Spectrometer Application

Generated by Doxygen 1.9.7

Chapter 1

Namespace Index

1.1 Package List

Here are the packages with brief descriptions (if available):

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 4

File Index

4.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 5

Namespace Documentation

5.1 DiplomaMB Namespace Reference

Classes

- class App

  App.
- class Bootstrapper

5.2 DiplomaMB.Models Namespace Reference

Classes

- class AvantesSpectrometer
- class BwtekSpectrometer

  Represents a Bwtek spectrometer. Implements the ISpectrometer interface.
- class ConfigProperty

  Represents a configuration property for a spectrometer.
- class DerivativeConfig

  Configuration model for calculating the derivative of a spectrum.
- interface ISpectrometer

  Interface representing a spectrometer device.
- class Peak

  Represents a single peak in a spectrum.
- class SmartRead

  Represents settings and parameters for performing smart reading of spectrums.
- class Smoothing

  Represents the parameters and options for performing data smoothing.
- class Spectrum

  Represents a spectrum with wavelengths and data values.

Enumerations

- enum DerivativeMethod { **Point_Diff** , **Savitzky_Golay** }

  Enum for types of derivative methods.
- enum IntegrationTimeUnit { **Miliseconds** , **Microseconds** }

  Enum for specifying the unit of integration time.
- enum SmoothingType { **Fft** , **SavGolay** , **BoxCar** }

  Defines the types of smoothing algorithms that can be used.

5.3 DiplomaMB.Utils Namespace Reference

Classes

- class **AvantesAPIWrapper**
- class BooleanToVisibilityConverter

  Converts boolean values to Visibility enum and vice versa.
- class EnumBooleanConverter
- class **IniFile**

  Provides utilities for reading and writing INI files.
- class SpectrumUtils

  Provides utilities for spectrum baseline removal.

5.4 DiplomaMB.ViewModels Namespace Reference

Classes

- class DerivativeViewModel

  ViewModel for managing derivative configuration.
- class EditingViewModel

  ViewModel class for editing spectra.
- class PeaksViewModel

  ViewModel responsible for peak detection and display in a spectrum.
- class ShellViewModel

  ShellViewModel class provides properties and methods for the main application logic.
- class SmoothingViewModel

  ViewModel for managing the smoothing settings.

Enumerations

- enum Operations {
  Add , **Subtract** , **Multiply** , **Divide** ,
  BaselineRemove , **Average** , **Merging** }

  Enumeration to represent the types of operations that can be performed on spectra.

5.5 DiplomaMB.Views Namespace Reference

Classes

- class DerivativeView

  Logika interakcji dla klasy DerivativeView.xaml.
- class EditingView

  Logika interakcji dla klasy EditingView.xaml.
- class PeaksView

  Interaction logic for PeaksView.xaml.
- class ShellView

  Interaction logic for ShellView.xaml.
- class SmoothingView

  Logika interakcji dla klasy SmoothingView.xaml.

5.6 XamlGeneratedNamespace Namespace Reference

Classes

- class GeneratedInternalTypeHelper

  GeneratedInternalTypeHelper.

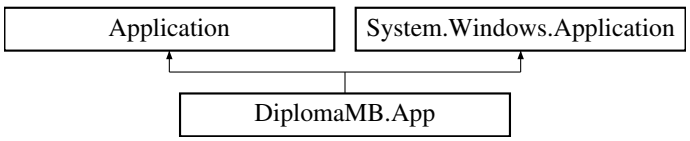
Chapter 6

Class Documentation

6.1 DiplomaMB.App Class Reference

App.

Inheritance diagram for DiplomaMB.App:



Public Member Functions

- void **InitializeComponent** ()
  InitializeComponent.

Static Public Member Functions

- static void **Main** ()
  Application Entry Point.

6.1.1 Detailed Description

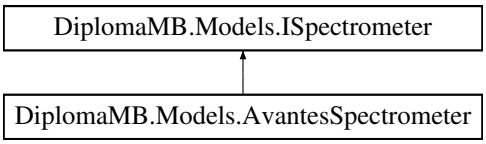
App.

The documentation for this class was generated from the following files:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/App.xaml.cs
- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/obj/Debug/net5.0-windows/App.g.i.cs

6.2 DiplomaMB.Models.AvantesSpectrometer Class Reference

Inheritance diagram for DiplomaMB.Models.AvantesSpectrometer:



Public Member Functions

- Spectrum CalculateDerivative (Spectrum spectrum, DerivativeConfig derivative_config)

  Calculates the derivative of a given spectrum.
- void Connect ()

  Connects to the spectrometer.
- void Disconnect ()

  Disconnects from the spectrometer.
- void GetDarkScan ()

  Acquires a dark scan.
- void LoadDarkScanFromFile ()

  Loads a previously acquired dark scan from a file.
- List< Spectrum > ReadData (int frames_to_acquire, bool new_id=true)

  Reads data from the spectrometer.
- Spectrum ReadDataSmart (SmartRead smart_read)

  Reads data from the spectrometer using smart reading techniques.
- void ResetDevice ()

  Resets the spectrometer device.
- void SaveDarkScanToFile ()

  Saves the current dark scan to a file.
- void SetIntegrationTime (int integration_time)

  Sets the integration time of the spectrometer.
- Spectrum Smoothing (Smoothing smoothing, Spectrum spectrum)

  Performs smoothing on a given spectrum.

- void Connect ()

  Connects to the spectrometer.
- void Disconnect ()

  Disconnects from the spectrometer.
- void ResetDevice ()

  Resets the spectrometer device.
- List< Spectrum > ReadData (int frames_to_acquire, bool new_id=true)

  Reads data from the spectrometer.
- Spectrum ReadDataSmart (SmartRead smart_read)

  Reads data from the spectrometer using smart reading techniques.
- void GetDarkScan ()

  Acquires a dark scan.
- void LoadDarkScanFromFile ()

  Loads a previously acquired dark scan from a file.

- void SaveDarkScanToFile ()

  Saves the current dark scan to a file.
- Spectrum Smoothing (Smoothing smoothing, Spectrum spectrum)

  Performs smoothing on a given spectrum.
- void SetIntegrationTime (int integration_time)

  Sets the integration time of the spectrometer.
- Spectrum CalculateDerivative (Spectrum spectrum, DerivativeConfig derivative_config)

  Calculates the derivative of a given spectrum.

Properties

- bool Connected `[get, set]`

  Gets or sets a value indicating whether the spectrometer is connected.
- int IntegrationTime `[get, set]`

  Gets or sets the integration time for the spectrometer.
- int IntegrationTimeMin `[get, set]`

  Gets the minimum allowable integration time for the spectrometer.
- string Status `[get]`

  Gets the current status of the spectrometer.
- bool DarkScanTaken `[get]`

  Gets a value indicating whether a dark scan has been taken.
- BindableCollection< ConfigProperty > ConfigProperties `[get, set]`

  Gets or sets the configuration properties of the spectrometer.
- IntegrationTimeUnit IntegrationTimeUnit `[get, set]`

  Gets or sets the unit of measurement for integration time.
- string IntegrationTimeUnitStr `[get]`

  Gets the string representation of the unit of measurement for integration time.

Properties inherited from DiplomaMB.Models.ISpectrometer

- bool Connected `[get, set]`

  Gets or sets a value indicating whether the spectrometer is connected.
- int IntegrationTime `[get, set]`

  Gets or sets the integration time for the spectrometer.
- int IntegrationTimeMin `[get, set]`

  Gets the minimum allowable integration time for the spectrometer.
- string Status `[get]`

  Gets the current status of the spectrometer.
- bool DarkScanTaken `[get]`

  Gets a value indicating whether a dark scan has been taken.
- BindableCollection< ConfigProperty > ConfigProperties `[get, set]`

  Gets or sets the configuration properties of the spectrometer.
- IntegrationTimeUnit IntegrationTimeUnit `[get, set]`

  Gets or sets the unit of measurement for integration time.
- string IntegrationTimeUnitStr `[get]`

  Gets the string representation of the unit of measurement for integration time.

6.2.1 Member Function Documentation

6.2.1.1 CalculateDerivative()

```
Spectrum DiplomaMB.Models.AvantesSpectrometer.CalculateDerivative (
            Spectrum spectrum,
            DerivativeConfig derivative_config )
```

Calculates the derivative of a given spectrum.

Parameters

spectrum	The spectrum to use.
derivative_config	Configuration for the derivative calculation.

Returns

A spectrum representing the derivative.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.2 Connect()

```
void DiplomaMB.Models.AvantesSpectrometer.Connect ( )
```

Connects to the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.3 Disconnect()

```
void DiplomaMB.Models.AvantesSpectrometer.Disconnect ( )
```

Disconnects from the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.4 GetDarkScan()

```
void DiplomaMB.Models.AvantesSpectrometer.GetDarkScan ( )
```

Acquires a dark scan.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.5 LoadDarkScanFromFile()

```
void DiplomaMB.Models.AvantesSpectrometer.LoadDarkScanFromFile ( )
```

Loads a previously acquired dark scan from a file.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.6 ReadData()

```
List< Spectrum > DiplomaMB.Models.AvantesSpectrometer.ReadData (
            int frames_to_acquire,
            bool new_id = true )
```

Reads data from the spectrometer.

Parameters

frames_to_acquire	Number of frames to acquire.
new_id	A boolean indicating whether to generate a new ID for each acquired spectrum. Default is true.

Returns

A list of spectra.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.7 ReadDataSmart()

```
Spectrum DiplomaMB.Models.AvantesSpectrometer.ReadDataSmart (
            SmartRead smart_read )
```

Reads data from the spectrometer using smart reading techniques.

Parameters

smart_read	Settings for smart reading.

Returns

A single spectrum.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.8 ResetDevice()

```
void DiplomaMB.Models.AvantesSpectrometer.ResetDevice ( )
```

Resets the spectrometer device.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.9 SaveDarkScanToFile()

```
void DiplomaMB.Models.AvantesSpectrometer.SaveDarkScanToFile ( )
```

Saves the current dark scan to a file.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.10 SetIntegrationTime()

```
void DiplomaMB.Models.AvantesSpectrometer.SetIntegrationTime (
            int integration_time )
```

Sets the integration time of the spectrometer.

Parameters

integration_time	The new integration time.

Implements DiplomaMB.Models.ISpectrometer.

6.2.1.11 Smoothing()

```
Spectrum DiplomaMB.Models.AvantesSpectrometer.Smoothing (
            Smoothing smoothing,
            Spectrum spectrum )
```

Performs smoothing on a given spectrum.

Parameters

smoothing	Smoothing parameters.
spectrum	The spectrum to smooth.

Returns

A smoothed spectrum.

Implements DiplomaMB.Models.ISpectrometer.

6.2.2 Property Documentation

6.2.2.1 ConfigProperties

```
BindableCollection<ConfigProperty> DiplomaMB.Models.AvantesSpectrometer.ConfigProperties
[get], [set]
```

Gets or sets the configuration properties of the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.2.2.2 Connected

```
bool DiplomaMB.Models.AvantesSpectrometer.Connected  [get], [set]
```

Gets or sets a value indicating whether the spectrometer is connected.

Implements DiplomaMB.Models.ISpectrometer.

6.2.2.3 DarkScanTaken

```
bool DiplomaMB.Models.AvantesSpectrometer.DarkScanTaken  [get]
```

Gets a value indicating whether a dark scan has been taken.

Implements DiplomaMB.Models.ISpectrometer.

6.2.2.4 IntegrationTime

```
int DiplomaMB.Models.AvantesSpectrometer.IntegrationTime  [get], [set]
```

Gets or sets the integration time for the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.2.2.5 IntegrationTimeMin

```
int DiplomaMB.Models.AvantesSpectrometer.IntegrationTimeMin  [get], [set]
```

Gets the minimum allowable integration time for the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.2.2.6 IntegrationTimeUnit

```
IntegrationTimeUnit DiplomaMB.Models.AvantesSpectrometer.IntegrationTimeUnit  [get], [set]
```

Gets or sets the unit of measurement for integration time.

Implements DiplomaMB.Models.ISpectrometer.

6.2.2.7 IntegrationTimeUnitStr

```
string DiplomaMB.Models.AvantesSpectrometer.IntegrationTimeUnitStr  [get]
```

Gets the string representation of the unit of measurement for integration time.

Implements DiplomaMB.Models.ISpectrometer.

6.2.2.8 Status

```
string DiplomaMB.Models.AvantesSpectrometer.Status  [get]
```

Gets the current status of the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/AvantesSpectrometer.cs

6.3 DiplomaMB.Utils.AvantesAPIWrapper.AvsIdentityType Struct Reference

Public Attributes

- string **m_SerialNumber**
- string **m_UserFriendlyName**
- DEVICE_STATUS **m_Status**

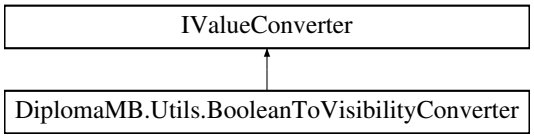
The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.4 DiplomaMB.Utils.BooleanToVisibilityConverter Class Reference

Converts boolean values to Visibility enum and vice versa.

Inheritance diagram for DiplomaMB.Utils.BooleanToVisibilityConverter:



Public Member Functions

- object Convert (object value, Type targetType, object parameter, CultureInfo culture)
  Converts a boolean value to a Visibility enum value.
- object ConvertBack (object value, Type targetType, object parameter, CultureInfo culture)
  Not implemented for this converter.

6.4.1 Detailed Description

Converts boolean values to Visibility enum and vice versa.

6.4.2 Member Function Documentation

6.4.2.1 Convert()

```
object DiplomaMB.Utils.BooleanToVisibilityConverter.Convert (
            object value,
            Type targetType,
            object parameter,
            CultureInfo culture )
```

Converts a boolean value to a Visibility enum value.

Parameters

value	The boolean value to be converted.
targetType	The target type for the conversion (unused).
parameter	A string ¨invert¨ to invert the logic.
culture	Culture info (unused).

Returns

Returns Visibility value after conversion.

6.4.2.2 ConvertBack()

```
object DiplomaMB.Utils.BooleanToVisibilityConverter.ConvertBack (
            object value,
            Type targetType,
            object parameter,
            CultureInfo culture )
```

Not implemented for this converter.

Parameters

value	The Visibility value to convert back.
targetType	The target type for the back-conversion (unused).
parameter	A string ¨invert¨ to invert the logic (unused).
culture	Culture info (unused).

Returns

Throws NotImplementedException.

Exceptions

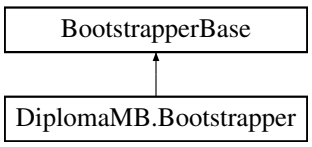
NotImplementedException	Throws this exception as the method is not implemented.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/Converters.cs

6.5 DiplomaMB.Bootstrapper Class Reference

Inheritance diagram for DiplomaMB.Bootstrapper:



Protected Member Functions

- override void **OnStartup** (object sender, StartupEventArgs e)

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Bootstrapper.cs

6.6 DiplomaMB.Utils.AvantesAPIWrapper.BroadcastAnswerType Struct Reference

Public Attributes

- byte **InterfaceType**
- string **serial**
- ushort **port**
- byte **status**
- uint **RemoteHostIp**
- uint **LocalIp**
- byte[ ] **reserved**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.7 BwtekAPIWrapper Class Reference

Public Member Functions

- static bool **InitDevices** ()
- static int **CloseDevices** ()
- static int **GetDeviceCount** ()
- static Int32 **GetCCode** (byte[ ] pCCode, Int32 nChannel)
- static Int32 **GetUSBType** (ref int USBType, Int32 nChannel)
- static Int32 **bwtekTestUSB** (Int32 nUSBTiming, Int32 nPixelNo, Int32 nInputMode, Int32 nchannel, Int32 pParam)
- static Int32 **bwtekSetTimeUSB** (Int32 lTime, Int32 nchannel)
- static Int32 **bwtekGetTimeBaseUSB** (ref Int32 TimeBase, ref Int32 TimeBaseUnit, Int32 nchannel)
- static Int32 **bwtekSetTimeBaseUSB** (Int32 lTimeBase, Int32 nchannel)
- static Int32 **bwtekSetTimeBase0USB** (Int32 lTimeBase, Int32 nchannel)
- static Int32 **bwtekSetTimingsUSB** (Int32 lTriggerExit, Int32 nMultiple, Int32 nChannel)

- static Int32 **bwtekDataReadUSB** (Int32 nTriggerMode, UInt16[ ] pArray, Int32 nchannel)
- static Int32 **bwtekReadResultUSB** (Int32 nTriggerMode, Int32 nAverage, Int32 nTypeSmoothing, Int32 nValueSmoothing, UInt16[ ] pArray, Int32 nchannel)
- static Int32 **bwtekCloseUSB** (Int32 nchannel)
- static Int32 **bwtekReadEEPROMUSB** (string OutFileName, Int32 nChannel)
- static Int32 **bwtekStopIntegration** (Int32 nchannel)
- static Int32 **bwtekReadTemperature** (Int32 nADChannel, ref Int32 nADValue, ref double dTemperature, Int32 nChannel)
- static Int32 **bwtekSetTemperature** (Int32 nDAChannel, Int32 nSetTemp, Int32 nChannel)
- static Int32 **bwtekSmoothingUSB** (int nTypeSmoothing, int nValueSmoothing, double[ ] pArray, int nNum)
- static Int32 **bwtekConvertDerivativeDouble** (Int32 nTypeDerivate, Int32 nPolynominalPointHalf, Int32 nPolynominalOrder, Int32 nDerivativeOrder, double[ ] pSrcArray, double[ ] pResultArray, Int32 nNum)
- static Int32 **bwtekDifferentiateDouble** (Int32 nPointInterval, double[ ] pSrcArray, double[ ] pWavelengthArray, double[ ] pResultArray, Int32 nNum)
- static Int32 **bwtekPolyFit** (double[ ] x, double[ ] y, int numPts, double[ ] coefs, int order)
- static void **bwtekPolyCalc** (Double[ ] coefs, Int32 order, Int32 x, ref Double y)
- static Int32 **bwtekSetExtLaser** (Int32 onoff, Int32 nChannel)
- static Int32 **bwtekSetExtSync** (Int32 onoff, Int32 nChannel)
- static Int32 **bwtekSetExtShutter** (Int32 onoff, Int32 nChannel)
- static Int32 **bwtekGetedMode** (Int32 nGateTime, Int32 nChannel)
- static Int32 **bwtekSetExtPulse** (Int32 nOnOff, Int32 nDelayTime, Int32 nHigh, Int32 nLow, Int32 nPulse, Int32 nInverse, Int32 nChannel)
- static Int32 **bwtekGetExtStatus** (Int32 nChannel)
- static Int32 **bwtekSetTTLIn** (Int32 nNo, ref Int32 pGetValue, Int32 nChannel)
- static Int32 **bwtekSetTTLOut** (Int32 nNo, Int32 nSetValue, Int32 nInverse, Int32 nChannel)
- static Int32 **bwtekGetAnalogIn** (Int32 nNo, ref Int32 nValue, ref double dVoltage, Int32 nChannel)
- static int **bwtekSetAnalogOut** (int nNo, int nValue, int nChannel)
- static Int32 **bwtekLEDOn** (Int32 nChannel)
- static Int32 **bwtekLEDOff** (Int32 nChannel)
- static Int32 **bwtekLEDDelay** (Int32 nDelay, Int32 nChannel)
- static void **bwtekSetPulseNo** (Int32 nPulseNo, Int32 nChannel)
- static Int32 **bwtekShutterOpen** (Int32 nChannel)
- static Int32 **bwtekShutterClose** (Int32 nChannel)
- static Int32 **bwtekShutterInverse** (Int32 nInverse, Int32 nChannel)
- static Int32 **bwtekShutterControl** (Int32 nSetShutter1, Int32 nSetShutter2, Int32 nChannel)
- static Int32 **bwtekSetABGain** (Int32 nAB, Int32 nGain, Int32 nChannel)
- static Int32 **bwtekSetABOffset** (Int32 nAB, Int32 nOffset, Int32 nChannel)
- static Int32 **bwtekGetABGain** (Int32 nAB, ref Int32 nGain, Int32 nChannel)
- static Int32 **bwtekGetABOffset** (Int32 nAB, ref Int32 nOffset, Int32 nChannel)
- static Int32 **bwtekSetInGaAsMode** (Int32 nMode, Int32 nChannel)
- static Int32 **bwtekGetInGaAsMode** (ref Int32 nMode, Int32 nChannel)
- static Int32 **bwtekQueryTemperature** (Int32 nCommand, ref Int32 nADValue, ref double dTemperature, Int32 nChannel)
- static Int32 **bwtekAccessDeltaTemp** (Int32 nReadWrite, ref double dDeltaTemperature, Int32 nChannel)
- static Int32 **bwtekAccessDeltaTemp1** (Int32 nReadWrite, ref double dDeltaTemperature, ref double dDeltaTemperature1, Int32 nChannel)
- static Int32 **bwtekReadValue** (Int32 nMode, ref Int32 GetValue, Int32 nChannel)
- static Int32 **bwtekWriteValue** (Int32 nMode, Int32 SetValue, Int32 nChannel)
- static Int32 **bwtekSetTimeUnitUSB** (Int32 nTimeUnit, Int32 nChannel)
- static Int32 **bwtekGetTimeUnitUSB** (ref Int32 nTimeUnit, Int32 nChannel)
- static Int32 **bwtekSetupChannel** (Int32 nFlag, [In, Out] Byte[ ] pChannelStatus)
- static Int32 **bwtekSaveEEPROMChannel** ([In, Out] Byte[ ] pChannelStatus)
- static Int32 **bwtekGetCCode** ([In, Out] Byte[ ] pCCode, Int32 nChannel)
- static Int32 **bwtekGetXaxisInverseByte** (ref Int32 InverseByte, Int32 nChannel)

- static Int32 **bwtekDSPDataReadUSB** (Int32 nAveNum, Int32 nSmoothing, Int32 nDarkCompensate, Int32 nTriggerMode, UInt16[ ] pArray, Int32 nChannel)
- static Int32 **bwtekFrameDataReadUSB** (Int32 nFrameNum, Int32 nTriggerMode, UInt16[ ] pArray, Int32 nChannel)
- static Int32 **bwtekEraseBlockUSB** (Int32 nChannel)
- static Int32 **bwtekWriteBlockUSB** (Int32 nAddrress, byte[ ] pDataArray, Int32 nNum, Int32 nChannel)
- static Int32 **bwtekReadBlockUSB** (Int32 nAddrress, byte[ ] pDataArray, Int32 nNum, Int32 nChannel)
- static Int32 **bwtekSetLowNoiseModeUSB** (Int32 nEanbleLowNoiseMode, Int32 nchannel)
- static Int32 **bwtekSoftReset_CEnP** (Int32 nChannel)

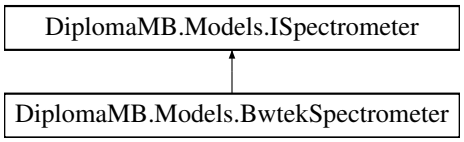
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/BwtekAPIWrapper.cs

6.8 DiplomaMB.Models.BwtekSpectrometer Class Reference

Represents a Bwtek spectrometer. Implements the ISpectrometer interface.

Inheritance diagram for DiplomaMB.Models.BwtekSpectrometer:



Public Member Functions

- **BwtekSpectrometer** ()

  Initializes a new instance of the BwtekSpectrometer class.
- void Connect ()

  Attempts to connect the spectrometer.
- void Disconnect ()

  Disconnects the spectrometer.
- void ResetDevice ()

  Resets the device.
- List< Spectrum > ReadData (int frames_to_acquire, bool new_id=true)

  Reads spectrum data from the spectrometer.
- Spectrum ReadDataSmart (SmartRead smart_read)

  Reads spectrum data from the spectrometer with smart settings.
- void GetDarkScan ()

  Acquires a dark scan from the spectrometer.
- void LoadDarkScanFromFile ()

  Loads a dark scan from a CSV file.
- void SaveDarkScanToFile ()

  Saves the current dark scan to a CSV file.
- Spectrum Smoothing (Smoothing smoothing, Spectrum spectrum)

  Applies smoothing to a given spectrum.
- void SetIntegrationTime (int integration_time)

Sets the integration time of the spectrometer.

- Spectrum CalculateDerivative (Spectrum spectrum, DerivativeConfig derivative_config)

  Calculates the derivative of a given spectrum.
- Spectrum GenerateDummySpectrum ()

  Generates a dummy spectrum for testing purposes.

- void Connect ()

  Connects to the spectrometer.
- void Disconnect ()

  Disconnects from the spectrometer.
- void ResetDevice ()

  Resets the spectrometer device.
- List< Spectrum > ReadData (int frames_to_acquire, bool new_id=true)

  Reads data from the spectrometer.
- Spectrum ReadDataSmart (SmartRead smart_read)

  Reads data from the spectrometer using smart reading techniques.
- void GetDarkScan ()

  Acquires a dark scan.
- void LoadDarkScanFromFile ()

  Loads a previously acquired dark scan from a file.
- void SaveDarkScanToFile ()

  Saves the current dark scan to a file.
- Spectrum Smoothing (Smoothing smoothing, Spectrum spectrum)

  Performs smoothing on a given spectrum.
- void SetIntegrationTime (int integration_time)

  Sets the integration time of the spectrometer.
- Spectrum CalculateDerivative (Spectrum spectrum, DerivativeConfig derivative_config)

  Calculates the derivative of a given spectrum.

Properties

- BindableCollection< ConfigProperty > ConfigProperties `[get, set]`

  Gets or sets the configuration properties for the spectrometer.
- bool Connected `[get, set]`

  Gets or sets the connection status of the spectrometer.
- int IntegrationTime `[get, set]`

  Gets or sets the integration time for the spectrometer.
- int IntegrationTimeMin `[get, set]`

  Gets or sets the minimum allowable integration time for the spectrometer.
- IntegrationTimeUnit IntegrationTimeUnit `[get, set]`

  Gets or sets the unit of measurement for integration time.
- string IntegrationTimeUnitStr `[get]`

  Gets the unit for integration time as a string.
- string Status `[get]`

  Gets the current status of the spectrometer.
- bool DarkScanTaken `[get]`

  Gets whether a dark scan has been taken.

Properties inherited from DiplomaMB.Models.ISpectrometer

- bool Connected `[get, set]`

  Gets or sets a value indicating whether the spectrometer is connected.
- int IntegrationTime `[get, set]`

  Gets or sets the integration time for the spectrometer.
- int IntegrationTimeMin `[get, set]`

  Gets the minimum allowable integration time for the spectrometer.
- string Status `[get]`

  Gets the current status of the spectrometer.
- bool DarkScanTaken `[get]`

  Gets a value indicating whether a dark scan has been taken.
- BindableCollection< ConfigProperty > ConfigProperties `[get, set]`

  Gets or sets the configuration properties of the spectrometer.
- IntegrationTimeUnit IntegrationTimeUnit `[get, set]`

  Gets or sets the unit of measurement for integration time.
- string IntegrationTimeUnitStr `[get]`

  Gets the string representation of the unit of measurement for integration time.

6.8.1 Detailed Description

Represents a Bwtek spectrometer. Implements the ISpectrometer interface.

6.8.2 Member Function Documentation

6.8.2.1 CalculateDerivative()

```
Spectrum DiplomaMB.Models.BwtekSpectrometer.CalculateDerivative (
            Spectrum spectrum,
            DerivativeConfig derivative_config )
```

Calculates the derivative of a given spectrum.

Parameters

spectrum	The spectrum for which to calculate the derivative.
derivative_config	Derivative configuration parameters.

Returns

The spectrum after derivative calculation.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.2 Connect()

```
void DiplomaMB.Models.BwtekSpectrometer.Connect ( )
```

Attempts to connect the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.3 Disconnect()

```
void DiplomaMB.Models.BwtekSpectrometer.Disconnect ( )
```

Disconnects the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.4 GenerateDummySpectrum()

```
Spectrum DiplomaMB.Models.BwtekSpectrometer.GenerateDummySpectrum ( )
```

Generates a dummy spectrum for testing purposes.

Returns

A dummy spectrum with random data.

6.8.2.5 GetDarkScan()

```
void DiplomaMB.Models.BwtekSpectrometer.GetDarkScan ( )
```

Acquires a dark scan from the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.6 LoadDarkScanFromFile()

```
void DiplomaMB.Models.BwtekSpectrometer.LoadDarkScanFromFile ( )
```

Loads a dark scan from a CSV file.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.7 ReadData()

```
List< Spectrum > DiplomaMB.Models.BwtekSpectrometer.ReadData (
            int frames_to_acquire,
            bool new_id = true )
```

Reads spectrum data from the spectrometer.

Parameters

frames_to_acquire	Number of frames to acquire.
new_id	A boolean indicating whether to generate new IDs for each acquired spectrum. Default is true.

Returns

A list of spectrum data.

This method acquires a specified number of frames from the spectrometer, one frame at a time, and returns them as a list of Spectrum objects. The method throws an exception if it fails to receive the expected amount of data for each frame. If new_id is true, each Spectrum object will have a unique ID.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.8 ReadDataSmart()

```
Spectrum DiplomaMB.Models.BwtekSpectrometer.ReadDataSmart (
            SmartRead smart_read )
```

Reads spectrum data from the spectrometer with smart settings.

Parameters

smart_read	The smart read configuration.

Returns

A spectrum object containing the read data.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.9 ResetDevice()

```
void DiplomaMB.Models.BwtekSpectrometer.ResetDevice ( )
```

Resets the device.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.10 SaveDarkScanToFile()

```
void DiplomaMB.Models.BwtekSpectrometer.SaveDarkScanToFile ( )
```

Saves the current dark scan to a CSV file.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.11 SetIntegrationTime()

```
void DiplomaMB.Models.BwtekSpectrometer.SetIntegrationTime (
            int integration_time )
```

Sets the integration time of the spectrometer.

Parameters

integration_time	Integration time to set.

Implements DiplomaMB.Models.ISpectrometer.

6.8.2.12 Smoothing()

```
Spectrum DiplomaMB.Models.BwtekSpectrometer.Smoothing (
            Smoothing smoothing,
            Spectrum spectrum )
```

Applies smoothing to a given spectrum.

Parameters

smoothing	Smoothing configuration.
spectrum	Spectrum to be smoothed.

Returns

Smoothed spectrum.

Implements DiplomaMB.Models.ISpectrometer.

6.8.3 Property Documentation

6.8.3.1 ConfigProperties

```
BindableCollection<ConfigProperty> DiplomaMB.Models.BwtekSpectrometer.ConfigProperties  [get],
[set]
```

Gets or sets the configuration properties for the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.8.3.2 Connected

```
bool DiplomaMB.Models.BwtekSpectrometer.Connected  [get], [set]
```

Gets or sets the connection status of the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.8.3.3 DarkScanTaken

```
bool DiplomaMB.Models.BwtekSpectrometer.DarkScanTaken  [get]
```

Gets whether a dark scan has been taken.

Implements DiplomaMB.Models.ISpectrometer.

6.8.3.4 IntegrationTime

```
int DiplomaMB.Models.BwtekSpectrometer.IntegrationTime  [get], [set]
```

Gets or sets the integration time for the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.8.3.5 IntegrationTimeMin

```
int DiplomaMB.Models.BwtekSpectrometer.IntegrationTimeMin  [get], [set]
```

Gets or sets the minimum allowable integration time for the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

6.8.3.6 IntegrationTimeUnit

```
IntegrationTimeUnit DiplomaMB.Models.BwtekSpectrometer.IntegrationTimeUnit  [get], [set]
```

Gets or sets the unit of measurement for integration time.

Implements DiplomaMB.Models.ISpectrometer.

6.8.3.7 IntegrationTimeUnitStr

```
string DiplomaMB.Models.BwtekSpectrometer.IntegrationTimeUnitStr  [get]
```

Gets the unit for integration time as a string.

Implements DiplomaMB.Models.ISpectrometer.

6.8.3.8 Status

```
string DiplomaMB.Models.BwtekSpectrometer.Status  [get]
```

Gets the current status of the spectrometer.

Implements DiplomaMB.Models.ISpectrometer.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/BwtekSpectrometer.cs

6.9 DiplomaMB.Models.ConfigProperty Class Reference

Represents a configuration property for a spectrometer.

Public Member Functions

- ConfigProperty (string name, string value)

  Initializes a new instance of the ConfigProperty class.

Properties

- string **Name** `[get, set]`

  Gets or sets the name of the configuration property.
- string **Value** `[get, set]`

  Gets or sets the value of the configuration property.

6.9.1 Detailed Description

Represents a configuration property for a spectrometer.

6.9.2 Constructor & Destructor Documentation

6.9.2.1 ConfigProperty()

```
DiplomaMB.Models.ConfigProperty.ConfigProperty (
            string name,
            string value )
```

Initializes a new instance of the ConfigProperty class.

Parameters

name	Name of the configuration property.
value	Value of the configuration property.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/ISpectrometer.cs

6.10 DiplomaMB.Utils.AvantesAPIWrapper.ControlSettingsType Struct Reference

Public Attributes

- ushort **m_StrobeControl**
- uint **m_LaserDelay**
- uint **m_LaserWidth**
- float **m_LaserWaveLength**
- ushort **m_StoreToRam**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.11 DiplomaMB.Utils.AvantesAPIWrapper.DarkCorrectionType Struct Reference

Public Attributes

- byte **m_Enable**
- byte **m_ForgetPercentage**

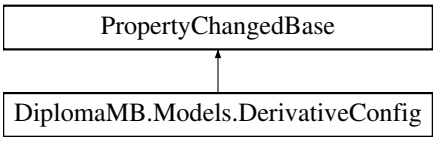
The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.12 DiplomaMB.Models.DerivativeConfig Class Reference

Configuration model for calculating the derivative of a spectrum.

Inheritance diagram for DiplomaMB.Models.DerivativeConfig:



Public Member Functions

- **DerivativeConfig** ()

  Initializes a new instance of the DerivativeConfig class.

Properties

- bool **PerformDerivative** `[get, set]`

  Gets or sets whether to perform derivative calculation.
- int **DegreeOfPolynomial** `[get, set]`

  Gets or sets the degree of the polynomial used in the derivative calculation.
- int **DerivativeOrder** `[get, set]`

  Gets or sets the order of the derivative.
- int **WindowSize** `[get, set]`

  Gets or sets the window size for the derivative calculation.
- DerivativeMethod **DerivativeMethod** `[get, set]`

  Gets or sets the type of derivative method to use.
- bool **IsPointDiffEnabled** `[get]`

  Checks if Point Difference method is enabled.
- bool **IsSavitzkyGolayEnabled** `[get]`

  Checks if Savitzky-Golay method is enabled.

6.12.1 Detailed Description

Configuration model for calculating the derivative of a spectrum.

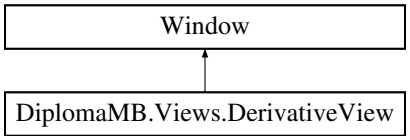
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/DerivativeConfig.cs

6.13 DiplomaMB.Views.DerivativeView Class Reference

Logika interakcji dla klasy DerivativeView.xaml.

Inheritance diagram for DiplomaMB.Views.DerivativeView:



6.13.1 Detailed Description

Logika interakcji dla klasy DerivativeView.xaml.

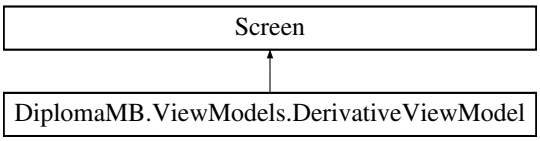
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Views/DerivativeView.xaml.cs

6.14 DiplomaMB.ViewModels.DerivativeViewModel Class Reference

ViewModel for managing derivative configuration.

Inheritance diagram for DiplomaMB.ViewModels.DerivativeViewModel:



Public Member Functions

- DerivativeViewModel (Spectrum _spectrum, ISpectrometer _spectrometer)

  Initializes a new instance of the DerivativeViewModel class.
- void **CloseWindow** ()

  Closes the derivative configuration window and performs the derivative operation.
- void **CancelWindow** ()

  Closes the derivative configuration window without performing any operations.

Properties

- DerivativeConfig **DerivativeConfig** `[get, set]`

  Gets or sets the DerivativeConfig settings.
- Spectrum **Spectrum** `[get, set]`

  Gets or sets the spectrum.
- Spectrum **ResultSpectrum** `[get, set]`

  Gets or sets the result spectrum.
- ISpectrometer **Spectrometer** `[get, set]`

  Gets or sets the spectrometer.
- bool **OperationDone** `[get, set]`

  Gets or sets the operation_done flag.

6.14.1 Detailed Description

ViewModel for managing derivative configuration.

6.14.2 Constructor & Destructor Documentation

6.14.2.1 DerivativeViewModel()

```
DiplomaMB.ViewModels.DerivativeViewModel.DerivativeViewModel (
            Spectrum _spectrum,
            ISpectrometer _spectrometer )
```

Initializes a new instance of the DerivativeViewModel class.

Parameters

_spectrum	The spectrum.
_spectrometer	The spectrometer.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/DerivativeViewModel.cs

6.15 DiplomaMB.Utils.AvantesAPIWrapper.DetectorType Struct Reference

Public Attributes

- byte **m_SensorType**
- ushort **m_NrPixels**
- float[ ] **m_aFit**
- byte **m_NLEnable**
- double[ ] **m_aNLCorrect**

- double **m_aLowNLCounts**
- double **m_aHighNLCounts**
- float[ ] **m_Gain**
- float **m_Reserved**
- float[ ] **m_Offset**
- float **m_ExtOffset**
- ushort[ ] **m_DefectivePixels**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.16 DiplomaMB.Utils.AvantesAPIWrapper.DeviceConfigType Struct Reference

Public Attributes

- ushort **m_Len**
- ushort **m_ConfigVersion**
- byte[ ] **m_aUserFriendlyId**
- DetectorType **m_Detector**
- IrradianceType **m_Irradiance**
- SpectrumCalibrationType **m_Reflectance**
- SpectrumCorrectionType **m_SpectrumCorrect**
- StandAloneType **m_StandAlone**
- DynamicStorageType **m_DynamicStorage**
- TempSensorType[ ] **m_aTemperature**
- TecControlType **m_TecControl**
- ProcessControlType **m_ProcessControl**
- EthernetSettingsType **m_EthernetSettings**
- byte[ ] **m_aReserved**
- OemDataType **m_OemData**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.17 DiplomaMB.Utils.AvantesAPIWrapper.DstrStatusType Struct Reference

Public Attributes

- uint **m_TotalScans**
- uint **m_UsedScans**
- uint **m_Flags**
- byte **m_IsStopEvent**
- byte **m_IsOverflowEvent**
- byte **m_IsInternalErrorEvent**
- byte **m_Reserved**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.18 DiplomaMB.Utils.AvantesAPIWrapper.DynamicStorageType Struct Reference

Public Attributes

- int **m_Nmsr**
- byte[ ] **reserved**

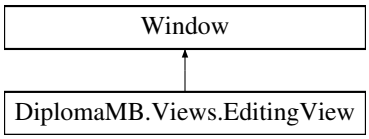
The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.19 DiplomaMB.Views.EditingView Class Reference

Logika interakcji dla klasy EditingView.xaml.

Inheritance diagram for DiplomaMB.Views.EditingView:



6.19.1 Detailed Description

Logika interakcji dla klasy EditingView.xaml.

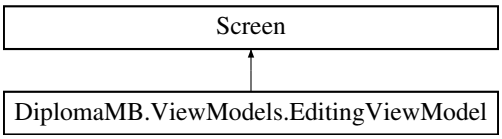
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Views/EditingView.xaml.cs

6.20 DiplomaMB.ViewModels.EditingViewModel Class Reference

ViewModel class for editing spectra.

Inheritance diagram for DiplomaMB.ViewModels.EditingViewModel:



Public Member Functions

- EditingViewModel (BindableCollection< Spectrum > spectrums)

  Initializes a new instance of the EditingViewModel class.
- void **CloseWindow** ()

  Executes the selected operation and closes the window.

Properties

- BindableCollection< Spectrum > **Spectrums1** `[get, set]`

  Gets or sets the first set of spectra.
- BindableCollection< Spectrum > **Spectrums2** `[get, set]`

  Gets or sets the second set of spectra.
- Spectrum? **SelectedSpectrum1** `[get, set]`

  Gets or sets the selected spectrum from the first set of spectra.
- Spectrum? **SelectedSpectrum2** `[get, set]`

  Gets or sets the selected spectrum from the second set of spectra.
- Spectrum? **ResultSpectrum** `[get, set]`

  Gets or sets the resulting spectrum after an operation is performed.
- Operations SelectedOperation `[get, set]`
- bool **OperationDone** `[get, set]`

  Gets or sets a value indicating whether the operation has been done.
- double **DoubleValue** `[get, set]`

  Gets or sets a double value used for certain operations.
- int **MergingThreshold** `[get, set]`
- int **NewMaxValue** `[get, set]`
- bool **MergingWindowVisible** `[get]`
- string **NewSpectrumName** `[get, set]`

  Gets or sets the name for the new spectrum after an operation.
- bool **IsSpectrums2ComboBoxEnabled** `[get, set]`

  Gets or sets a value indicating whether the second spectrum ComboBox is enabled.
- bool **CanSecondValueBeNumber** `[get, set]`
- long **BaselineRemovalLambda** `[get, set]`

  Gets or sets the lambda value for baseline removal.
- bool **IsPanel1Enabled** `[get, set]`

  Gets or sets a value indicating whether the first panel is enabled.
- bool **IsPanel2Enabled** `[get, set]`

  Gets or sets a value indicating whether the second panel is enabled.

6.20.1 Detailed Description

ViewModel class for editing spectra.

6.20.2 Constructor & Destructor Documentation

6.20.2.1 EditingViewModel()

```
DiplomaMB.ViewModels.EditingViewModel.EditingViewModel (
            BindableCollection< Spectrum > spectrums )
```

Initializes a new instance of the EditingViewModel class.

Parameters

spectrums	The set of spectra to be edited.

6.20.3 Property Documentation

6.20.3.1 SelectedOperation

```
Operations DiplomaMB.ViewModels.EditingViewModel.SelectedOperation  [get], [set]
```

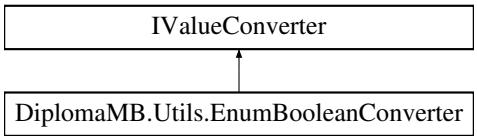
Gets or sets the selected operation to be performed.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/EditingViewModel.cs

6.21 DiplomaMB.Utils.EnumBooleanConverter Class Reference

Inheritance diagram for DiplomaMB.Utils.EnumBooleanConverter:



Public Member Functions

- object Convert (object value, Type targetType, object parameter, CultureInfo culture)
  Converts an enum value to a boolean.
- object ConvertBack (object value, Type targetType, object parameter, CultureInfo culture)
  Converts a boolean value back to an enum value.

6.21.1 Member Function Documentation

6.21.1.1 Convert()

```
object DiplomaMB.Utils.EnumBooleanConverter.Convert (
            object value,
            Type targetType,
            object parameter,
            CultureInfo culture )
```

Converts an enum value to a boolean.

Parameters

value	The enum value to be converted.
targetType	The target type for the conversion (unused).
parameter	An optional string representing the enum value to consider as 'true'.
culture	Culture info (unused).

Returns

Returns boolean value after conversion.

6.21.1.2 ConvertBack()

```
object DiplomaMB.Utils.EnumBooleanConverter.ConvertBack (
            object value,
            Type targetType,
            object parameter,
            CultureInfo culture )
```

Converts a boolean value back to an enum value.

Parameters

value	The boolean value to convert back.
targetType	The target type of the enum.
parameter	An optional string representing the enum value to consider as 'true'.
culture	Culture info (unused).

Returns

Returns enum value after back-conversion.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/Converters.cs

6.22 DiplomaMB.Utils.AvantesAPIWrapper.EthernetSettingsType Struct Reference

Public Attributes

- uint **m_IpAddr**
- uint **m_NetMask**
- uint **m_Gateway**
- byte **m_DhcpEnabled**
- short **m_TcpPort**
- byte **m_LinkStatus**

- byte **m_ClientIdType**
- char[ ] **m_ClientIdCustom**
- byte[ ] **m_Reserved**

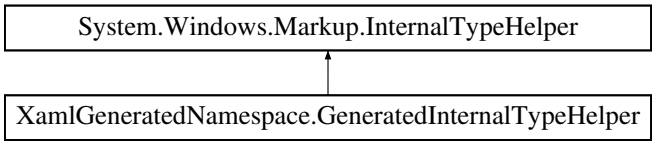
The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.23 XamlGeneratedNamespace.GeneratedInternalTypeHelper Class Reference

GeneratedInternalTypeHelper.

Inheritance diagram for XamlGeneratedNamespace.GeneratedInternalTypeHelper:



Protected Member Functions

- override object **CreateInstance** (System.Type type, System.Globalization.CultureInfo culture)

  CreateInstance.
- override object **GetPropertyValue** (System.Reflection.PropertyInfo propertyInfo, object target, System.↩ Globalization.CultureInfo culture)

  GetPropertyValue.
- override void **SetPropertyValue** (System.Reflection.PropertyInfo propertyInfo, object target, object value, System.Globalization.CultureInfo culture)

  SetPropertyValue.
- override System.Delegate **CreateDelegate** (System.Type delegateType, object target, string handler)

  CreateDelegate.
- override void **AddEventHandler** (System.Reflection.EventInfo eventInfo, object target, System.Delegate handler)

  AddEventHandler.

6.23.1 Detailed Description

GeneratedInternalTypeHelper.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/obj/Debug/net5.0-windows/Generated↩ InternalTypeHelper.g.i.cs

6.24 DiplomaMB.Utils.AvantesAPIWrapper.HeartbeatReqType Struct Reference

Public Attributes

- uint **m_Data**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.25 DiplomaMB.Utils.AvantesAPIWrapper.HeartbeatRespType Struct Reference

Public Attributes

- uint **m_BitMatrix**
- uint **m_Reserved**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.26 DiplomaMB.Utils.AvantesAPIWrapper.IrradianceType Struct Reference

Public Attributes

- SpectrumCalibrationType **m_IntensityCalib**
- byte **m_CalibrationType**
- uint **m_FiberDiameter**

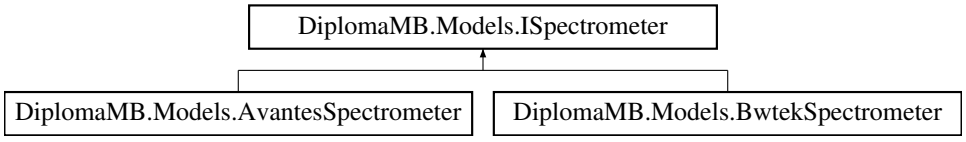
The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.27 DiplomaMB.Models.ISpectrometer Interface Reference

Interface representing a spectrometer device.

Inheritance diagram for DiplomaMB.Models.ISpectrometer:



Public Member Functions

- void Connect ()

  Connects to the spectrometer.
- void Disconnect ()

  Disconnects from the spectrometer.
- void ResetDevice ()

  Resets the spectrometer device.
- List< Spectrum > ReadData (int frames_to_acquire, bool new_id=true)

  Reads data from the spectrometer.
- Spectrum ReadDataSmart (SmartRead smart_read)

  Reads data from the spectrometer using smart reading techniques.
- void GetDarkScan ()

  Acquires a dark scan.
- void LoadDarkScanFromFile ()

  Loads a previously acquired dark scan from a file.
- void SaveDarkScanToFile ()

  Saves the current dark scan to a file.
- Spectrum Smoothing (Smoothing smoothing, Spectrum spectrum)

  Performs smoothing on a given spectrum.
- void SetIntegrationTime (int integration_time)

  Sets the integration time of the spectrometer.
- Spectrum CalculateDerivative (Spectrum spectrum, DerivativeConfig derivative_config)

  Calculates the derivative of a given spectrum.

Properties

- bool Connected `[get, set]`

  Gets or sets a value indicating whether the spectrometer is connected.
- int IntegrationTime `[get, set]`

  Gets or sets the integration time for the spectrometer.
- int IntegrationTimeMin `[get, set]`

  Gets the minimum allowable integration time for the spectrometer.
- string Status `[get]`

  Gets the current status of the spectrometer.
- bool DarkScanTaken `[get]`

  Gets a value indicating whether a dark scan has been taken.
- BindableCollection< ConfigProperty > ConfigProperties `[get, set]`

  Gets or sets the configuration properties of the spectrometer.
- IntegrationTimeUnit IntegrationTimeUnit `[get, set]`

  Gets or sets the unit of measurement for integration time.
- string IntegrationTimeUnitStr `[get]`

  Gets the string representation of the unit of measurement for integration time.

6.27.1 Detailed Description

Interface representing a spectrometer device.

6.27.2 Member Function Documentation

6.27.2.1 CalculateDerivative()

```
Spectrum DiplomaMB.Models.ISpectrometer.CalculateDerivative (
            Spectrum spectrum,
            DerivativeConfig derivative_config )
```

Calculates the derivative of a given spectrum.

Parameters

spectrum	The spectrum to use.
derivative_config	Configuration for the derivative calculation.

Returns

A spectrum representing the derivative.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.2 Connect()

```
void DiplomaMB.Models.ISpectrometer.Connect ( )
```

Connects to the spectrometer.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.3 Disconnect()

```
void DiplomaMB.Models.ISpectrometer.Disconnect ( )
```

Disconnects from the spectrometer.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.4 GetDarkScan()

```
void DiplomaMB.Models.ISpectrometer.GetDarkScan ( )
```

Acquires a dark scan.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.5 LoadDarkScanFromFile()

```
void DiplomaMB.Models.ISpectrometer.LoadDarkScanFromFile ( )
```

Loads a previously acquired dark scan from a file.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.6 ReadData()

```
List< Spectrum > DiplomaMB.Models.ISpectrometer.ReadData (
            int frames_to_acquire,
            bool new_id = true )
```

Reads data from the spectrometer.

Parameters

frames_to_acquire	Number of frames to acquire.
new_id	A boolean indicating whether to generate a new ID for each acquired spectrum. Default is true.

Returns

A list of spectra.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.7 ReadDataSmart()

```
Spectrum DiplomaMB.Models.ISpectrometer.ReadDataSmart (
            SmartRead smart_read )
```

Reads data from the spectrometer using smart reading techniques.

Parameters

smart_read	Settings for smart reading.

Returns

A single spectrum.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.8 ResetDevice()

```
void DiplomaMB.Models.ISpectrometer.ResetDevice ( )
```

Resets the spectrometer device.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.9 SaveDarkScanToFile()

```
void DiplomaMB.Models.ISpectrometer.SaveDarkScanToFile ( )
```

Saves the current dark scan to a file.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.10 SetIntegrationTime()

```
void DiplomaMB.Models.ISpectrometer.SetIntegrationTime (
            int integration_time )
```

Sets the integration time of the spectrometer.

Parameters

integration_time	The new integration time.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.2.11 Smoothing()

```
Spectrum DiplomaMB.Models.ISpectrometer.Smoothing (
            Smoothing smoothing,
            Spectrum spectrum )
```

Performs smoothing on a given spectrum.

Parameters

smoothing	Smoothing parameters.
spectrum	The spectrum to smooth.

Returns

A smoothed spectrum.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.3 Property Documentation

6.27.3.1 ConfigProperties

```
BindableCollection<ConfigProperty> DiplomaMB.Models.ISpectrometer.ConfigProperties  [get],
[set]
```

Gets or sets the configuration properties of the spectrometer.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.3.2 Connected

```
bool DiplomaMB.Models.ISpectrometer.Connected  [get], [set]
```

Gets or sets a value indicating whether the spectrometer is connected.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.3.3 DarkScanTaken

```
bool DiplomaMB.Models.ISpectrometer.DarkScanTaken  [get]
```

Gets a value indicating whether a dark scan has been taken.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.3.4 IntegrationTime

```
int DiplomaMB.Models.ISpectrometer.IntegrationTime  [get], [set]
```

Gets or sets the integration time for the spectrometer.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.3.5 IntegrationTimeMin

```
int DiplomaMB.Models.ISpectrometer.IntegrationTimeMin  [get], [set]
```

Gets the minimum allowable integration time for the spectrometer.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.3.6 IntegrationTimeUnit

```
IntegrationTimeUnit DiplomaMB.Models.ISpectrometer.IntegrationTimeUnit  [get], [set]
```

Gets or sets the unit of measurement for integration time.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.3.7 IntegrationTimeUnitStr

```
string DiplomaMB.Models.ISpectrometer.IntegrationTimeUnitStr  [get]
```

Gets the string representation of the unit of measurement for integration time.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

6.27.3.8 Status

```
string DiplomaMB.Models.ISpectrometer.Status  [get]
```

Gets the current status of the spectrometer.

Implemented in DiplomaMB.Models.AvantesSpectrometer, and DiplomaMB.Models.BwtekSpectrometer.

The documentation for this interface was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/ISpectrometer.cs

6.28 DiplomaMB.Utils.AvantesAPIWrapper.MeasConfigType Struct Reference

Public Attributes

- ushort **m_StartPixel**
- ushort **m_StopPixel**
- float **m_IntegrationTime**
- uint **m_IntegrationDelay**
- uint **m_NrAverages**
- DarkCorrectionType **m_CorDynDark**
- SmoothingType **m_Smoothing**
- byte **m_SaturationDetection**
- TriggerType **m_Trigger**
- ControlSettingsType **m_Control**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.29 DiplomaMB.Utils.AvantesAPIWrapper.OemDataType Struct Reference

Public Attributes

- byte[ ] **m_data**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.30 DiplomaMB.Models.Peak Class Reference

Represents a single peak in a spectrum.

Public Member Functions

- Peak (int peak_index, int peak_begin_index, int peak_end_index)

  Initializes a new instance of the Peak class.

Properties

- int **PeakIndex** `[get, set]`

  Gets or sets the index position of the peak.
- int **PeakBeginIndex** `[get, set]`

  Gets or sets the index position where the peak begins.
- int **PeakEndIndex** `[get, set]`

  Gets or sets the index position where the peak ends.

6.30.1 Detailed Description

Represents a single peak in a spectrum.

6.30.2 Constructor & Destructor Documentation

6.30.2.1 Peak()

```
DiplomaMB.Models.Peak.Peak (
            int peak_index,
            int peak_begin_index,
            int peak_end_index )
```

Initializes a new instance of the Peak class.

Parameters

peak_index	The index position of the peak.
peak_begin_index	The index position where the peak begins.
peak_end_index	The index position where the peak ends.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/Peak.cs

6.31 DiplomaMB.ViewModels.PeaksViewModel.PeakInfo Class Reference

Represents a peak with its details.

Public Member Functions

- PeakInfo (int index, double peak_value, double start_wavelength, double end_wavelength, double peak_↩ wavelength)

Properties

- int **PeakIndex** `[get, set]`
- double **PeakValue** `[get, set]`
- double **StartWavelength** `[get, set]`
- double **EndWavelength** `[get, set]`
- double **PeakWavelength** `[get, set]`

6.31.1 Detailed Description

Represents a peak with its details.

6.31.2 Constructor & Destructor Documentation

6.31.2.1 PeakInfo()

```
DiplomaMB.ViewModels.PeaksViewModel.PeakInfo.PeakInfo (
            int index,
            double peak_value,
            double start_wavelength,
            double end_wavelength,
            double peak_wavelength )
```

Initializes a new instance of the PeakInfo class.

Parameters

index	The index of the peak.
peak_value	The value of the peak.
start_wavelength	The starting wavelength of the peak.
end_wavelength	The ending wavelength of the peak.
peak_wavelength	The peak wavelength.

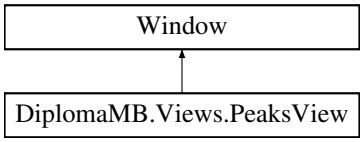
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/PeaksViewModel.cs

6.32 DiplomaMB.Views.PeaksView Class Reference

Interaction logic for PeaksView.xaml.

Inheritance diagram for DiplomaMB.Views.PeaksView:



6.32.1 Detailed Description

Interaction logic for PeaksView.xaml.

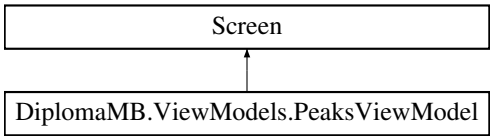
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Views/PeaksView.xaml.cs

6.33 DiplomaMB.ViewModels.PeaksViewModel Class Reference

ViewModel responsible for peak detection and display in a spectrum.

Inheritance diagram for DiplomaMB.ViewModels.PeaksViewModel:



Classes

- class PeakInfo

  Represents a peak with its details.

Public Member Functions

- PeaksViewModel (Spectrum _spectrum, ISpectrometer _spectrometer)

  Initializes a new instance of the PeaksViewModel class.
- void **DetectPeaks** ()

  Detects the peaks within the spectrum based on various parameters.

Properties

- Spectrum **Spectrum** `[get, set]`

  Gets or sets the current spectrum.
- ISpectrometer **Spectrometer** `[get, set]`

  Gets or sets the spectrometer instance.
- BindableCollection< PeakInfo > **Peaks** `[get, set]`

  Gets or sets the collection of peaks.
- int **MinPeakHeight** `[get, set]`

  Gets or sets the minimum peak height for peak detection.

6.33.1 Detailed Description

ViewModel responsible for peak detection and display in a spectrum.

6.33.2 Constructor & Destructor Documentation

6.33.2.1 PeaksViewModel()

```
DiplomaMB.ViewModels.PeaksViewModel.PeaksViewModel (
            Spectrum _spectrum,
            ISpectrometer _spectrometer )
```

Initializes a new instance of the PeaksViewModel class.

Parameters

_spectrum	The spectrum to be used.
_spectrometer	The spectrometer to be used.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/PeaksViewModel.cs

6.34 DiplomaMB.Utils.AvantesAPIWrapper.PixelArrayType Struct Reference

Public Attributes

- double[ ] **Value**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.35 DiplomaMB.Utils.AvantesAPIWrapper.ProcessControlType Struct Reference

Public Attributes

- float[ ] **AnalogLow**
- float[ ] **AnalogHigh**
- float[ ] **DigitalLow**
- float[ ] **DigitalHigh**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.36 DiplomaMB.Utils.AvantesAPIWrapper.SaturatedArrayType Struct Reference

Public Attributes

- byte[ ] **Value**

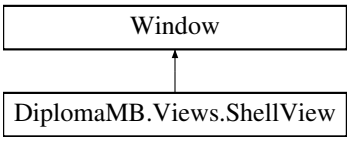
The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.37 DiplomaMB.Views.ShellView Class Reference

Interaction logic for ShellView.xaml.

Inheritance diagram for DiplomaMB.Views.ShellView:



6.37.1 Detailed Description

Interaction logic for ShellView.xaml.

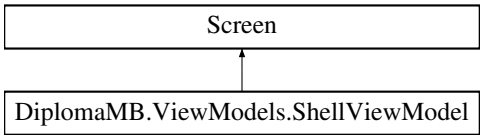
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Views/ShellView.xaml.cs

6.38 DiplomaMB.ViewModels.ShellViewModel Class Reference

ShellViewModel class provides properties and methods for the main application logic.

Inheritance diagram for DiplomaMB.ViewModels.ShellViewModel:



Public Member Functions

- **ShellViewModel** ()

  Initializes a new instance of the ShellViewModel class.
- void **OnClose** (CancelEventArgs e)

  Event handler for closing the application.
- void **UpdatePlot** ()

  Updates the PlotModel with the enabled spectrums.
- void **ExitProgram** ()

  Safely exits the program by disconnecting the spectrometer and shutting down the application.
- void **ConnectSpectrometer** ()

  Connects to the spectrometer and updates the integration time if the connection is successful.
- void **ResetSpectrometer** ()

  Resets the spectrometer device.
- void **SetIntegrationTime** ()

  Sets the integration time for the spectrometer and shows a message box indicating the result.

- async void **GetSpectrum** ()

  Acquires a spectrum and adds it to the Spectrums collection.
- async void **GetDarkScan** ()

  Acquires a dark scan from the spectrometer.
- void **StartAcquire** ()

  Starts acquiring spectra continuously using a separate thread.
- void **StopAcquire** ()

  Stops the acquiring process and unlocks the GUI.
- async void **GetSpectrumSmart** ()

  Acquires a ¨smart¨ spectrum asynchronously.
- void **LoadSpectrum** ()

  Opens a dialog to load a spectrum from a file.
- void **LoadDarkScan** ()

  Loads a dark scan from a file.
- void **SaveDarkScan** ()

  Saves the current dark scan to a file.
- void **DeleteSelectedSpectrum** ()

  Deletes the selected spectrum and updates the plot.
- void **DeleteAllSpectrums** ()

  Deletes all spectra and updates the plot.
- void **SaveSelectedSpectrum** ()

  Saves the selected spectrum to a file. If no spectrum is selected, shows an error message.
- void **SpectrumPeaks** ()

  Opens a dialog for peak detection in the selected spectrum.
- void **SpectrumOperations** ()

  Opens a dialog for editing and applying various operations on the spectra.
- void **EditSmoothing** ()

  Opens a dialog for smoothing the selected spectrum.
- void **Derivative** ()

  Opens a dialog for derivative calculations on the selected spectrum.

Properties

- PlotModel **PlotModel** `[get, set]`

  Gets or sets the PlotModel.
- ISpectrometer **Spectrometer** `[get, set]`

  Gets or sets the spectrometer object.
- Spectrum? **SelectedSpectrum** `[get, set]`

  Gets or sets the selected spectrum.
- BindableCollection< Spectrum > **Spectrums** `[get, set]`

  Gets or sets the list of spectrums.
- int **FramesToAcquire** `[get, set]`

  Gets or sets the number of frames to acquire.
- int **IntegrationTime** `[get, set]`

  Gets or sets the integration time for the spectrometer.
- SmartRead **SmartRead** `[get, set]`

  Gets or sets the SmartRead object for the spectrometer.
- bool CanConnectSpectrometer `[get]`

  Checks if the spectrometer can be connected.
- bool CanResetSpectrometer `[get]`

Checks if the spectrometer can be reset.

- bool CanSetIntegrationTime [get]

  Checks if the integration time can be set.
- bool CanGetSpectrum [get]

  Checks if a spectrum can be acquired.
- bool CanGetDarkScan [get]

  Checks if a dark scan can be acquired.
- bool **CanStartAcquire** [get]

  Checks if the acquiring process can be started.
- bool **CanStopAcquire** [get]

  Checks if the acquiring process can be stopped.
- bool **CanGetSpectrumSmart** [get]

  Checks if a ¨smart¨ spectrum can be acquired.
- bool **CanLoadSpectrum** [get]

  Checks if a spectrum can be loaded from a file.
- bool **CanLoadDarkScan** [get]

  Checks if a dark scan can be loaded from a file.
- bool **CanSaveDarkScan** [get]

  Checks if a dark scan can be saved to a file.
- bool **CanDeleteSelectedSpectrum** [get]

  Checks if the selected spectrum can be deleted.
- bool **CanDeleteAllSpectrums** [get]

  Checks if all spectra can be deleted.
- bool **CanSaveSelectedSpectrum** [get]

  Checks if the selected spectrum can be saved.
- bool **CanSpectrumPeaks** [get]

  Checks if peak detection can be performed on the spectra.
- bool **CanSpectrumOperations** [get]

  Checks if additional operations can be performed on the spectra.
- bool **CanEditSmoothing** [get]

  Checks if smoothing can be applied to the spectra.
- bool **CanDerivative** [get]

  Checks if derivative calculations can be performed on the spectra.

6.38.1 Detailed Description

ShellViewModel class provides properties and methods for the main application logic.

6.38.2 Property Documentation

6.38.2.1 CanConnectSpectrometer

```
bool DiplomaMB.ViewModels.ShellViewModel.CanConnectSpectrometer [get]
```

Checks if the spectrometer can be connected.

Returns

True if the spectrometer can be connected, otherwise false.

6.38.2.2 CanGetDarkScan

```
bool DiplomaMB.ViewModels.ShellViewModel.CanGetDarkScan [get]
```

Checks if a dark scan can be acquired.

Returns

True if a dark scan can be acquired, otherwise false.

6.38.2.3 CanGetSpectrum

```
bool DiplomaMB.ViewModels.ShellViewModel.CanGetSpectrum [get]
```

Checks if a spectrum can be acquired.

Returns

True if a spectrum can be acquired, otherwise false.

6.38.2.4 CanResetSpectrometer

```
bool DiplomaMB.ViewModels.ShellViewModel.CanResetSpectrometer [get]
```

Checks if the spectrometer can be reset.

Returns

True if the spectrometer can be reset, otherwise false.

6.38.2.5 CanSetIntegrationTime

```
bool DiplomaMB.ViewModels.ShellViewModel.CanSetIntegrationTime [get]
```

Checks if the integration time can be set.

Returns

True if the integration time can be set, otherwise false.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/ShellViewModel.cs

6.39 DiplomaMB.Models.SmartRead Class Reference

Represents settings and parameters for performing smart reading of spectrums.

Public Member Functions

- **SmartRead** ()

  Initializes a new instance of the SmartRead class with default settings.

Properties

- int **SpectrumsToAverage** `[get, set]`

  Gets or sets the number of spectrums to average during a smart read operation.
- bool **Smoothing** `[get, set]`

  Gets or sets a value indicating whether smoothing should be applied during a smart read operation.
- bool **DarkCompensation** `[get, set]`

  Gets or sets a value indicating whether dark compensation should be applied during a smart read operation.

6.39.1 Detailed Description

Represents settings and parameters for performing smart reading of spectrums.

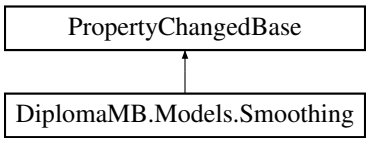
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/SmartRead.cs

6.40 DiplomaMB.Models.Smoothing Class Reference

Represents the parameters and options for performing data smoothing.

Inheritance diagram for DiplomaMB.Models.Smoothing:



Properties

- bool **PerformSmoothing** `[get, set]`

  Gets or sets a value indicating whether smoothing should be performed.
- bool **CreateNewSpectrum** `[get, set]`

  Gets or sets a value indicating whether a new spectrum should be created after smoothing.
- int **BoxCarWindow** `[get, set]`

  Gets or sets the window size for the BoxCar smoothing algorithm.
- int **SavGolayWindow** `[get, set]`

  Gets or sets the window size for the Savitzky-Golay smoothing algorithm.
- int **FftSmoothingDegree** `[get, set]`

  Gets or sets the degree for FFT (Fast Fourier Transform) smoothing.
- SmoothingType **SmoothingType** `[get, set]`

Gets or sets the type of smoothing algorithm to be used.

- bool **IsBoxCarEnabled** `[get]`

  Gets a value indicating whether the BoxCar algorithm is enabled.
- bool **IsFftEnabled** `[get]`

  Gets a value indicating whether the FFT algorithm is enabled.
- bool **IsSavGolayEnabled** `[get]`

  Gets a value indicating whether the Savitzky-Golay algorithm is enabled.
- int **Parameter** `[get]`

  Gets the parameter value for the selected smoothing algorithm.
- int **Type** `[get]`

  Gets the type index for the selected smoothing algorithm.

6.40.1 Detailed Description

Represents the parameters and options for performing data smoothing.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/Smoothing.cs

6.41 DiplomaMB.Utils.AvantesAPIWrapper.SmoothingType Struct Reference

Public Attributes

- ushort **m_SmoothPix**
- byte **m_SmoothModel**

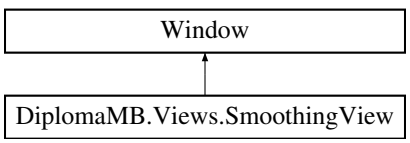
The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.42 DiplomaMB.Views.SmoothingView Class Reference

Logika interakcji dla klasy SmoothingView.xaml.

Inheritance diagram for DiplomaMB.Views.SmoothingView:



6.42.1 Detailed Description

Logika interakcji dla klasy SmoothingView.xaml.

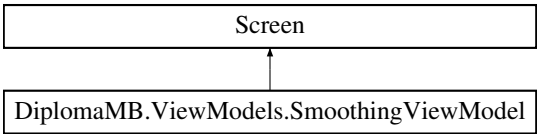
The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Views/SmoothingView.xaml.cs

6.43 DiplomaMB.ViewModels.SmoothingViewModel Class Reference

ViewModel for managing the smoothing settings.

Inheritance diagram for DiplomaMB.ViewModels.SmoothingViewModel:



Public Member Functions

- **SmoothingViewModel** ()

  Initializes a new instance of the SmoothingViewModel class.
- void **CloseWindow** ()

  Closes the smoothing settings window and saves the changes.
- void **CancelWindow** ()

  Closes the smoothing settings window without saving the changes.

Properties

- Smoothing **Smoothing** `[get, set]`

  Gets or sets the Smoothing settings.

6.43.1 Detailed Description

ViewModel for managing the smoothing settings.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/SmoothingViewModel.cs

6.44 DiplomaMB.Models.Spectrum Class Reference

Represents a spectrum with wavelengths and data values.

Public Member Functions

- Spectrum (List< double > _wavelengths, List< double > _dataValues, bool update_id=true, string _name="")

  Initializes a new instance of the Spectrum class with the provided wavelengths and data values.
- Spectrum (string file_path)

  Initializes a new instance of the Spectrum class by loading data from a file.
- OxyPlot.Series.LineSeries getPlotSerie ()

  Creates and returns a plot series for displaying on an OxyPlot chart.
- OxyPlot.Series.ScatterSeries getPeaks ()

  Creates and returns a scatter series representing the peaks for displaying on an OxyPlot chart.
- Spectrum PerformBaselineCorrection (Spectrum spectrum, long lambda, uint itermax)

  Performs baseline correction on a given Spectrum object using the AirPLS algorithm.
- void SaveToFile ()

  Opens a SaveFileDialog to let the user save the data to a file in either CSV or JSON format.

Static Public Member Functions

- static Spectrum operator+ (Spectrum spectrum1, Spectrum spectrum2)

  Adds each data value in one Spectrum to the corresponding data value in another Spectrum.
- static Spectrum operator+ (Spectrum spectrum1, double doubleValue)

  Adds a specified double value to each data value in the Spectrum.
- static Spectrum operator- (Spectrum spectrum1, Spectrum spectrum2)

  Subtracts each data value in one Spectrum from the corresponding data value in another Spectrum.
- static Spectrum operator- (Spectrum spectrum1, double doubleValue)

  Subtracts a specified double value from each data value in the Spectrum.
- static Spectrum operator∗ (Spectrum spectrum1, Spectrum spectrum2)

  Multiplies each data value in one Spectrum by the corresponding data value in another Spectrum.
- static Spectrum operator∗ (Spectrum spectrum1, double doubleValue)

  Multiplies each data value in the Spectrum by a specified double value.
- static Spectrum operator/ (Spectrum spectrum1, Spectrum spectrum2)

  Divides each data value in one Spectrum by the corresponding data value in another Spectrum.
- static Spectrum operator/ (Spectrum spectrum1, double doubleValue)

  Divides each data value in the Spectrum by a specified double value.
- static Spectrum AverageSpectrums (Spectrum spectrum1, Spectrum spectrum2)

  Averages the data values of two Spectrum objects element-wise.
- static Spectrum **MergeSpectrums** (Spectrum spectrum1, Spectrum spectrum2, int threshold, int spectrum↩ _max_value)
- static void **IncrementLastId** ()

  Increments last_spectrum_id value.

Properties

- int **Id** `[get, set]`
- string **Name** `[get, set]`
- bool **Enabled** `[get, set]`
- List< double > **Wavelengths** `[get, set]`
- List< double > **DataValues** `[get, set]`
- List< Peak > Peaks `[get, set]`

  Gets or sets the list of peaks in the spectrum.

6.44.1 Detailed Description

Represents a spectrum with wavelengths and data values.

6.44.2 Constructor & Destructor Documentation

6.44.2.1 Spectrum() [1/2]

```
DiplomaMB.Models.Spectrum.Spectrum (
            List< double > _wavelengths,
            List< double > _dataValues,
            bool update_id = true,
            string _name = "" )
```

Initializes a new instance of the Spectrum class with the provided wavelengths and data values.

Parameters

_wavelengths	A list of wavelengths to be assigned to this instance.
_dataValues	A list of data values to be assigned to this instance.
update_id	A boolean indicating whether to increment the last_spectrum_id. Default is true.
_name	A string representing the name of the Spectrum. If an empty string is provided, a default name based on the spectrum ID will be used.

The constructor initializes the Wavelengths, DataValues, and Name properties with the provided values. If update↩ _id is true, it also increments the last_spectrum_id. It sets the Enabled property to true and initializes an empty list for storing peaks.

6.44.2.2 Spectrum() [2/2]

```
DiplomaMB.Models.Spectrum.Spectrum (
            string file_path )
```

Initializes a new instance of the Spectrum class by loading data from a file.

Parameters

file_path	The path to the file to be loaded. The file can be either a CSV or a JSON file.
_id	An integer ID that will be assigned to the Spectrum instance.

The constructor will determine the file type based on the file extension (.csv or .json) and then call the appropriate method (LoadCsvFile or LoadJsonFile) to load the data. After loading the data, it initializes an empty list for storing peaks.

Note: The given file should conform to the expected CSV or JSON format. Otherwise, the behavior is undefined.

6.44.3 Member Function Documentation

6.44.3.1 AverageSpectrums()

```
static Spectrum DiplomaMB.Models.Spectrum.AverageSpectrums (
            Spectrum spectrum1,
            Spectrum spectrum2 )  [static]
```

Averages the data values of two Spectrum objects element-wise.

Parameters

spectrum1	The first Spectrum object whose data values are to be averaged.
spectrum2	The second Spectrum object whose data values are to be averaged.

Returns

A new Spectrum object where each data value is the average of the corresponding data values in the input Spectrums.

This function allows for easy averaging of data values from two Spectrum objects. It creates a new Spectrum object that contains the averaged data values.

Note: This operation does not alter the original Spectrum objects.

Caution: The function assumes that both Spectrum objects have the same length of data values. If they do not, this will result in an index out-of-range exception.

6.44.3.2 getPeaks()

```
OxyPlot.Series.ScatterSeries DiplomaMB.Models.Spectrum.getPeaks ( )
```

Creates and returns a scatter series representing the peaks for displaying on an OxyPlot chart.

Returns

An instance of OxyPlot.Series.ScatterSeries containing the data for the scatter plot.

This method initializes a new ScatterSeries object with various properties such as MarkerFill, MarkerSize, and MarkerType. It populates the scatter series with data points based on the 'peaks' field and associates each point with its corresponding wavelength and data value.

Note: This method assumes that the 'peaks' field contains valid Peak objects that reference correct indices in 'wavelengths' and 'data_values'.

6.44.3.3 getPlotSerie()

```
OxyPlot.Series.LineSeries DiplomaMB.Models.Spectrum.getPlotSerie ( )
```

Creates and returns a plot series for displaying on an OxyPlot chart.

Returns

An instance of OxyPlot.Series.LineSeries containing the data for the plot.

This method initializes a new LineSeries object with various properties such as StrokeThickness and MarkerSize. It populates the plot series with data points based on the 'data_values' and 'wavelengths' fields of the current instance.

Note: This method assumes that 'data_values' and 'wavelengths' are synchronized, meaning they have the same count of items.

6.44.3.4 operator∗() [1/2]

```
static Spectrum DiplomaMB.Models.Spectrum.operator* (
            Spectrum spectrum1,
            double doubleValue )  [static]
```

Multiplies each data value in the Spectrum by a specified double value.

Parameters

spectrum1	The Spectrum object whose data values are to be multiplied.
doubleValue	The double value by which to multiply each data value in the Spectrum.

Returns

A new Spectrum object where each data value is the result of the multiplication.

This operator allows for the easy multiplication of each data value in a Spectrum object by a double value. It creates a new Spectrum object that contains the result of the multiplication.

Note: This operation does not alter the original Spectrum object.

6.44.3.5 operator∗() [2/2]

```
static Spectrum DiplomaMB.Models.Spectrum.operator* (
            Spectrum spectrum1,
            Spectrum spectrum2 )  [static]
```

Multiplies each data value in one Spectrum by the corresponding data value in another Spectrum.

Parameters

spectrum1	The first Spectrum object whose data values are to be multiplied.
spectrum2	The second Spectrum object by which to multiply each data value in the first Spectrum.

Returns

A new Spectrum object where each data value is the result of the multiplication of corresponding data values in the input Spectra.

This operator allows for pointwise multiplication of each data value in one Spectrum object by the corresponding data value in another Spectrum object. It creates a new Spectrum object that contains the result of each multiplication.

The operation is performed only if the number of data values in both Spectrum objects are equal.

Note: This operation does not alter the original Spectrum objects.

6.44.3.6 operator+() [1/2]

```
static Spectrum DiplomaMB.Models.Spectrum.operator+ (
            Spectrum spectrum1,
            double doubleValue )  [static]
```

Adds a specified double value to each data value in the Spectrum.

Parameters

spectrum1	The Spectrum object whose data values are to be added to.
doubleValue	The double value to be added to each data value in the Spectrum.

Returns

A new Spectrum object where each data value is the result of the addition.

This operator allows for the easy addition of a double value to each data value in a Spectrum object. It creates a new Spectrum object containing the results of the addition.

Note: This operation does not alter the original Spectrum object.

6.44.3.7 operator+() [2/2]

```
static Spectrum DiplomaMB.Models.Spectrum.operator+ (
            Spectrum spectrum1,
            Spectrum spectrum2 )  [static]
```

Adds each data value in one Spectrum to the corresponding data value in another Spectrum.

Parameters

spectrum1	The first Spectrum object whose data values are to be added.
spectrum2	The second Spectrum object whose data values are to be added to the first Spectrum.

Returns

A new Spectrum object where each data value is the result of the addition of corresponding data values in the input Spectra.

This operator enables pointwise addition of each data value in one Spectrum object to the corresponding data value in another Spectrum object. It creates a new Spectrum object that contains the result of each addition.

The operation is only performed if the number of data values in both Spectrum objects are equal.

Note: This operation does not alter the original Spectrum objects.

6.44.3.8 operator-() [1/2]

```
static Spectrum DiplomaMB.Models.Spectrum.operator- (
            Spectrum spectrum1,
            double doubleValue )  [static]
```

Subtracts a specified double value from each data value in the Spectrum.

Parameters

spectrum1	The Spectrum object whose data values are to be subtracted from.
doubleValue	The double value to be subtracted from each data value in the Spectrum.

Returns

A new Spectrum object where each data value is the result of the subtraction.

This operator allows for the easy subtraction of a double value from each data value in a Spectrum object. It creates a new Spectrum object containing the results of the subtraction.

Note: This operation does not alter the original Spectrum object.

6.44.3.9 operator-() [2/2]

```
static Spectrum DiplomaMB.Models.Spectrum.operator- (
            Spectrum spectrum1,
            Spectrum spectrum2 )  [static]
```

Subtracts each data value in one Spectrum from the corresponding data value in another Spectrum.

Parameters

spectrum1	The Spectrum object from which data values are to be subtracted.
spectrum2	The Spectrum object whose data values are to be subtracted from the first Spectrum.

Returns

A new Spectrum object where each data value is the result of the subtraction of corresponding data values in the input Spectra.

This operator enables pointwise subtraction of each data value in one Spectrum object from the corresponding data value in another Spectrum object. It creates a new Spectrum object that contains the result of each subtraction.

The operation is only performed if the number of data values in both Spectrum objects are equal.

Note: This operation does not alter the original Spectrum objects.

6.44.3.10 operator/() [1/2]

```
static Spectrum DiplomaMB.Models.Spectrum.operator/ (
            Spectrum spectrum1,
            double doubleValue )  [static]
```

Divides each data value in the Spectrum by a specified double value.

Parameters

spectrum1	The Spectrum object whose data values are to be divided.
doubleValue	The double value by which to divide each data value in the Spectrum.

Returns

A new Spectrum object where each data value is the result of the division.

This operator allows for easy division of each data value in a Spectrum object by a double value. It creates a new Spectrum object that contains the result of the division.

Note: This operation does not alter the original Spectrum object.

6.44.3.11 operator/() [2/2]

```
static Spectrum DiplomaMB.Models.Spectrum.operator/ (
            Spectrum spectrum1,
            Spectrum spectrum2 )  [static]
```

Divides each data value in one Spectrum by the corresponding data value in another Spectrum.

Parameters

spectrum1	The numerator Spectrum object whose data values are to be divided.
spectrum2	The denominator Spectrum object by which to divide each data value in the first Spectrum.

Returns

A new Spectrum object where each data value is the result of the division of corresponding data values in the input Spectra.

This operator allows for pointwise division of each data value in one Spectrum object by the corresponding data value in another Spectrum object. It creates a new Spectrum object that contains the result of each division.

The operation is performed only if the number of data values in both Spectrum objects are equal.

If any data value in the denominator Spectrum is zero, the corresponding result will be zero to avoid division by zero errors.

Note: This operation does not alter the original Spectrum objects.

6.44.3.12 PerformBaselineCorrection()

```
Spectrum DiplomaMB.Models.Spectrum.PerformBaselineCorrection (
            Spectrum spectrum,
            long lambda,
            uint itermax )
```

Performs baseline correction on a given Spectrum object using the AirPLS algorithm.

Parameters

spectrum	The Spectrum object containing the original data.
lambda	The regularization parameter for the AirPLS algorithm.
itermax	The maximum number of iterations for the AirPLS algorithm.

Returns

Returns a new Spectrum object with the baseline corrected data.

This method performs baseline correction on the input Spectrum object using the AirPLS algorithm. It subtracts the estimated baseline from the original data and returns a new Spectrum object containing the corrected data.

The 'lambda' and 'itermax' parameters control the behavior of the AirPLS algorithm. 'lambda' is the regularization parameter, and 'itermax' is the maximum number of iterations allowed.

The method can also be modified to use different baseline correction algorithms like ALS (currently commented out).

6.44.3.13 SaveToFile()

```
void DiplomaMB.Models.Spectrum.SaveToFile ( )
```

Opens a SaveFileDialog to let the user save the data to a file in either CSV or JSON format.

This method uses a SaveFileDialog to allow the user to specify the format and location where the data should be saved.

The supported file formats are:

- CSV: Save the data in comma-separated values format.
- JSON: Save the data in JSON format.

Depending on the selected file extension (.csv or .json), the appropriate SaveAsCsvFile or SaveAsJsonFile method is called to perform the save operation.

6.44.4 Property Documentation

6.44.4.1 Peaks

```
List<Peak> DiplomaMB.Models.Spectrum.Peaks  [get], [set]
```

Gets or sets the list of peaks in the spectrum.

A list of Peak objects representing the peaks in the spectrum.

Use this property to manipulate the peaks associated with the spectrum.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/Spectrum.cs

6.45 DiplomaMB.Utils.AvantesAPIWrapper.SpectrumCalibrationType Struct Reference

Public Attributes

- SmoothingType **m_Smoothing**
- float **m_CalInttime**
- float[ ] **m_aCalibConvers**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.46 DiplomaMB.Utils.AvantesAPIWrapper.SpectrumCorrectionType Struct Reference

Public Attributes

- float[ ] **m_aSpectrumCorrect**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.47 DiplomaMB.Utils.SpectrumUtils Class Reference

Provides utilities for spectrum baseline removal.

Static Public Member Functions

- static double[ ] BaselineRemoveAirPLS (double[ ] y, double lambda, uint itermax)
- static double[ ] BaselineRemoveALS (double[ ] y, double lambda, double p, uint itermax)

  Removes the baseline from a spectrum using the ALS algorithm.

6.47.1 Detailed Description

Provides utilities for spectrum baseline removal.

6.47.2 Member Function Documentation

6.47.2.1 BaselineRemoveAirPLS()

```
static double[] DiplomaMB.Utils.SpectrumUtils.BaselineRemoveAirPLS (
            double[] y,
            double lambda,
            uint itermax )  [static]
```

Removes the baseline from a spectrum using the airPLS algorithm.

Parameters

y	The spectrum data points.
lambda	The smoothing parameter for airPLS.
itermax	The maximum number of iterations for airPLS.

Returns

Returns an array of baseline-removed data points.

6.47.2.2 BaselineRemoveALS()

```
static double[] DiplomaMB.Utils.SpectrumUtils.BaselineRemoveALS (
            double[] y,
            double lambda,
            double p,
            uint itermax )  [static]
```

Removes the baseline from a spectrum using the ALS algorithm.

Parameters

y	The spectrum data points.
lambda	The smoothing parameter for ALS.
p	The asymmetry parameter for ALS.
itermax	The maximum number of iterations for ALS.

Returns

Returns an array of baseline-removed data points.

The documentation for this class was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/SpectrumUtils.cs

6.48 DiplomaMB.Utils.AvantesAPIWrapper.StandAloneType Struct Reference

Public Attributes

- byte **m_Enable**
- MeasConfigType **m_Meas**
- short **m_Nmsr**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.49 DiplomaMB.Utils.AvantesAPIWrapper.String16Type Struct Reference

Public Attributes

- string **String16**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.50 DiplomaMB.Utils.AvantesAPIWrapper.String20Type Struct Reference

Public Attributes

- string **String20**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.51 DiplomaMB.Utils.AvantesAPIWrapper.TecControlType Struct Reference

Public Attributes

- byte **m_Enable**
- float **m_Setpoint**
- float[ ] **m_aFit**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.52 DiplomaMB.Utils.AvantesAPIWrapper.TempSensorType Struct Reference

Public Attributes

- float[ ] **m_aFit**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.53 DiplomaMB.Utils.AvantesAPIWrapper.TimeStampType Struct Reference

Public Attributes

- ushort **m_Date**
- ushort **m_Time**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

6.54 DiplomaMB.Utils.AvantesAPIWrapper.TriggerType Struct Reference

Public Attributes

- byte **m_Mode**
- byte **m_Source**
- byte **m_SourceType**

The documentation for this struct was generated from the following file:

- C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs

Chapter 7

File Documentation

7.1 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/BwtekSpectrometer.cs File Reference

BwtekSpectrometer class for handling spectrometer functionalities.

Classes

- class DiplomaMB.Models.BwtekSpectrometer

  Represents a Bwtek spectrometer. Implements the ISpectrometer interface.

7.1.1 Detailed Description

BwtekSpectrometer class for handling spectrometer functionalities.

Author

Mateusz Braszczok

Date

2023-08-26

7.2 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/DerivativeConfig.cs File Reference

DerivativeConfig class for configuring derivative calculations on a spectrum.

Classes

- class DiplomaMB.Models.DerivativeConfig

  Configuration model for calculating the derivative of a spectrum.

Enumerations

- enum DiplomaMB.Models.DerivativeMethod { **Point_Diff** , **Savitzky_Golay** }

  Enum for types of derivative methods.

7.2.1 Detailed Description

DerivativeConfig class for configuring derivative calculations on a spectrum.

Author

Mateusz Braszczok

Date

2023-08-26

7.3 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/ISpectrometer.cs File Reference

Provides the interface for interacting with different types of spectrometers.

Classes

- class DiplomaMB.Models.ConfigProperty

  Represents a configuration property for a spectrometer.
- interface DiplomaMB.Models.ISpectrometer

  Interface representing a spectrometer device.

Enumerations

- enum DiplomaMB.Models.IntegrationTimeUnit { **Miliseconds** , **Microseconds** }

  Enum for specifying the unit of integration time.

7.3.1 Detailed Description

Provides the interface for interacting with different types of spectrometers.

Author

Mateusz Braszczok

Date

2023-08-26

7.4 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/Peak.cs File Reference

Represents a single peak in a spectrum.

Classes

- class DiplomaMB.Models.Peak
  Represents a single peak in a spectrum.

7.4.1 Detailed Description

Represents a single peak in a spectrum.

Author

Mateusz Braszczok

Date

2023-08-26

7.5 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/SmartRead.cs File Reference

Represents settings and parameters for performing smart reading of spectrums.

Classes

- class DiplomaMB.Models.SmartRead
  Represents settings and parameters for performing smart reading of spectrums.

7.5.1 Detailed Description

Represents settings and parameters for performing smart reading of spectrums.

Author

Mateusz Braszczok

Date

2023-08-26

7.6 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/Smoothing.cs File Reference

Represents the parameters and options for performing data smoothing.

Classes

- class DiplomaMB.Models.Smoothing
  Represents the parameters and options for performing data smoothing.

Enumerations

- enum DiplomaMB.Models.SmoothingType { **Fft** , **SavGolay** , **BoxCar** }
  Defines the types of smoothing algorithms that can be used.

7.6.1 Detailed Description

Represents the parameters and options for performing data smoothing.

Author

Mateusz Braszczok

Date

2023-08-26

7.7 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Models/Spectrum.cs File Reference

This file contains the Spectrum class which represents a spectrum with wavelengths and data values.

Classes

- class DiplomaMB.Models.Spectrum
  Represents a spectrum with wavelengths and data values.

7.7.1 Detailed Description

This file contains the Spectrum class which represents a spectrum with wavelengths and data values.

Author

Mateusz Braszczok

Date

2023-08-25

7.8 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/AvantesAPIWrapper.cs File Reference

AvantesAPIWrapper class for interfacing with Avantes spectrometer API.

Classes

- class **DiplomaMB.Utils.AvantesAPIWrapper**
- struct DiplomaMB.Utils.AvantesAPIWrapper.PixelArrayType
- struct DiplomaMB.Utils.AvantesAPIWrapper.SaturatedArrayType
- struct DiplomaMB.Utils.AvantesAPIWrapper.String16Type
- struct DiplomaMB.Utils.AvantesAPIWrapper.String20Type
- struct DiplomaMB.Utils.AvantesAPIWrapper.AvsIdentityType
- struct DiplomaMB.Utils.AvantesAPIWrapper.DetectorType
- struct DiplomaMB.Utils.AvantesAPIWrapper.IrradianceType
- struct DiplomaMB.Utils.AvantesAPIWrapper.SpectrumCalibrationType
- struct DiplomaMB.Utils.AvantesAPIWrapper.SmoothingType
- struct DiplomaMB.Utils.AvantesAPIWrapper.SpectrumCorrectionType
- struct DiplomaMB.Utils.AvantesAPIWrapper.StandAloneType
- struct DiplomaMB.Utils.AvantesAPIWrapper.DynamicStorageType
- struct DiplomaMB.Utils.AvantesAPIWrapper.MeasConfigType
- struct DiplomaMB.Utils.AvantesAPIWrapper.TimeStampType
- struct DiplomaMB.Utils.AvantesAPIWrapper.DarkCorrectionType
- struct DiplomaMB.Utils.AvantesAPIWrapper.TriggerType
- struct DiplomaMB.Utils.AvantesAPIWrapper.ControlSettingsType
- struct DiplomaMB.Utils.AvantesAPIWrapper.BroadcastAnswerType
- struct DiplomaMB.Utils.AvantesAPIWrapper.TempSensorType
- struct DiplomaMB.Utils.AvantesAPIWrapper.TecControlType
- struct DiplomaMB.Utils.AvantesAPIWrapper.ProcessControlType
- struct DiplomaMB.Utils.AvantesAPIWrapper.EthernetSettingsType
- struct DiplomaMB.Utils.AvantesAPIWrapper.OemDataType
- struct DiplomaMB.Utils.AvantesAPIWrapper.DeviceConfigType
- struct DiplomaMB.Utils.AvantesAPIWrapper.HeartbeatReqType
- struct DiplomaMB.Utils.AvantesAPIWrapper.HeartbeatRespType
- struct DiplomaMB.Utils.AvantesAPIWrapper.DstrStatusType

7.8.1 Detailed Description

AvantesAPIWrapper class for interfacing with Avantes spectrometer API.

Author

Mateusz Braszczok

Date

2023-08-25

7.9 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/BwtekAPIWrapper.cs File Reference

BwtekAPIWrapper class for interfacing with Bwtek's spectrometer API.

Classes

- class BwtekAPIWrapper

7.9.1 Detailed Description

BwtekAPIWrapper class for interfacing with Bwtek's spectrometer API.

Author

Mateusz Braszczok

Date

2023-08-25

7.10 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/Converters.cs File Reference

Provides utilities for converting between types in WPF.

Classes

- class DiplomaMB.Utils.EnumBooleanConverter
- class DiplomaMB.Utils.BooleanToVisibilityConverter

  Converts boolean values to Visibility enum and vice versa.

7.10.1 Detailed Description

Provides utilities for converting between types in WPF.

Author

Mateusz Braszczok

Date

2023-08-25

7.11 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/IniFile.cs File Reference

Provides utilities for reading and writing INI files.

Classes

- class **DiplomaMB.Utils.IniFile**
  Provides utilities for reading and writing INI files.

7.11.1 Detailed Description

Provides utilities for reading and writing INI files.

Author

Mateusz Braszczok

Date

2023-08-25

7.12 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/Utils/SpectrumUtils.cs File Reference

Provides utilities for spectrum baseline removal.

Classes

- class DiplomaMB.Utils.SpectrumUtils
  Provides utilities for spectrum baseline removal.

7.12.1 Detailed Description

Provides utilities for spectrum baseline removal.

Author

Mateusz Braszczok

Date

2023-08-25

7.13 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/DerivativeViewModel.cs File Reference

ViewModel for derivative configuration.

Classes

- class DiplomaMB.ViewModels.DerivativeViewModel
  ViewModel for managing derivative configuration.

7.13.1 Detailed Description

ViewModel for derivative configuration.

Author

Mateusz Braszczok

Date

2023-08-25

7.14 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/EditingViewModel.cs File Reference

This file contains the EditingViewModel class, responsible for handling the editing operations related to spectrums like Add, Subtract, Multiply, Divide, and BaselineRemove.

Classes

- class DiplomaMB.ViewModels.EditingViewModel
  ViewModel class for editing spectra.

Enumerations

- enum DiplomaMB.ViewModels.Operations {
  Add , **Subtract** , **Multiply** , **Divide** ,
  BaselineRemove , **Average** , **Merging** }
  Enumeration to represent the types of operations that can be performed on spectra.

7.14.1 Detailed Description

This file contains the EditingViewModel class, responsible for handling the editing operations related to spectrums like Add, Subtract, Multiply, Divide, and BaselineRemove.

Author

Mateusz Braszczok

Date

2023-08-25

7.15 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/PeaksViewModel.cs File Reference

ViewModel for peak detection.

Classes

- class DiplomaMB.ViewModels.PeaksViewModel

  ViewModel responsible for peak detection and display in a spectrum.
- class DiplomaMB.ViewModels.PeaksViewModel.PeakInfo

  Represents a peak with its details.

7.15.1 Detailed Description

ViewModel for peak detection.

Author

Mateusz Braszczok

Date

2023-08-25

7.16 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/ShellViewModel.cs File Reference

ShellViewModel class responsible for handling the main application logic including spectrometer connectivity and data acquisition.

Classes

- class DiplomaMB.ViewModels.ShellViewModel

  ShellViewModel class provides properties and methods for the main application logic.

7.16.1 Detailed Description

ShellViewModel class responsible for handling the main application logic including spectrometer connectivity and data acquisition.

Author

Mateusz Braszczok

Date

2023-08-25

7.17 C:/Users/Mateusz/OneDrive - Politechnika Śląska/Pulpit/DiplomaMB/ViewModels/SmoothingViewModel.cs File Reference

ViewModel for the Smoothing settings.

Classes

- class DiplomaMB.ViewModels.SmoothingViewModel

  ViewModel for managing the smoothing settings.

7.17.1 Detailed Description

ViewModel for the Smoothing settings.

Author

Mateusz Braszczok

Date

2023-08-25

Index