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Ingenieurbüro für Angewandte Spektrometrie

FTM-ProLib++

Programming Library for Film Thickness Measurement

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

With FTM-ProLib++ 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 Professional and FTM-ProVis Lite software packages.

FTM-ProLib+ gives you full access to all measured spectra (including 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. This way you can easily view and check all measurements executed with your application and FTM-ProLib++.

- Runtime licensed Dynamic Link Library (DLL) providing standard C calls
  Compatible with common C/C++ compilers, Visual Basic and VBA (Excel), LabVIEW
- Extensive parameter checks and measurement status verification
  You hardly can do anything wrong when working with FTM-ProLib++
- Supports external I/O module with 8-channel TTL and 4-channel analog out
- 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-ProLib++ Programming Library • Technical Specifications

December 2019, related to version 4.2, without guarantee, subject to changes.

Minimum Hardware and Software Requirements

- Standard PC/Laptop with Windows 7 or Windows 10
- C/C++ development system (MS Visual Studio recommended), Delphi, Visual Basic or VBA (Excel), LabVIEW
- TranSpec or TranSpec Lite Film Thickness Gauge (FTM-ProVis software is recommended, but not required)

Programming Example

```
// Step 1: open and initialize spectrometer
FTMPRO_SPECHARDWARE sSpecHardwareInfo;
FTMPro_OpenSpectrometer( FTMPRO_TRANSPEC_LITE, &sSpecHardwareInfo );

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

// Step 3: perform measurement of an averaged Dark Current
FTMPro_CloseShutter();                    // close shutter of connected lamp
FTMPro_RunMeasDarkCurrent();              // start measurement
FTMPRO_SPECSTATUS sSpecStatus;
FTMPro_GetSpecStatus( &sSpecStatus );     // wait until measurement is done
while ( sSpecStatus.bRunDarkCurrent )
    FTMPro_GetSpecStatus( &sSpecStatus );

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

// Step 5: setup film thickness evaluation parameter (simple example)
FTMPRO_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
FTMPro_SetSingleLayerEvalPara( &sEvalPara);  // initialize single layer evaluation

// Step 6: measure and evaluate an averaged and Dark Current corrected interference spectrum
FTMPro_RunMeasInterference();             // start measurement
FTMPro_GetSpecStatus( &sSpecStatus );     // wait until measurement is done
while (sSpecStatus.bRunInterference )
    FTMPro_GetSpecStatus( &sSpecStatus );
FTMPRO_RESULT sResult;
FTMPro.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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