Smart EPU Software
Frequently asked questions

General questions

1.) What are the hardware requirements and installation steps for Smart EPU Software?

A: Smart EPU Software runs on a dedicated acquisition server, called a DMP, connected to your cryo-TEM. The system must meet performance specifications for GPU, RAM, and storage to ensure smooth real-time optimization and automation capabilities. Installation and configuration are performed by a Thermo Fisher Scientific field service engineer (FSE) or digital solutions engineer (DSE), who ensures that Smart EPU Software is fully integrated with your microscope hardware and network environment.

2.) What training is provided with Smart EPU Software installation?

A: Operators can take advantage of optional personalized onboarding by a Thermo Fisher application specialist. Additional resources, such as tutorials and knowledge base articles, are available through the Thermo Fisher support portal.

3.) What level of user experience is required to operate Smart EPU Software?

A: Smart EPU Software is designed for ease of use. Its automated setup and guided workflows reduce the need for extensive training, allowing new users to start acquiring data with confidence. At the same time, it includes customizable features for experienced users who want to fine-tune acquisition strategies.

4.) How does Smart EPU Software differ from traditional EPU Software?

A: Smart EPU Software introduces a higher level of automation than EPU Software that is powered by AI algorithms for SPA data acquisition. It features adaptive decision-making during runs, which is particularly useful for fully automated screening sessions, and real-time parameter optimization to assure high-quality data.

Its intuitive user interface minimizes manual intervention, so it's great for both novice and expert users aiming for higher throughput and reproducibility.

5.) I'm currently using traditional EPU Software. Can I upgrade?

A: Yes, current EPU Software users are eligible to upgrade to Smart EPU Software through a standard transition process handled by Thermo Fisher field service engineers. The upgrade includes installation, system validation, and user training to ensure a smooth changeover.

6.) Is Smart EPU Software compatible with my current cryo-transmission electron microscope (cryo-TEM) system?

A: Please consult your account manager to see if your system is supported. Smart EPU Software is designed to integrate seamlessly with our various Thermo Scientific™ Cryo-TEM systems, including the Krios™, Glacios™, and Tundra™ Cryo-TEMs.

7.) Is data generated with Smart EPU Software compatible with third-party data processing tools?

A: Yes. Smart EPU Software exports standard-format SPA data compatible with widely used cryo-EM processing pipelines. Specifically, it supports:

- MRC format, which is compatible with various cameras, including the Falcon 4 Detector, K2, and K3
- TIFF format, which is also supported for Falcon 4 Detectors
- EER format, which is available for Falcon 4 Detectors but not for Falcon 3 Detectors or Ceta-F cameras

These formats are used for both stacked images (fractions and movies) and integrated image outputs. Metadata and acquisition conditions are retained to support efficient downstream analysis. Additionally, we offer Smart EPU Software with Embedded CryoSPARC Live for a complete pipeline of image processing. Projects from Embedded CryoSPARC Live can be exported to CryoSPARC for advanced processing.

8.) Does Smart EPU Software support remote monitoring or control?

A: Smart EPU Software supports remote session access through CryoFlow Software, a secure data management platform. While active control should be performed on-site or via secured methods, you can monitor session progress and access log data remotely via CryoFlow Software's secured interface.

9.) How many users can access Smart EPU Software on the microscope system?

A: For data acquisition setup, Smart EPU Software supports multiple user accounts set for the whole microscope system, though only one active user session can control a data collection run at a time. User-specific settings and templates help maintain consistent quality across sessions and users. For monitoring, the program supports access for up to 15 concurrent users.

10.) What kind of support is available for Smart EPU Software users?

A: Ongoing support is provided by Thermo Fisher's global Digital Solutions and Service teams for systems under a service contract. Users receive regular software updates, performance enhancements, and access to support resources through their service agreement.

Technical questions

11.) Can Smart EPU Software be customized for different sample types?

A: Yes. Smart EPU Software allows you to create and save acquisition templates tailored to different sample types, grid conditions, or project needs. Additionally, the software's neural networks automatically adapt to different grid types to recognize grid holes and foil holes.
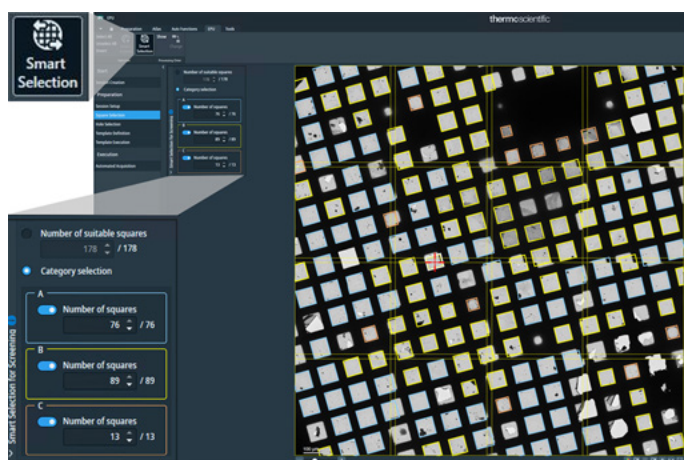
12.) How does Smart EPU Software help increase throughput in SPA workflows?

A: Smart EPU Software is engineered for high-throughput applications operating over multiple grids. Sessions prepared for each grid are queued and executed without supervision one after the other, minimizing the microscope's idle time. Continuous operation using multigrid applies to both screening and high-resolution imaging. Additionally, fully automated smart screening streamlines the entire process, speeding up the search for optimal grids for further imaging.

13.) How does Smart EPU Software improve reproducibility between runs or users?

A: Smart EPU Software allows you to save and share acquisition templates, ensuring consistent parameter settings across sessions and users. AI-based decisions objectively select imaging areas and make such decisions without user input. Real-time optimization also reduces session-to-session variability, which supports more reproducible data acquisition.

14.) Does Smart EPU Software support beam-tilt-based data acquisition strategies (e.g., beam-image shift)?

A: Yes. Smart EPU Software supports beam-image shift to enable faster data collection across multiple grid holes, minimizing stage movements and optimizing throughput.

15.) How does Smart EPU Software manage drift and focus during long acquisition sessions?

A: Smart EPU Software includes continuous drift monitoring and automatic refocusing based on predefined thresholds. This ensures consistent image quality across extended sessions with minimal manual intervention. Smart EPU Software features conditional logic that can pause or adjust acquisition parameters based on changes in grid quality, drift levels, or imaging metrics.

16.) What camera types and detectors are supported in Smart EPU Software?

A: Smart EPU Software supports a range of Thermo Scientific cameras, including Falcon Direct Electron Detectors. Compatibility with additional camera models is system-dependent—your Thermo Fisher representative can provide a complete list.
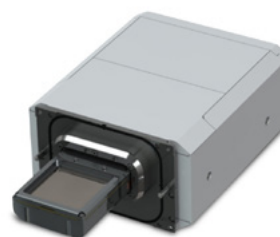
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