

## When, Where, and How.

DICOM calibration is one of the defining characteristics of a diagnostic display. DICOM specifies when, where, and how to calibrate a display. DICOM recommends regular calibration, in the center of the display with a 10% target and 20% gray surround, using a calibrated photometer. When Dome introduced the first medical imaging flat-panel displays, we knew that auto-calibration was a key feature that would dramatically improve display quality and reliability. In 2001, Dome introduced the first auto-calibrating, liquid-crystal, display system.

DICOM calibration required a photometer to measure and characterize the display's behavior. This is the first and most critical step in the calibration process. To perform auto-calibration, we knew we would have to compromise *when*, *where*, or *how* this characterization was done. We believed that *where* and *how* must not be compromised, because that directly affected the display characterization. Instead, we compromised *when*.

Dome use's true DICOM test targets and takes measurements over the full dynamic range with a high-precision, instrumentation photometer. This provides the most accurate characterization of the display possible. The characterization data is then permanently stored in the flat panel, and is always available to be read back and used to perform an instant calibration at any time.

Other vendors choose to compromise where and how the display is characterized, using a tiny front sensor instead of a calibrated photometer and measuring at the very edge of the display, rather than the center. Due to bezel crimping and backlight non-uniformity, the edge of the flat panel is a poor substitute for center measurements. Using a low-precision sensor to take measurements also yields much poorer results. Not surprisingly, front sensor calibration is less accurate and more volatile, but it's hard to know this if the same front sensor is also used for QA and conformance testing as well.



## **Long-term Reliability.**

For our system to work, the display behavior must be stable over time, and it is. Over a decade of research and experience has demonstrated this. A 10-year-old Dome display is still as perfectly calibrated as it was the day it left the factory. The huge advantage of this approach is that the display will always be DICOM calibrated.

Independent data collected by a customer compared Dome displays with over 30,000 operating hours to those that were brand new, and many in-between. They compared 3MP and 5MP displays, as well as color and grayscale displays. The results showed strong conformance no matter the age of the display. Moreover, there was no correlation between the age of the display and the accuracy of the conformance. Liquid crystal displays are remarkably stable over time, and we would be glad to share the data that shows this. It turns out that compromising when to calibrate is really no compromise at all. It gives you the quality of factory-controlled calibration instead of the hassle and variability of calibration in the field.

This is calibration done right. Don't just take our word for it; we encourage you to measure for yourself. If you compare the conformance of a Dome display to any other display on the market, we are confident that you will see our superior calibration. In fact, if you do a full 256-step conformance test, you will not only see our extraordinary calibration, but you can witness the volatility of front sensor based approaches. Measure the Dome display as a base line, then measure another vendor's display and compare. Next run a front sensor calibration and measure the alternative display again. Not only will you see tighter conformance to DICOM on the Dome display, but you will also see the variation caused by front sensor calibration method. That little sensor just isn't up to the job.