Zoned Video and Event Responder Tutorial

The following instructions will guide you through the steps needed to connect Zoned Video to Cheetah DAS directly or, through the NetCom Router. It will also guide you through a basic Zoned Video setup and, if desired, connection to Event Responder to utilize the events created from Zoned Video to output TTL responses. Preliminary knowledge of Cheetah DAS and Video Tracker setup is recommended prior to completing this tutorial.

Required Components:

- Digital Lynx SX & Cheetah Data Acquisition Software (DAS)
- Video Tracking Kit and VT License
- HS-XX-LED (excluding HS-8)
- Zoned Video http://neuralynx.com/research_software/video_tracking_software/
- NetCom Router (Not required with Cheetah 5.7.4 and newer) http://neuralynx.com/research_software/experiment_control_software/
- NeuraView http://neuralynx.com/research_software/file_converters_and_utilities/
- Event Responder http://neuralynx.com/research_software/experiment_control_software/

NOTE:
As with all electronics, static discharges cause damage to semiconductor devices and especially to high impedance inputs. The opamp inputs are protected against a 2000V discharge but care must still be used when handling and using the HS amplifier. Please observe the guidelines at the end of this document to properly handle HS devices.

Zoned Video Setup

1. Open *Cheetah DAS* with the desired CSC, Spike configuration. Be sure to include a Video Tracker setup in the configuration.

2. In the Acquisition Entity Settings for the Video Tracker, setup your Plot Type, Threshold Settings, Tracking Mode, and any other settings you wish to manipulate. It may be easier to adjust these settings while acquiring a live feed from the camera.

3. Launch the *NetCom Router* on the acquisition computer, not required on Cheetah 5.7. 4 and newer. Select Networking - Connect to Server from the menu bar. Enter the acquisition computer's Name (typically auto- filled) or IP Address.

4. Open the *Zoned Video* program either on the acquisition computer or a computer on the same network. Note: Events created by Zoned Video will have decreased response time due to network and computer latency if run on a remote computer.
    a. Select Networking - Connect to Server from the menu bar. Enter the acquisition computer name or IP address from step 2 above. Click OK.
    b. A "Connection was successful" dialog box should appear. Click OK.
    c. Select Networking - Start Data Stream from the menu bar.
    d. A "Stream opened successfully" dialog box should appear. Click OK

5. Start Acquisition in Cheetah DAS, if not already started, in order to see the video feed in Zoned Video. Zoned Video will only display the Threshold view of the camera system so no live imagery will be displayed. If no LED's or other light markers are in the environment, the display will look black. It is recommended to use LED sources to mark the corners of the Zones to be created to more accurately define Zone locations instead of "free-handing" their locations.

The following steps will guide the user through the creation of Zones in the Zoned Video program. These Zones are used to trigger Event markers in Cheetah DAS as to when areas of the recorded environment have been “Entered” or “Exited”.

6. Create a Zone in Zoned Video by pushing the Insert Key on the keyboard or, Click on Select- Create Zone in the menu bar.
    a. The first Zone will be labeled “0”, and appear as a square on the screen. Using the computer mouse, click and drag to create a Zone over the desired area of the environment. Release the mouse button to finish creating the Zone.
    b. If you’re not satisfied with the size or location of the Zone, simply click and drag again as Zone “0” will remain editable until another zone is created.
    c. Continue this process until all desired Zones are created. To toggle between Zones, select the numeric key on the keyboard which corresponds to the desired Zone. See Image 1 for an example of a completed Zone configuration.

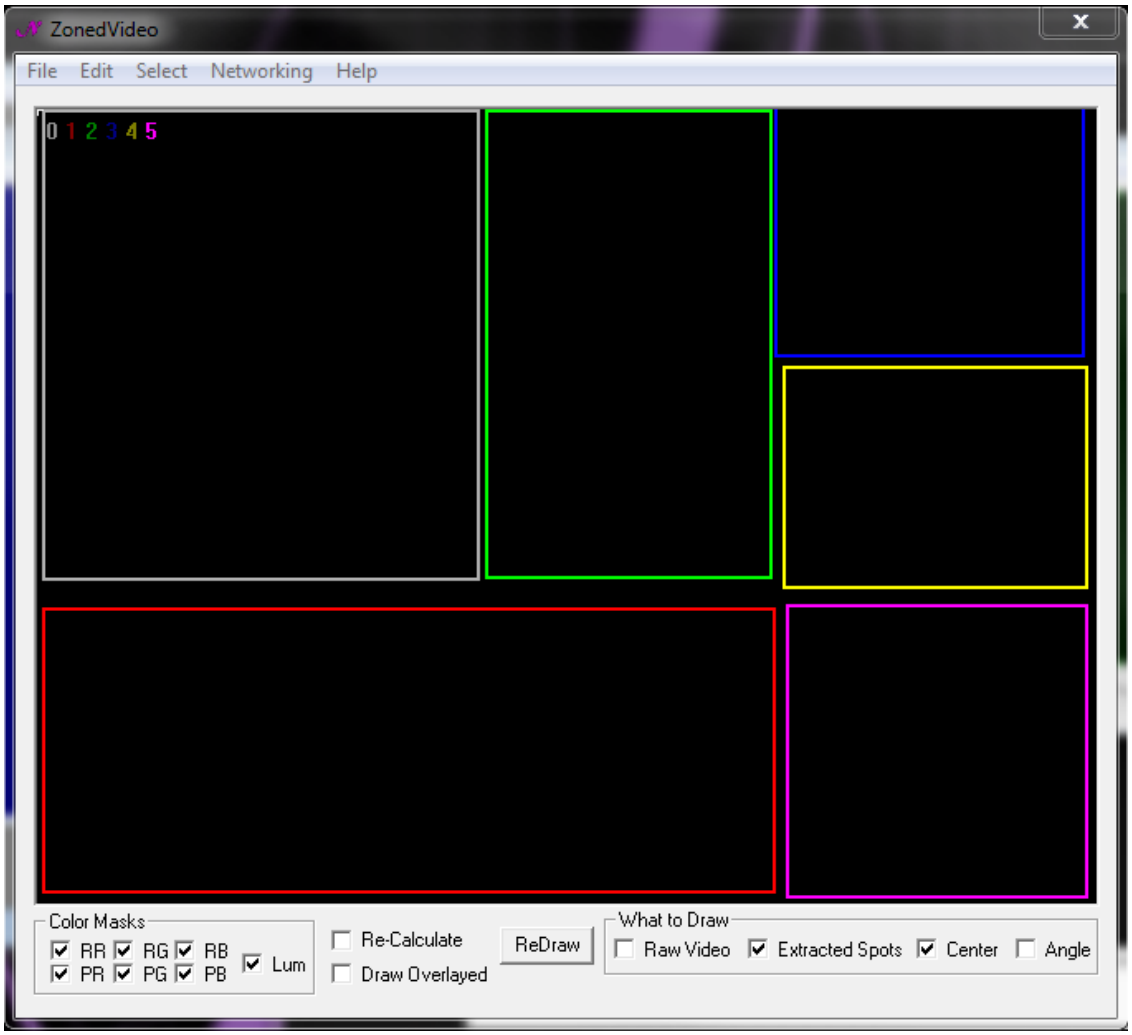

Image 1

7. In Cheetah DAS, Open the Event Display window, located under the View button on the menu bar. Every time the Video Tracker detects the Headstage “Entering” and “Exiting” a zone, an Event will be created in Cheetah with the respective Timestamp the Event occurred.

8. Test the Video Tracker setup by moving the LED equipped Headstage connected to the acquisition system through the recording environment, allowing it to pass through all the Zones created in Zoned Video. Attempt to simulate the movement of the research subject to accurately portray movement through the environment. An Event with the Zone number should be created each time the HS passes “Enters” and “Exists” each of the Zones. See Image 2

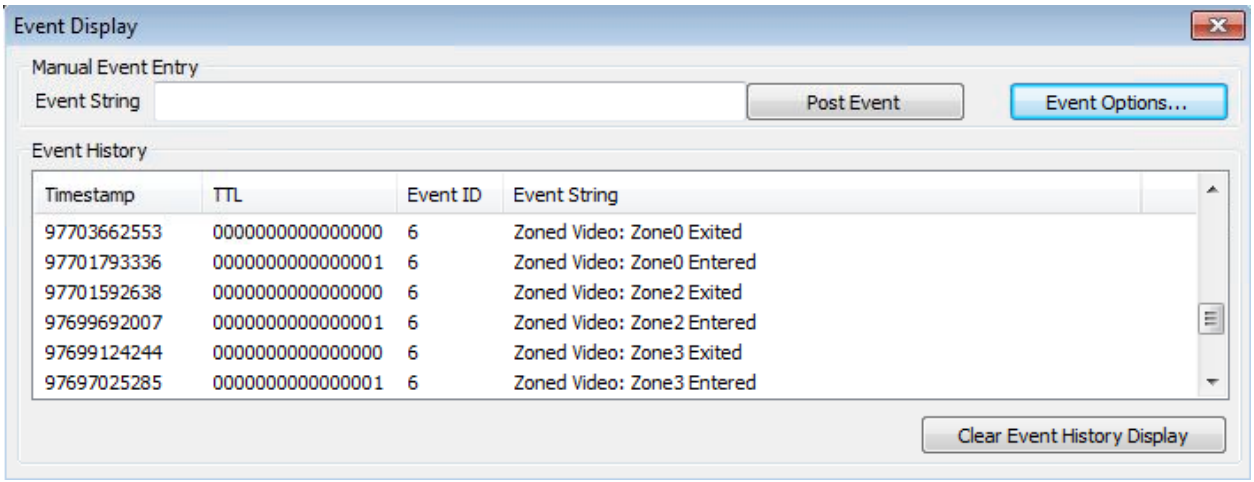

Image 2

Event Responder

1. NetCom Router application is required to run both Zoned Video and Event Responder applications. See Netcom tutorial for further information.

2. Connect Event Responder to the NetCom Router by clicking on the “Connect” button.

3. Next, click the “Add Event” button on the left of the window below the Event List area. A Default Event String name will appear under the Event Properties area. Highlight this text and replace it with a desired Zone# Entered or Exited event string which can be seen in the Event Display window of Cheetah under the Event String column.
    a. In this example, **Zoned Video: Zone0 Entered** will be used as the trigger name to send the response command. Please note, the text must be entered exactly as it appears in the Event Display screen. See Image 3
    b. For this example, the Event ID and TTL Value will not be used to exicute a Response Command.

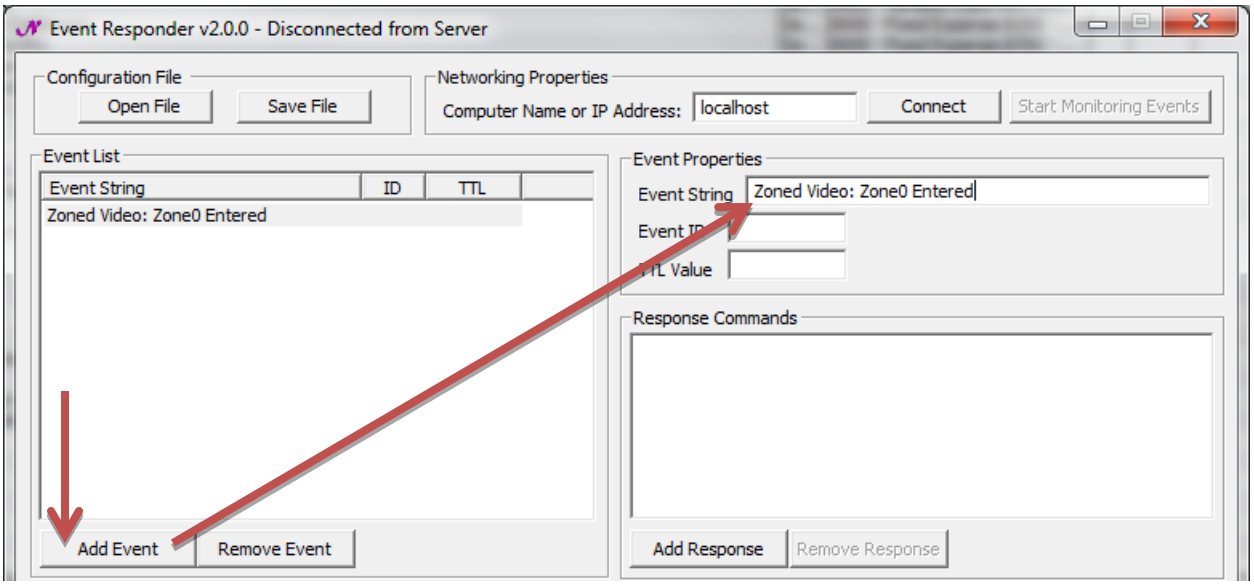

Image 3

4. Now, click the “Add Response” button and click the **New Event Response** text that has appeared in the Response Commands area. This is the location in which the desired response command will be input so when the trigger event is read, the response command will be exicuted. See Image 4

    a. In this example, the command entered is:
    -DigitalIOTtlPulse AcqSystem1_0 0 6 High

    This command will trigger an output on the Digital Lynx SX TTL Digital I/O from Port 0, Bit 6. It will be set high for the duration established in the Cheetah Digital I/O Setup window. The port must also be set to “Output” prior to executing this command or an error message will occur.

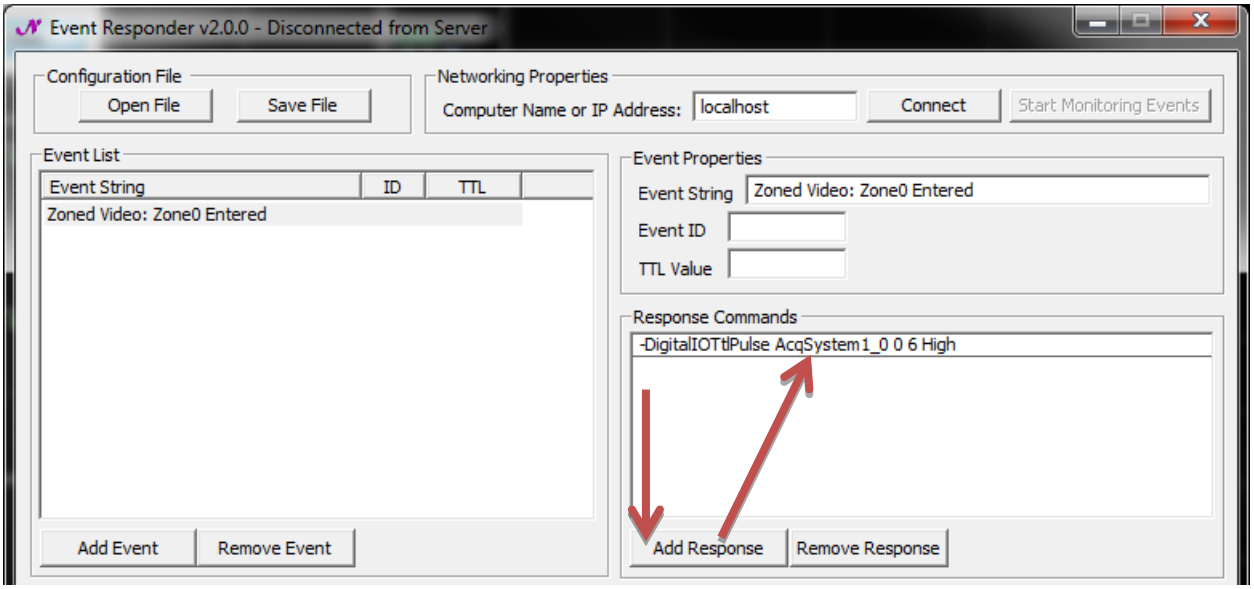

Image 4

5. Repeat steps 3 and 4 until the desired event triggers and responses have all been entered. In this case, enter which “Zones.” Please note, any number of Response Commands can be entered for each triggering Event String. See Image 5
    a. In this example, the entering of “Zone0” will trigger Event Responder to send the digital I/O pulse as indicated in step 4, as well as delay the next command for 300 milliseconds before finally starting the actual recording of the session.

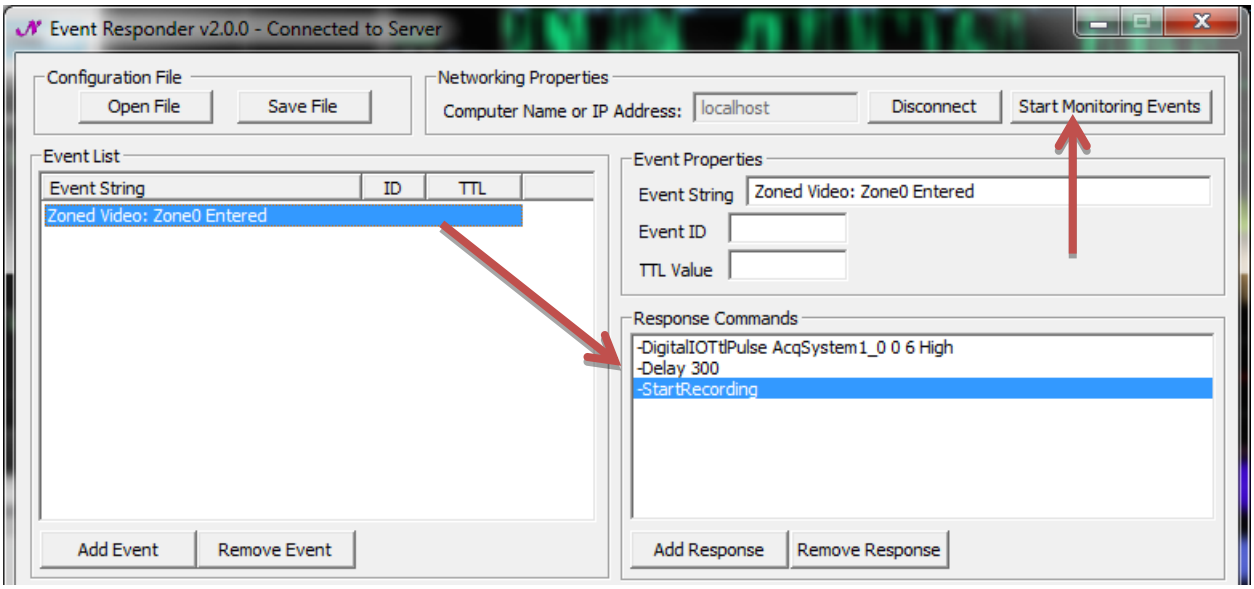

Image 5

6. Lastly, click the “Start Monitoring Events” button in the upper right corner. See Image 5 This allows the Event Responder program to monitor the event strings coming into Cheetah during Acquisition. These events can be viewed in the Event Display window of Cheetah. See Image 2. Please note, Acquisition must be on in order for Event Responder to begin monitoring events

At this time it is recommended to do at least one trial run with the research subject connected to the system. This will allow any issues to be resolved prior to recording research data. During this trial session, adjust the Video Tracker Entity Settings to provide the most accurate tracking clarity. Be sure to Stop Acquisition prior to connecting and disconnecting any research subjects.

Headstage Handling Precautions

1. Always wear a grounding wrist strap when handling an animal which is connected for recording.
2. Always wear a grounding wrist strap when handling the HS amplifier.
3. Store the complete HS assembly (amplifier, tether, and MDR50) in the antistatic protective box in which it was shipped.
4. Static discharge damage will usually result in lower amplifier input impedance and noisier amplifier channel performance.