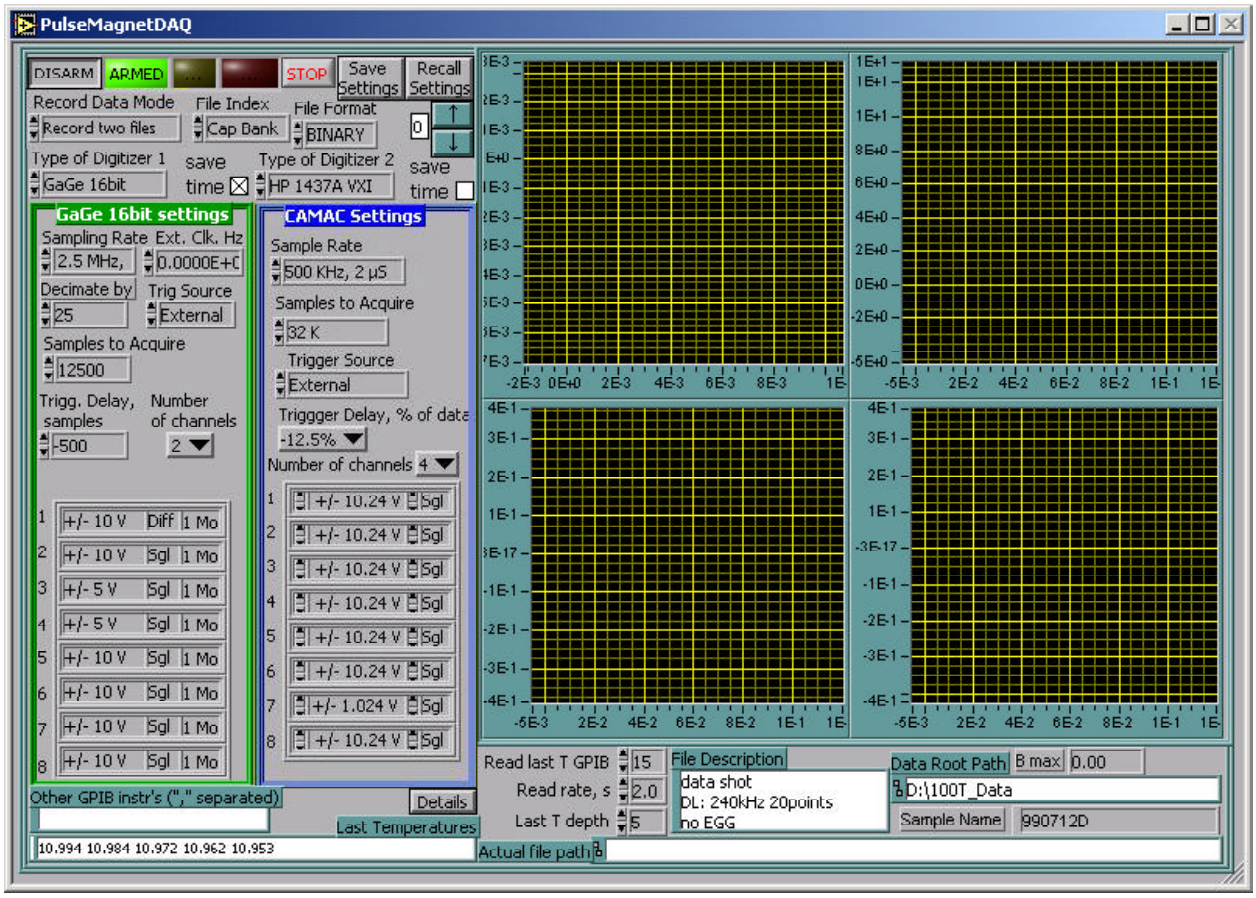
MAIN PULSE MAGNET DAQ SCREEN:



ARM

Press this button to arm the DAQ system. When all boards are armed, the magnet DAQ software is ready to go. The text of the 'arm' button will change to 'disarm' when armed and, if clicked again, will disarm the system changing the text back to 'arm'. When the system is armed, the green 'armed' indicator light will appear next to the button.

TRIGGER INDICATOR LIGHT

The yellow 'trigger' indicator light appears when all the boards are triggered.

DONE INDICATOR LIGHT

The red 'done' indicator light appears once data has been collected, processed and saved.

STOP

Use the 'stop' button if you want to stop the program. After the program stops, one can close the screen. The program can also be restarted by clicking the white arrow in the top left corner.

SAVE SETTINGS

This control saves all the settings in a configuration file. A unique file name can be provided in the file save dialog, or the configuration can be saved over an existing file.

RECALL SETTINGS

Use this button to restore settings from a saved 'settings' file.

RECORD DATA MODE

There are three possible selections for the record data mode: 1) recording as one file, 2) recording as two files (when two types of digitizers are selected) or 3) not recording (test shot). If you are using two different types of digitizers, it is possible to record the data as one file AS LONG AS the digitizer waveform parameters (points, delay, rates, etc.) are the same. This is not necessary if the data is recorded as two files.

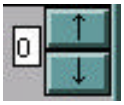
FILE INDEX

This field determines the way in which the file index portion of the actual file path is generated. Selecting 'Cap Bank' will make the file index indicate the shot number. If 'Local' is selected, the file index will indicate a generic number for the date starting with 001.

FILE FORMAT

There are two choices for file formatting. BINARY format saves file space and time; however, TEXT format is more user friendly. BINARY format is a two dimensional array in IEEE single precision floating-point format (4 bytes per number) preceded by 24 bytes of binary header. The data in TEXT form is saved in columns separated by tabulation.

UP AND DOWN ARROWS



These buttons allow the user to scroll through the different channels that are displayed on the right side of the screen. The indicator next to the arrows shows the number (starting from zero) of the channel that is displayed in the top left box.

Click on one of the display channels to enlarge it and to view different axes.

TYPE OF DIGITIZER 1

This field allows the user to select different types of digitizers for data acquisition. In order to choose the best one for the experiment, refer to the most up to date list of configurations for your cell located on the magnet control webpage (http://jellybean.lanl.gov).

Some of the digitizers are installed inside the computer, while some (such as CAMAC ones) are separate components.

It is also possible to select two types of digitizers to take readings simultaneously if it fits the needs of the experiment. Select the second type under the field '**TYPE OF DIGITIZER 2**.'

SAVE TIME

This control, if selected, adds a column of time values to the file. Note that these time values are artificially generated.

Parameters of 16bit GaGe Digitizers

SAMPLING RATE

The sampling rate determines the number of data samples acquired in one second of measurement.

EXTERNAL CLOCK Hz

This field shows the rate of data acquisition, or samples per second. This will only work if the 'external' option is selected as a sampling rate.

DECIMATE BY

This control is very useful in noise reduction. In essence, it reduces the data acquisition rate by the *decimation* number without reducing the duty cycle. The '*decimate by*' number indicates the number of points which will be averaged and saved as one point. For example, if a 10 MHz signal is *decimated* by 10, the actual sample rate saved to file would be 1 MHz, but the noise bandwidth also drops to 1 MHz.

TRIGGER SOURCE

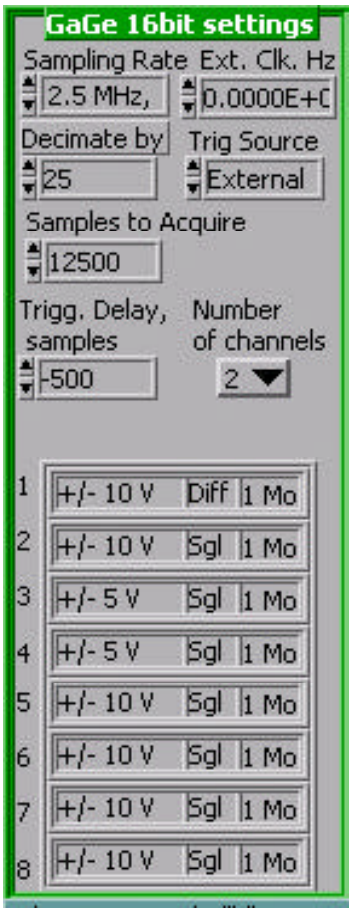
This field allows one to change how the data acquisition is triggered. There are three possibilities: 1) by an external source (capacitor bank), 2) immediately after arming (for testing) or 3) by reaching a threshold voltage on the data channel.

SAMPLES TO ACQUIRE

This control determines the number of samples saved at a *decimated* frequency from each channel.

TRIGGER DELAY

This field indicates the delay between the start of data acquisition and the trigger pulse, expressed as a number of *decimated* samples. Note that a negative number will indicate that data acquisition starts before the trigger pulse.



NUMBER OF CHANNELS

This field shows how many channels will acquire and save data.

CHANNEL SETTINGS

This section shows a row for each channel and the different settings that can be selected for each. These settings include 1) voltage range, 2) single ended or differential measurement and 3) input impedance

Parameters of 12bit GaGe Digitizers

SAMPLING RATE

The sampling rate determines the number of data samples acquired in one second of measurement.

EXTERNAL CLOCK Hz

This field shows the rate of data acquisition, or samples per second. This will only work if the 'external' option is selected as a sampling rate.

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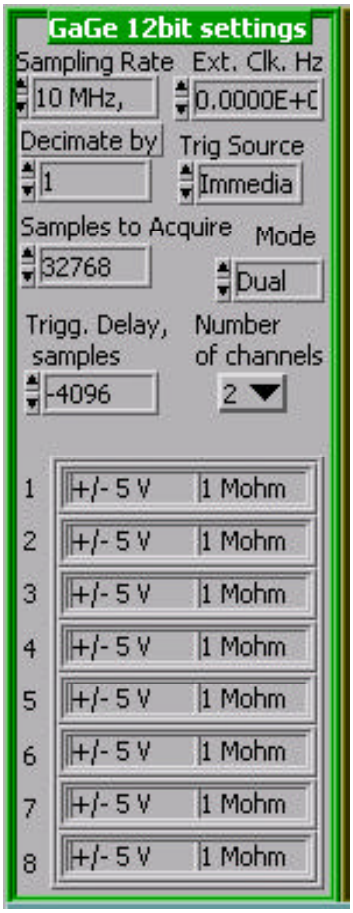
SAMPLES TO ACQUIRE

This control determines the number of samples saved at a *decimated* frequency from each channel.

MODE

For 12 bit digitizers, there are two mode choices: dual channel or single channel. Dual channel mode acquires data from both inputs A and B, and thus the maximum memory is cut in half and the rate is cut in half. Single channel mode



acquires data from input A only.

TRIGGER DELAY

This field indicates the delay between the start of data acquisition and the trigger pulse, expressed as a number of *decimated* samples. Note that a negative number will indicate that data acquisition starts before the trigger pulse.

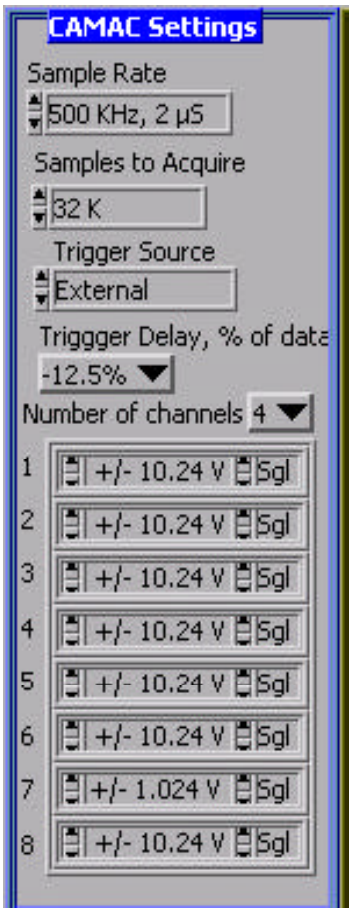
NUMBER OF CHANNELS

This field shows how many channels will acquire and save data.

CHANNEL SETTINGS

This section shows a row for each channel and the different settings that can be selected for each. These settings include 1) voltage range, 2) input impedance.

Parameters of CAMAC Digitizers



SAMPLING RATE

The sampling rate determines the number of data samples acquired in one second of measurement.

SAMPLES TO ACQUIRE

This control determines the number of samples saved from each channel.

TRIGGER SOURCE

This field allows one to change how the data acquisition is triggered. There are three possibilities: 1) by an external source (capacitor bank), 2) immediately after arming (for testing) or 3) by reaching a threshold voltage on the data channel.

TRIGGER DELAY % OF DATA

This field indicates the delay between the start of data acquisition and the trigger pulse, expressed as a percentage of the total number of samples. Note that a negative number will indicate that data acquisition starts before the trigger pulse.

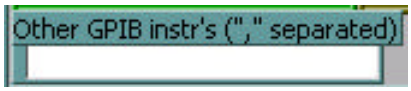
NUMBER OF CHANNELS

This field shows how many channels will acquire and save data.

CHANNEL SETTINGS

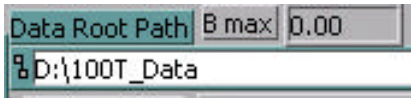
This section shows a row for each channel and the different settings that can be selected for each. These settings include 1) voltage range, 2) single ended or differential measurement.

OTHER GPIB INSTRUMENTS



This feature can save the configuration of lock-in amplifiers. To do so, first connect the lock-ins to the GPIB bus port and then provide the GPIB addresses separated by a comma.

DATA ROOT PATH



This control indicates the root directory for saving files. The user can change this field as desired.

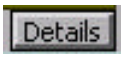
ACTUAL FILE PATH

This indicator will be automatically filled with the path and name of the actual data file after the shot is completed. However, it is important to note the components of the file path in order to locate the file later.

The file name includes the following: data_ root_path\month_year\MMDDYY\snnn_MMDDYY.dat

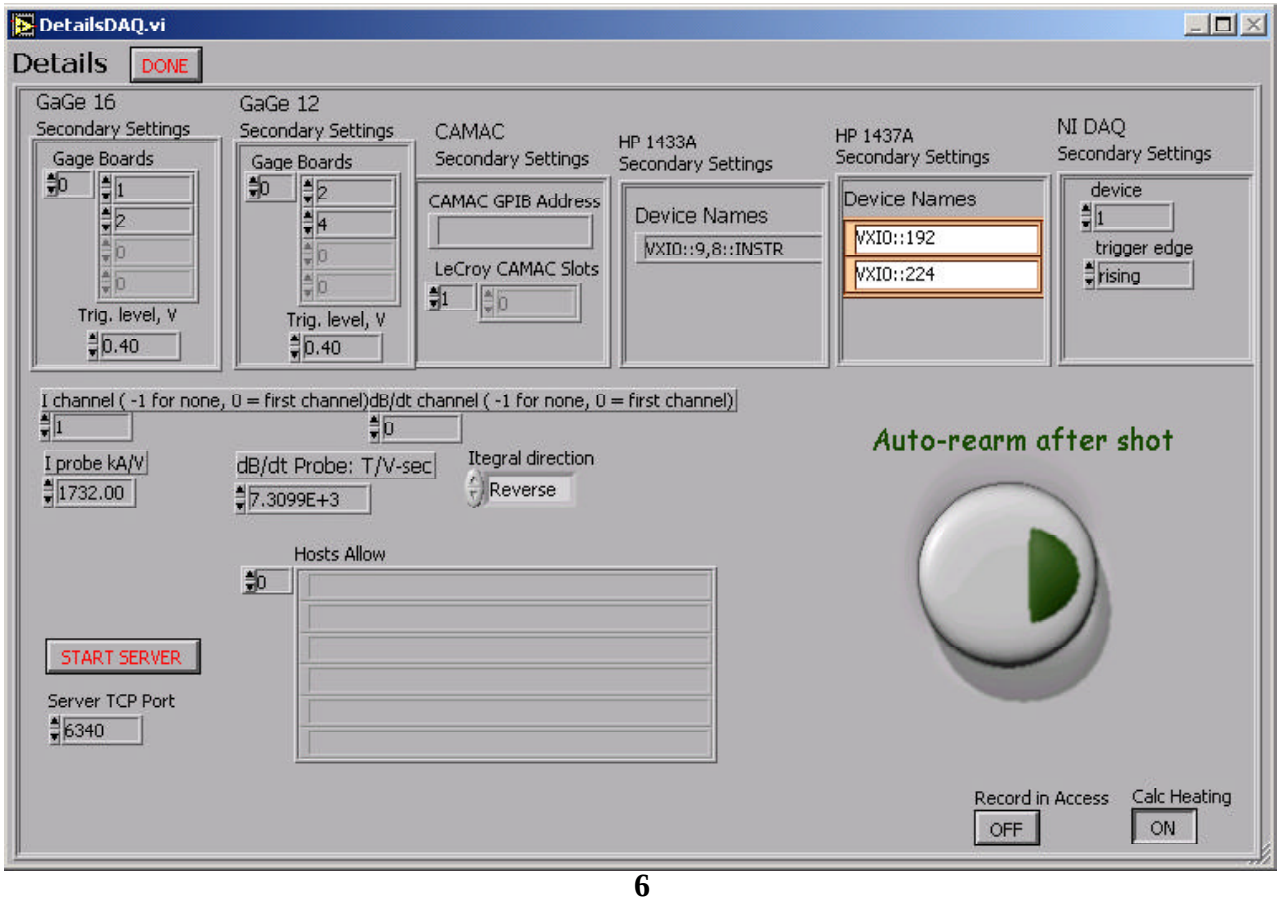
-*data root path* is determined by that which is entered under 'Data Root Path.'

-*nnn* indicates the file index number. The index source is determined by the 'File Index' control mentioned earlier. *MMDDYY* is a numerical representation of today's date.



This indicator opens the Details Screen where secondary parameters can be adjusted.

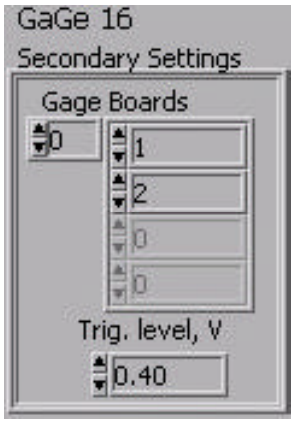
DETAILS SCREEN:



DONE

Press ‘done’ when you would like to close the details window.

GaGe 16 SECONDARY SETTINGS

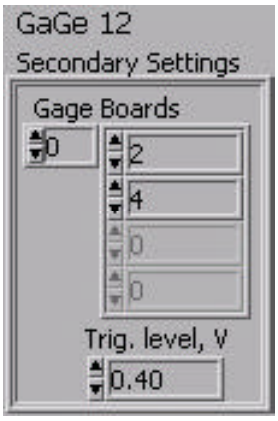


This array lists the board numbers for the 16-bit GaGe digitizers that are installed in the cell computer. For the most up to date configuration settings for the cell, consult http://jellybean.lanl.gov.

TRIG LEVEL V

This category indicates the external trigger level for GaGe 16 bit boards.

GaGe 12 SECONDARY SETTINGS

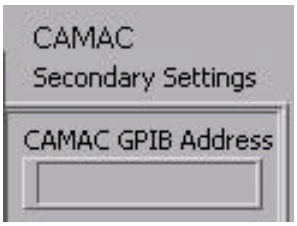


The array lists the board numbers for the 12-bit GaGe digitizers that are installed in the cell computer. For the most up to date configuration settings for the cell, consult http://jellybean.lanl.gov.

TRIG LEVEL V

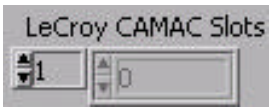
This category indicates the external trigger level for GaGe 12 bit boards.

CAMAC SECONDARY SETTINGS



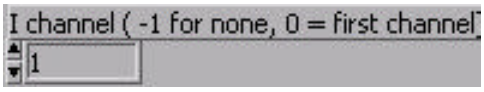
The CAMAC GPIB Address contains the address of the CAMAC crate controller.

LECROY CAMAC SLOTS



The ‘LeCroy CAMAC Slots’ array contains the crate slot numbers for the LeCroy CAMAC digitizers.

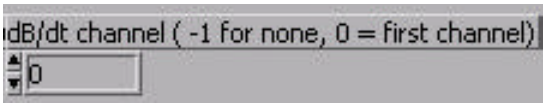
I CHANNEL



The ‘I Channel’ control contains the channel number for the magnet current starting from zero. A negative number indicates that the magnet current has not been calculated and the sensor is disconnected.

*Note that the indicated channel must be from the digitizer that is selected as ‘Digitizer 1.’

dB/dt CHANNEL



This control contains the channel number for the magnetic field from the dB/dt sensor starting from zero. A negative number indicates that the magnetic field has not been calculated.

*Note that the indicated channel must be from the digitizer that is selected as 'Digitizer 1.'

I PROBE kA/V

This control indicates the magnet current sensor calibration constant.

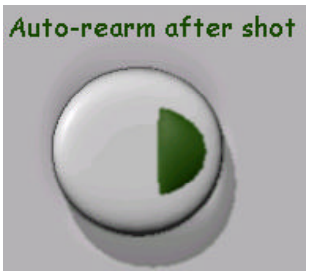
dB/dt PROBE: T/V-SEC

This field indicates the dB/dt coil calibration constant in inverse square meters.

INTEGRAL DIRECTION

This directs whether the I dot and dB/dt integrations will be performed from the beginning or from the end of the data.

AUTO RE-ARM AFTER SHOT



Use this button to automatically re-arm the digitizers after each shot is performed.

CONTENTS

Main Pulse Magnet DAQ Screen:

**Please note: these instructions are for the most commonly used portions of the DAQ Software. The LabVIEW screen may include other fields for which we have not provided explanations.*

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Pulse Magnet DAQ

User Manual