Engineer's Office for Applied Spectroscopy

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FTM-Lite++

Programming Library for Film Thickness Measurement on FTM-Lite and TranSpec® Gauges

For developing your own film thickness measurement applications using our TranSpec spectrometers or FTM-Lite film thickness gauges, we provide our powerful and very easy-to-use programming library **FTM-Lite++**.

With FTM-Lite++ the entire spectra data acquisition, like scanning the diode array, raw data averaging, dark current correction and the spectra normalization is fully encapsulated in just a few simple function calls. The measured interference spectra will be evaluated in real-time for either single or double layer film thickness using the same high precise Fast-Fourier Transform (FFT) algorithm as our FTM-ProVis 2000 and FTM-ProVis Lite software packages.

FTM-Lite++ gives you full access to all measured spectra (including the raw data), the computed FFT spectrum and film thickness results and lets you create the so-called Spectra-Recorder files, which can be viewed and re-processed using FTM-ProVis Lite or FTM-ProVis 2000. This way you can easily check all measurements executed with your application and FTM-Lite++.

- Runtime licensed Dynamic Link Library (DLL) providing standard C calls
  Compatible with common C/C++ compilers, Visual Basic and VBA (Excel), LabView, etc.
- Extensive Parameter Checks and Measurement Status Verification
  You hardly can do anything wrong when working with FTM-Lite++
- Detailed User's Manual as compiled HTML file and printed PDF document
- Demo software as Windows console application, including C/C++ source code
- See next page for a programming example!

Technical specifications on next page ►

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FTM-Lite++ • Technical Specifications

October 2007, related to version 1.02, without guarantee, subject to changes.

Minimum Hardware and Software Requirements

- PC with at least Pentium-4
- Windows 2000 or Windows XP **Note:** FTM-Lite++ does not run on Windows NT/95/98/ME
- C/C++ development system (MS Visual Studio recommended), Delphi, Visual Basic or VBA, LabView
- FTM-Lite Film Thickness Gauge or TranSpec Spectrometer with HSL-2 Halogen Lamp
- FTM-ProVis Lite (or FTM-ProVis 2000) software is recommended, but not required

Programming Example

```
// Step 1: open and initialize spectrometer
FTMLITE_SPECHARDWARE sSpecHardwareInfo;
FTMLite_OpenSpectrometer( FTMLITE_TRANSPEC_LITE, &sSpecHardwareInfo );

// Step 2: setup measurement parameter:
FTMLITE_MEASPARA sMeasPara;
sMeasPara.dIntegrationTime = 20.0;      // 20 ms integration time
sMeasPara.bEnableAverage  = 1;          // averaging on
sMeasPara.lNumberAverage = 10;          // 10 scans for averaging
FTMLite_SetMeasPara( &sMeasPara );      // notify settings to spectrometer

// Step 3: perform measurement of an averaged Dark Current
FTMLite_CloseShutter();                 // close shutter of connected lamp
FTMLite_RunMeasDarkCurrent();           // start measurement
FTMLITE_SPECSTATUS sSpecStatus;
FTMLite_GetSpecStatus( &sSpecStatus );  // wait until measurement is done
while ( sSpecStatus.bRunDarkCurrent )
    FTMLite_GetSpecStatus( &sSpecStatus );

// Step 4: perform measurement of an averaged and Dark Current corrected Reference spectrum
FTMLite_OpenShutter();                  // open shutter of connected lamp
FTMLite_RunMeasReference();             // start measurement
FTMLite_GetSpecStatus( &sSpecStatus );  // wait until measurement is done
while (sSpecStatus.bRunReference )
    FTMLite_GetSpecStatus( &sSpecStatus );

// Step 5: setup film thickness evaluation parameter (simple example)
FTMLITE_EVALPARA sEvalPara;
sEvalPara.bSpecEvalRangeFull = 1;       // use entire interference spectrum for evaluation
sEvalPara.bPeakSearchRangeFull = 1;     // search entire FFT spectrum for peak
sEvalPara.dRefIndex = 1.56;             // refraction index of the layer
FTMLite_SetSingleLayerEvalPara( &sEvalPara);  // initialize single layer evaluation

// Step 6: measure and evaluate an averaged and Dark Current corrected interference spectrum
FTMLite_RunMeasInterference();          // start measurement
FTMLite_GetSpecStatus( &sSpecStatus );  // wait until measurement is done
while (sSpecStatus.bRunInterference )
    FTMLite_GetSpecStatus( &sSpecStatus );
FTMLITE_RESULT sResult;
FTMLite.EvalSingleLayer( &sResult );    // evaluate interference spectrum

// Done!  Aside from other information, the structure sResult now contains:
sResult.dThickness      // the film thickness in microns
sResult.bIsPlausible    // thickness seems to be plausible or not
sResult.sDateAndTime    // the date and time (microsecond resolution) of the measurement
```


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