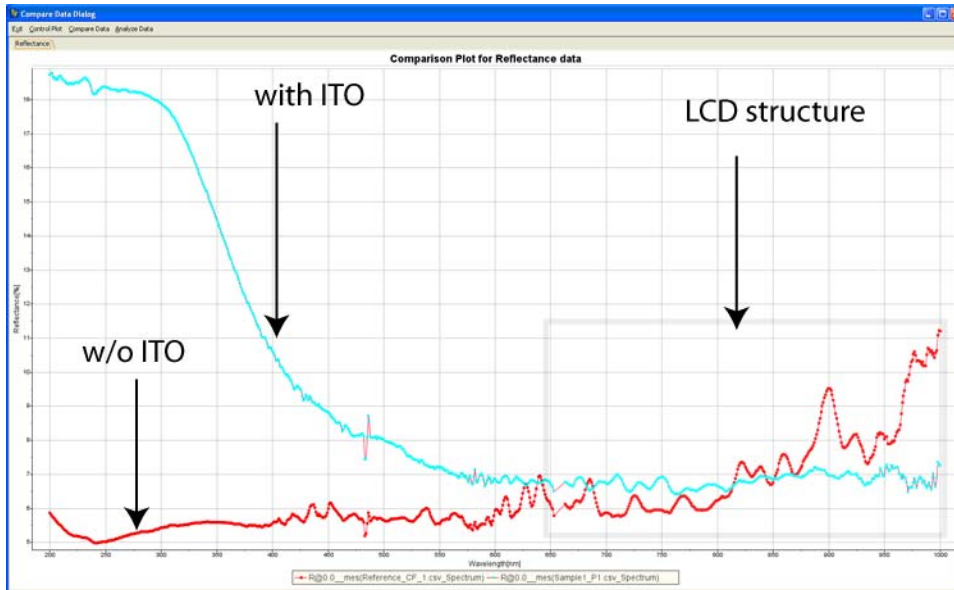




Thin Film Measurement solution  
Software, sensors, custom development  
and integration

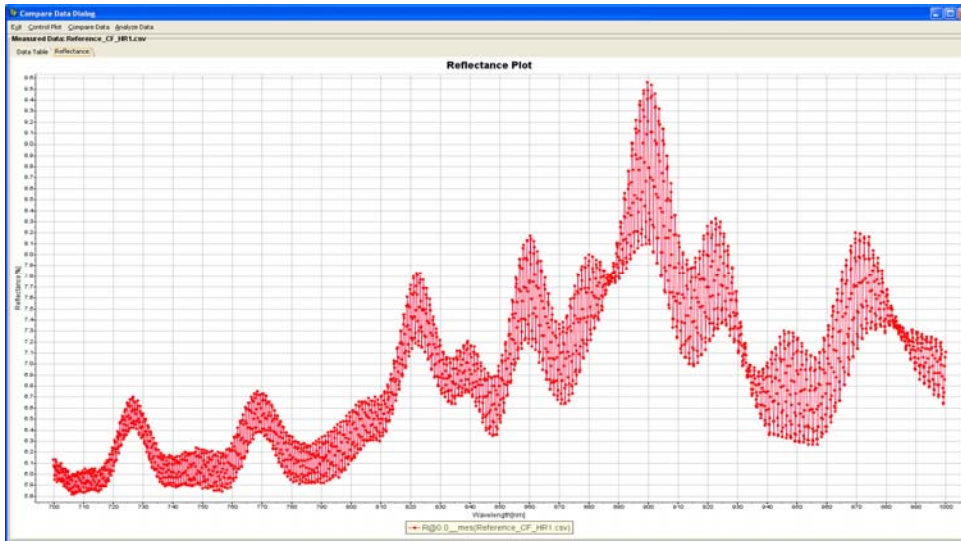
### Measuring Thin ITO on Touch Screen display.

Measuring thickness of thin ITO layer on glass using MProbe system is easy. But what about measuring it on touch screen display with multiple layers underneath? MProbe UVVisSR (200-1000nm wavelength range) was used to measure a thin ITO on touch screen (ITO/ 0.2um glass/RGB filter/LC layer/0.2um glass). Measured reflectance spectra displayed on Fig. 1 show that effect of the ITO layer is very clear at the shorter wavelengths, while LCD structure is appearing in the Vis-NIR range (Fig. 2).

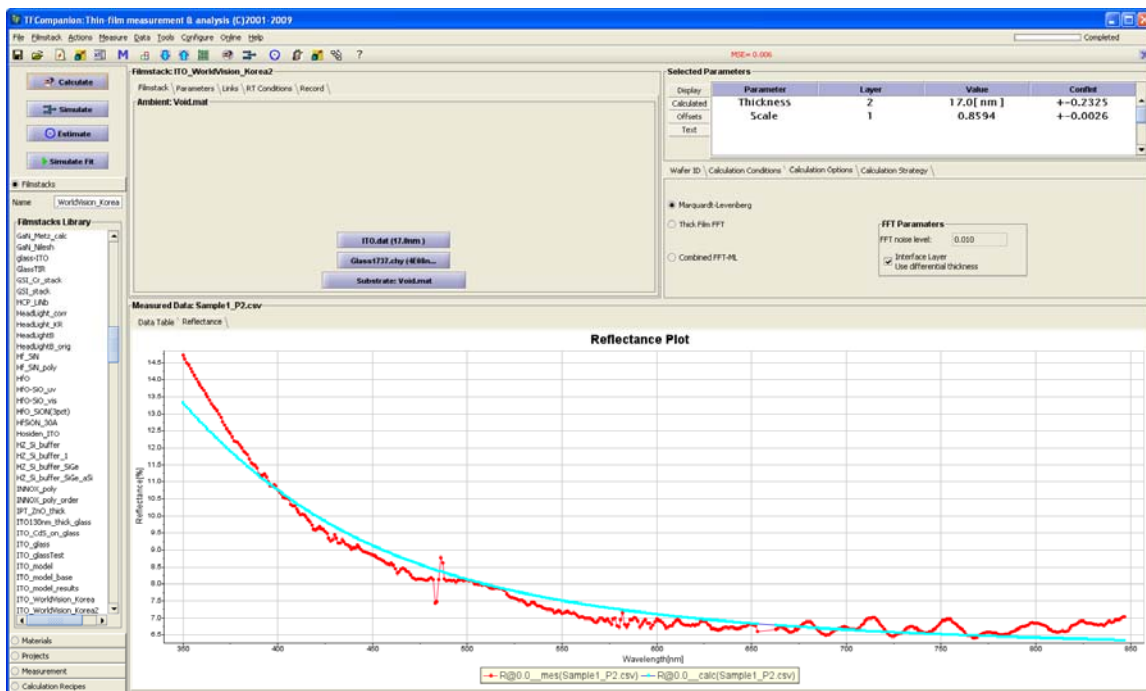


**Fig. 1.** Measured reflectance spectra (200-1000nm wavelength range) of LCD with ITO (blue) and without ITO (red).

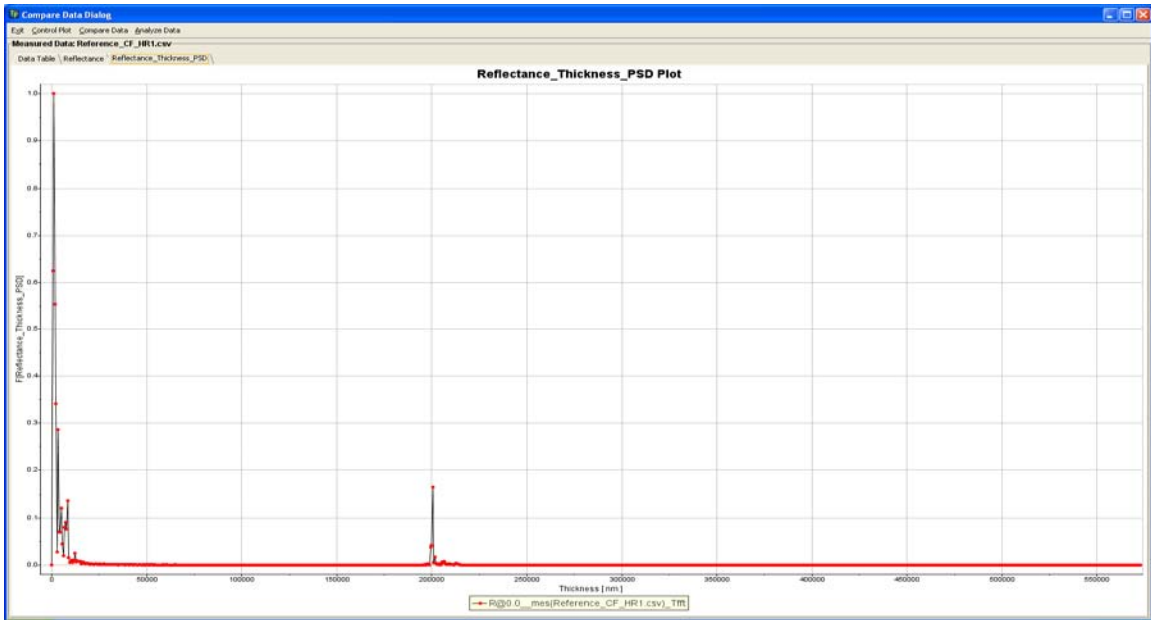
The effect of the underlying LCD structure is relatively small, in part, because the spectrum is smoothed by low resolution (<2nm) of the UVVis spectrum (high resolution spectrum see Fig. 2). This allows to use a simple one layer model ITO/glass/void to analyze the data in order to determine the thickness of the ITO layer (Fig. 3).



**Fig. 2.** NIR part (700-1000nm) of the reflectance spectra (Fig.1) measured with MProbe VisNR system for better resolution (see Fig. 4 for analysis)



**Fig. 3.** Fit of the model to the measured data to determine the thickness (17nm) of the ITO layer. The effect of the LCD structure in the NIR range is ignored.



**Fig. 4** Results of the data analysis of measurement (Fig. 2) – LCD structure. The position of the peaks indicate the thicknesses of the layers: 200  $\mu\text{m}$  (glass), 1  $\mu\text{m}$ , 8  $\mu\text{m}$  and 12  $\mu\text{m}$  (RGB filter, LC layer, interface layer)