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Frequently Asked Questions and Answers



Analytical Products

DualVision® CCD Cameras

Questions and Answers

Question	Answer
1. Why are the cameras called DualVision?	DualVision refers to a family of cameras that can provide image output in both digital and video (analog) format.
2. What does “300W” and “600” stand for?	The number 300 and 600 represent the effective CCD size. In general, for a given number of CCD pixels, the larger the effective CCD size, the higher the resolution. “W” indicates that the camera is mounted in the wide angle (35mm) position of the TEM.
3. Is DualVision CCD a digital camera?	Yes. The data depth is 12-bit, i.e. 4096 intensity levels.
4. What is the pixel resolution of DualVision?	The DV 300W is 1300 x 1030 pixels and the DV 600 is 1024 x 1024.
5. What is the TEM operating voltage?	DV 300W can be operated up to 200kV and DV 600 up to 300kV/400kV with additional lead shield.
6. What is the computer platform?	DualVision is currently supported on Windows 98 and NT. As of January 2001, DualVision will be supported on Windows 2000. There is no Macintosh support.
7. What is the advantage of using Windows 98 over Windows NT?	There is really no advantage of using one over the other. The only reason we recommend Windows 98 is that the Dazzle frame grabber only supports Windows 98. We are currently testing a new generation of Dazzle on Windows 2000.
8. What is the field of view?	Due to the mounting position, the field of view is very different for DV300W and DV600. The former has a field of view 60% larger than the film, and the latter only 10% of the film.

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<p>9. What is the effective magnification on the camera?</p>	<p>The effective magnification for DV300W is about 10% of the instrumental magnification (indicated on the TEM panel), and 80% for DV600.</p>
<p>10. Can I use DualVision 300W to capture high resolution lattice images?</p>	<p>No. The camera is not designed for high resolution imaging purpose. The reason is simply due to the fact that this camera is mounted in the 35mm port of a TEM column. The effective magnification on the CCD is only 10% of the instrumental magnification. To image graphite fringes (0.34nm), one would need a magnification over 1,000,000x.</p>
<p>11. What is the main difference between the DualVision and the MultiScan® cameras?</p>	<p>The main difference is the CCD sensor. MultiScan uses a traditional CCD sensor called a full-frame CCD. It is necessary to use a beam shutter during data readout. DualVision uses a CCD operating at a higher speed that eliminates the need for a shutter. Furthermore, DualVision cameras do not need cooling water connection, which makes the installation simpler.</p>
<p>12. What are the unique features?</p>	<p>There are three unique features about the DualVision cameras: (1) they have both digital and video output; (2) camera rotation about the sensor axis; and (3) excellent anti-blooming design (essential for electron diffraction work).</p>
<p>13. What are the suitable TEM applications?</p>	<p>The DualVision cameras are designed to meet the needs of a broad range of TEM applications in both life and materials science such as pathology, anatomy, cells and tissues, intercellular structures, pharmaceutical industry, etc. and metals, ceramic, semiconductor industry, nano-phase materials, oxide, etc.</p>
<p>14. Are DualVision cameras cooled?</p>	<p>Yes. They are both cooled to a moderate temperature (about +15°C) by using a thermoelectric cooling method.</p>
<p>15. How many ports are needed for DualVision 300W?</p>	<p>Two ports, one for the CCD camera's optical assembly and other one for retractable prism.</p>

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16. Since there is no TEM shutter required, how is the dark subtraction procedure carried out?	DV 300W has a built-in internal shutter in its CCD electronics. DV 600 uses dark current parameterization technique to subtract the dark current.
17. Does Gatan TEM Tune and DigitalMontage® software work with DualVision cameras?	Yes, both software packages work with DualVision cameras. The only requirement is the availability of a functional RS232 serial interface (except Tecnai and FastEM).
18. How stable is the gain reference image of DualVision 300W when the camera is inserted and retracted?	The gain reference image is quite stable for extended period of use. The retraction and insertion have sub-pixel accuracy. The retraction mechanism is based on Gatan patented technique that was previously used in the AccuView CCD camera.
19. Do I have to prepare a new gain reference image when rotating the DualVision cameras?	Yes, you do for the DV 300W. No, you do not for the DV 600. For DV300W, the scintillator and CCD are independent in their positions, so when rotation occurs, a new correspondence between the scintillator and the CCD pixel must be re-established. For DV600, the scintillator and the CCD remain a rigid body assembly, so camera rotation does not alter the relationship between the scintillator and the CCD.
20. What is the format of video output?	Industry standard EIA (525 line) or CCIR (625 line).
21. What is the video frame rate?	15 frames per second.
22. What is the video image resolution in the MPEG movie clip?	The resolution is about 320 x 240 pixels, but can be up to 640 x 480 pixels.
23. What is the time resolution in MPEG movie?	The camera outputs video signal at a rate of 15 fps even the standard video rate is 30 fps (525 line) or 25 fps (625 line). So the limiting rate is 15 fps. Therefore the time resolution is 1/15 sec.
24. In recording <i>in-situ</i> experiments, how long can I record my MPEG movie?	You can record experiments as long as you like provided you have enough space on your hard disk.

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25. How much memory does MPEG movie require?	It depends on the quality of the MPEG movie. For the highest quality, it takes about 23MB per minute and for the normal presentation quality, it takes about 15 MB per minute.
26. What is the difference between “Start Imaging” and “Start Diffraction” in the video option?	The only difference is the exposure time for the CCD. “Start Diffraction” uses a slightly longer exposure to improve the image quality.
27. Is the video image gain normalized?	No.
28. Should I be worried about the possible damage to the scintillator when viewing or recording diffraction patterns with the DualVision cameras?	You do not need to worry about damaging the scintillator, but care should be taken. Just like treating the TEM viewing screen, you should not leave a focused intense electron beam or electron diffraction pattern on the scintillator unattended. Whenever possible, use reduced beam current on the sample and SAD aperture when imaging diffraction patterns.
29. Can DualVision 600 replace 622 TV camera?	622 TV has a higher DQE than DV600. This means 622 is more sensitive than the DV600. Under high resolution imaging conditions, where electron dose on sample is limited, 622 has the advantage in image detection over the DV600.
30. Are DualVision cameras embedded on Tecnai microscopes?	Yes, they have been tested on Tecnai microscope and passed the test.
31. Does DualVision use Gatan’s FireWire to acquire image data?	No. DualVision cameras use a PCI DMA card from Roper Scientific Instruments to acquire the image data.
32. Can I do Live FFT?	Yes, you can do Live FFT with either camera.
33. Can I use DualVision cameras to study beam sensitive samples?	This is not recommended. DualVision cameras are designed for their image quality, not their sensitivity. To study beam sensitive samples, use Gatan MultiScan [®] CCD cameras.
34. Can I trade-in my old Gatan AccuView camera for DualVision 300W?	Yes, you can. Please contact your Gatan sales representative for details.

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35. Can I use my own computer to control the DualVision cameras?	This is not recommended. Any range of problems might occur from using a computer that is not fully tested. We strongly recommend you buy the entire camera package and leave the risk to us. Please contact your Gatan sales representative for ordering instructions.
36. If I have a DualVision 300W and a bottom mount MultiScan, can I use DigitalMicrograph to control both cameras?	You will be able to when we release the new software on Windows 2000 in January of 2001.
37. Can I mount DualVision 300W camera at the bottom of my TEM?	No. We have other cameras for you to choose from. Please contact your Gatan sales representative for details.