

EPU 3.10

Release Notes

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Document History

Rev A, October 2024

Introduction

Purpose

This document describes the Thermo Fisher Scientific EPU software releases.

Audience and Scope

These release notes are intended for users of the Thermo Fisher Scientific EPU software and those who manage the installation of Thermo Fisher Scientific EPU software on the microscope computer.

This document describes the content of the most recent and few historic EPU releases.

Hardware Requirements

The EPU software can be used on the Microscope PC of Thermo Fisher Scientific and FEI TEM systems that are equipped with a compatible camera. See the release specific chapters below for a specification of the supported TEM Server software versions and cameras.

System, Software and Configuration Compatibility

The following tables show the compatible microscope software versions, the preferred EPU software versions per microscope software version, and the system configuration compatibility.

Although the EPU software is backward compatible with a limited range of microscope software versions, some of the new features and improvements may be available only for the most recent supported microscope software version(s).

Preferred EPU Version per Microscope Software Version

Titan	Talos	Tecnai	EPU	Remarks
3.17 - 3.22	2.17 - 2.22	–	3.10	
3.16	2.16	–	3.9	
3.15	2.15	–	3.8	
3.14	2.14	–	3.7	

Titan	Talos	Tecnai	EPU	Remarks
3.13	2.13	–	3.6	Falcon C support added.
3.12	2.12	–	3.5	
3.11	2.11	–	3.4	
3.10	2.10	–	3.3	
3.9	2.9	–	3.2	
3.8	2.8	–	3.1	
3.7	2.7	–	3.0	
3.11	2.11	–	2.14	
3.5	2.5	–	2.13	
3.4	2.4	–	2.12.1	
3.3	2.3	–	2.11	
3.2	2.2	–	2.10	
3.0 - 3.1	2.0 - 2.1	–	2.9	
2.15	1.15	–	2.12.1	
2.14	1.14	–	2.8.1	
2.13	1.13	–	2.7	
2.12	1.12	–	2.6.1	
2.6 - 2.11	1.6 - 1.11	5.6 - 5.7	1.12	Last release for Falcon II.
2.0 - 2.5	1.1 - 1.5	–	1.7	
1.6	–	4.6.4	1.6	Last release for Windows XP.

Compatible Microscope Software Versions per EPU Version

EPU	Titan	Talos	Remarks
3.10	3.17 - 3.22	2.17 - 2.22	
3.9	3.16 - 3.21	2.16 - 2.21	
3.8	3.15 - 3.20	2.15 - 2.20	
3.7	3.14 - 3.19	2.14 - 2.19	
3.6	3.13 - 3.18	2.13 - 2.18	Falcon C support added.
3.5	3.12 - 3.17	2.12 - 2.17	
3.4	3.11 - 3.16	2.11 - 2.16	
3.3	3.10 - 3.15	2.10 - 2.15	
3.2	3.9 - 3.14	2.9 - 2.14	
3.1	3.8 - 3.13	2.8 - 2.13	
3.0	3.7 - 3.12	2.7 - 2.12	
2.14	3.6 - 3.11	2.6 - 2.11	
2.13	3.5 - 3.10	2.5 - 2.10	
2.12.1	2.15 3.4 - 3.9	1.15 2.4 - 2.9	<ul style="list-style-type: none"> • Preferred over EPU 2.12.0 • Most recent release that supports Windows 7.
2.12.0	2.15 3.4 - 3.9	1.15 2.4 - 2.9	
2.11	2.15 3.3 - 3.8	1.15 2.3 - 2.8	

EPU	Titan	Talos	Remarks
2.10	2.15 3.2 - 3.7	1.15 2.2 - 2.7	
2.9	2.15 - 3.6	1.15 - 2.6	
2.8.1	2.14 - 3.5	1.14 - 2.5	Replaces EPU 2.8.0
2.8.0	2.14 - 3.5	1.14 - 2.5	EPU 2.8.0 is withdrawn Do not install EPU 2.8.0
2.7	2.13 - 3.4	1.13 - 2.4	
2.6.1	2.12 - 3.3	1.12 - 2.3	Preferred over EPU 2.6.0
2.6.0	2.12 - 3.3	1.12 - 2.3	
2.5	2.12 - 3.2	1.12 - 2.2	
2.4	2.12 - 3.1	1.12 - 2.1	First release for Windows 10
2.3	2.12 - 2.15	1.12 - 1.15	
2.2	2.12 - 2.14	1.12 - 1.14	
2.1	2.12 - 2.13	1.12 - 1.13	
2.0	2.12	1.12	Released only to Beta customers

Compatible CryoFlow and EQM Versions per EPU Version

EPU	CryoFlow	EQM	Remarks
3.10	1.26	1.19	
3.9	1.25	1.18	
3.8	1.24	1.17	

EPU	CryoFlow	EQM	Remarks
3.7	1.23	1.16	
3.6	1.22	1.15	Falcon C support added.
3.5	1.21	1.14	
3.4	1.20	1.13	
3.3	1.19	1.12	
3.2	1.18	1.11	
3.1	1.17	1.10	
3.0	1.16	1.9	
2.14	1.15	1.8	
2.13	1.14	1.7	
2.12	1.13	1.6	
2.11	1.12	1.5	
2.10	1.10	1.4	
2.9	1.9.2	1.3	
2.8	1.8.2	1.2	
2.7	1.8	1.1	First EPU release with DMP integration for: <ul style="list-style-type: none"> • Falcon 3EC and Falcon 4 • Gatan filters with Gatan K2 or K3 camera.
2.6.1 and earlier	–	–	Not supported

Compatible Cameras for EPU

Camera	Supported	Remarks
Ceta	Yes	<ul style="list-style-type: none"> All Ceta Sensor Packages: 16M / -D / -S / -M / -F With and without Speed Enhancement (Ceta-2).
Ceta-F	Yes	EPU 2.14 and later.
Falcon 4	Yes	EPU 2.6 and later.
Falcon 4i	Yes	EPU 2.14 and later.
Falcon 3EC	Yes	
Falcon I / II	No	EPU 1.12 and earlier.
Gatan Orius SC200 / SC1000	Yes	
Gatan OneView	Yes	
Gatan US1000 / 1000XP / 4000	Yes	

Note: The compatible cameras may not all be supported by the compatible microscope software versions. See the TEM Server Release Notes for a definitive list of supported cameras.

Compatible Cameras and Energy Filters for EPU

Camera	Supported	Remarks
Selectris / Selectris X	Yes	Requires Titan 3.6 / Talos 2.6 or later.

Camera	Supported	Remarks
Gatan Enfinium SE / ER with US1000XP camera	Yes	
Gatan Quantum 963 / 964 / 965 / 966	Yes	
Gatan Quantum 967 with K2 camera	Yes	
Gatan BioQuantum 1967 with K3 camera	Yes	<ul style="list-style-type: none"> • EPU 2.3 and earlier: only in stand-alone configuration. • EPU 2.4 and later: <ul style="list-style-type: none"> • Embedded configuration is supported with: Titan 2.15.2/3 or 3.2 and later and Talos 1.15.2/3 or 2.2 and later. • All other Titan and Talos versions: only in stand-alone configuration.
Gatan BioContinuum 1069 with K3 camera	Yes	EPU 2.8 and later on systems with Titan 3.5 / Talos 2.5 or later.

i **Note:** The compatible energy filters may not all be supported by the compatible microscope software versions. See the TEM Server Release Notes for a definitive list of supported energy filters.

EPU 3.10

EPU 3.10 introduces the below functionalities,

1. Optimize Optics Enhancements in EPU Auto Functions for Tundra and Glacios systems:
 - The Optimize Optics task shows an overview of the steps that will be executed.
 - A step in progress is denoted by a spinner.
 - When a step is completed, a green checkmark is displayed.
 - When a step fails, a red cross is shown.
 - A clear indication of when manual interaction is needed is shown by a click icon on the step.
 - In addition to the sequence, diagnostic images provided by Tool Readiness are displayed in the image viewer while Optimize Optics is running.
2. New AI-based Smart Hole Finder to automatically detect foil holes on Grid Square images. The feature supports **Holey Gold** grids across hole patterns R0.6/1, R1.2/1.3 and R2/2 and **Holey Carbon** across most popular hole patterns R1.2/1.3, R 1/2, and R 2/2, R 0.6/1 and R 1/1.
3. Smart Grid Square Selection now supports grid type **Holey Gold**.
4. **Measurement** tool enabling users interactive measure of distances in the EPU image viewer.

Improvements

- For Tundra systems, the Image Beam Shift range in EPU is limited to a maximum of 6um instead of the standard 12um for a better throughput/quality ratio.
- Linear mode for data acquisition with Falcon 4(i) camera.
- Binning for data acquisition with Ceta camera.
- Readout area selection for Auto-eucentric.
- User is notified when the TMP is running when starting the Autostigmat/Autocoma Auto functions.



Known Issues

A large amount of effort is spent on adding and improving workflows and on continuous quality improvements.

Historic Known Issues that are solved in a released software version are not listed.

ID	Issue Description and Workaround
EPUAPI-3981	The Smart Grid Square categorization UI with category selection can become unresponsive sometimes. Subsequently, other graphical interfaces in EPU (such as CryoFlow login, etc.) may not be visualized correctly, and the Smart Grid Square Plugin icon may not appear in EPU during the Square Selection task.
	Workaround: Switch between different tabs (such as Auto Functions or Atlas), restart EPU, or switch between different tasks in the EPU tab.
NPD-6089	Autostigmatate and Autocoma will fail on TEM SW 7.17.1 - 7.20.1 with Gatan cameras.
	Workaround: Install TEM SW patch that fixes missing pixel size in the metadata.
EPU-14566	At the end of the optimize optics run EPU UI does not correctly update which objective aperture is inserted.
	Workaround: Check PEOUI as it reflects the correct state of objective aperture.
EPU-14310	During automated acquisition, when Auto-eucentric fails on a Grid Square and Grid Square is skipped, no explanation is seen on EPU on why the Grid Square was skipped.

ID	Issue Description and Workaround
EPU-14196	<p data-bbox="462 317 1450 512">During an Automated Acquisition run in EPU, when auto eucentric is running on the grid square and before foil holes are found, when Skip Grid Square is selected then the grid square is not skipped and Skip Grid Square and Skip foil hole buttons on the ribbon become disabled till the end of the automated acquisition run.</p> <p data-bbox="462 554 1422 627">Workaround: In order to skip a grid square, it is advised to click the Skip Grid Square button after foil holes are found on the grid square.</p>
EPU-14221	<p data-bbox="462 667 1458 821">The smart plugin Stage Settling Time Predictions is disabled when Fast mode is enabled in an EPU session. However, the tooltip for this plugin when Fast mode is enabled provides a misleading message as it indicates that it is disabled due to Tilted acquisition:</p> <div data-bbox="467 852 868 1056" style="border: 1px solid black; background-color: #2c3e50; color: white; padding: 5px; margin: 10px 0;"> <p data-bbox="475 869 841 898">Stage Settling Time Predictions</p> <p data-bbox="475 913 846 1052">Smart Plugins are not available when Tilted Acquisition is enabled. To use Smart Plugins, disable Tilted Acquisition in the Session Setup Task.</p> </div>
EPUAPI-2343	<p data-bbox="462 1104 1455 1339">Atlas Image Outdated in Calibrate Image Shifts Task: This problem can occur if an Atlas session has been created, EPU is then shut down, and the sample is exchanged while EPU is still not running. In this scenario, the Atlas image loaded in the Calibrate Image Shifts task will not correspond to the current sample. Please note that this issue does not occur if the sample is exchanged while EPU is running.</p> <p data-bbox="462 1377 1450 1493">Workaround: Ensure you exchange the sample while EPU is running; or, if the sample is exchanged with EPU shut down, reacquire the Atlas image.</p>

ID	Issue Description and Workaround
EPU-11489	<p>Hole centering may fail on Hex grids on Krios and Glacios systems when skipping a hole while using the Measure Hole Size  functionality. Skipping a hole or more is typically needed in Glacios systems where the beam diameter is larger than the Foil Hole.</p> <p>While this affects the usability of Automated Acquisition, there is no issue with:</p> <ul style="list-style-type: none"> • Manual selection of holes. • Automatic selection using Measure Hole Size  for the purpose of Fast Screening rather than Acquisition.
EPU-10595	<p>License activation link is broken.</p> <p>Workaround: Manually visit the URL https://manual.bprotected.nl/activation.aspx?pub=Thermo+Scientific.</p>
EPU-10230	<p>Automatic alignments do not prepare system for acquisition in MicroProbe mode.</p> <p>Workaround: MicroProbe mode is not aligned automatically. In order to acquire data in MicroProbe mode, the system must be aligned manually from PEOUI.</p>
EPU-9718	<p>When the Chrome browser is not installed, the CryoFlow shortcuts in EPU might not work.</p> <p>Workaround: Install the Chrome browser or navigate to CryoFlow manually.</p>
EPU-7203	<p>When previewing fractions in EPU, other applications cannot use the camera.</p> <p>Workaround: In EPU, navigate to another tab or task to release the camera.</p>

ID	Issue Description and Workaround
EPU-6334	After executing the template in <i>EPU > Template Execution</i> , there is no way to inspect the acquired images. The acquired images are displayed during execution, but an acquired image is removed from the display as soon as a new image is acquired.
	Not available
EPU-4002 EPU-3693	Camera names and/or microscope settings are incorrect after a camera upgrade from Gatan K2 to Gatan K3.
	<ul style="list-style-type: none"> • Stop EPU • For all user-accounts, delete the <i>EFTEM_MicroscopeSettings.xml</i> file in the <i>%appdata%\Thermo Scientific\EPU\Parameter\</i> folder.
TT115829	Throughput issue when using K2 on BioQuantum. Calls to the energy filter can add significant delays. These can happen when switching between data acquisition and foil hole acquisition or between data acquisitions, depending on which function creates the problem.
	Workaround: Reset the camera and GMS. If that does not help, then reboot the Gatan PC.
TT121858	If the Atlas session folder is moved or renamed, then it is not possible to manually load an Atlas. In the EPU User Interface, a critical error appears that the Atlas.dm file may be corrupt.
	Workaround: Close EPU, restore the Atlas session folder path, start EPU, and try again.