

Application Note

Keywords

- Beer color
- OceanView spectroscopy software
- Schematic View

Techniques

- Absorbance spectroscopy
- Spectroradiometry

Applications

- Color analysis
- Quality control

Measuring Beer Color with OceanView

Written by Yvette Mattley, Ph.D.

OceanView Spectroscopy Software and Beer Analysis

OceanView is the flagship software program for use with Ocean Optics spectrometers. Beyond simple data visualization, OceanView allows you to generate, customize and save projects using its Schematic View function. Saved projects can then be reloaded or shared with others. The Schematic View presents the data processing steps in a diagram format with icons representing the different devices and processing steps in your project. In the Schematic, you can view and manipulate the flow of data from your spectrometer through each of your processing steps. Data flow is represented by the use of arrows that connect different nodes. The nodes represent points where data is processed or manipulated.



Beer is one of the most popular beverages in the world, with global consumption in the billions of gallons per year. This great thirst for beer is quenched by an endless array of varieties characterized by their color, alcohol content and bitterness. The most common measurements brewers use to specify beer color, which is determined by the malt used to brew the beer, are the Standard Reference Method (SRM) and European Brewery Convention (EBC). The SRM and EBC are both calculated by multiplying the absorbance in a 1 cm pathlength measured at 430 nm by a constant (12.7 for SRM and 25 for EBC).

About OceanView Schematic View

The Schematic View provides you with all of the functionality of the OceanView graph view, plus additional capabilities to customize your spectroscopy measurements:

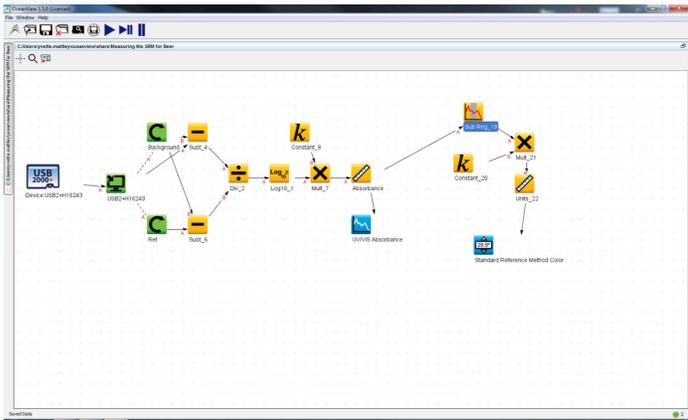
- More than 70 algorithm nodes enabling a range of math functions for basic to advanced calculations
- Subrange node to specify a subset of the spectrum or a single wavelength

- Interpolation of spectral data to output data at consistent, evenly spaced intervals
- Scalar view for monitoring a single value such as TEC temperature or an integral or average over a specified wavelength range
- Ability to preview spectra in graphs at every step in your process

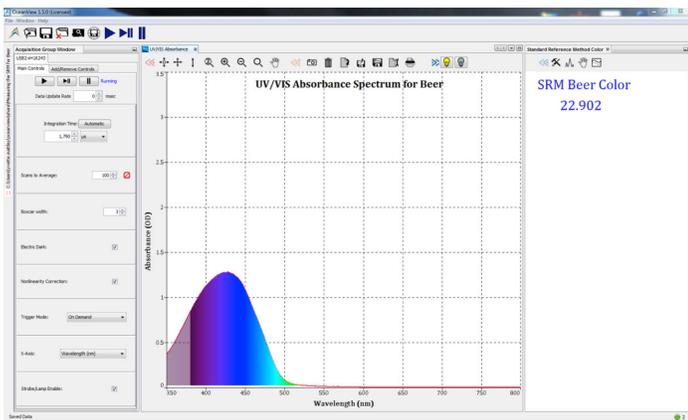
Create, configure and connect schematic nodes to read data from devices, transform and combine that data through a library of built-in spectroscopic functions, and then output the results to visual graphs and Excel-ready CSV files.

Project Description

This project was created to calculate the SRM or EBC for beer using a visible absorbance measurement.



Schematic



Project

Project Import Procedure

Import the project into OceanView by going to File Share project Import. OceanView will guide you through the steps necessary to swap the spectrometer you are using into the project including measuring a new reference and dark spectrum. As specified in the literature, the analytical wavelength for calculating the SRM is 430 nm, so you must use a spectrometer configured to detect light in this region.

When you open the Schematic, you will see that we use a SubRange node to specify the absorbance value only at 430 nm. We then multiply the absorbance at 430 nm by a literature-specified constant value to calculate the SRM value, which we display in a Scalar view. Use a constant value of 12.7 for SRM values (25 for EBC values). Update the value in the Constant node to the appropriate literature value based on the color measurement method you want to use. The measurement should be made with undiluted beer in a standard 1 cm pathlength cuvette.

Note that dilution may be required for darker beers to ensure the absorbance value falls within the linear absorbance range for the spectrometer. A good rule of thumb is to keep your absorbance between 0.1 and 1 AU when possible. If dilution is required, you can include a dilution factor in your calculations. To add this dilution factor to your Schematic, you add a new Constant node and a new Multiply node to the Schematic. Enter your dilution factor into the new Constant node and connect the new Constant node and the existing Multiply node to the new Multiply node to take your dilution into account.

Contact us today for more information on setting up your spectroscopy system from Ocean Optics.

