

What to consider when choosing a scanner system for routine diagnostics?



1. Goals

Formulate very carefully your goals and prioritize them bearing in mind the interdependent triad of image quality, scanning time and file size. This is also the time to confront your goals with your budget, remembering that a scanner itself is only a part of the investment which will include also software (primarily viewers and case managers), server, storage and working stations as well as technical service fees.

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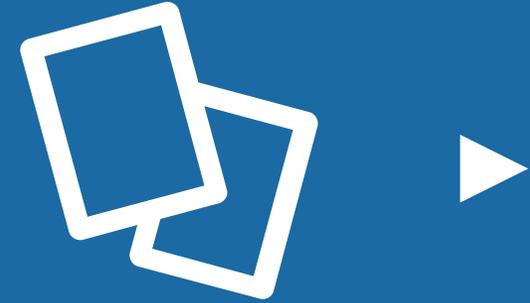
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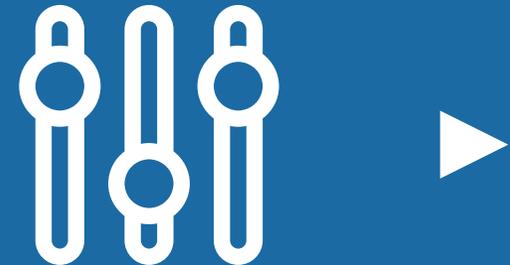
2. Proper test set

Another important step in the scanner system selection process is to develop a proper test set. In case of planned use for routine diagnostics the test set should be representative of typical workload at a given institution and reflect real-life variability in size, structure, density and thickness of tissues. It is also very important that the glasses are compliant with common scanner systems requirements in terms of glass sizes, and especially with glass and mounting medium thickness. The size of a test set should not be too large because in practice it may take ages to scan, transfer and analyze images acquired with different scanner parameters. We recommend 10 slides as an optimal size of a test set.



3. Adjustment of the tested system to the test set

A very, very important issue is to make adjustments of tested systems to your test set. In other words, by manipulating with various parameters you should try in an iterative process to achieve best possible quality of scans balanced against file size and scanning time. Important parameters are focus point density, various functions to improve focus offered by vendors, eg. extended focus, and scanning magnifications as well as image compression modes and degrees.





4. Test period

Applying your test set takes time and sometimes substantial efforts of both vendor technical team and pathology department personnel, and the best way to do it is to install the scanner system in your institution for a test period.



5. Comparisons between images of scanned slides

Comparisons between scanned images should include overall image quality (which is highly subjective) and analysis and comparisons of particular fields in which any of the tested systems performed suboptimally. The most objective and detailed method would be to compare images field by field but it is also very difficult in practice as it requires enormous workload. It is good to compare how scanners deal with everyday life artifacts, like folds, and occasional air bubbles as some scanners may lose focus in the surrounding area. One should make sure, that scanning times and file sizes are recorded and can be easily retrieved for subsequent comparisons. One can also compare standard colour characteristics (which is highly subjective) and possibilities to change them both on the stage of scanning settings as well as display settings.





7. Technical support

Last but not least, cooperation with technical support of a scanner system is pretty important issue and it is supposed to be a long-term relationship. It may be even beneficial if there are some technical problems to solve during a testing period, as the efficiency of a technical support can be stress-tested. The presence of a close, local technical support with a high level of competences may be an advantage as it can shorten reaction times.



6. Scanner and system must work together

Although there is more and more flexibility and interoperability in the field of digital pathology software and one can buy scanner and software from different vendors and they should work together, scanner system vendors usually provide their own viewers and case managers and it is worth to test their features. It is worth to check if all viewers have features necessary for planned scanner system usages. An example can be a feature to visualise a macrophotograph of a slide to have a possibility to check if everything on a slide has been scanned – this is crucial for routine diagnostics as a necessary quality control point at reporting stage.