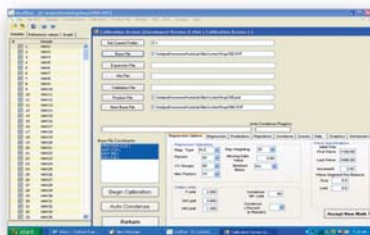


UCal Chemometric Database Management Software



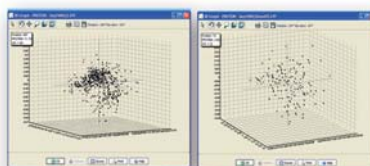
The UCal software is a powerful software tool for managing databases and developing calibrations. UCal is designed to ensure that calibrations are accurate by using databases that have been properly optimized to contain the correct samples. This intuitive, state of the art software is simple to use, yet powerful enough for even the most advanced user.

Easy File Management



UCal - Structure Databases & Calibrate

The UCal™ software is an intuitive Windows™ based program. Its logical data file structure allows for sets of data to be reviewed and combined with ease. Spectra files can easily be imported and exported along with constituent information to simplify the file management process. A graphical interface allows for quick and easy viewing of spectral data. Spectral graphs, calibration graphs, and text data can all be exported to other Windows™ programs for use in building reports and presentations.



Database Building and Condensing with ND

The UCal software contains a powerful file conversion section that converts spectral data from multiple vendor instruments into the UCal format. This means that UCal can be used on multiple vendor platforms. Data can be imported to and exported from UCal using Unity .svf format, j-camp (.dx, .jdx), Grams (.spc), NIRSystems (.nir and .cal), and other formats. Spectral data can be truncated and interpolated to match wavelength ranges when transferring a database.

UCal provides standardization to match a network of instruments to a "Master" instrument. This standardization feature can even accommodate instruments from different vendors. UCal also provides features to transfer an existing calibration database to the SpectraStar, while then be able to add new samples to the transferred database.

Easy Calibration Development

UCal provides a powerful, yet easy calibration development process for building the most accurate calibrations. With a single screen calibration interface, a compact file structure where a single calibration equation file is used for all constituents, and single push button operation, UCal makes creating calibrations easy.

Benefits/Features

- Easy to use
- Single screen calibration interface
- Compact file structure - single calibration equation file for all constituents
- Powerful calibration tools
 - PLS algorithm using neighborhood distance principle
 - Condense Algorithm for database optimization
 - Minimization (MIN) file to remove unwanted variation from the spectra
- Neighborhood distances use PLS (partial least squares) instead of PCA (principle component analysis) for database structuring
 - Each constituent has its own distribution
 - Best possible mathematical model to enhance the accuracy of the product database
 - Provides confidence that the predicted values are accurate
 - Provides the best tool to identify new samples for a database – chemistry can be run for specific constituents as opposed to running all constituents in a PCA structure.
 - Save thousands of dollars in maintaining and adding to a database over time.
- Can be used on multiple vendor platforms

For quantitative calibrations, UCal supports optimized PLS (Partial Least Squares) chemometric models. Optimized PLS uses the Neighborhood Distance (ND) Principle to optimize and build databases using PLS instead of PCA (Principle Component Analysis) to organize and structure the database. With this principle, UCal includes a patented Condensing algorithm to remove unwanted redundancy from large databases. Properly structuring a database in this way will greatly improve the calibration's accuracy.

Because the Neighborhood Distance Principle relies on PLS mathematics, databases are optimized per constituent as opposed to other software packages that only focus on PCA, which doesn't factor in constituent variation. This means that with UCal, each constituent will have its own sample distribution, leading to the best possible accuracy.

Using the ND Principle, UCal provides the best tool to identify new samples for a calibration database. Because the software is focusing on individual constituents, wet chemistry is only necessary for specific constituents as opposed to analyzing for all constituents in a PCA structure. This saves thousands of dollars in wet chemistry costs for building and maintaining calibrations and databases.

UCal includes standard math treatments such as absorbance, 1st through 4th derivatives with configurable gap and smoothing segments, SNV, Detrend, and more for developing accurate, stable calibrations. Math treatments can be customized for even greater flexibility. The Minimization (MIN) File helps to minimize unwanted variation in the data due to sampling effects or instrument differences. UCal provides automatic outlier diagnostics with various selection criteria on T and GH statistics to eliminate bad samples and simplify the calibration process. UCal also provides an off-line prediction tool for predicting spectra against multiple calibrations.

Unity boasts some of the finest technical specialists in the world. Our employees have an average of 19 years of experience implementing NIR technology on most NIR brand models. Our experienced staff can provide the training necessary for quick and easy implementation of UCal for calibration development and database management.



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UScan

UScan™ allows calibration equations that were developed using the UCal software to be used on multiple vendor platforms. UScan runs over the top of the routine operation software and provides predicted results from calibrations developed in UCal. All results are stored with date and time stamps. All spectra are stored in Unity format .svf files for use with the UCal software. Samples flagged in UScan as ND outliers are stored separately so that they can easily be added to the calibration database. The UScan software brings the power of the UCal software to other vendor NIR instrumentation.

UScan – Routine Operation

