TFCompanion Release Notes

Version 6.7 | Build 101326 | October 13, 2026

This release adds configurable thickness estimation, protected estimator files and customer calibration updates, together with improvements to fitting, batch analysis and measurement handling. These notes cover changes since Version 6.6, build 052026.

Real time thickness estimation

- A dataset-specific estimator can suggest the starting thickness before filmstack optimization. Software Properties selects the estimator file, matching filmstack name and optional target thickness parameter. If no target is specified, the filmstack must have exactly one thickness selected for calculation.
- Prediction runs in Java from the measured reflectance spectrum. Supported artifact preprocessing includes normalization, Savitzky-Golay smoothing and derivative processing. Artifacts can also use A/B sample location information from measurement names; Python is not required at runtime.
- An artifact can define a constraint around the suggested thickness. Batch calculations retain the original filmstack identity and measurement filename so matching and location corrections remain consistent after working copies are renamed.
- Predictions outside the calibrated training range generate a warning. If a configured estimator cannot be loaded or authorized, calculation continues with the current filmstack values; the desktop shows one notice per unavailable artifact until it recovers.

Customer estimator calibration

- The calibration dialog matches spectroscopic ellipsometry (SE) reference thicknesses to the original spectrum CSV files and previews an offset update. It requires a customer-calibration-enabled estimator and at least four unique reference samples, each with exactly one matching spectrum.
- The preview reports existing and proposed corrections, prediction errors and leave-one-out validation. It considers a global offset and, where supported by the artifact and reference data, separate A/B offsets. An update is accepted only when its validation criteria are met.
- The default maximum cumulative correction is 50 angstroms in either direction. The selected limit applies to the total correction after all updates, including location offsets; it does not change filmstack thickness constraints.
- An accepted update creates a new artifact and preserves the trained spectral coefficients, preprocessing and seed constraint. Protected input remains protected for the same recipients. Existing files and the active Software Properties selection are not overwritten.

Protected estimator distribution

- Version 2 protected artifacts use AES-128-GCM to authenticate the payload and recipient table. A file can authorize multiple UniKey dongle IDs and optionally one specified testing software license. Other protected format versions are rejected.
- Loading requires a validated, non-evaluation license. Authorization is checked on cached-estimator reuse and before prediction. Removing or changing the startup dongle prevents further protected-estimator use until valid authorization is restored.

Material fitting and model refinement

- Material fitting offers Smart Fit, Smart Fit + Cleanup and Direct Fit. Smart Fit initializes oscillator positions, widths and amplitudes from the target dispersion and suggests an oscillator count, reducing the amount of manual initialization required.
- Local Oscillator Refinement gives a selected wavelength region greater weight. Users can refine existing parameters or add one to five harmonic oscillators; when adding oscillators, the local fit adjusts the new oscillators while retaining the existing model parameters.
- Model Refinement supports focus wavelengths and adjacent windows, staged fitting of the current model, oscillator restructuring, and add/remove/split candidate searches. Candidates can be assessed against a target thickness and fit quality, then previewed before use.
- Configured wavelength weighting is applied consistently in MultiExperiment and Model Refinement. A selected wavelength range can use a constant weight or a Gaussian profile to concentrate the fit on the spectral region of interest.

GOF profiles and FFT analysis

- GOF Profile scans one selected parameter over a user-defined range or scans two parameters to produce a surface. Results include charts, tabulated values and text export for inspecting minima and parameter sensitivity.
- The GOF scan holds the other model parameters fixed. It evaluates cloned filmstacks against selected measured spectra inside the filmstack wavelength range, allowing inspection without changing the active filmstack.
- FFT peak refinement supports parabolic and Gaussian fits, with a parabolic fallback when the Gaussian fit cannot provide a formal confidence interval. Peak uncertainty is carried into thickness assignment where available.
- Multilayer FFT basis selection uses the thickest target layer, falling back to ordinary thickness constraints when target constraints are unavailable. Differential thickness processing includes shared-peak candidate handling and refractive-index corrections.

MultiExperiment material linking

- A material selected in one filmstack can be linked to matching materials across the participating filmstacks. Materials with differing characteristics require confirmation before replacement by the selected master material.
- Unlinking matching materials creates independent copies, allowing subsequent material changes in individual filmstacks without changing the shared source material.

Calculation behavior and diagnostics

- Partial-coherence evaluation averages phase-shifted coherent responses for intermediate coherence values, while retaining the coherent and incoherent endpoints. Reflectance and transmission corrections are applied after the optical response is evaluated.
- Timing support separates FFT and model-fit duration and provides more detailed solver measurements for investigation. A command-line benchmark can repeat calculations and export timing results to CSV for each measurement and calculation mode.

Production Batch templates and results

- Batch templates can supply per-measurement thickness seeds from a file or calculate seeds from an estimator artifact. Template settings select the target parameter, units and optional seed constraints; protected and unencrypted estimator directives are distinct.
- An optional material fallback list can retry alternative materials when a template-driven result exceeds the configured GOF threshold. This path applies when a separate multi-filmstack strategy is not active, and retains the best result from the attempted candidates.
- Batch exports match result parameters to the export column template by name, preserving column alignment when records contain different parameter sets. Thickness headers and values use the selected units, and missing values remain blank.
- Parameterized result reporting includes target comparisons, calibration-adjusted values and correlation statistics where applicable. Existing filmstack-selection, prediction and outlier diagnostics remain available with the expanded template workflow.

Measurement loading and comparison

- Data comparison loads multiple measurement files in the background with progress and cancellation. Canonical file paths prevent duplicate loading, and duplicate filenames from different directories receive distinct display names.
- Parsed files are passed to the interface one at a time to avoid an unbounded queue of spectra. Failed or skipped files are counted and reported while other files can continue loading.
- Production Batch preparation supports cancellable bulk measurement and template loading. List changes and prompts are coordinated with the Swing interface thread, and related chart changes can be grouped into one refresh to reduce repeated redraws.

Build and release compatibility

- The ProGuard crypto library reference now uses the Java 8 runtime jce.jar alongside rt.jar. This resolves the missing AEADBadTagException, GCMParameterSpec and Cipher.updateAAD references used by protected estimator files.
- Version.java reports Version 6.7 and build 101326, retains the earlier release history and adds a short numbered summary. VersionId.java is synchronized so newly generated updater metadata reports the same version and build date.
- Java 8 remains the build baseline. Estimator files are separate deployment assets: distribute the intended artifact and configure its filmstack and target parameter. Protected artifacts must include the intended dongle or testing-license recipient.

Using an updated estimator

After accepting a calibration update, explicitly select the new artifact in Software Properties or the relevant batch template. Keep the previous artifact for comparison. Confirm that the configured filmstack name and calculated thickness parameter match the intended calculation, and review any training-range or authorization warning before using the results.