How to best handle multiple cameras with Unibrain's Fire-i application

Depending on your 1394 networking configuration and on your system resources, Unibrain's Fire-i application and corresponding Fire-i API can handle multiple cameras for control, display and picture recording. Here is how to proceed.

1- Check for 1394 bandwidth availability.
   a. For every camera, you can compute the percentage of isochronous 1394 bandwidth it requires on the bus, and add until an absolute maximum of 100%, using downloadable document (link to camera_bytes_pkts_3Public.pdf)
   b. Check for the maximum number of receive DMA channels of your 1394 interface. One channel is needed by camera.
   c. Should you run out of bandwidth or DMA channels, you can add another 1394 interface to your system. It will create a new 1394 bus. The Fire-i application will handle transparently all connected cameras, even spread on different busses.
   d. if you have other uses of FireWire, like for networking (FireNet) or SBP2 (external FireWire Hard Disks), DO NOT CONNECT on the same interface board as used for cameras.

2- Check that your PCI bus will never overload, considering your other system loads. Consider 40 Mbytes/s additional load per 1394 interface used for cameras, taken out of the total of 133 Mbytes/s (typical 33MHz 32 bits PCI)
   a. if you display the camera pictures, avoid PCI-type Graphic Display Adapters, you will double the PCI load !
   b. if you record live picture on an archive resource, these should best not be interfaced through the PCI bus. This applies also for FireWire networking or FireWire external hard disks. If you do anyway, you must confirm that the PCI bus can accept the additional bandwidth of the streaming data transfer.

3- Reduce the processor load. Some easy rules improve significantly the system behavior, allowing you to handle more cameras.
   a. Best display the live preview in default format on screen. Fire-i viewer window allows you any resizing including full screen mode, but at the cost of processor computation.
   b. Use overlay. At least one (and for some GDA, 2) camera can be displayed in overlay. Availability of overlay depends on your Graphic Adapter, and on its setting for resolution and refresh rate. 60 Hz refresh rate usually helps for overlay capability.
   c. Optimize you Display Color Depth. You can reduce the load by appropriate selection between 16 bits and 32 bits color display
   d. if you need a live display only for monitoring purposes, Fire-i application offer an option to replace the camera icon by a miniature live picture.
   e. if you record live picture, be aware that selecting a picture compressor may significantly load your processor. You gain on Hard Disk space, but you loose on performance

4- For live recording, optimize your Hard Disk access.
   a. Use the Fire-i option to pre-allocate the recording space. This will create a continuous un-fragmented zone on the Hard Disk and avoid loosing any frames
   b. In case of multiple recordings, use best if possible multiple hard disks.