

LDS Change Log

Release Notes: LDS Version 4.2.2

Critical Bug Fix

- **Manual Caustic:** Fixed a bug where manual caustics (and “re-measuring”) gives inconsistent M^2 values. Manual caustics and Smartmode now match the accuracy of automatic caustics exactly.
- **LQM+ Compatibility:** Restored functionality by correcting parameter handling
- **Connection Stability:** Automated re-connection logic restored for all devices after signal loss.

SFM Enhancements

- **Automated Parameters:** Focal length is now saved in the measurement data, and the angle of incidence/distance is calculated automatically during caustic measurement.
- **2D Stitching:** New feature to combine multiple measurements of a large scanfield or compare two scanners via overlap analysis.

General & Bug Fixes

- **Cube+ Firmware:** Updates now handled directly in the LDS GUI.
- **Performance Meter:** Correct EEPROM values for power limits now applied.
- **FM+ Linescan:** Adjusted handling of incoming measurement data.
- **Process Volume:** Beam direction and misalignment angles added to tables.
- **BM+ Stitching Tool:** Further adjustments made.
- **Device Position Check:** Further adjustments made.
- **SFM 3D View:** Ability to save workbenches added.
- **Windows Search:** Launch LDS by typing “Primes” in Windows Start Menu.
- **Display Fixes:** Resolved minor display issues across different hardware and Windows versions.
- **Documentation:** Links to device manuals added to the help section.
- **SFM 2D:** Display of numerical value of z position of plane with smallest deviation (in XY)
- **GUI:** Fixed a display issue when using the windows function “scaling”

LDS Change Log

Release Notes: LDS Version 4.1.0 / 4.2.0

This update brings significant improvements in device support, an optimized user interface (GUI), and even more powerful analysis tools for challenging measurement scenarios.

Highlights & Strategic Innovations

Optimization of Manual Caustics (Focus AM Field of Application)

1. A central highlight of this release is the optimization of **manual caustic measurements**. This now enables devices without their own z-axis (e.g., FMW+) to perform complex measurement sequences with non-equidistant steps.
***Efficiency gain:** The PRIMES recommendation for the measurement of ring beams can now be implemented across hardware, without having to manually enter z-planes per plane.*
***Flexibility:** Enables the execution of customer-specific or highly specialized measurement sequences directly in the software, while still utilizing the smart features of an auto-caustic (prediction of window size and amplification), which offers a significant workflow advantage, especially in the AM environment.*
2. **Saving workbenches:** Do you want to show a colleague, customer, or supplier a detail in one of our evaluations (e.g., in the graph tool, or in several tools simultaneously)? Perform your evaluation “as usual”. Then simply mark the measurement →Right-click →Save workbench →Save measurement and send the lpf-file. The recipient opens the measurement in the LDS (>4.2.0), marks the measurement with a right-click and “Generate workbench” → They will see EXACTLY what you want to show them.
3. Do you have a caustic that cannot be measured fully according to ISO 11146? Previously, the LDS always aborted at this point with the corresponding notice. Of course, a manual caustic was possible. Starting with LDS 4.1, a query now appears after the pre-caustic asking whether the measurement should nevertheless be carried out as automatically as possible. The question however includes a clear warning that the measurement is not possible in compliance with the standard.

Expanded Device Support & Communication

- **New Hardware:** Full integration and optimization for **Cube+** and **SFM 2D**.
- **OPC-UA Communication:** Implementation for FMW+ R2 and LQM+. The activation status for OPC-UA is now conveniently displayed directly under the device name.
- **Ring Beam Analysis:** The ring beam measurement mode and associated caustics are now natively integrated into the customer version (no separate plugin required anymore).
 - o This does not apply to other/further customer-specific plugins. Please contact us if you feel any features are missing in the LDS!
 - o The new automated ring beam measurement is conducted with updated algorithms (dynamic plane placement), ISO-conform but providing a much higher z-resolution around the focal plane.

User Interface Optimizations (GUI)

Project Tree & Data Management

- **New measurements no longer create a project!** Instead, all measurements occurring in one sequence remain clearly organized within one project. “Only” a new series is created. New projects can, of course, be easily created via right-click or “Ctrl+N”.
- **Extended File Series:** Images and other files can be added directly to a measurement via the context menu and saved together.
- **Workbench Management:** Created workbenches can now be saved, loaded, and specifically deleted.
- **Workflow Improvement:** Drag & Drop in the project tree now moves measurements; a copy is simply created via CTRL + Drag & Drop.
- **Limits:** The limit values have been completely resorted and clearly grouped for a faster overview.
- **“Recommended Tools”:** Now even more clear. All tools are, of course, still available. Simply click on “Tools” at the top.

Device Control & Operation

- **Navigation:** Upon connection with a device, the primary device control opens automatically.
- **Navigation:** A new **Home button** leads back to the start page.
- **Structure:** Menu items such as “Save and load device parameters” have been moved to the “Connections” menu for better logic.
- **Modern Design:** The entire user interface has been updated to the current **Primes Design**; the device control can now be compactly expanded or collapsed via an arrow symbol.

Analysis Tools & Graphs

- **Interactive Layer Analysis:** Lines in the false-color view and in the graph can now be comfortably moved using the cursor keys as well as x, y, and i.
- **Flexible Scaling:** Scaling is now available in layer analysis, 3D view, Ring Beam SM, and in the context menu of the false-color view.
- **Fast Focusshift Tool:** Overhaul of the GUI as well as the new possibility to draw areas directly in the graph.
 - **Not sure what the tool does?** Simply click on the “i” (top left) in the tool. It explains which measurements should be carried out and how the evaluation then works.

Functional Extensions & Algorithms

- **MSM+ Performance:** A new algorithm for pre-caustic measurement ensures a significantly faster measurement speed.
- **Reference Caustics:** A new pop-up now actively asks whether the axis assignment should be adapted to the reference caustic. You will also find details/explanations there directly.

- **UKP Correction SFM:** With the SFM and SFM 2D, pulsed lasers are now measurable. For this, an envelope is placed around the measurement data. This correction can now be applied precisely to individual selected vectors or complete vector series.
- **SFM Evaluation Criteria:** Some SFM measurement values only have evaluation criteria. This enables a quality assessment of a measurement analogous to the evaluation in single layer or caustics of a PRIMES caustic measurement device.
- **Graph-Tool Extension:** New parameters “Rot. Mom. a,b adjusted” enable an evaluation of the caustic in the graph tool exactly as in the caustic analysis. Important for beams with significant astigmatism.
- **Graph-Tool Extension:** Ring beam and TopHat parameters are now also available in the graph tool. For some, a one-time calculation must be performed in the respective tool, otherwise a “0” is displayed. To do this, simply drag the measurement into the corresponding evaluation tool once. Afterwards, evaluation in the graph tool is immediately possible.
- **EC-PM:** Expert functions are now also included in standard customer versions of the LDS.

Help & Documentation

- **Direct Support:** A new “Support” submenu with direct contact options has been integrated into the help section.
- **In-App Guides:** Detailed instructions have been stored directly behind the info symbol (“i”) for the *Device Position Check Tool*, the *Fast Focusshift Tool*, and the *SFM Focusshift Tool*.

Minor Bug Fixes & Additions

Numerous smaller optimizations were made as part of this release: **Tool “Stopwatch”:** *Integration of a stopwatch with trigger function (starts automatically at the beginning of a measurement when a device functionality is added).* **Cube/Cube+:** Adjustment of technical terms (e.g., “Burst duration” → “Measurement duration”, “On time” → “Exposure duration”) and correction of power displays. **SFM Evaluation:** *Radius is now displayed analogously to the normal layer analysis; data are saved consistently unrotated. i.e., left/right remains apparent at a glance.* **General:** Resolution of Bluetooth connection problems (Cube), optimization of window arrangement (“Automatic window arrangement”), as well as various fixes in the functionality of the limits. **Lock symbol:** *is now even more restrictive.* **Free Parameter:** Now automatically carries over to new measurements without manual rework. **Structure depth:** *now also available for TopHat (single layer evaluation).* **Help: Beam information:** was expanded to include evaluation algorithms.