AI Configure - Assigns data allocation

1) Buffer Size - How many scans to buffer.

AI Start - Tells DAQ card to start collecting data

1) # of Scans to acq:
   -1 (Fills up entire buffer) - default
   = 0 (Continuous acq.)
   = N (fills up N of the buffer elements)

2) Scan Rate is samples per second

3) Trigger Type - our card only has digital trigger
   Pretrigger - # points before trigger that are in scan

AI Read - Pulls data from DAQ card

1) # of Scans to Read: How much to pull off
   =-1 (Entire buffer) - default
   = N (Leading N of the buffer elements)
   (Note for continuous acq, -1 pulls 100 scans)

2) For Continuous collection, "Read" should be in a loop.
   You need to ensure data is leaving buffer faster than it enters.

3) Waveform Data is an array of waveforms (even if only one channel is acquired). To isolate, use Index Array to pull out element.

4) Scan Backlog is an indicator that reports # of scans still in the buffer.

5) Conditional Retrieval - Analog Trigger like readout. Only writes out data that meets criteria. See help for more details
AO Configure

1) Sets up device, channel(s) used, and size of the buffer.

2) It is a pretty good idea to set the buffer size to the size of the waveform you are planning on generating. I.e. if your waveform is 100 elements long, you probably should have your buffer also set to 100. This way, you will not end up with blank output.

AO Write

1) Allows you to load the waveform into the buffer. Waveform can be created by one of the waveform generation VIs or via point to point creation with waveform builder.

2) Be aware of the time step (Δt₁) in waveform. If it does not match the update rate time period (Δt₂), the signal will be sped up by the ratio of the time steps.

3) Hint: if using waveform generation VI’s you can put Bundle of Sampling info onto panel to get number of points and sample frequency. Wire # points to buffer size on Config and sample frequency to the update rate input on Start.

AO Start

1) Number of Buffer Iterations: This control tells the DAQ board how many times to write out the buffer. If set to zero (0), card will write until AO Clear is run (including after termination of LabVIEW).

2) Be aware of the time step (Δt₁) in waveform. If it does not match the update rate time period (Δt₂ = 1/update rate), the signal will be sped up by the ratio of the time steps.

AO Clear
Terminates writing
Front Panel

- **device (1)**
- **channels (0)**
- **buffer size**
  - 1000
- **update rate**
  - 1000.00
- **number of buffer iterations (1)**
  - 1

**waveform data**

- **t0**
  - 4:00:00 PM
  - 12/31/1903

- **dt**
  - 0.000000