pixels in an image in which all pixels have the same intensity level.
Blob Analysis	A series of processing operations and analysis functions that produce some information about the blobs in an image.
Color Matching	An algorithm for matching a color template model with a color sample.
Digital Camera	A camera that transforms light information into pixels and then outputs a digital video signal.

Infrared Camera — A camera that measures the emission of thermal or infrared, energy. Hotter objects emit more infrared energy, and the cameras measure these differences and display them in varying colors.

Pattern Matching — An algorithm for locating a feature within a gray scale image.

Thermal Imaging — Acquiring images of varying levels of heat emission that the naked eye cannot see by using an infrared camera.