

CompuScope eXpert On-board Processing Firmware Options

New-generation CompuScope models like the CS14200, CS12400, CS14105 and the Octopus CompuScope family 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 a software utility that will upgrade only a CompuScope with a specific serial number. The utility loads the new eXpert image into one of the two optional spaces within 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 flash loading utility to swap flash images, when necessary.

The presence of eXpert images may be verified using the CompuScope Manager utility. eXpert images are listed within the FIRMWARE folder from the Information Tab. 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.

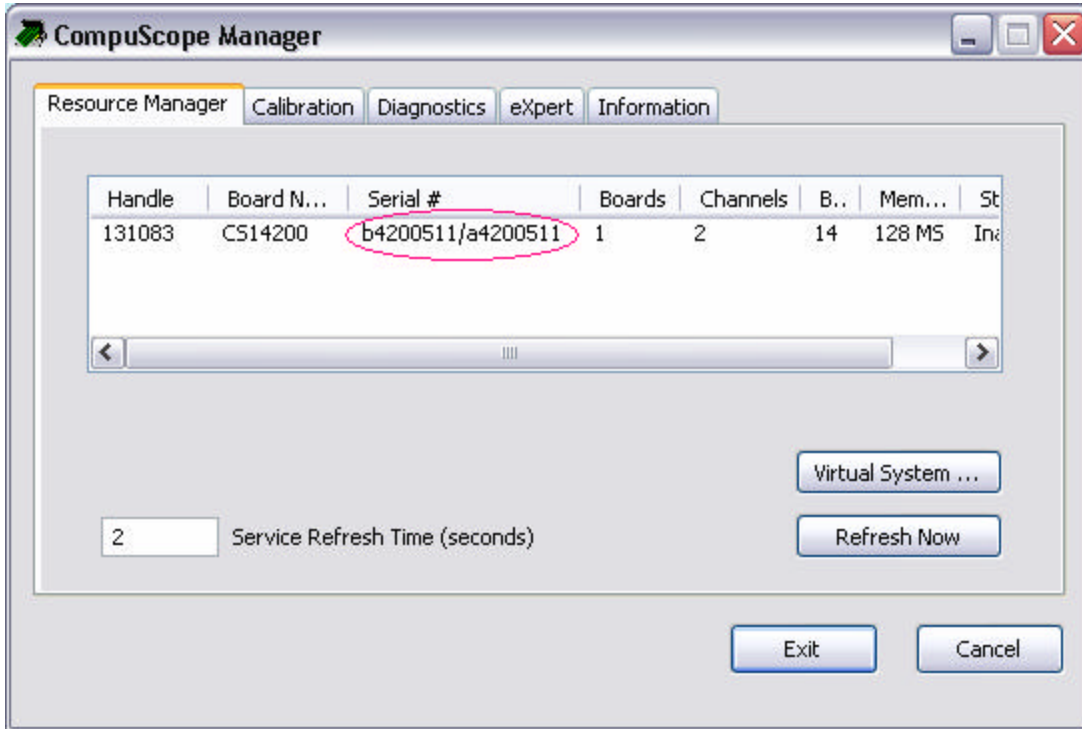
CompuScope Software Development Kits (SDKs) are required for operating eXpert firmware options and include dedicated eXpert sample programs. Most eXpert options are supported by all CompuScope SDKs. Some eXpert options, however, are only supported by the C/C# SDK, because they require the superior performance 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

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

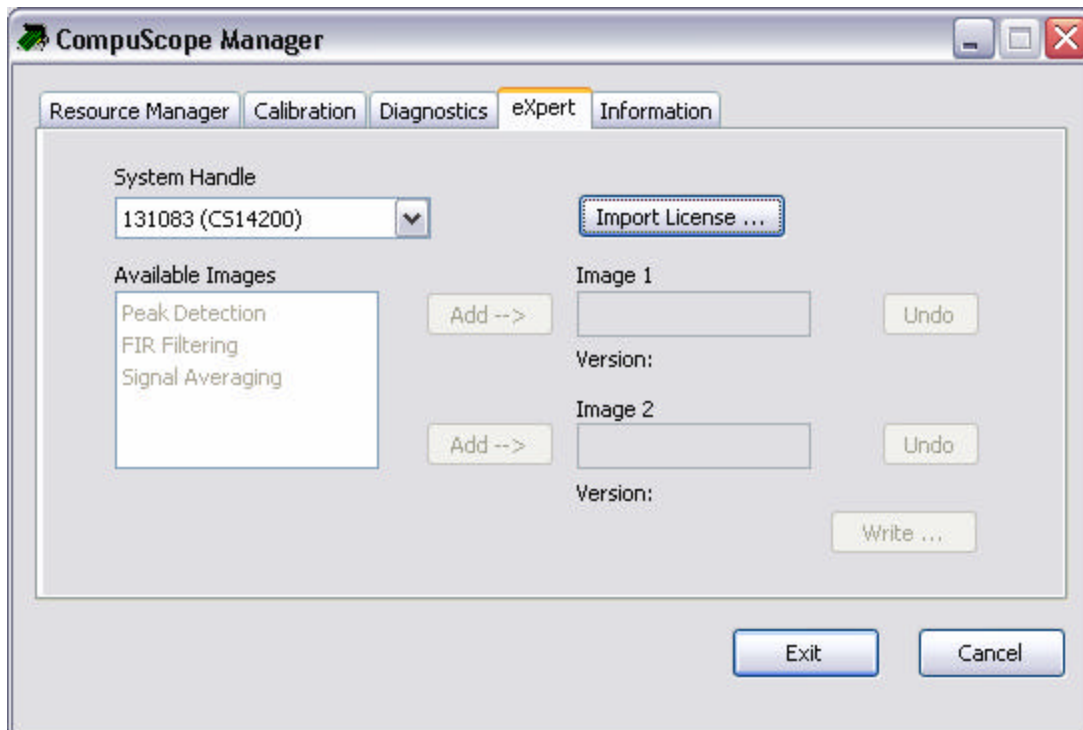
The CompuScope Manager utility is used to retrieve the unique serial number of your CompuScope card. Select the **Resource Manager** tab and locate the serial number of your CompuScope card in the **Serial #** column.



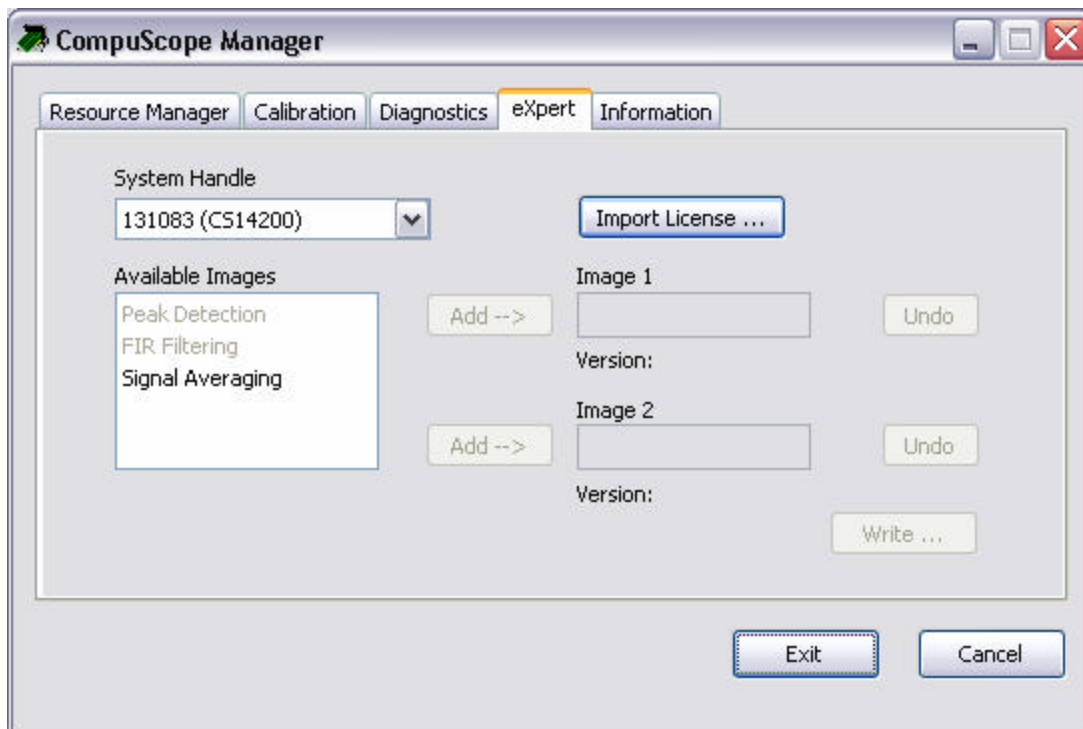
GaGe Customer Support will request the serial number of your CompuScope card from you in order to generate the eXpert license file (.dat) that you will need to install the optional eXpert images that you have purchased.

Importing eXpert licenses

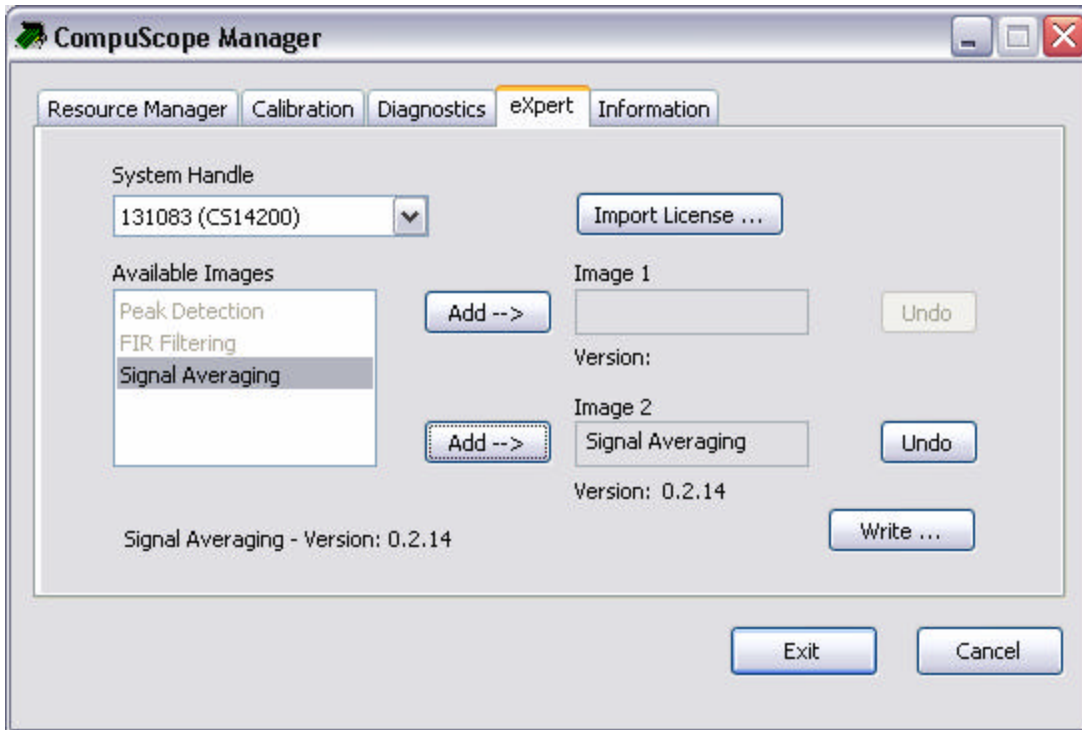
Once you have received the eXpert license file (.dat) file from GaGe Customer Support, you will need to use it to install the optional eXpert images that you have purchased onto your CompuScope card. First, select the **eXpert** tab in the CompuScope Manager Utility and click on **Import License** to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



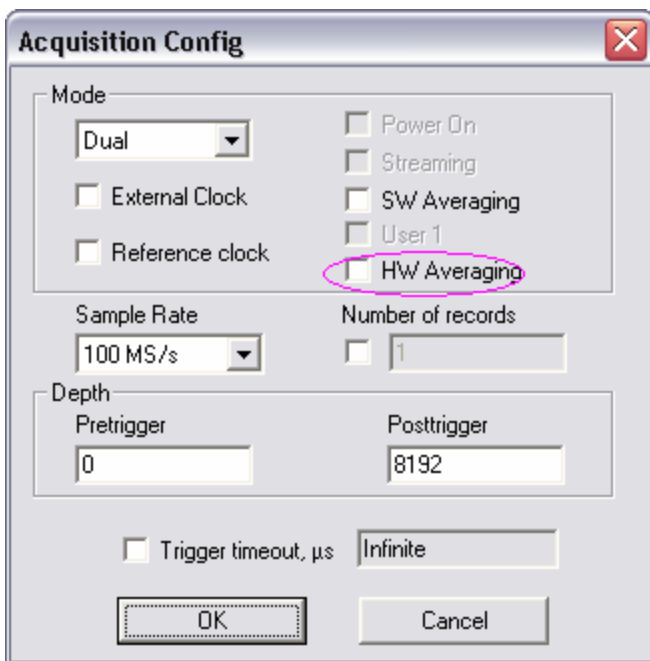
In the example above, the customer has purchased the Signal Averaging eXpert option that now appears as an available image to be added to the CompuScope card. Next, select the newly available image and click on **Add**:



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+**.