

## **CompuScope eXpert On-board Processing Firmware Options**

New-generation CompuScope models such as the CS14200, CS12400, CS14105 and the Octopus or Cobra CompuScope families may be equipped with eXpert™ on-board processing firmware options. Normally, CompuScope digitizers store only raw acquired waveform data and transfer them quickly to the user for analysis, display and/or storage. Installation of an eXpert option, however, allows some numerical analysis to be performed on the CompuScope hardware itself, within its on-board Field Programmable Gate Array (FPGA).

There are two advantages to the processing of CompuScope waveform data using an eXpert firmware option. Firstly, processing data on-board the CompuScope hardware reduces the data processing load on the host computer. More importantly, however, on-board processing may provide data reduction, which reduces the PCI data transfer traffic. PCI traffic reduction may allow a correspondingly greater CompuScope raw data acquisition rate. For instance, by summing repetitive waveforms on-board the CompuScope hardware before data transfer, the eXpert signal averaging option allows a more rapid waveform averaging rate. Similarly, by reducing a waveform acquisition to only a compact peak information set, the eXpert Peak Detection option allows an accelerated trigger rate.

CompuScope eXpert FPGA images are loaded from an on-board flash memory module, which may be pre-loaded with eXpert options. The flash memory has the capacity to hold three FPGA images – the regular CompuScope FPGA image, which is always present, and up to two optional eXpert images.

eXpert firmware options may be purchased along with the CompuScope hardware. In this case, eXpert images are pre-loaded into the CompuScope flash memory before shipment from the factory. Alternatively, customers may purchase eXpert options after the initial CompuScope purchase and the upgrade may be performed without having to return the CompuScope to the factory. The customer is provided with an eXpert license file that will allow upgrade of only a CompuScope with a specific serial number. The eXpert license file allows CompuScope Manager to load eXpert image files into the CompuScope flash memory. Refer to the following section “Installing Optional eXpert Images”.

Although three eXpert images may be pre-loaded into CompuScope flash memory, only one image may be loaded into the CompuScope FPGA at a time. Consequently, eXpert functionalities cannot be combined in any way. For instance, the user cannot simultaneously make use of eXpert Signal Averaging and the eXpert FIR Filtering functionality. Furthermore, since the flash memory may only hold two eXpert images, users who own more than two eXpert images will need to use the CompuScope Manager to swap flash images, when necessary. CompuScope Manager allows complete management of eXpert images, as documented below.

Currently, eXpert images are not supported by GageScope. GageScope displays each acquired waveform and so cannot exploit the improved CompuScope performance that is afforded when using eXpert technology. Some eXpert images may be operated in CsTest+, however, for testing purposes.

CompuScope Software Development Kits (SDKs) are required for operating eXpert firmware options and include dedicated eXpert sample programs. Most eXpert options are supported by all CompuScope SDKs. Some eXpert options, however, are only supported by the C/C# SDK, because they require the superior performance or functionality of the C programming environment. eXpert sample programs are not documented within the SDK manuals but within PDF files that accompany the eXpert sample programs. Currently available eXpert options are described in the following pages.

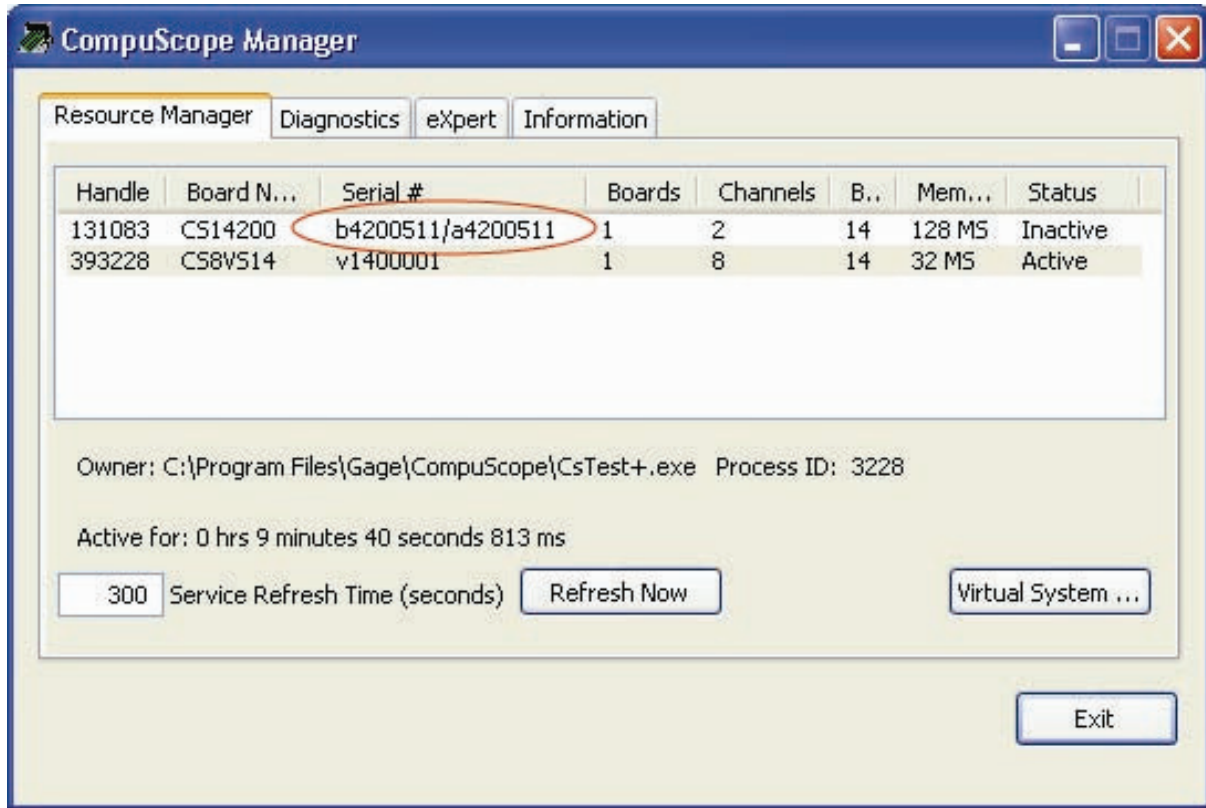
## Installing Optional eXpert Images

Note that the following procedure for installation of optional eXpert images is applicable to New-generation CompuScope models such as the CS14200, CS12400, CS14105 and the Octopus or Cobra CompuScope families with driver version 4.12.00 and above. If your CompuScope card is one of the models mentioned above but you do not have driver version 4.12.00 or higher, then you must re-install the drivers in order to proceed with installing the optional eXpert images. Please contact GaGe Customer Support if you require more information.

You must provide GaGe Customer Support with the serial number of your CompuScope card in order to receive the optional eXpert images that you have purchased.

### Retrieving the serial number of your CompuScope card

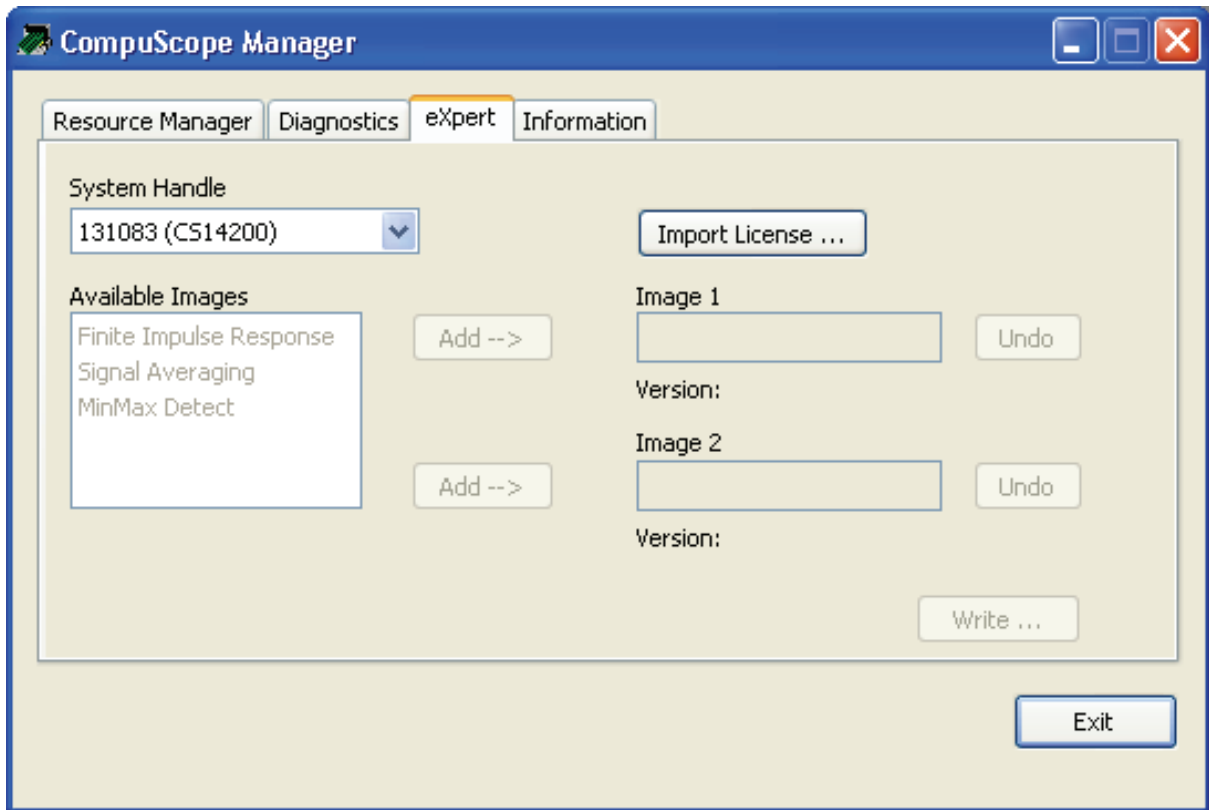
The CompuScope Manager utility is used to retrieve the unique serial number of your CompuScope card. Select the **Resource Manager** tab and locate the serial number of your CompuScope card in the **Serial #** column.



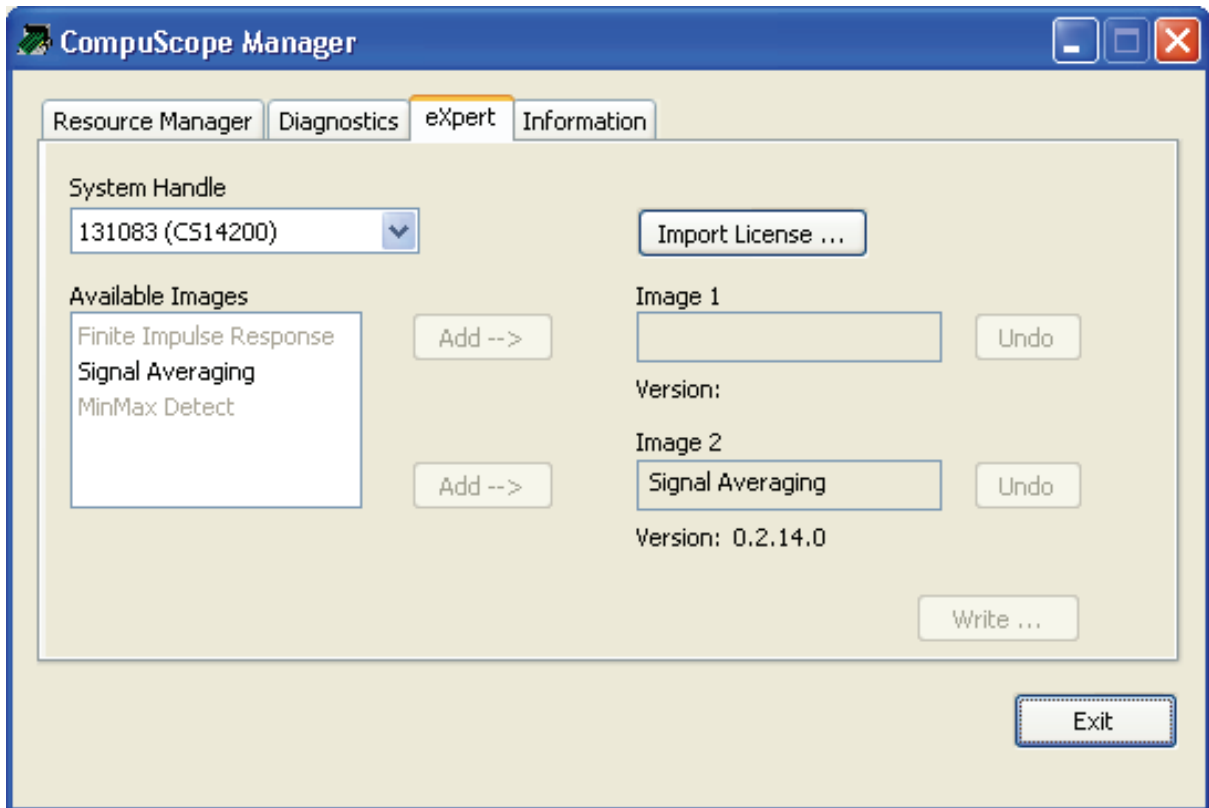
GaGe Customer Support will request the serial number of your CompuScope card from you in order to generate the eXpert license file (.dat) that you will need to install the optional eXpert images that you have purchased.

### Importing eXpert licenses

Once you have received the eXpert license file (.dat) file from GaGe Customer Support, you will need to use it to install the optional eXpert images that you have purchased onto your CompuScope card. First, select the **eXpert** tab in the CompuScope Manager Utility and click on **Import License** to browse to the location of the .dat file that you received from GaGe Customer Support:



Note that the eXpert firmware images that you have purchased now appear as **Available Images** in the CompuScope Manager window above. Next click on **Add** to either **Image 1** or **Image 2**:



In the example above, the customer has purchased the Signal Averaging eXpert option that has now been added to **Image 2**.

Note that as previously mentioned there can be a maximum of two optional eXpert images installed on your CompuScope card at the same time. Repeat the above step to install a second eXpert image if you have purchased more than one. To complete the installation, click on **Write** to activate the eXpert images on your CompuScope card.

If you have purchased more than two eXpert images, you can alternate between them by repeating the above instructions to add another available image to your CompuScope card. Note that installing a new image into **Image 1** or **Image 2** will overwrite any previously installed images in those positions.

Once you have successfully installed the eXpert images, they become available modes of acquiring data and can be viewed in the **Acquisition Config** window of **CSTest+**:



For more details regarding CSTest+, refer to section **Verifying signal acquisition with CSTest+**.