

UCAL™ 5 NIR Calibration Platform



CALIBRATION EXPERTISE, BUILT IN, FOR SPECTRASTAR™ XT SERIES ANALYZERS

UCAL™ 5 runs in your web browser, on a Windows PC or on your company's own server, and keeps your spectra, laboratory values, trial calibrations and published models organized in groups and projects that match how your organization works. Add your scans and laboratory results, and UCAL™ 5 helps you build and check the calibration and prepares it for your analyzers. It makes NIR calibration development accessible to every laboratory and production site, whether you are building your first calibration or have years of chemometrics experience.

THE STARTING LINE: KPM CALIBRATIONS

Rather than beginning calibration development from scratch, users can purchase from KPM Analytics' growing library of over 250 ready-to-use and customizable calibrations via the KPM Web Store, including product- and market-specific bundles. Going this route gives the user a solid framework to build calibrations for their unique products.

THE COACH: BUILT-IN LESSONS

Fifteen short lessons inside the platform, starting with how NIR calibration works. No previous experience is needed.

THE BUILDER: UCAL AUTOPILOT™

The UCAL Autopilot™ application builds a calibration of its own right from your data, alongside yours, and displays which settings it chose differently. Beginners who use UCAL Autopilot™ get a solid starting point when building their calibrations, while experienced users get a quick cross-check of their work.

THE REVIEWER: UCAL INSIGHT™

UCAL Insight™ looks over the data, the calibration, and the validation results, pointing out anything that deserves a closer look, marked green, yellow or red with the reason.



UCAL™ 5 PLATFORM FEATURES

- Four clear and simple steps from sample scanning to a finished calibration
- Runs on a Windows PC or a company server for a full team
- Built for large data sets
- Secure calibration file storage with both private and shareable options (Enterprise only)
- Integrates with KPMLink® cloud-based management software to simplify calibration distribution to instruments connected on a network
- Individually select the best constituent results out of your trials to build your calibrations
- Batch prediction and validation enabled
- Available in 11 languages
- UCAL™ 5 Lite is free with a new SpectraStar™ XT analyzer (introductory offer) and can be upgraded to Pro with a license key



1

Collect

Samples and
reference data



2

Build

Manually or with
UCAL Autopilot™



3

Review

With
UCAL Insight™



4

Deploy

To your analyzers
via PC or
KPMLink®



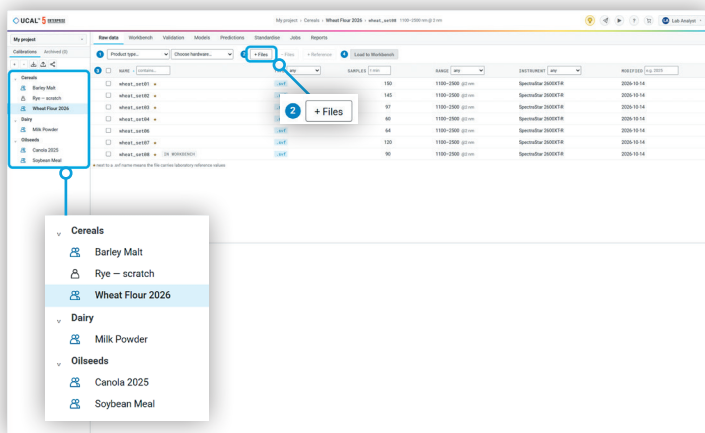
A GUIDED, SIMPLE-TO-FOLLOW WORKFLOW

There are four simple steps to building custom calibrations in UCAL™ 5. Each step guides to the next, and all adjustments are recorded and kept independent of the original files. Longer tasks run in the background while you work.

1

RAW DATA COLLECTION

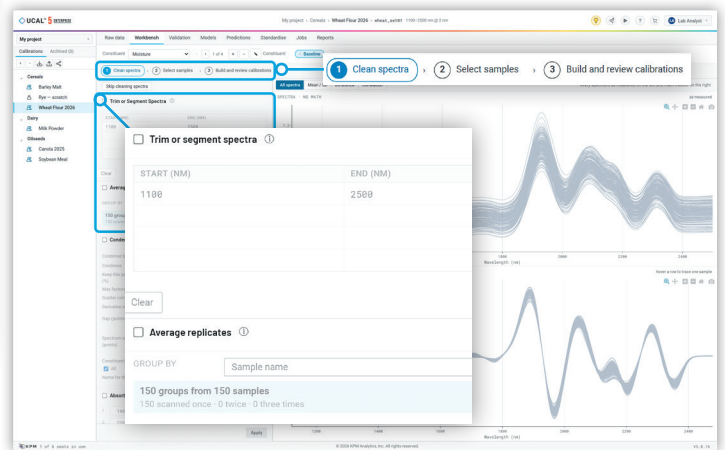
- Choose or create a calibration in the project tree on the left, where calibrations are kept in groups named by the user (Cereals, Dairy, etc.). In UCAL™ 5 Enterprise, each can be private or shared with the full team.
- Add your spectra and lab results with "+Files", or type or paste lab values into the grid.



2

WORKBENCH: CLEAN DATA & BUILD

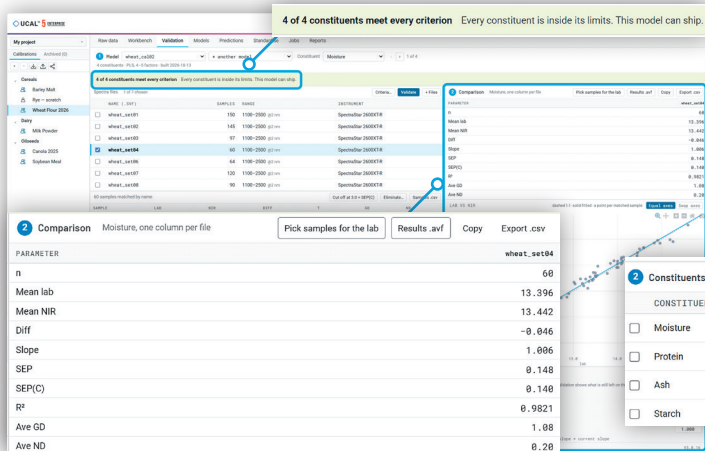
- Clean the spectra: Trim the wavelength range, average repeat scans and set aside scans you do not want. Any of these can be reversed later.
- Build a calibration, try other settings next to it, and compare the results. With UCAL Autopilot™ on, users have a comparison calibration to help validate their efforts.
- When you are happy with the result, click "Accept and validate."



3

VALIDATE

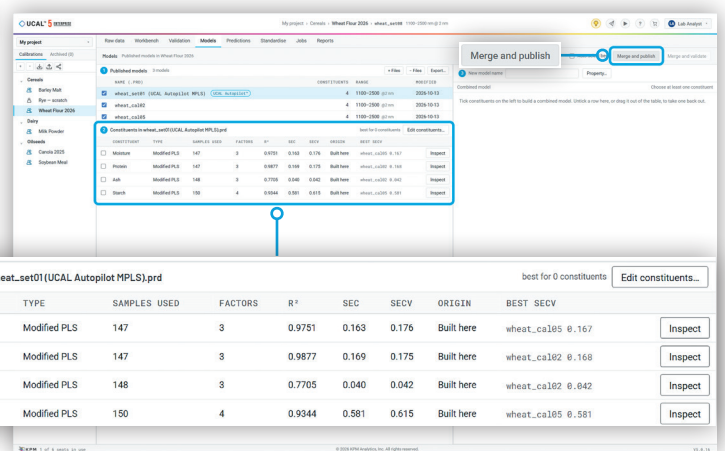
- Check the calibration against new samples it has not seen before.
- Adjust bias and slope if necessary.
- UCAL Insight™ points out anything worth a second look before you publish.



4

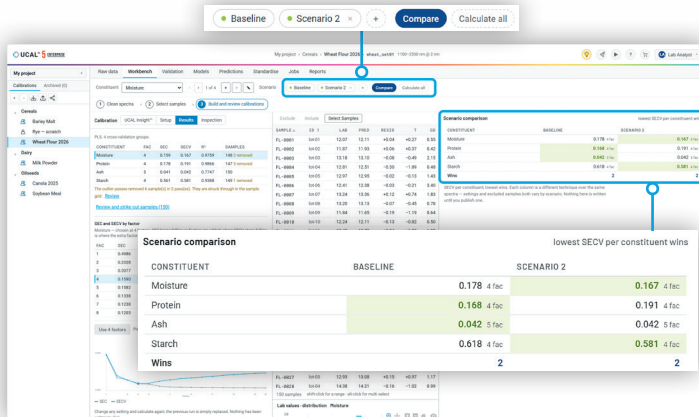
MODELS: COMBINE & PUBLISH

- Pick the best result for each property and click "Merge and publish" to create the calibration file (.prd) for your SpectraStar™ analyzers.
- Finished calibrations are listed under Models, ready to load onto your analyzers (e.g., via PC or KPMLink®).



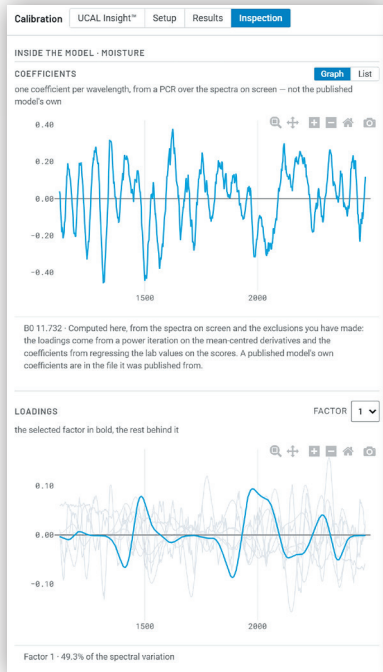
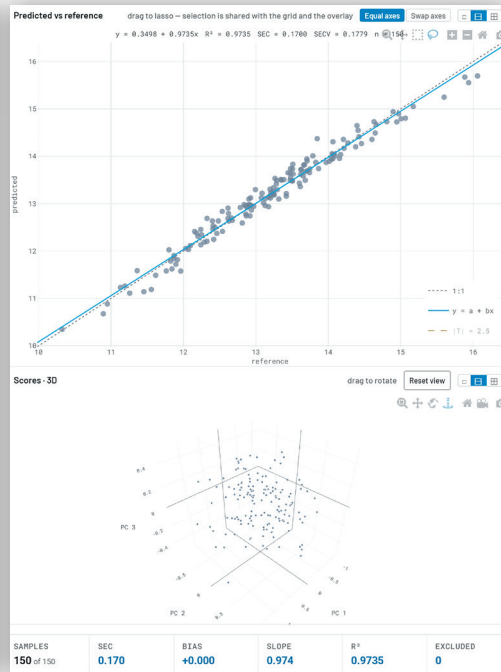
WHAT UCAL™ 5 ADDS

Chemometrics you know in a simple program



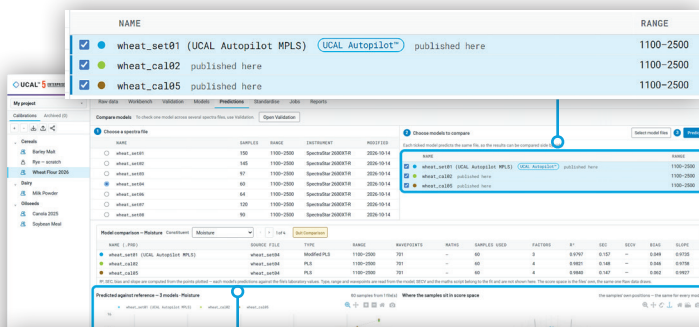
SETTINGS COMPARED SIDE BY SIDE

- Try different settings on the same data and see every result in one table, one row per property.
- The best result in each row is highlighted, so each property can use the settings that suit it best.
- Nothing is final until you publish, so making adjustments never affects the original work.



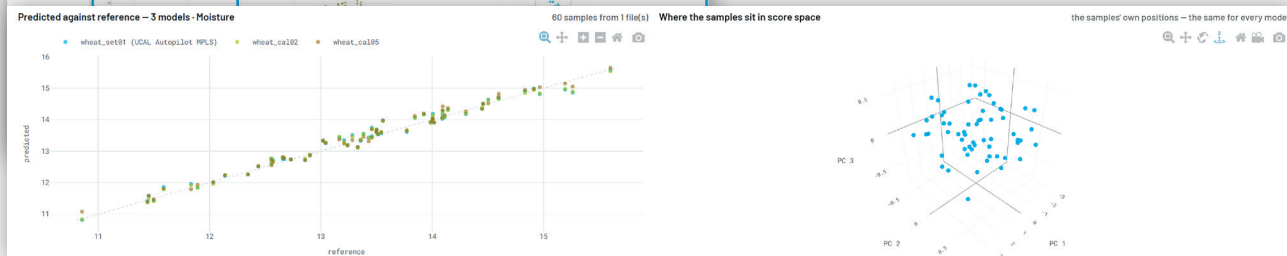
LOOK INSIDE THE CALIBRATION

- View the coefficients, loadings, and scores for any property, as a chart or a table.
- Plot predicted values against lab values to see how well the calibration fits.



COMPARE PREDICTIONS

- Predict one spectra file with several calibrations at once.
- See their results side by side: R², SEC, bias, and slope for each, and every prediction plotted against the lab values in its own color.

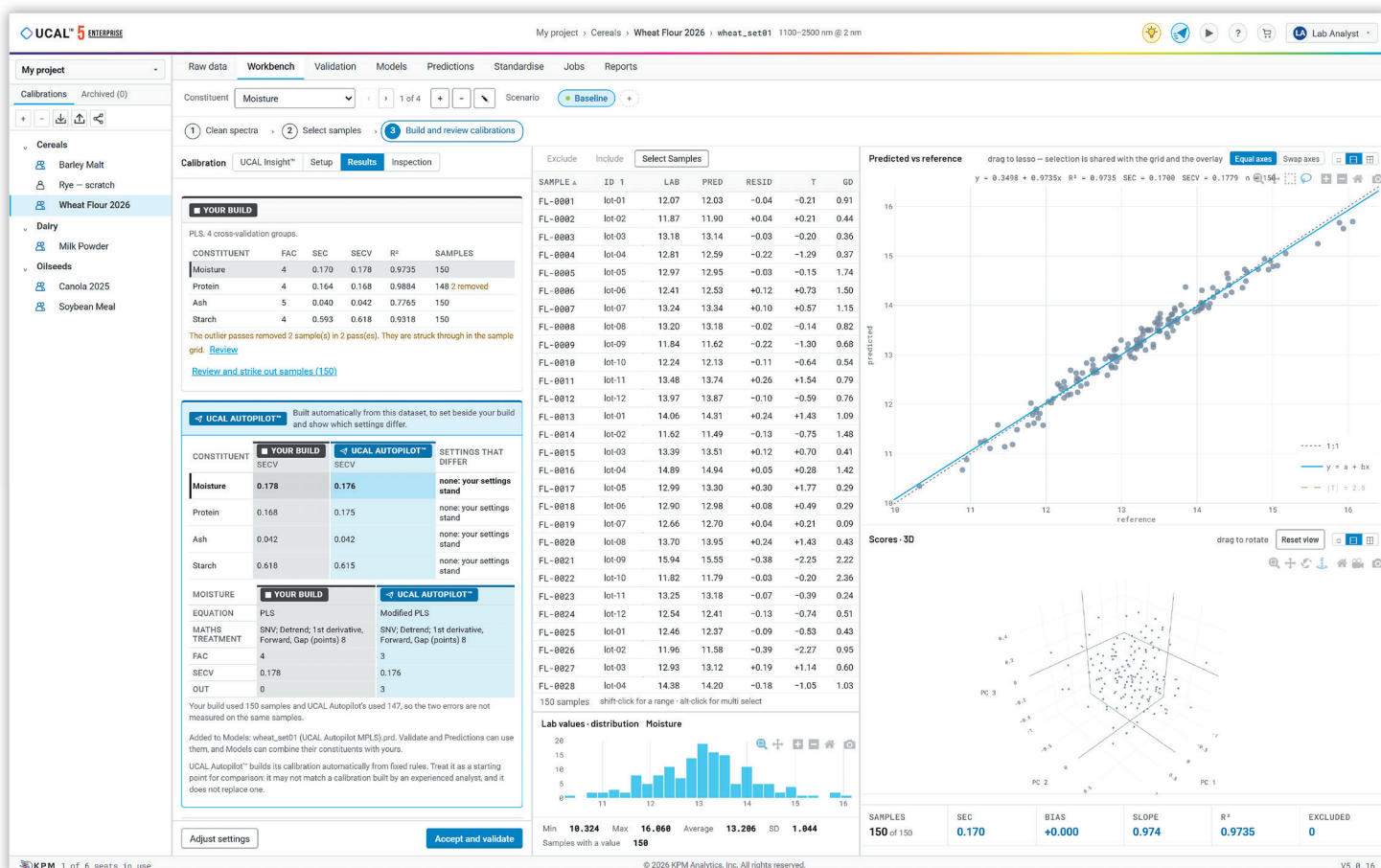




UCAL AUTOPILOT™

A calibration built for comparison

The UCAL Autopilot™ application automatically builds a calibration from the user's input data using the platform's default settings. The UCAL Autopilot™ shows every setting it chose so that the user can compare their decisions and is ready to use like any other calibration from UCAL™ 5.



HOW UCAL AUTOPILOT™ WORKS

- UCAL Autopilot™ tries several calibration methods with the platform's standard settings. It presents the calibration that performs best and lists every setting that differs from yours. This process makes it easy to see what to try next.
- It uses PLS, PLS/PCA and vPLS in every edition and adds Modified PLS in UCAL 5 Pro and Enterprise.

WHAT UCAL AUTOPILOT™ PROVIDES

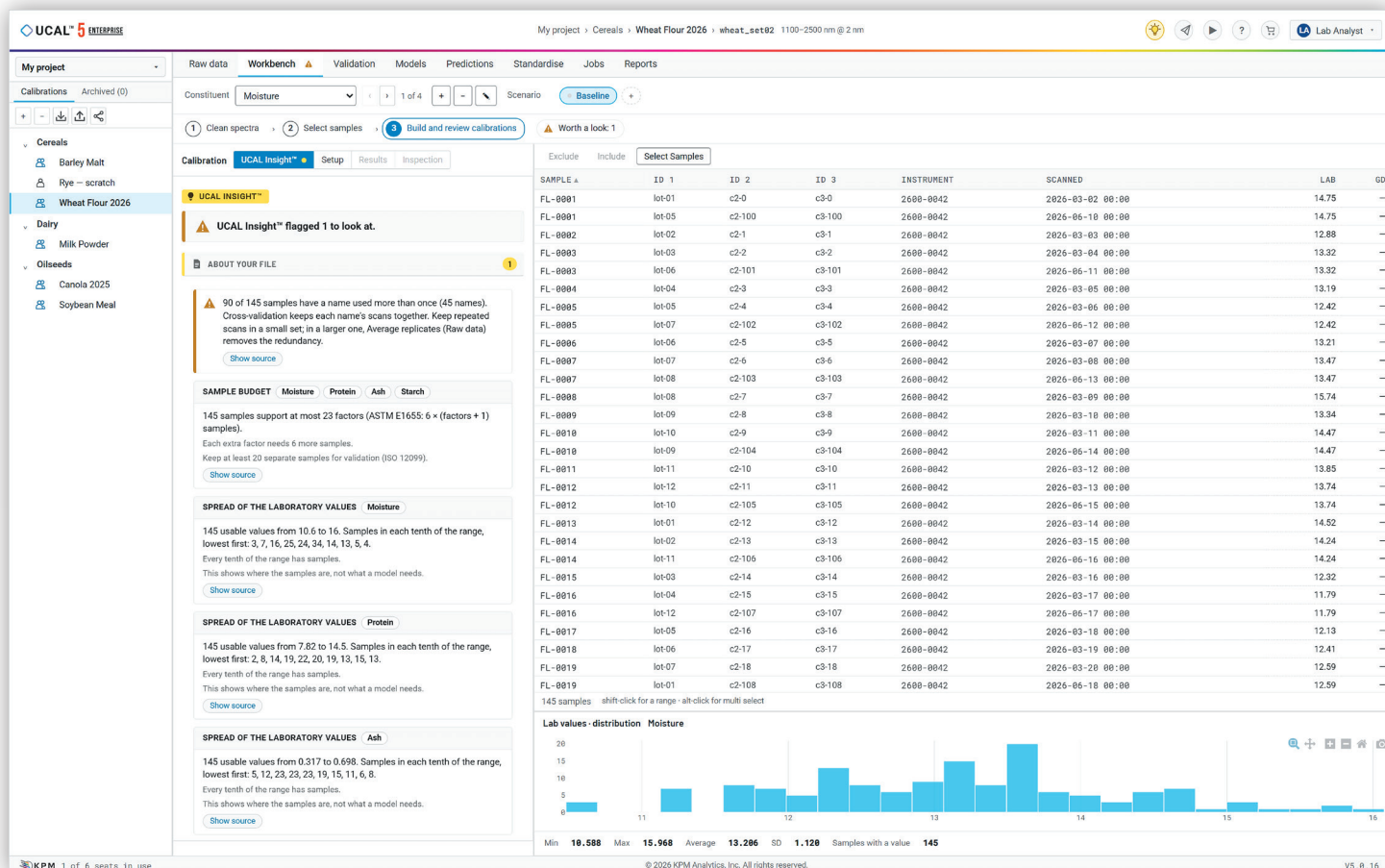
- A solid starting point for beginners, and a quick cross-check for experienced users.
- It is built once for each data set and again only when the data changes.
- After validation, its results are shown next to yours property by property.
- If you prefer its result, you can publish it like any other calibration. You always decide what is published.
- Turn the application on or off by selecting the paper airplane icon from the top menu bar.

UCAL Insight™ looks over your data, your calibration and your validation results, and tells you in plain language what deserves a closer look.



UCAL INSIGHT™

Checks your work before you publish



WHAT UCAL™ INSIGHT CHECKS

- **Your data:** Whether there are enough samples for the calibration (ASTM E1655), how well the lab values cover the range you need, and duplicate sample names.
- **Your calibration:** How it was built and how its errors compare.
- **Your validation:** Whether new samples confirm the calibration, following ASTM and ISO practice.

HOW UCAL™ INSIGHT REPORTS

- Each point is marked green, yellow or red, with the reason and what to check. These are suggestions, not rules. The user always has the final decision.
- Turn it on or off with the light-bulb button on the top menu bar.



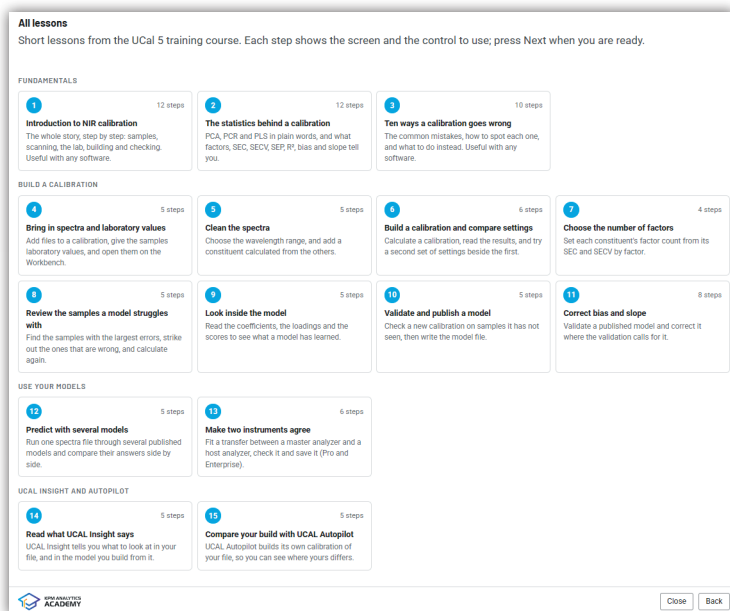
MULTI-TIER TRAINING

Learn NIR calibrations inside the platform

UCAL™ 5 is built for experienced and novice users alike. KPM Analytics offers multiple training outlets, whether within the UCAL™ 5 platform itself, or through our on-demand and in-person training offers.

TIER 1: UCAL™ TUTORIALS (TWO TUTORIALS PLUS 15 LESSONS)

UCAL™ Tutorials includes a simplified “New to UCAL™ 5” tutorial, a “Coming from an earlier version” tutorial for experienced UCAL™ 4 users, and 15 NIR calibration development and software training lessons. The first three lessons explain what a calibration is, the statistics used to judge one, and the most common reasons calibrations go wrong. The other 12 walk through the UCAL™ 5 platform itself, from adding spectra to publishing a validated calibration, and also working with UCAL Insight™ and UCAL Autopilot™ applications.



All lessons
Short lessons from the Ucal 5 training course. Each step shows the screen and the control to use; press Next when you are ready.

FUNDAMENTALS

- 1 Introduction to NIR calibration (12 steps)
- 2 The statistics behind a calibration (12 steps)
- 3 Ten ways a calibration goes wrong (10 steps)

BUILD A CALIBRATION

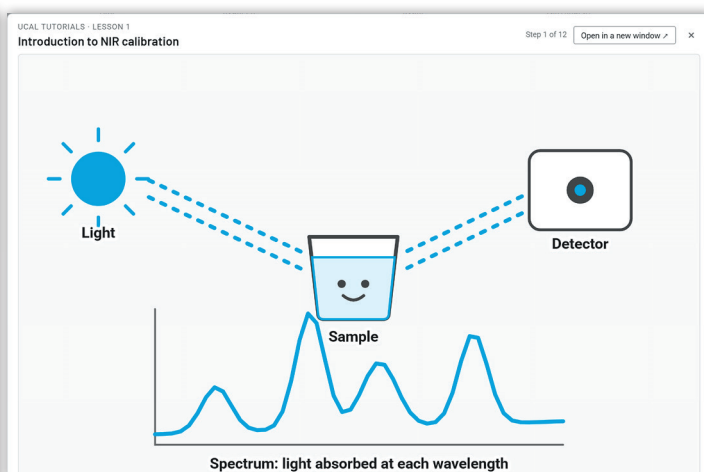
- 4 Bring in spectra and laboratory values (5 steps)
- 5 Clean the spectra (5 steps)
- 6 Build a calibration and compare settings (6 steps)
- 7 Choose the number of factors (4 steps)
- 8 Review the samples a model struggles with (5 steps)
- 9 Look inside the model (5 steps)
- 10 Validate and publish a model (5 steps)
- 11 Correct bias and slope (5 steps)

USE YOUR MODELS

- 12 Predict with several models (5 steps)
- 13 Make two instruments agree (6 steps)

UCAL INSIGHT AND AUTOPILOT

- 14 Read what UCAL Insight says (5 steps)
- 15 Compare your build with UCAL Autopilot (5 steps)



- The guided tutorials use the real UCAL™ 5 screens, so you learn the platform while working through it.
- Open them at any time from the Tutorial button on the top bar.



TIER 2: ON-DEMAND ONLINE TRAINING

Each copy of UCAL™ 5 includes access to the KPM Academy UCAL™ online training course for one year. Additional student seats and extensions are available.



KPM ACADEMY

Scan here to learn more
about the UCAL™ 5
KPM Academy Training
Course.



TIER 3: IN-PERSON UCAL™ 5 TRAINING

KPM offers in-person training for UCAL™ 5 at our KPM Analytics North America headquarters (Westborough, MA, USA) and KPM Analytics France headquarters (Villeneuve-La-Garenne, France). The class covers all aspects of NIR calibration development with UCAL™ 5.

Custom on-site training is also available.

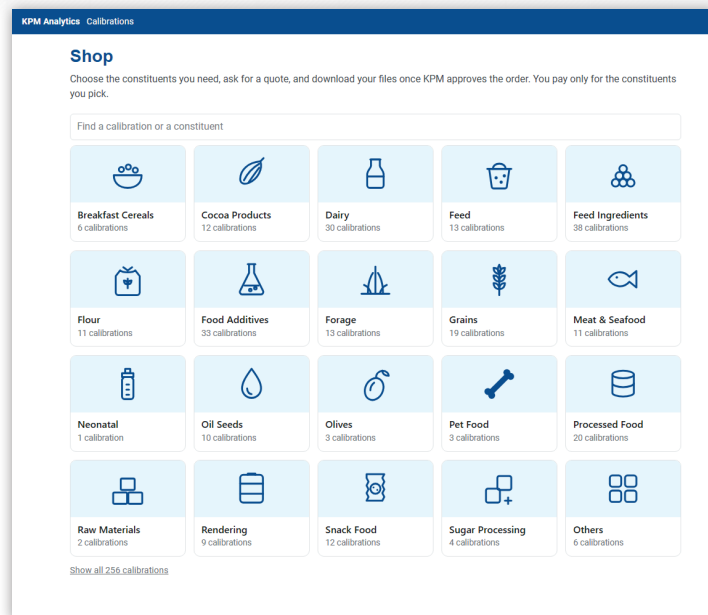
Contact us at service@kpmanalytics.com to learn more.

MAKE KPM CALIBRATIONS YOUR OWN IN UCAL™ 5

KPM Analytics has built a library of over 250 SpectraStar™ XT NIR calibrations through many years of work with food, feed, and agricultural products. You can now buy these calibrations directly from the KPM Web Store, allowing you to begin building your custom calibration with a proven model rather than from scratch. Choose only the properties you measure, such as moisture or protein, or select one of 15 ready-made bundles.

Two types of calibration files:

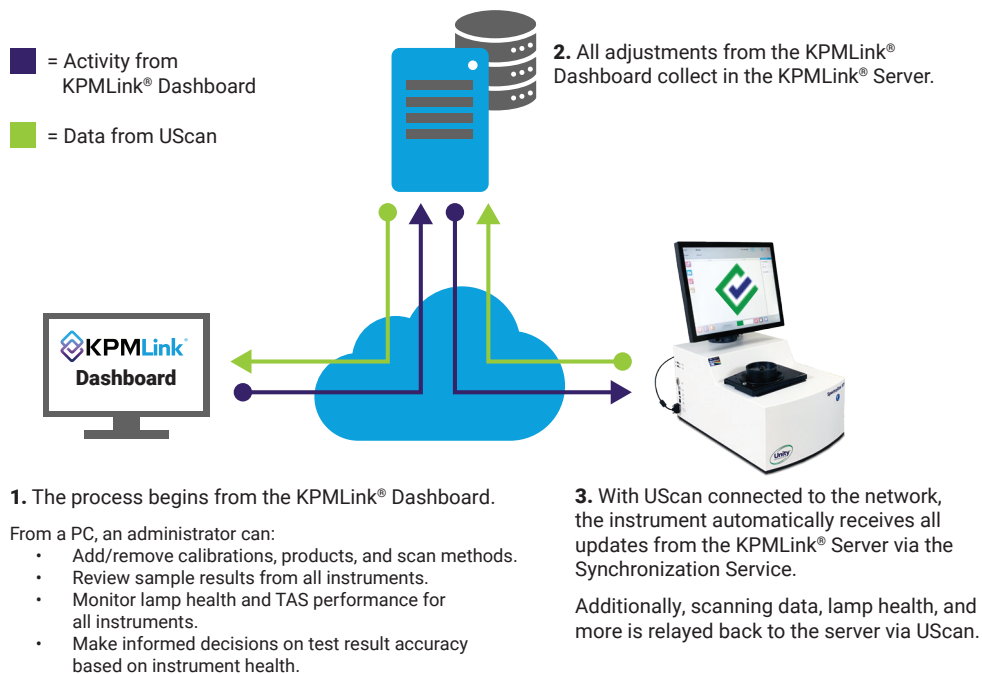
- **Ready-to-use calibration:** Load it directly onto your SpectraStar™ XT analyzer. It is available for one instrument, or as one file for your full fleet.
- **Encrypted Spectra Sample File (.esf):** Contains a KPM calibration and the spectra behind it. Open it in UCAL™ 5, add your own samples, and build a calibration that fits your products.



DEPLOY CALIBRATIONS INSTANTLY WITH KPMLINK® CLOUD-BASED MANAGEMENT

KPMLink® is an intuitive software designed for streamlined configuration of product settings, efficient management of calibrations, and synchronization of SpectraStar™ XT Series NIR analyzers globally. KPMLink® offers users and managers access to complete diagnostic history for each instrument, thereby providing detailed health information and instilling confidence needed for making decisions on collected measurement data.

KPMLink® makes it easy to distribute your UCAL™ 5 custom calibrations while ensuring all SpectraStar™ analyzers within your organization are operating at exact standards and at consistent configurations.



HOW UCAL™ 5 OPTIONS COMPARE

Platform Version	UCAL™ 4 (Legacy Software)	 UCAL™ 5 LITE	 UCAL™ 5 PRO	 UCAL™ 5 ENTERPRISE
Typical User	Single analyst	Beginners	One analyst, full tool set	A complete lab team with a shared server
Pricing Method	Licensed per PC	Free with SpectraStar™ XT Purchase (Introductory price for existing SpectraStar™ XT owners)	Per computer	Per user
Total Users	1	1	1	As many as licensed
UCAL Co-work™	No	No	No	Yes
Installation	Windows desktop	Windows 10/11 PC	Windows 10/11 PC	Company server, used through a web browser
Samples Per Calibration	Up to 5,000	500 from .svf files; unlimited from KPM libraries	No set limit	No set limit
Calibration Methods	14: PLS, vPLS, PLS/PCA, PCR, LWP, MLR, 5 qualitative and more	4: PLS, vPLS, PLS/PCA, PCR	18: All of UCAL™ 4's, plus Modified PLS and 3 neural-network models	Same as Pro
UCAL Autopilot™	No	Lite (PLS, PLS/PCA and vPLS)	Pro (adds Modified PLS)	Yes (adds Modified PLS)
UCAL Insight™	No	Lite	Pro	Yes
Built-in Lessons	No	Yes	Yes	Yes
File Types	UCAL™ 4 formats	.svf, .lvf, .prd, .esf, .csv, .txt, .xlsx	UCAL™ 4 formats + .esf	UCAL™ 4 formats + .esf
Advanced Tools (Sample Selection, Condensing, Multi-Model Prediction, Instrument Standardization)	Yes	No	Yes	Yes
Record of Every Change	No	Yes	Yes	Yes
Languages	3 (English, Japanese, Russian)	11 (English, German, Spanish, French, Japanese, Polish, Russian, Chinese, Portuguese, Korean, and Italian)	11 (English, German, Spanish, French, Japanese, Polish, Russian, Chinese, Portuguese, Korean, and Italian)	11 (English, German, Spanish, French, Japanese, Polish, Russian, Chinese, Portuguese, Korean, and Italian)

A free 30-day trial of UCAL™ 5 Pro is available to SpectraStar™ XT owners. After trial completion, the user can upgrade to Pro or Enterprise and keep all of their data from Lite. Pro and Enterprise licenses are perpetual, with yearly maintenance for new versions.

UCAL™ 4 WORK OPENS WITHOUT CONVERSION

UCAL™ 4 files open directly, and calibrations already on your analyzers give the same results. Pro and Enterprise add Modified PLS and neural-network methods, and work with far larger data sets.

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