CONTINUOUS RECORDING SETUP

Craig Lippus

April 2016

The following is written in the context of the Geode, but it applies also to the StrataVisor NZXP and the ES-3000. It is assumed that the user is familiar with setting up their GPS (if available) and serial input parameters, including the use of a third-party tool like Hyperterminal to troubleshoot.

The Geode can be configured to acquire continuous, or gapless, data. The data will not be stored in a single file but in numerous, time-contiguous or time-overlapping SEG files (depending on acquisition parameters). Since the Geode does not begin transferring data until the entire record has been acquired, continuous recording requires that the time needed to transfer a file be shorter than its record length *in time*. I.e., if a record is 4 seconds long, it must require less than 4 seconds to transfer the file to the PC.

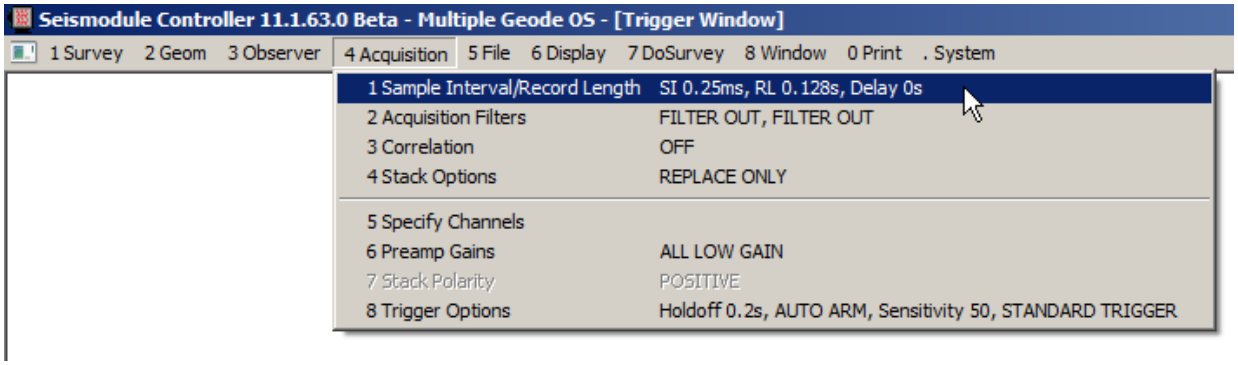
The transfer time can be estimated by dividing the typical throughput of the system (450 Kb/sec) by the file size.

The key parameters for continuous recording are Sample Interval, Record Length, Delay, Trigger Holdoff, Stack Options, and Auto Save. Generally, the sample interval is the most important, and all other parameters are subservient and derived from it.

To set up the continuous recording parameters, launch SCS.

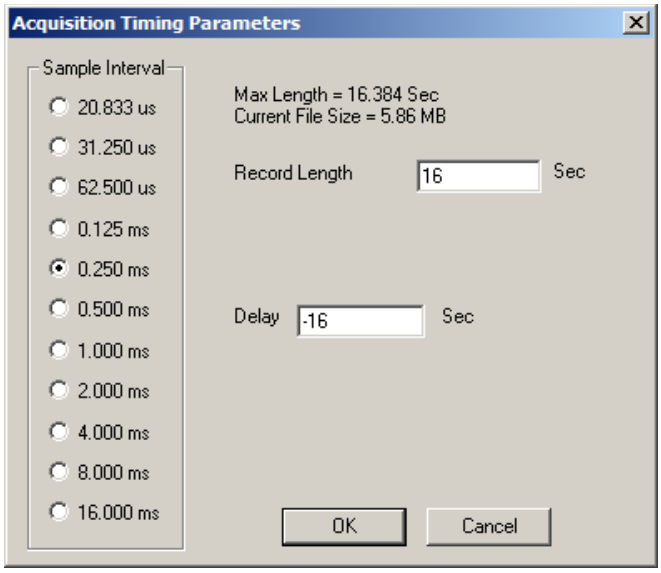
- Make sure the system is disarmed. Press the "1" key to toggle between armed and disarmed. When disarmed, the status bar will be colored red:

- Select *Acquisition >> Sample Interval/Record Length*.

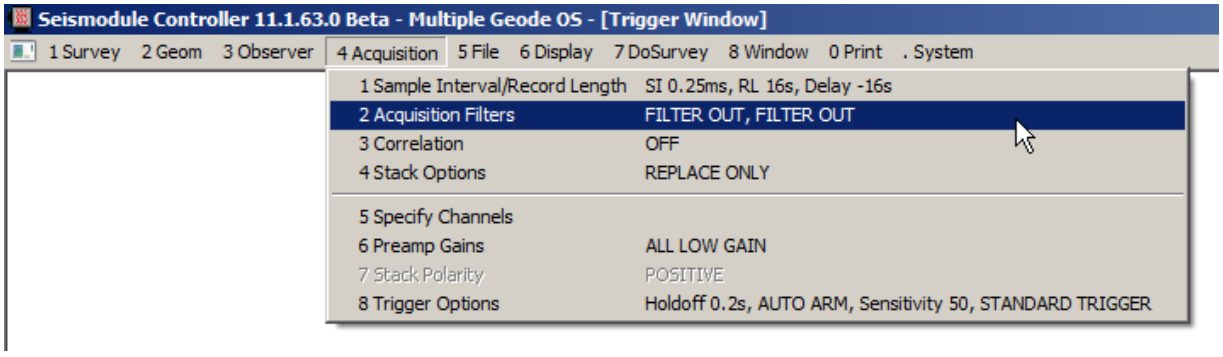


- Set your desired sample interval and record length. The file size in Kb will be displayed. **We recommend that you use the longest record length possible,** as longer record lengths and fewer

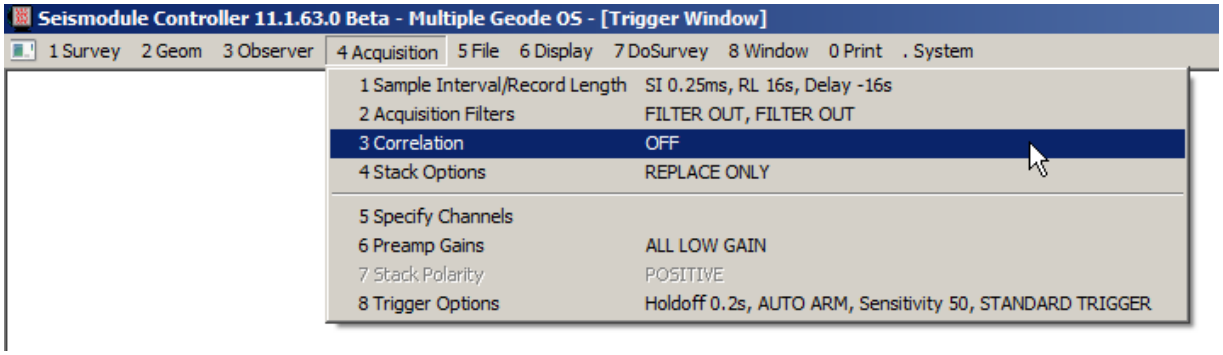
records are more efficient than the converse. Next, set the delay to be a **negative** number **equal to the record length**. If the record length is 16 seconds, set a delay of -16.



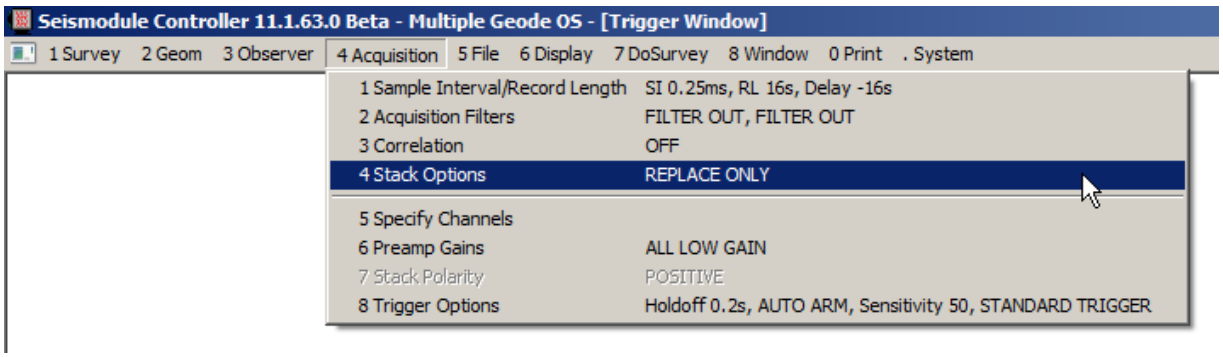
- Divide the file size by 450 Kb/sec (pay attention to units) to calculate the transfer time. Is it shorter than the record length? If so, continue. If not, adjust your parameters (in the example above, the transfer time would be roughly 5860/450 or about 13 seconds. This means that, theoretically, the time between triggers should be no less than 13 seconds, or gaps in the data will occur. In this example, our record length of 16 seconds is longer than the transfer time, so gapless recording is ensured.
- Select *Acquisition* and make sure all filters are out.



- Select *Acquisition* and make sure correlation is disabled.

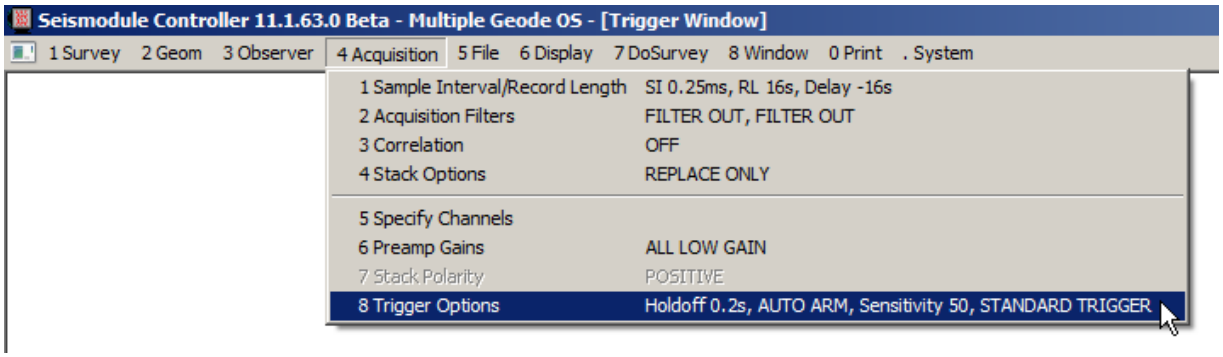


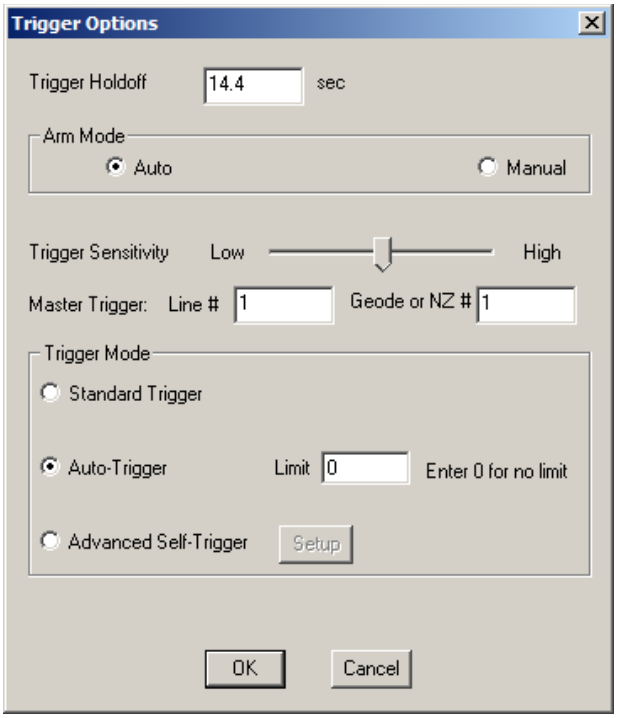
- Select *Acquisition* and set the stacking mode to "replace only".



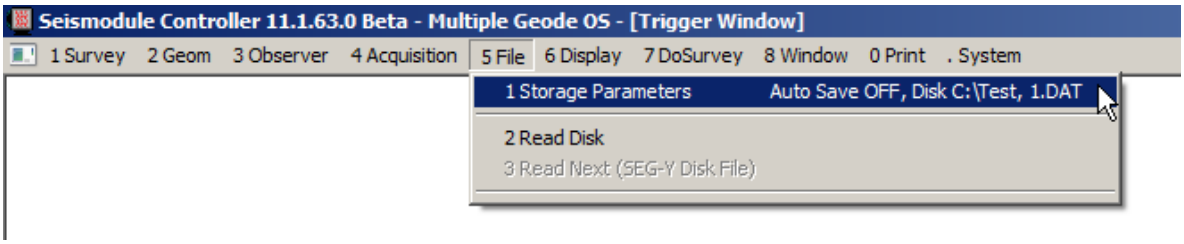
If you are **NOT** using an external triggering device (typically a GPS):

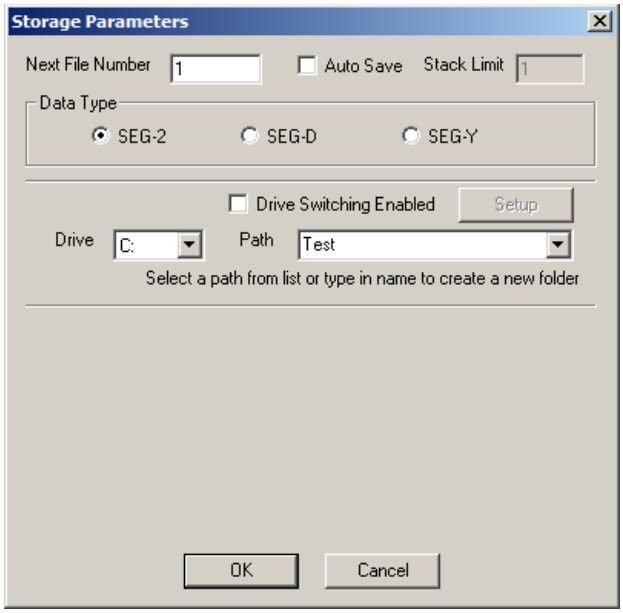
- Select *Acquisition >> Trigger Options.* Set a trigger holdoff of 90% of the record length. Set the arm mode to "auto". Choose Auto-trigger and set the limit to zero.



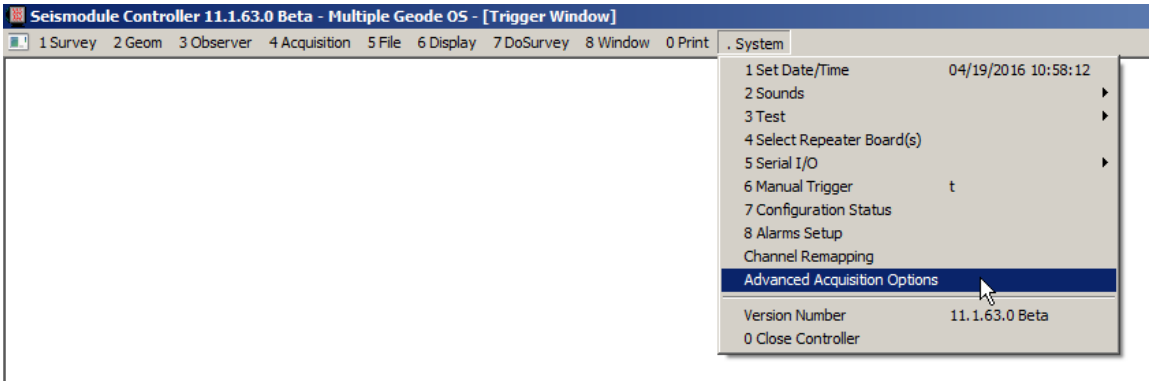


- Select *File* and then *Storage Parameters*. Set the beginning file number and path to save the data. For now, leave Auto Save disabled. Set the file format to either SEG-2 or SEG-D (SEG-Y is not recommended for continuous recording).

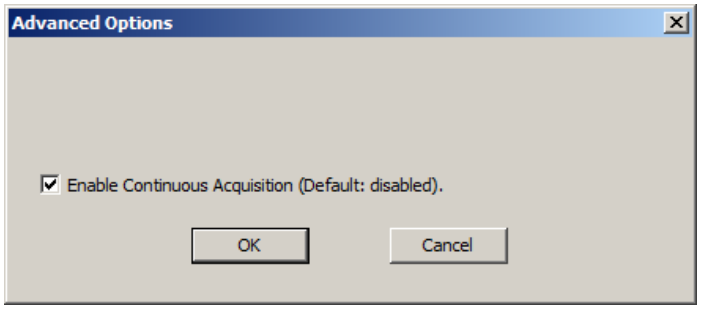




- Select *System >> Advanced Acquisition Options*.

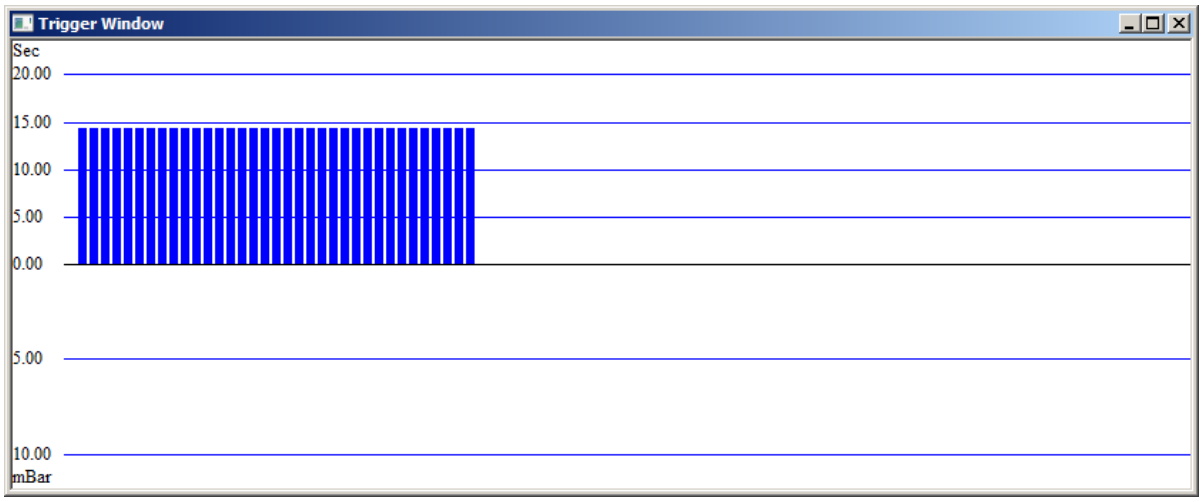


Check the box to enable continuous acquisition:



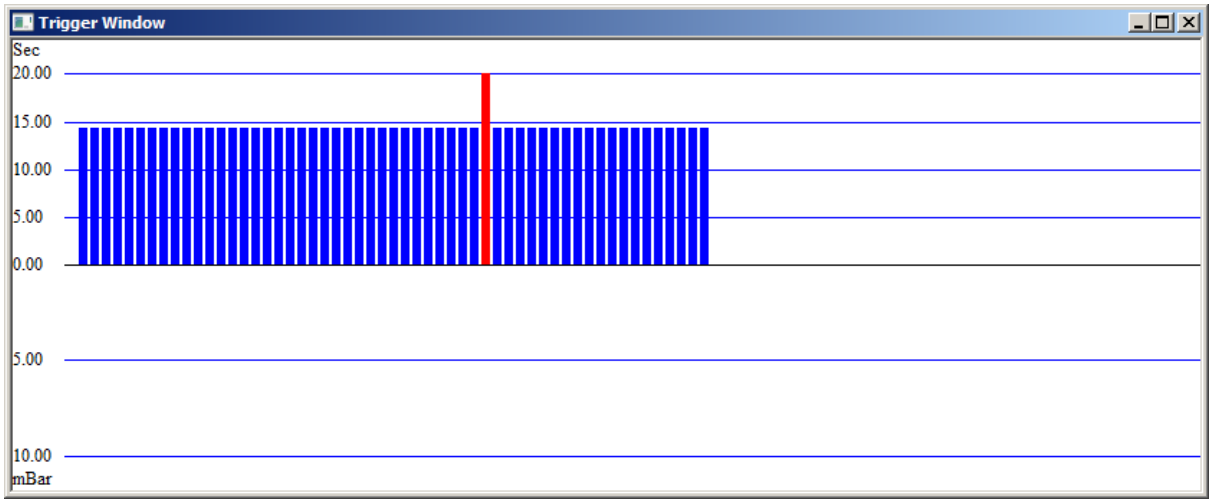
Test:

- Maximize the trigger window and set an appropriate time scale. Press the "1" key to arm the system and begin recording. Make sure that the shot-to-shot time is consistently equal to the trigger holdoff time.



It may not be exact, but it will be close. The main thing is that it is less than the record length; in this case, 16 seconds. What you are looking for is missed triggers, which will be signified by a doubling of the shot-to-shot time. If you see this, it represents a gap in your data and you need to adjust your parameters. You probably broke the main rule, which is that the transfer time must be smaller than the record length.

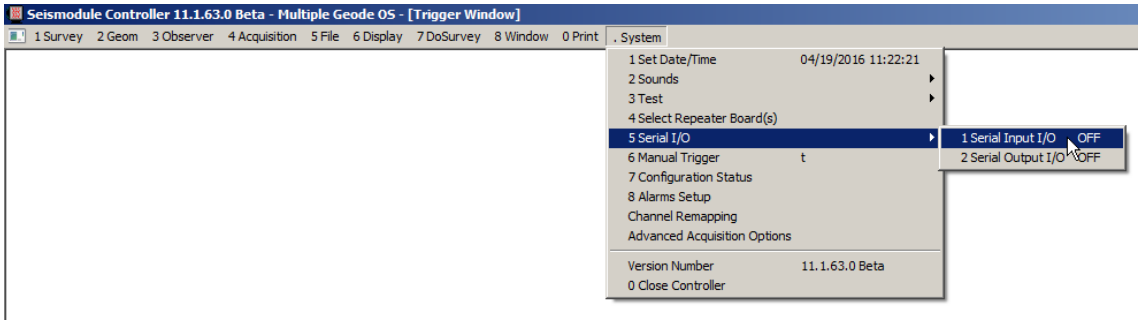
- Disarm the system, enable Auto Save, re-arm, and repeat the above. Let the system run for 5 minutes. If it doesn't miss any triggers, you should be ready to acquire continuous data. Your trigger time plot should look something like this (the red bar is the time between arming and disarming).

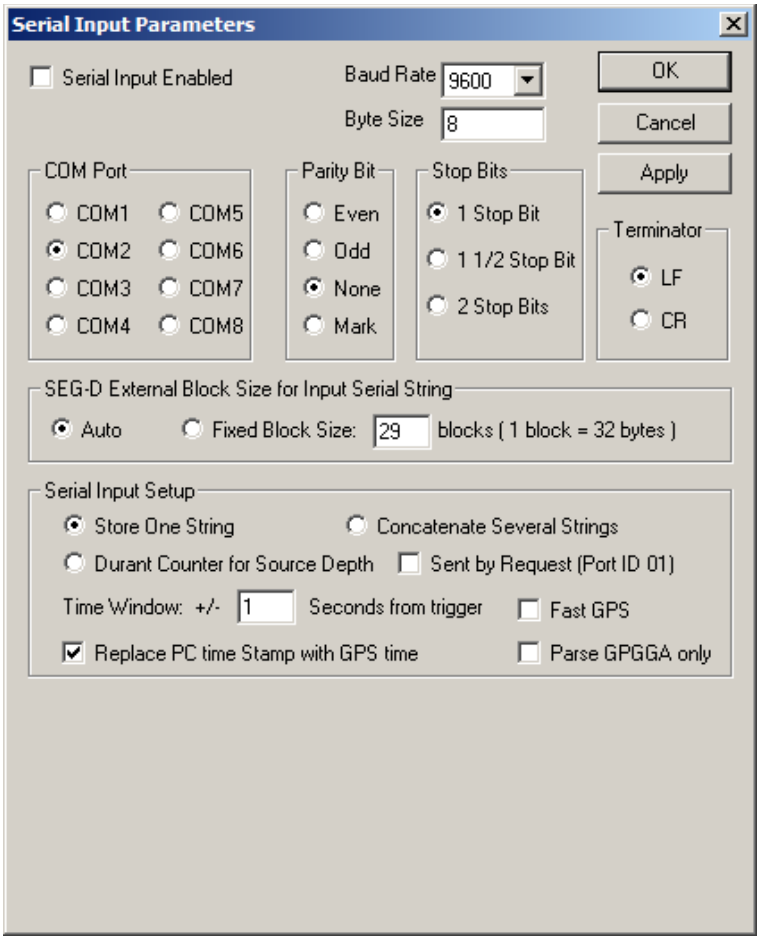


Note: Because we set a 14.4-second holdoff time, and because the triggers are coming continuously, the SEG files will have a time-overlap of approximately 1.6 seconds. There will be a slight amount of jitter in this – it will vary by a few samples owing to network and data writing inconsistencies from shot to shot.

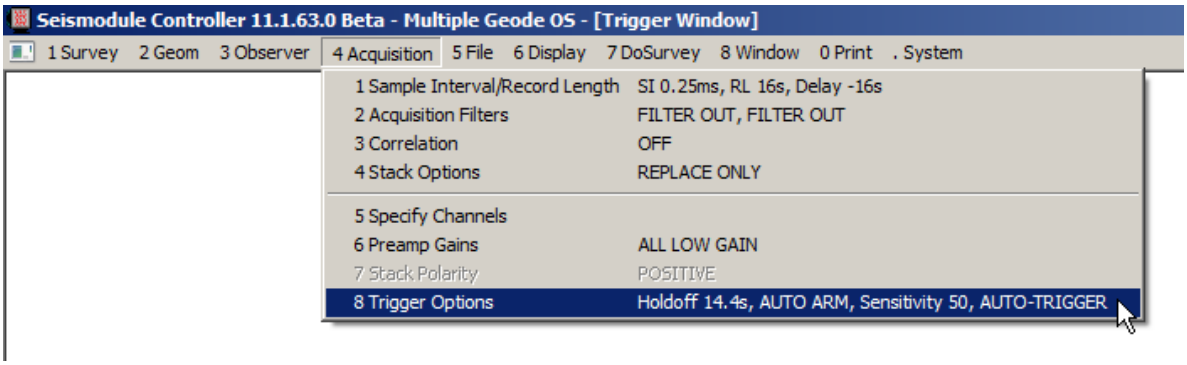
If you **ARE** using an external triggering device:

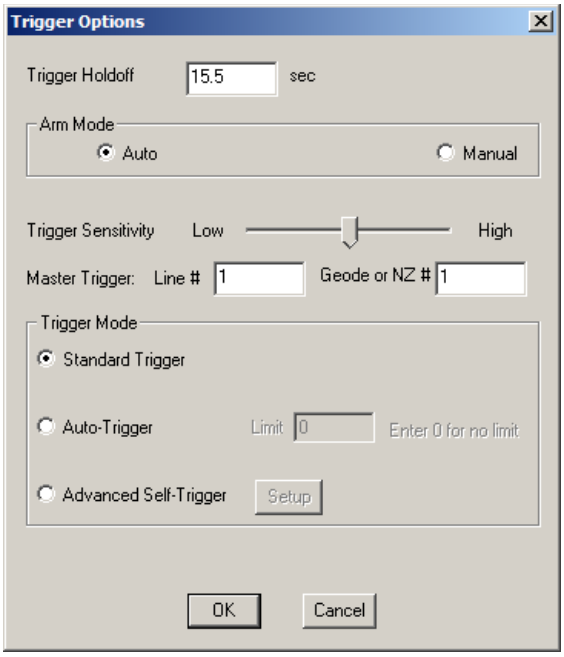
- Connect the device trigger output to the trigger input on the Master Geode.
- Connect the data output to a serial port on the PC.
- Select *System >> Serial I/O >> Serial Input* and set up the serial input parameters to match those of your GPS.





- Select *Acquisition >> Trigger Options*. Set the trigger holdoff to be ½ second less than the record length. Set the trigger mode to standard trigger.





Test

- Maximize the trigger window. Start your GPS sending serial data and PPS output. Press the "1" key to arm the system and begin recording. Make sure that the shot-to-shot time is consistently equal to the trigger holdoff time. Again, what you are looking for is missed triggers, which will be signified by a doubling of the shot-to-shot time. If you see this, it represents a gap in your data and you need to adjust your parameters.
- Disarm the system, enable Auto Save, re-arm, and repeat the above. Let the system run for 5 minutes. If it doesn't miss any triggers, you should be ready to acquire continuous data.

Note: Because we set a 15.5-second holdoff time, and because the triggers are coming once per second, the SEG files will have a time-overlap of approximately 0.5 seconds – the system will trigger on every 16th PPS from the GPS. There will be a slight amount of jitter in this – it may sometimes vary by $\pm$ one sample.

In both of the above cases, it should be noted that the amount of overlap can vary from one shot to the next. It is up to the user to account for overlap. If you write concatenation software, each trace of each file should be compared to its counterpart in the next file, because overlap can vary even on a trace-by-trace basis. If it is essential to record perfect, time-contiguous records with no overlap on any traces, additional hardware is required and is available.