

Virtual Reality Laboratory in the Munroe Meyer Institute

# cometrics

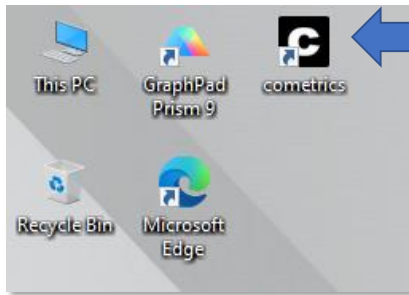
v1.3.1 User Guide

Hurtz, Morgan L | Arce, Walker | Walker, Seth, PhD, BCBA-D  
8-4-2022

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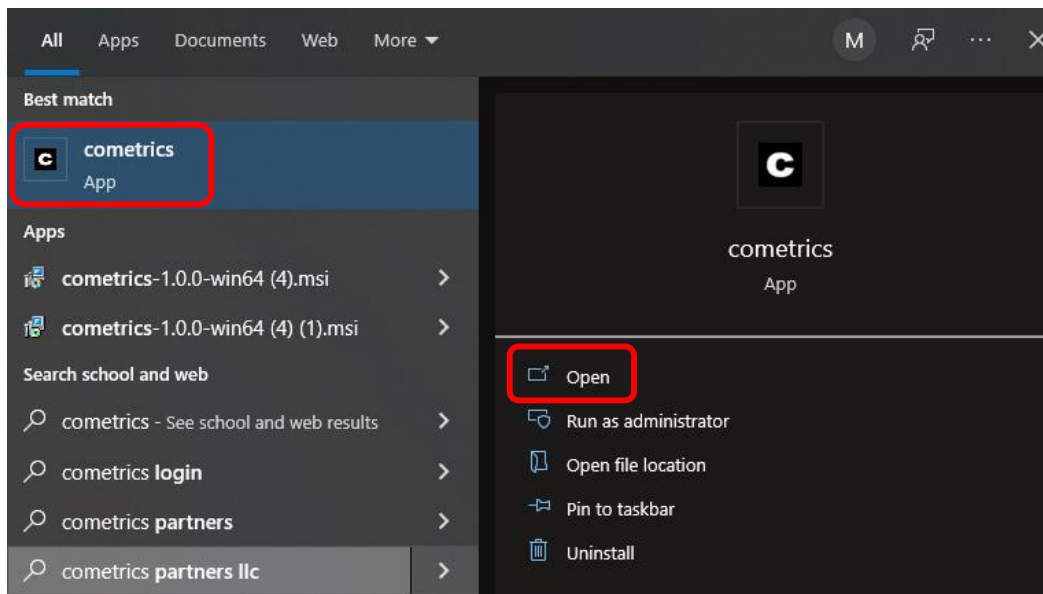
## Section 1 Open Program



- Locate the **cometrics** icon on desktop

OR

- Search “**cometrics**” in the Windows search bar (bottom left of screen)



Select a Phase

Continue

Cancel

Section 1    Open Program

Start Menu will open

Project Setup

Recent Projects

Create or Import New Project

Existing Patients

Presenting Concerns

Select a Phase

Keystroke File Setup

Select Concern and Phase to Load

Import

Frequency Key

Tag

Duration Key

Tag

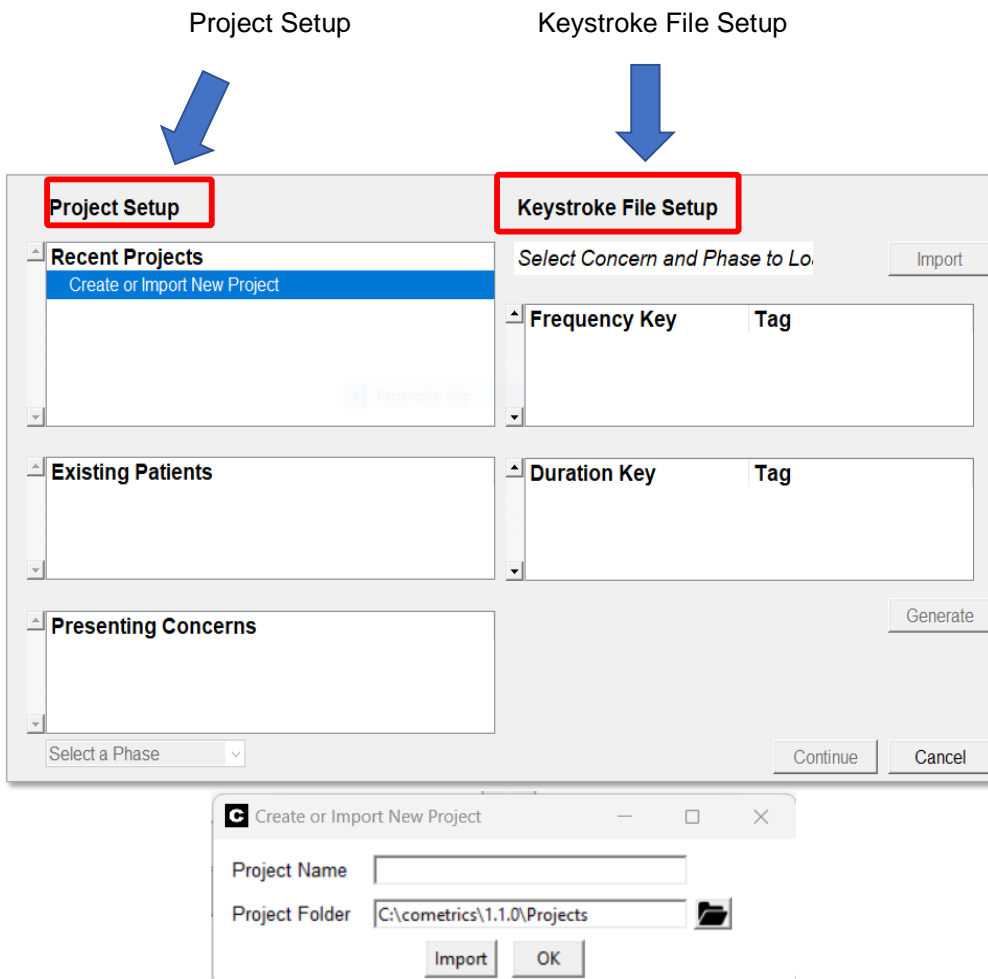
Generate

Continue

Cancel

## Section 2 Start Menu

### Two Sections of Start Menu:



Pressing **Create or Import New Project** will open the above window.  
The default save directory can be changed using the folder icon.  
Existing projects can be imported using the **Import** button

## Section 3 Project Setup

---

**Project Setup**

**Recent Projects**

Create or Import New Project

Rectangular Snip

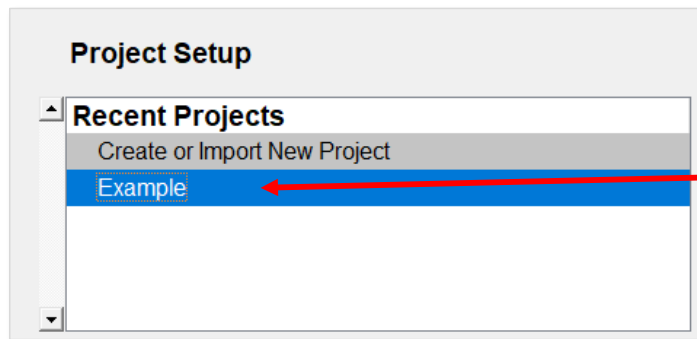
**Existing Patients**

**Presenting Concerns**

Select a Phase

- **Recent Projects** tab is used for creating and importing projects
- **Existing Patients** tab shows which patient is being studied in each session
- **Presenting Concerns** tab shows what behaviors are being recorded / analyzed in the session

## Section 3 Project Setup

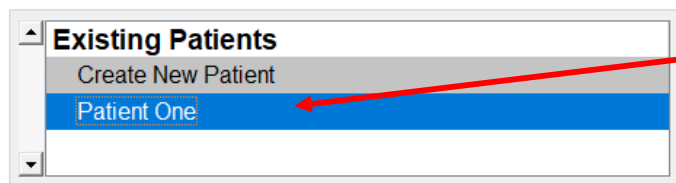


**Project Setup**

**Recent Projects**

- Create or Import New Project
- Example

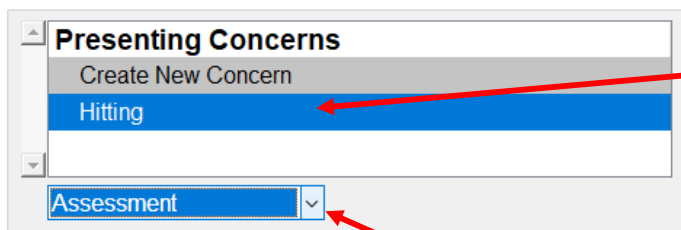
- 1) Create or import the session you wish to work on
  - a. Right clicking a project will delete the project from the list



**Existing Patients**

- Create New Patient
- Patient One

- 2) Create or select the patient being assessed



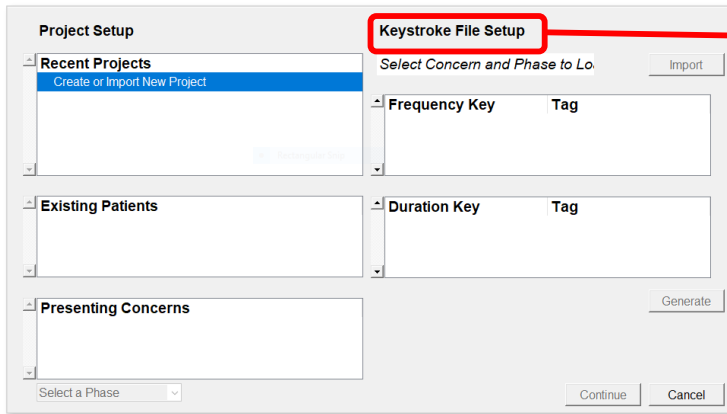
**Presenting Concerns**

- Create New Concern
- Hitting

Assessment

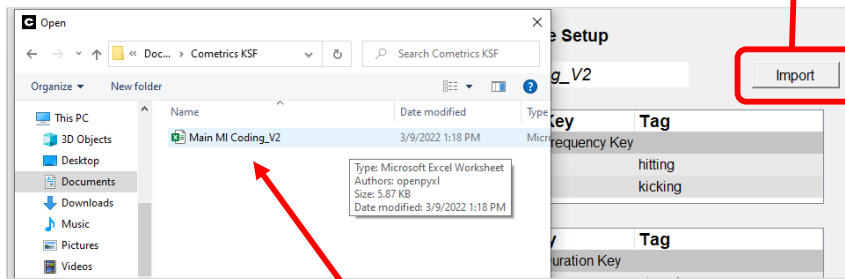
- 3) Create and add the presenting concerns in the session
- 4) Select whether this is an **Assessment** or **Treatment** phase

## Section 4    Keystroke File Setup



- **Keystroke File Setup** is used to assign behaviors to keys when coding

- This is done by **importing** an Excel spreadsheet associated with these codes



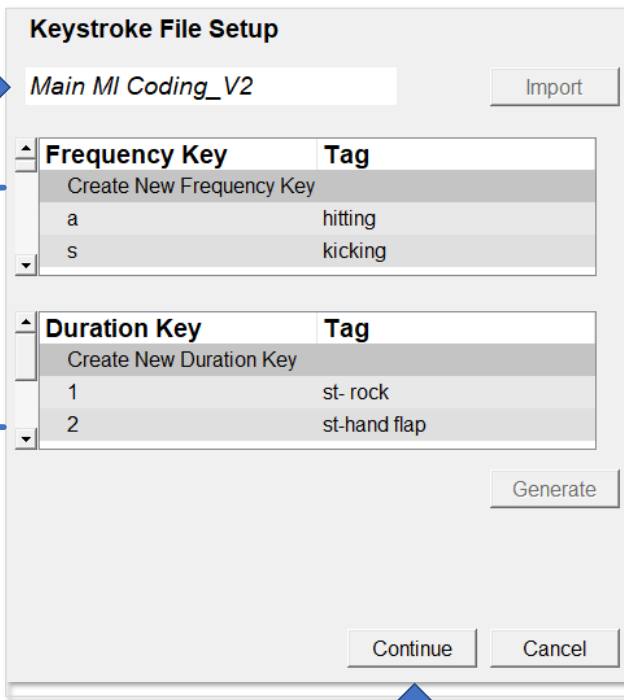
- If a file is not already uploaded, press **Import** to find and select the Excel file you wish to use for coding



## Section 4      Keystroke File Setup

- Name of the selected Excel file

- Preview of the coding keys in the Excel file



The dialog box titled "Keystroke File Setup" contains the following elements:

- A text field at the top containing "Main MI Coding\_V2" with an "Import" button to its right. A blue arrow points from the text "Name of the selected Excel file" to this field.
- A section titled "Frequency Key" with a "Tag" column. It includes a "Create New Frequency Key" button and a list of two items: "a" with tag "hitting" and "s" with tag "kicking". A blue bracket points from the text "Preview of the coding keys in the Excel file" to this section.
- A section titled "Duration Key" with a "Tag" column. It includes a "Create New Duration Key" button and a list of two items: "1" with tag "st-rock" and "2" with tag "st-hand flap".
- A "Generate" button located below the Duration Key section.
- At the bottom, "Continue" and "Cancel" buttons. A blue arrow points from the text "Select Continue in the bottom right to begin coding" to the "Continue" button.

- Select **Continue** in the bottom right to begin coding

## Section 5 Patient Information (Page 1)

**NOTE:** You will **not** be able to begin coding until all sections of **Patient Information** are complete (error messages will occur until the spaces are filled)

The screenshot shows a form titled "Patient Information" with the following fields and annotations:

- Name:** Example Patient (Annotation: Patient name)
- Medical Record Number:** (Annotation: Unique identifier for patient)
- Session Location:** (Annotation: Where the session is happening)
- Assessment Name:** (Annotation: The name of the assessment)
- Condition Name:** (Annotation: Induced stimulus that you are recording measures for)
- Primary Therapist:** (Annotation: Name of primary therapist)
- Case Manager:** (Annotation: Name of case manager)
- Session Therapist:** (Annotation: Name of session therapist)

At the bottom of the form, there are navigation controls:


- A left arrow icon.
- A tab indicator showing "1/3".
- A right arrow icon.


Annotations for the navigation controls:


- There are 3 **Patient Information** tabs
- Use the arrows to navigate the **Patient Information** tabs


## Section 5 Patient Information (Page 2)



**Patient Information**

Data Recorder  
Your Name |  Name of the person coding the video

Session Number  
1  Identifying number for the session

Primary or Reliability Session  
☒ Primary ☐ Reliability  Select if this is a Primary session (patient video) or a Reliability session (test for coder accuracy)

Session Date: March 07, 2022  
Session Start Time: 16:19:24  The date and starting time of the coding session

 2/3 

## Section 5 Patient Information (Page 3)

Patient Information	
Char	Tag
a	hitting
s	kicking
d	pushing
f	grab_scratch
g	head butting
j	hair pulling
h	biting
k	choking
l	sib-head bang
q	sib-head hit
w	sib-self-hit
e	sib-biting
r	sib-eye poke
t	sib-body slam
y	sib-hair pull
u	sib-choking
i	sib-pinch_scratch
o	throwing object

Navigation controls: Left arrow, 3/3, Right arrow

Page 3 of the **Patient Information** tab lists the keyboard characters assigned to each behavior tag  
This will be automatically shown when the session is started

## Section 6 Session Times

The screenshot shows the 'Session' tab of a software interface. It includes fields for 'Session Time' and 'Break Time', both set to '0:00:00'. Below these is a 'Session Stopped' status indicator. There are three checkboxes: 'Reminder Beep (Seconds)' (unchecked), 'Session Duration' (checked, with a value of 262), and 'Double Speed Playback' (unchecked). At the bottom, there are two buttons: 'Start Session' (green) and 'Pause Session' (grey). Below the buttons are three video control icons: a double left arrow (backward), a right arrow (play/pause), and a double right arrow (forward). Red arrows point from text descriptions to these icons. Blue arrows point from text descriptions to the session controls. The 'Session Stopped' text is red, while the others are black or grey.

**Session** **Review**

**Session Time** 0:00:00 Records the amount of time spent coding

**Break Time** 0:00:00 Records the amount of time spent paused

**Session Stopped** Shows if session is Started (**green**), Stopped (**red**) or Paused (**yellow**)

☐ **Reminder Beep (Seconds)** Enable to play a sound on an interval for discontinuous measurement strategies

☒ **Session Duration** 262 Sets the total duration of the session

☐ **Double Speed Playback** Enable to play a loaded video at double speed

**Start Session** Esc Key Start / Stop the session

**Pause Session** Left Ctrl Pause / Resume the session

Used to go **Backward** in video by one second

Used to **Play / Pause** video in video tab

Used to go **Forward** in video by one second

## Section 7

## Key Bindings

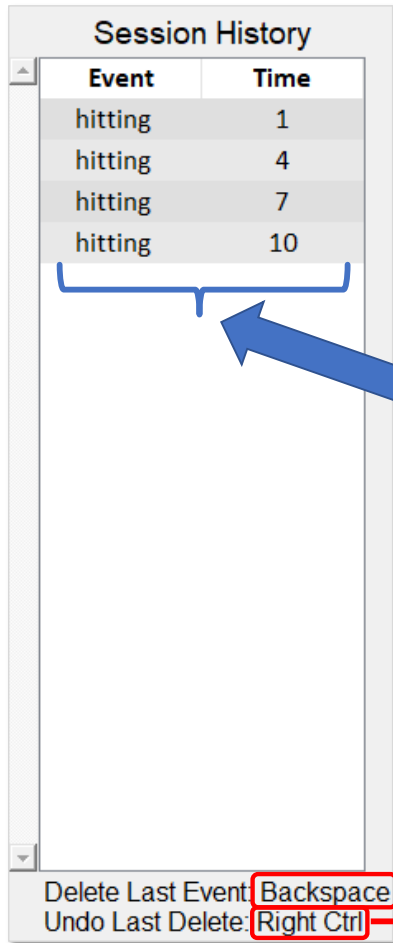
- The **Key Bindings** tab shows the **characters** tied to each behavior

Key Bindings				E4 Streams				Video View			
Frequency Bindings				Duration Bindings							
Char	Freq	Tag		Char	Dur	Total	Tag				
a	0	hitting		1	0	0	st-roc				
s	0	kicking		2	0	0	st-har				
d	0	pushing		3	0	0	st-tou				
f	0	grab_scr		4	0	0	st-hea				
g	0	head bur		5	0	0	sterec				
j	0	hair pull									
h	0	biting									
k	0	choking									
l	0	sib-head									
q	0	sib-head									
w	0	sib-self-l									
e	0	sib-bitin									
r	0	sib-eye p									
t	0	sib-body									
y	0	sib-hair l									
u	0	sib-chok									
i	0	sib-pincl									
o	0	throwing									

Commented [w1]: Add some details about the session history and the commands for it.

- The **Frequency** column shows the number of times a code has been used in the session
- The **Dur** and **Total** column records how long a code has been active per activation and per session, respectively

## Section 7 Key Bindings



Event	Time
hitting	1
hitting	4
hitting	7
hitting	10

Delete Last Event: Backspace

Undo Last Delete: Right Ctrl

- The **Session History** tab gives a basic view of what codes have been used and the time (in seconds) at which they occurred
- The **Event** and **Time** columns show what behaviors have been coded during the session and at what time they occurred, respectively
- Press **Backspace** to delete the last coded event
- Press the **Rightmost Control** key to undo the last deleted event

## Section 7 Key Bindings (Keyboard)

### Keyboard Codes

	1 Stereo Rock	2 St-Hand Flap	3 St-Touch / Tap	4 St-Head Swing	5 Stereo- vox								
	Q Sib Head-Hit	W Sib Self- Hit	E Sib Biting	R Sib Eye-Poke	T Sib Body- Slam	Y Sib Hair- Pull	U Sib Choking	I Sib Pinch / Scratch	O Throwing Object	P Kick / Hit Object			
	A Hitting	S Kicking	D Pushing	F Grab / Scratch	G Head butt	H Biting	J Hair Pulling	K Choking	L Sib Head Bang				
		Z Flip Furniture					N Flop						

### Keyboard Close Up

1 Stereo Rock	2 St-Hand Flap	3 St-Touch / Tap	4 St-Head Swing	5 Stereo- vox							
Q Sib Head-Hit	W Sib Self- Hit	E Sib Biting	R Sib Eye-Poke	T Sib Body- Slam	Y Sib Hair- Pull	U Sib Choking	I Sib Pinch / Scratch	O Throwing Object	P Kick / Hit Object		
A Hitting	S Kicking	D Pushing	F Grab / Scratch	G Head butt	H Biting	J Hair Pulling	K Choking	L Sib Head Bang			
	Z Flip Furniture					N Flop					

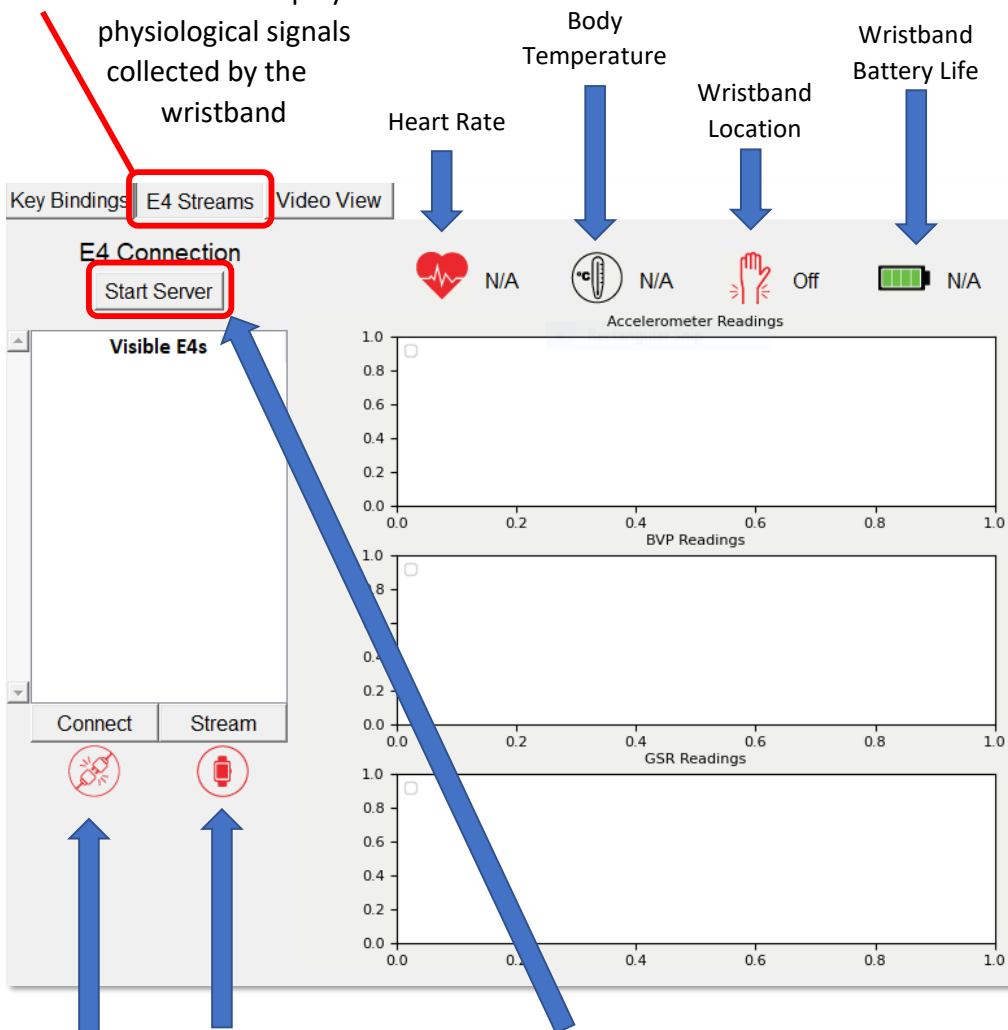
**\*\*For exact descriptions of each behavior,  
see [Operational Definitions](#) document**

**\*\*See the [Coding Cheat-Sheet](#) for simplified  
descriptions of the behaviors and their keys**



## Section 8 E4 Streams

- **E4 Streams** tab displays physiological signals collected by the wristband



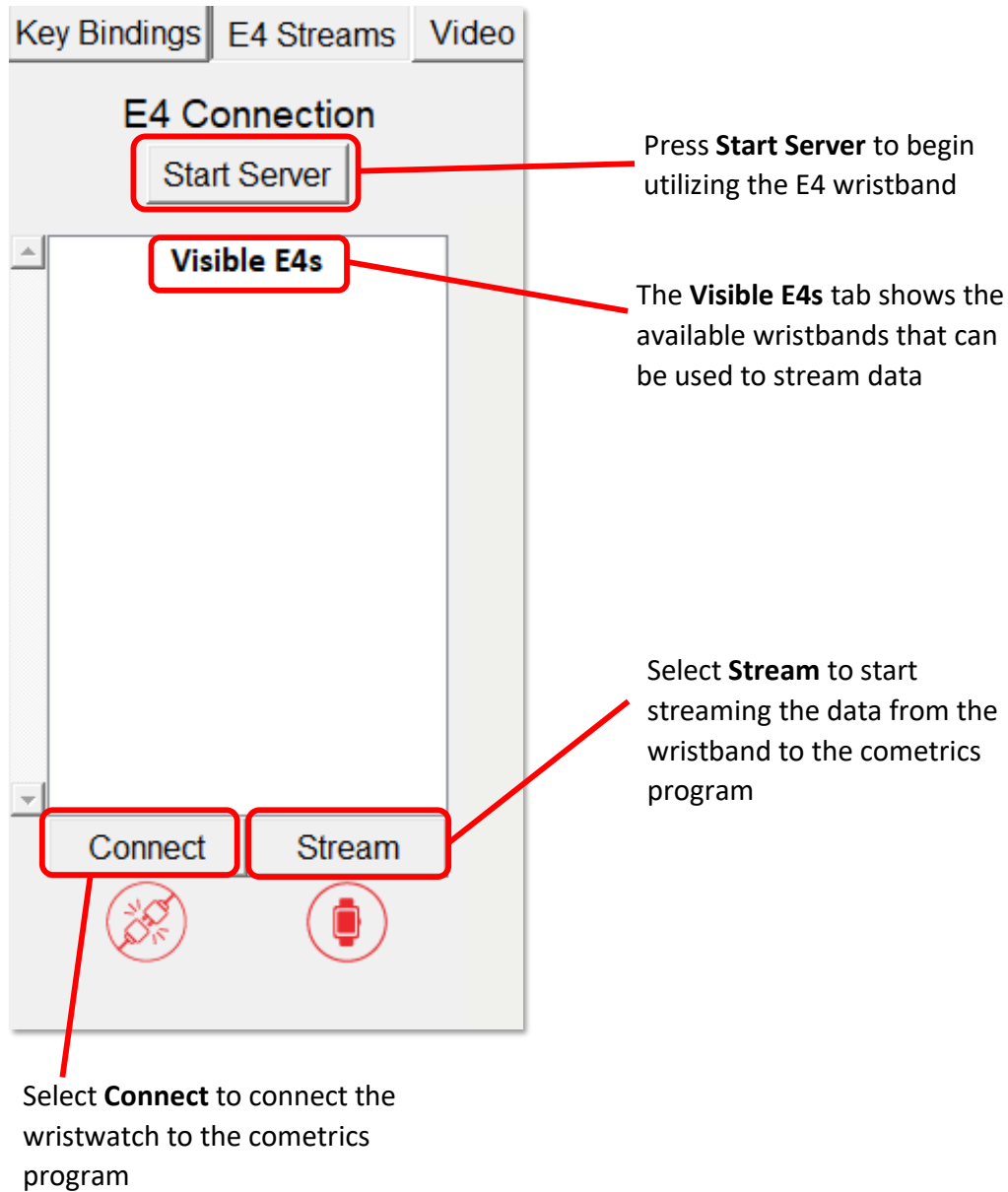
Connection  
status of  
wristband

Streaming  
status of  
wristband

<https://developer.empatica.com/windows-streaming-server-usage.html>

To connect an Empatica E4 to cometrics, setup the Streaming Server as described in the above link before pressing "Start Server"

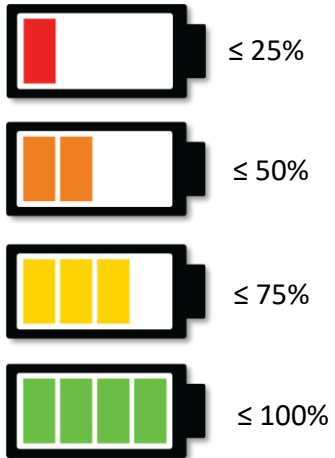
## Section 8 E4 Streams



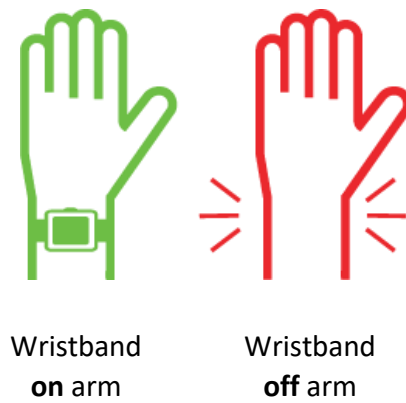
## Section 8

## E4 Streams (Icons)

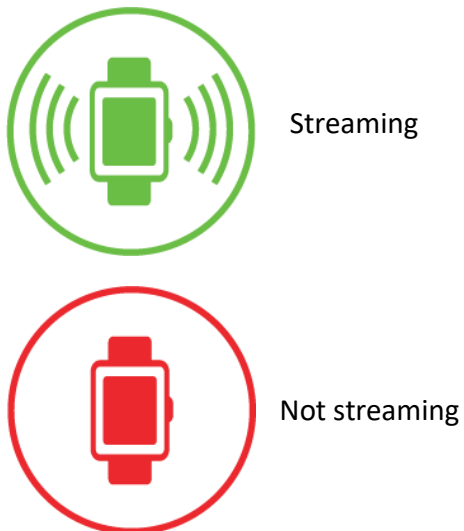
### Battery Life



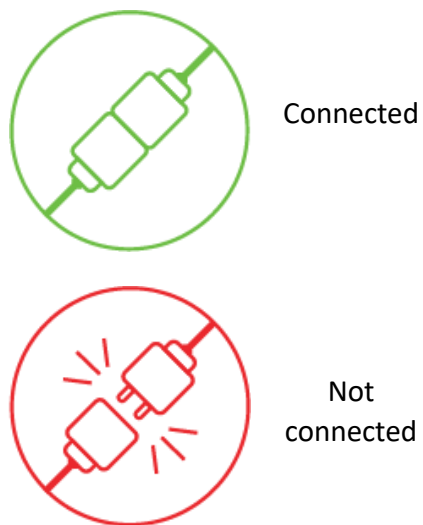
### Wristband Location



### Streaming Status

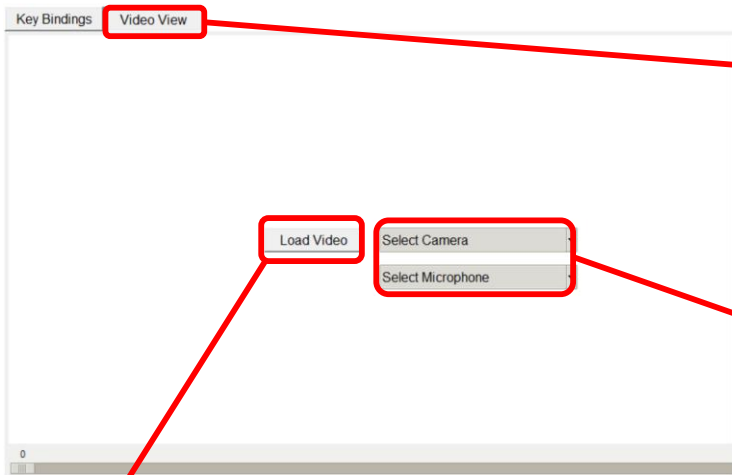


### Connection Status



## Section 9

## Video View

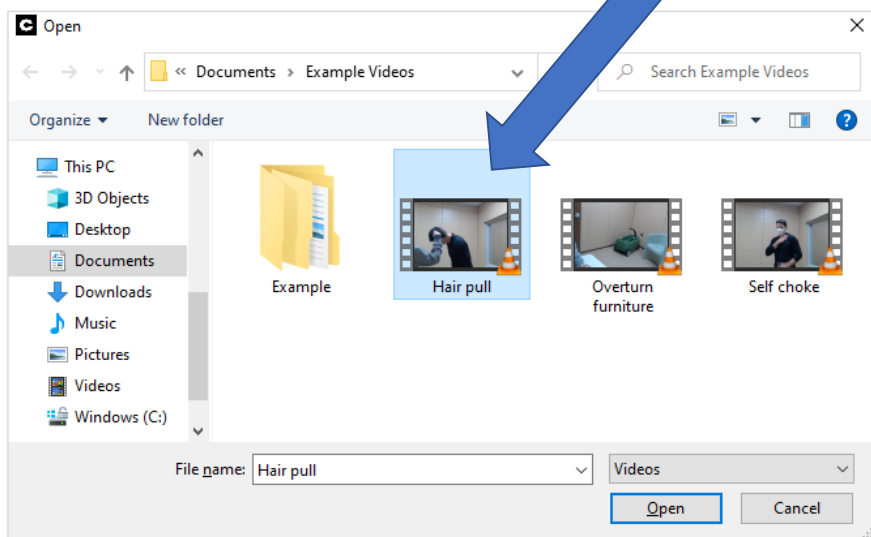


The **Video View** window shows the video recording of the session

To record from a connected **Webcam**, use the dropdown to select an input

The **Load Video** button is used to select and upload the video you want to code

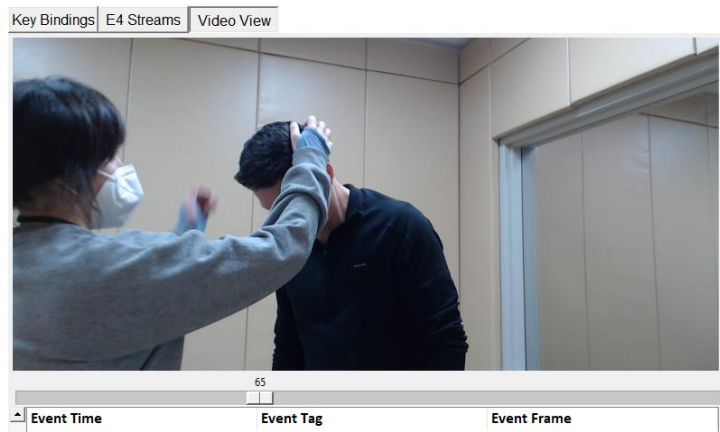
After pressing **Load Video**, locate the video file you wish to upload



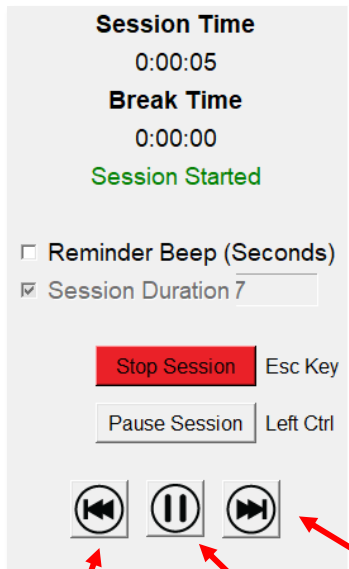
Commented [w2]: Update picture and text

Commented [w3R2]: Complete

## Section 9 Video View



Selected video will  
upload and be viewable  
for coding



Used to go  
**Backward** in video  
by one second

Used to **Play / Pause** video


Used to go **Forward** in video by one  
second

Section 9

Video View

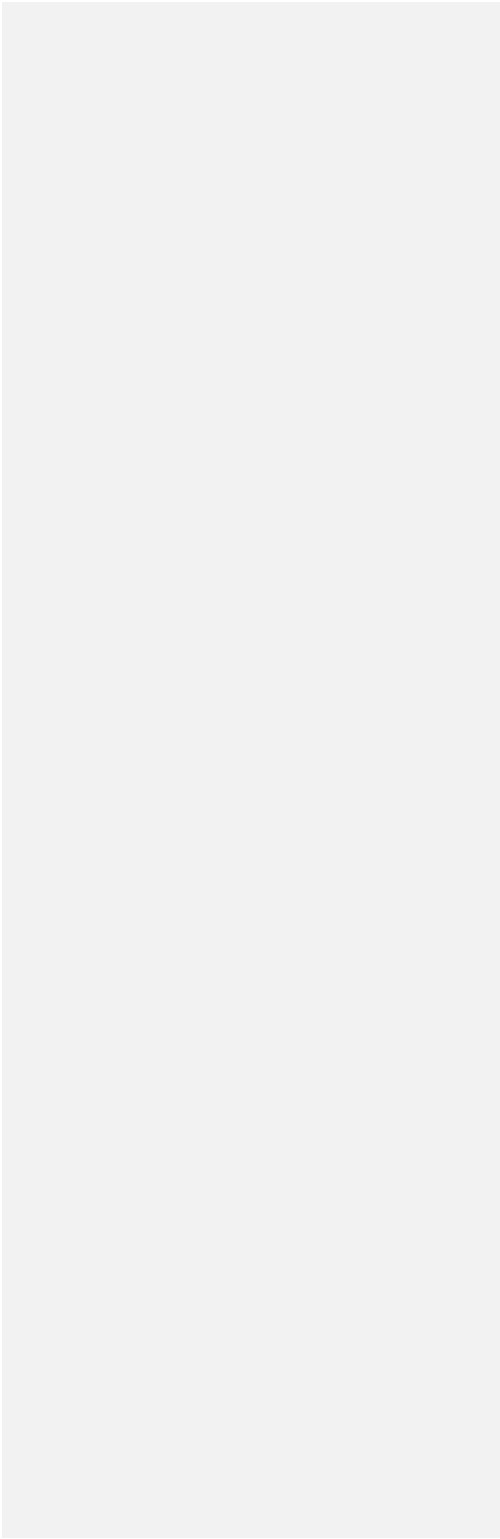
When coding an uploaded video, the **Video View** tab will look like this. The individual codes given to the video are labeled by 3 characteristics: **Event Time**, **Event Tag**, and **Event Frame**.

Key BindingsE4 StreamsVideo View



82

Event Time	Event Tag	Event Frame
1	hair pulling	15
2	hair pulling	46
3	hair pulling	82
4	hair pulling	115
5	hair pulling	152
6	hair pulling	185



## Section 9

## Video View

Commented [w4]: Update with event editing

Commented [w5R4]: Complete

Codes can be viewed underneath the **Video View** Tab

82		
Event Time	Event Tag	Event Frame
1	hair pulling	15
2	hair pulling	46
3	hair pulling	82
4	hair pulling	115
5	hair pulling	152
6	hair pulling	185

The **Event Time** column breaks the video into more manageable sections. This makes it easier to recall the general time frame in which events occurred.

The **Event Tag** column shows the behavior assigned to the given code

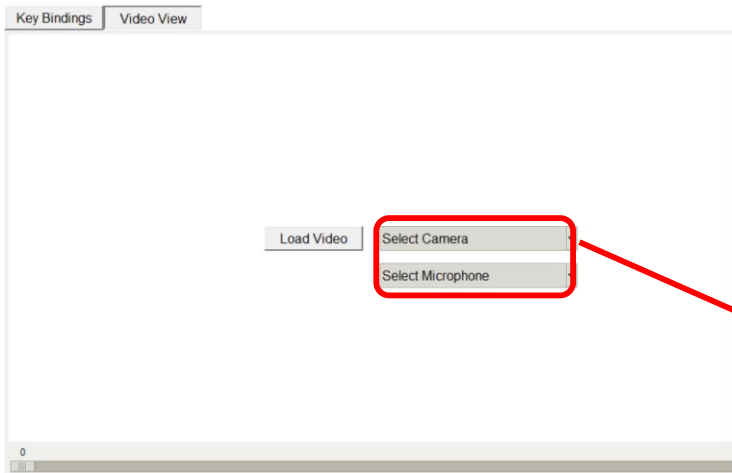
The **Event Frame** tab shows the specific frame where the coded event begins

This example video has 189 total frames. The **Event Time** column breaks this down into 6 sections.

Events can be edited by double clicking an event. A popup window will open that allows the event to be changed using a dropdown.

## Section 9

## Video View



To turn on the **Webcam and Mic** or other connected camera, press **Select Camera** and choose the desired input and press **Select Microphone** and choose the desired input

Connected cameras can be selected for use in this tab

Selected cameras can be used to **view, record,** and **code** sessions **live**

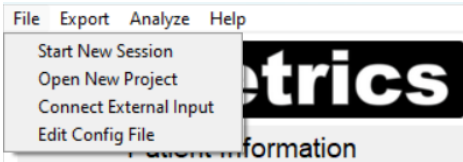
The order of activation of connected **Webcams** is the order of the inputs on the camera dropdown menu

Commented [w6]: Update picture and text

Commented [w7R6]: Complete



## Section 10 Quick Access Menu

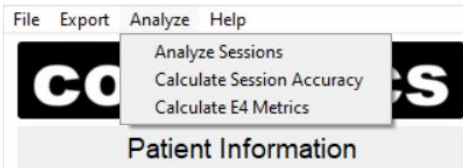


**Start New Session** – Reset the coding UI with the same settings

**Open New Project** – Close the coding UI and restart cometrics

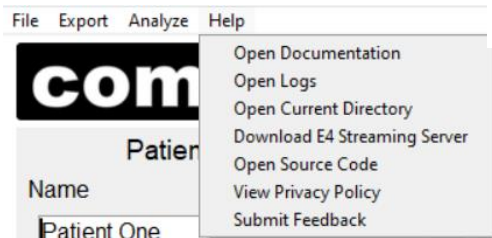


**Export CSV** – Used to export all existing session data for the patient into CSV files



**Analyze Sessions** – Plots the session history for the patient into their KSF

**Calculate Session Accuracy** – Calculate the interobserver metrics between two sessions



**Open Documentation** – Opens this guide using default PDF viewer

**Open Logs** – Opens the log file directory using File Explorer

**Open Current Directory** – Opens the working directory for the current patient

**Download E4 Streaming Server** – Opens the documentation for setting up the E4 Streaming Server and automatically downloads the same

**Open Source Code** – Opens the default web browser to the public GitHub page for the cometrics software package

**View Privacy Policy** – Opens cometrics privacy policy using the default browser

**Submit Feedback** – Opens popup that collects feedback and sends it to the developer. This feedback will be posted as an Issue on the GitHub repository

## Section 11      Keystroke File Format

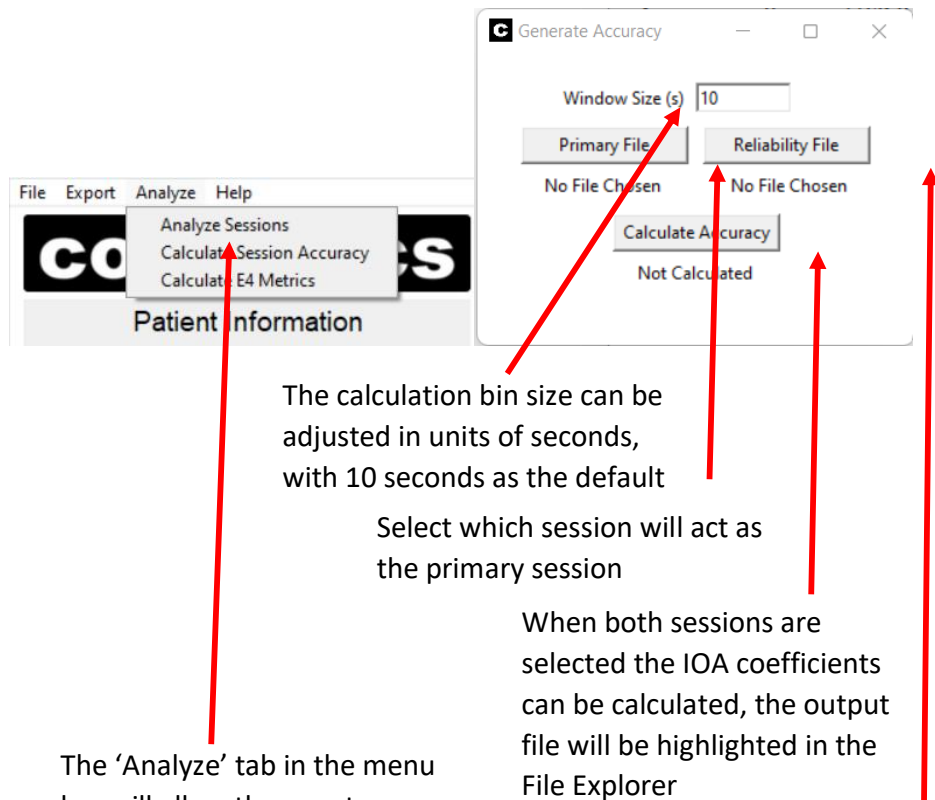
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Assessment:																					
2	Client:			Data Coll.					Session Data													
3	Session	Cond.	Date	Therapist	Primary	Reliability	Notes	Sess. Dur. (mins)	Frequency						Duration							
									q	w	e	r	t	y	a	b	c	d	e	ST	PT	
4									Freq 1	Freq 2	Freq 3	Freq 4	Freq 5	Freq 6	Dur 1	Dur 2	Dur 3	Dur 4	Dur 5	Session Time	Pause Time	

Commented [w8]: I'll add the following sections once your changes are complete

The keystroke file has a format that needs to be followed, an example of a working keystroke file can be found in the *references* folder of the root directory of the cometrics installation

The fields in the example keystroke file need to be present and when a new revision is created within the cometrics user interface, any custom fields or formatting are **not preserved**

## Section 12 Interobserver Agreement Coefficients



The calculation bin size can be adjusted in units of seconds, with 10 seconds as the default

Select which session will act as the primary session

When both sessions are selected the IOA coefficients can be calculated, the output file will be highlighted in the File Explorer

The 'Analyze' tab in the menu bar will allow the user to calculate the interobserver agreement (IOA) coefficients between two sessions

Pressing this button will open the window to the right

Select which session will act as the reliability session

## Section 12 Interobserver Agreement Coefficients

---

### Frequency Keys Partial Interval Agreement Percentage (PIA)

For each interval,  $x = \text{smaller value} / \text{larger value}$

If both reliability and primary have zero value, then  $x = 1$

Partial Interval Agreement = average all  $x$  values \* 100

### Frequency Keys Occurrence Interval Agreement Percentage (OIA)

Given that one observer scored 1 or more for an interval, agreement if both scored at least 1

If both observers recorded zero responses, the interval is excluded

Occurrence Interval Agreement = agreements / (agreements + disagreements) \* 100

### Frequency Keys NonOccurrence Interval Agreement Percentage (NIA)

Given that one scored 0 for an interval, agreement if both scored 0

If both observers recorded at least one response in the interval, then the interval is excluded

NonOccurrence Interval Agreement = agreements / (agreements + disagreements) \* 100

### Frequency Keys Exact Agreement Percentage (EIA)

Agreement is scored if both primary and reli have same value for an interval.

Exact Agreement Percentage = total agreements / total intervals \* 100

### Frequency Keys Total Agreement Percentage (TIA)

Agreement = # of intervals where both scored zero or > 1

Total agreement = number of agreements / total intervals \* 100

### Duration Keys Partial Interval Agreement Percentage (PIA)

For each interval,  $x = \text{smaller value} / \text{larger value}$

If both reli and primary have zero value, then  $x = 1$

Partial Interval Agreement = the average of all  $x$  values \* 100

### Duration Keys Exact Interval Agreement Percentage (EIA)

For each interval the value of the primary and reli is rounded to the nearest second

Agreement is scored if both primary and reli have same value for an interval.

Exact Agreement Percentage = total agreements / total intervals \* 100

## Section 13      Session Output File Format

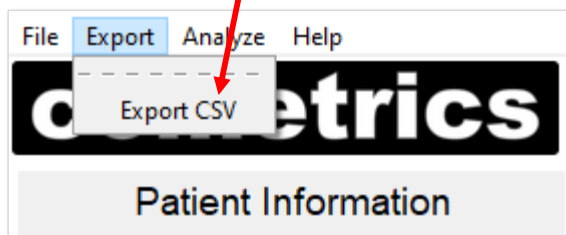
---

Each session has an output file that lists all collected information during a session including the Patient Information fields, keystrokes logged with timestamps from the timer, E4 frame, and video frame, where applicable, as well as all E4 data organized into one second windows

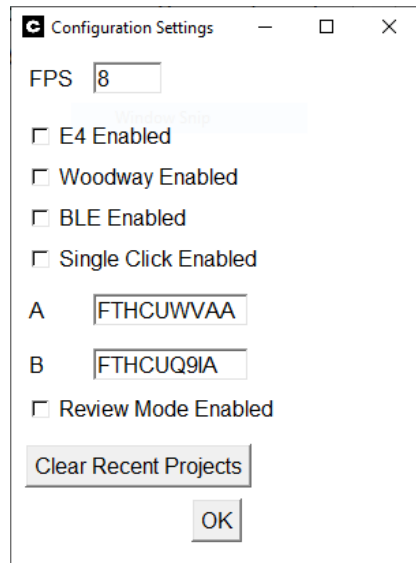
The session file is in JSON format, which is a human-readable file that is easily parsed in various programming languages

The file can be opened and read in a text file editor, such as Notepad

Additionally, sessions can be converted to comma-separated value (CSV) format using the button in the 'Export' tab



## Section 14 Configuration Changes



Commented [CX9]: Update picture with single click enabled

Commented [w10]: Update picture

Commented [w11R10]: Complete

In the root directory of the cometrics installation is a file called *config.yml*, which defines several control variables for the software

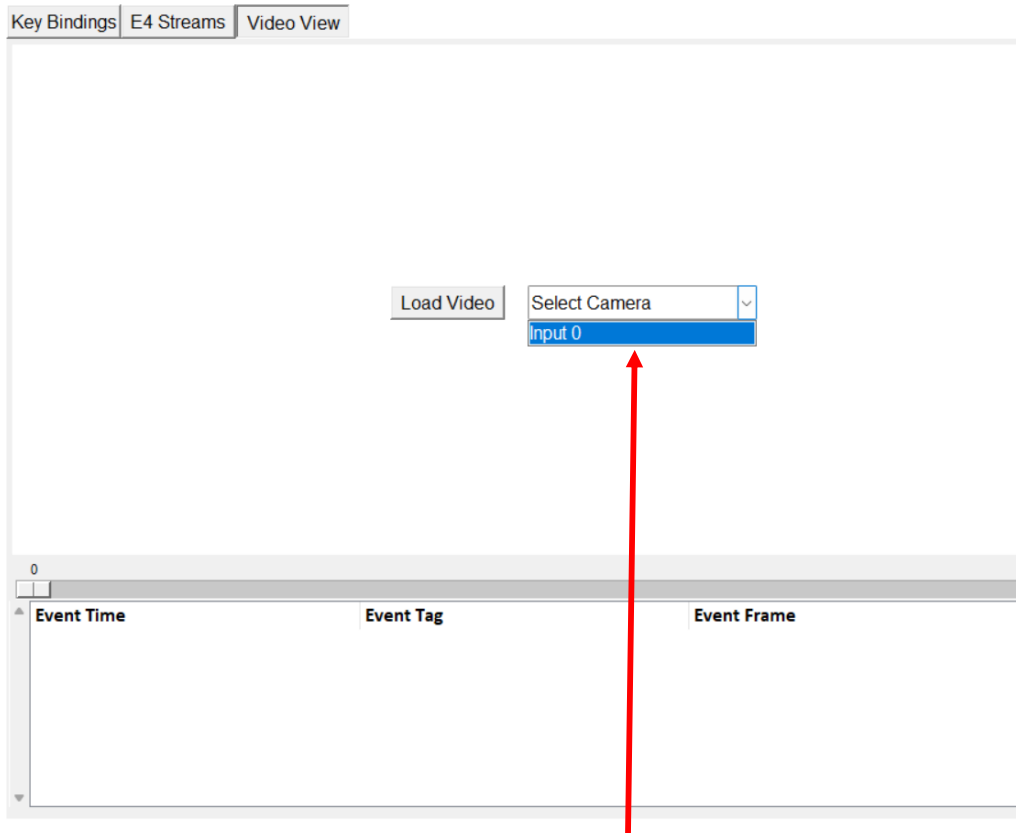
The above user interface allows the user to modify this file. The “FPS” field allows the user to change the frames per second on the webcam feed. Values up to 30 FPS have been used, but the max FPS is dependent on your camera.

The E4 checkbox enables the recording of Empatica E4 data. The Woodway checkbox enables the control of a Woodway Split Belt Treadmill. The BLE checkbox enables the control of a BLE peripheral device. The Single Click toggle between single and double click selection in Project Setup View. The Review mode checkbox enables the Review Mode tab.

The A and B fields allow the input of the serial numbers of the Woodway Split Belt Treadmill.

The “Clear Recent Projects” will delete all the projects that are saved and shown during Project Setup.

## Section 15 Understanding Webcam Order



When cometrics starts up it will poll for all connected cameras, either integrated or connected via USB and the list indicated above will be populated with the cameras found

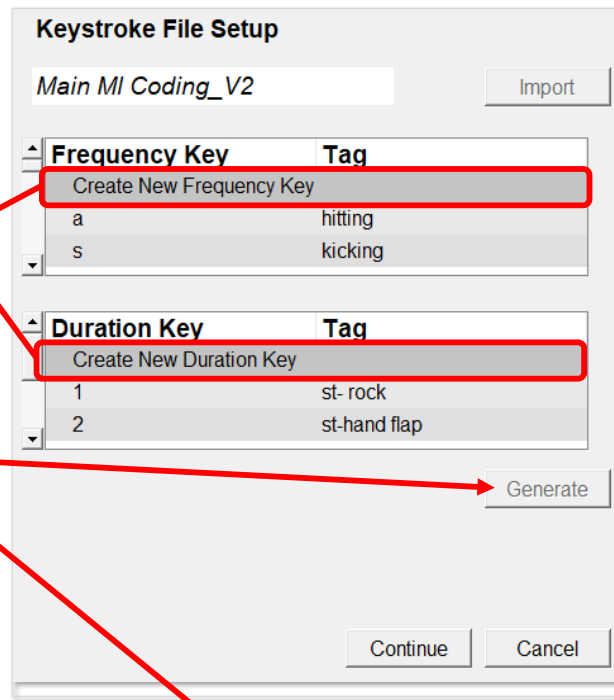
This order is the same each time given the same cameras being connected, but there is no way to differentiate between cameras

The user will have to evaluate each input to determine which camera is which input

## Section 16      Modifying Keystroke Files

Pressing either of the two highlighted buttons will create a new key within the keystroke file

When a new key is created, the “Generate” button will be interactable and a popup will show



The 'Keystroke File Setup' dialog box shows a file named 'Main MI Coding\_V2'. It contains two tables. The first table, 'Frequency Key', has a 'Create New Frequency Key' button highlighted in red, and a list with 'a' (hitting) and 's' (kicking). The second table, 'Duration Key', has a 'Create New Duration Key' button highlighted in red, and a list with '1' (st-rock) and '2' (st-hand flap). A 'Generate' button is located to the right of the tables. At the bottom are 'Continue' and 'Cancel' buttons.

Frequency Key	Tag
Create New Frequency Key	
a	hitting
s	kicking

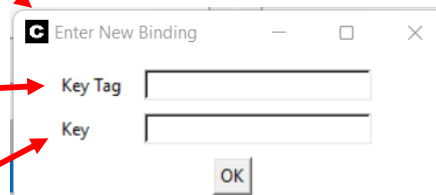
  

Duration Key	Tag
Create New Duration Key	
1	st-rock
2	st-hand flap

**Key Tag** – The tag (behavior, label, etc.) that should be associated with hitting the specified key

**Key** – The key press that should trigger the recording of the specified tag

Pressing “OK” will add the key to the end of the displayed list



The 'Enter New Binding' dialog box has two input fields: 'Key Tag' and 'Key'. An 'OK' button is at the bottom right.

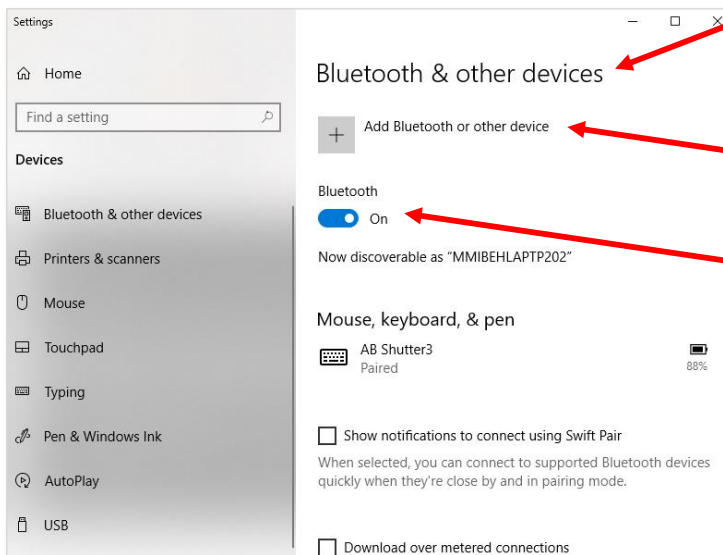
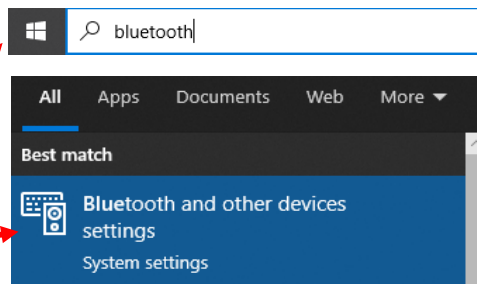


## Section 17 Connecting External Input

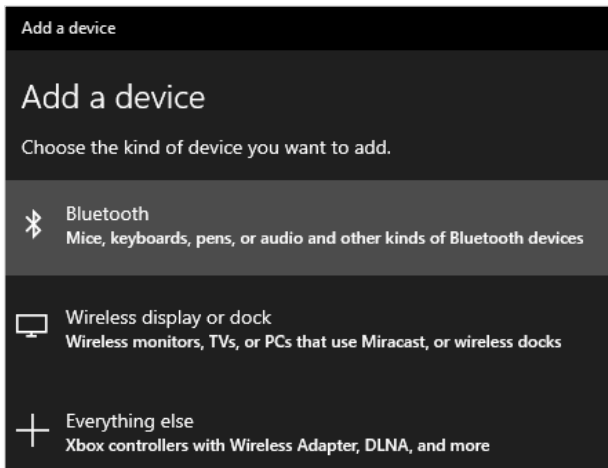
**External devices** can be added via **Bluetooth** for use during coding.  
Connected devices (clicker, mouse, etc.) can be used as an **external button**

We used [this \(Amazon Link\)](#) for development, similar buttons may work but no guarantee is made.

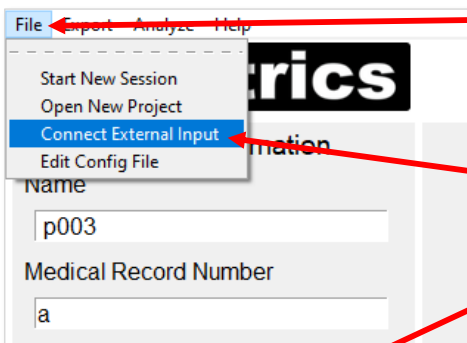
- First, the user must **connect** the desired device to their computer **via Bluetooth**
- In the Windows search bar in the bottom left, search for “**Bluetooth and other devices settings**”
- Click to open system settings



- The “Bluetooth and other devices” window will open
- Select “Add Bluetooth or other device”
- Make sure Bluetooth is turned on



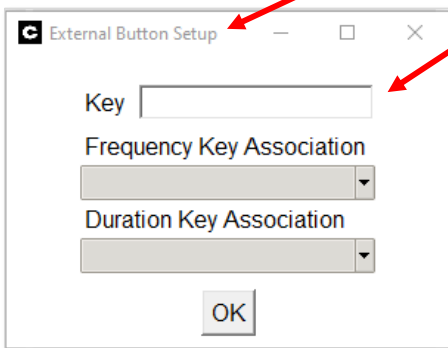
- The “Add a device” menu will open
- Select “Bluetooth” as the device type
- Find and select the desired device from the list of connectable devices
  - If the desired device is not listed, check that it is turned on / discoverable



To setup an external button in **cometrics**, select “File” in the top left-hand corner.

Select “Connect External Input”

The “External Button Setup” menu will pop-up



Use the cursor to activate the “Key” input line. Press your external device to set it as the key

Select whether this button will be used as a Frequency key or a Duration Key

- Select the specific behavior that will be assigned to the external button

## Section 18 Reporting Bugs and Other Issues (GitHub)

Bugs and other issues found while using the cometrics program can be reported through the Munroe Meyer Institute Virtual Reality Laboratory GitHub page. The steps for reporting a bug are as follows:

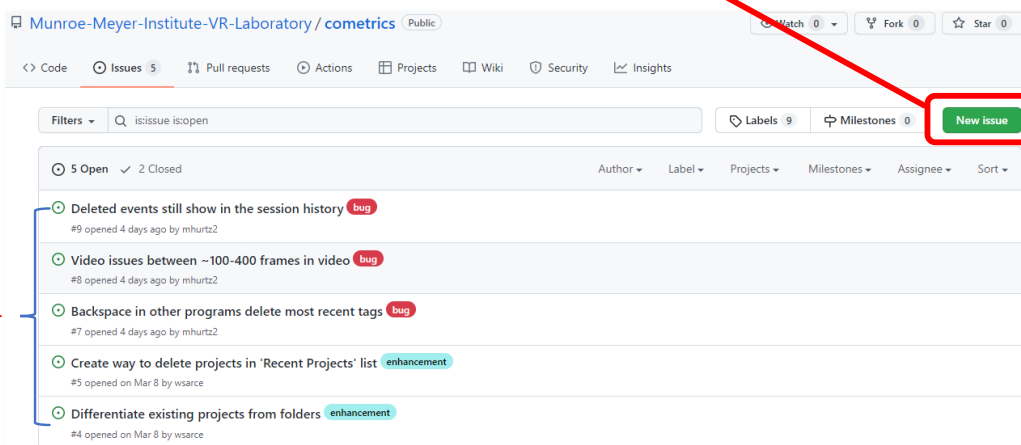
- 1) Create or login to a GitHub account

[https://github.com/login?return\\_to=https%3A%2F%2Fgithub.com%2Fjoin](https://github.com/login?return_to=https%3A%2F%2Fgithub.com%2Fjoin)

- 2) Use the following link to access the Issues section of the cometrics' GitHub

<https://github.com/Munroe-Meyer-Institute-VR-Laboratory/cometrics/issues>

- 3) Select the green "New Issue" button in the top right of the Issues page



- a. The Issues page is also used to view what bugs have already been reported, preventing repeated reports of the same bug

4) The “Submit new Issue” page (pictured below) will open

The screenshot shows the GitHub interface for the repository 'Munroe-Meyer-Institute-VR-Laboratory / cometrics'. The 'Issues' tab is selected, showing 5 issues. The 'Submit new issue' page is open, featuring a 'Title' field, a 'Write' tab, a 'Preview' tab, and a large text area for 'Leave a comment'. The right sidebar contains sections for 'Assignees' (No one assigned), 'Labels' (None yet), 'Projects' (None yet), 'Milestone' (No milestone), 'Development' (Shows branches and pull requests linked to this issue), and 'Helpful resources' (GitHub Community Guidelines). A green 'Submit new issue' button is located at the bottom right of the main form area.

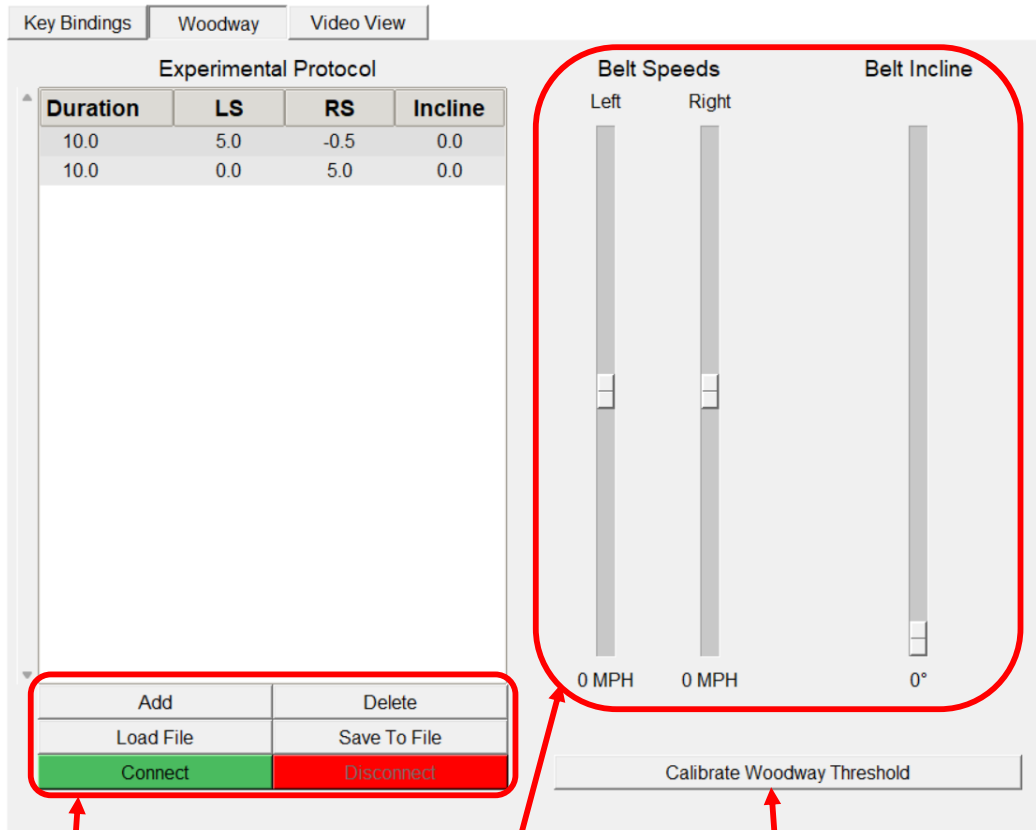
5) In the “Title” section, provide a general description of the issue

This annotated version of the screenshot highlights the input fields for creating an issue. A red arrow points to the 'Title' field at the top. Another red arrow points to the 'Leave a comment' text area. A red box highlights the green 'Submit new issue' button at the bottom right.

6) In the “Leave a comment” section, write a detailed description of the issue (what happened, how it occurred, etc.)

7) Press the green “Submit new Issue” button in the bottom right to finalize bug report

## Section 19 Woodway Split-Belt Treadmill Support



Once connected to the Woodway, the belt speed and treadmill incline can be manually changed

Pressing **Calibrate Woodway Threshold** will open the window shown on next page

**Add** – Create a new protocol step

**Delete** – Remove a selected protocol step

**Load File** – Select a protocol file from filesystem

**Save To File** – Save new revision of protocol

**Connect** – Connect to Woodway treadmill

**Disconnect** – Disconnect from Woodway treadmill

**Edit** – Double click any protocol step to edit

## Section 19 Woodway Split-Belt Treadmill Support

Set the duration in seconds for new protocol step

Set the change in speed for the left belt for this protocol step

Set the change in speed for the right belt for this protocol step

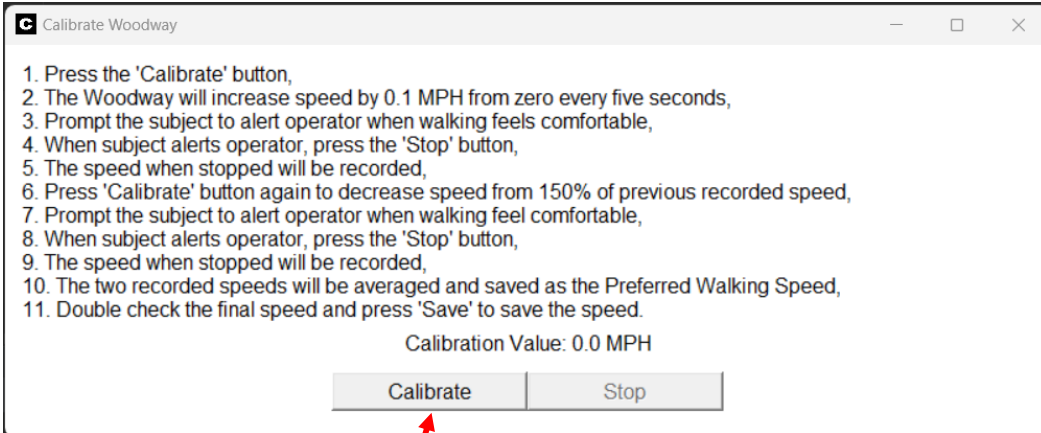
Set the change in incline for the treadmill for this protocol step

Add the protocol step

The screenshot shows a dialog box titled "Add Woodway Step" with a close button (X) in the top right corner. It contains four input fields with labels above them: "Step Duration" (value: 10.0), "Left Side Speed" (value: 5.0), "Right Side Speed" (value: -0.5), and "Incline" (value: 0.0). An "OK" button is located at the bottom right of the dialog. Red arrows point from the text instructions on the left to each of these input fields and the "OK" button.

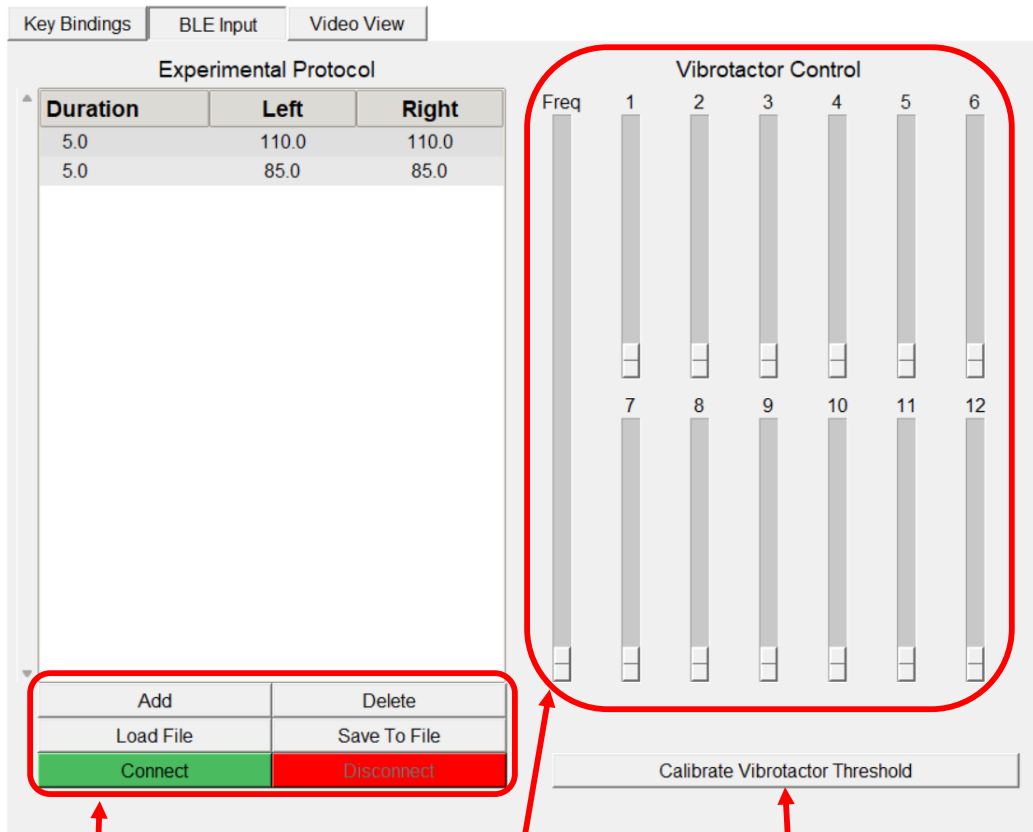
Field Label	Value
Step Duration	10.0
Left Side Speed	5.0
Right Side Speed	-0.5
Incline	0.0

## Section 19 Woodway Split-Belt Treadmill Support



Press **Calibrate** to start the calibration process and follow the directions

## Section 20 BLE Peripheral Support



Once connected to vibrotactors, the motor levels and frequency can be manually altered

Pressing **Calibrate Vibrotactor Threshold** will open the window shown on next page

**Add** – Create a new protocol step

**Delete** – Remove a selected protocol step

**Load File** – Select a protocol file from filesystem

**Save To File** – Save new revision of protocol

**Connect** – Connect to vibrotactors

**Disconnect** – Disconnect from vibrotactors

**Edit** – Double click any protocol step to edit



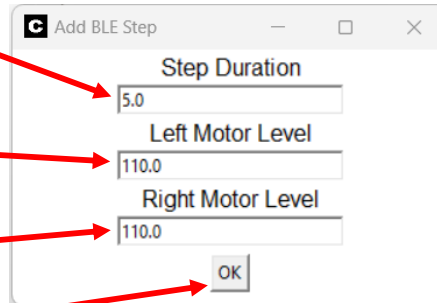
## Section 20 BLE Peripheral Support

Set the duration in seconds for new protocol step

Set the motor vibration level for the left vibrotactor array as a percentage of the threshold

Set the motor vibration level for the right vibrotactor array as a percentage of the threshold

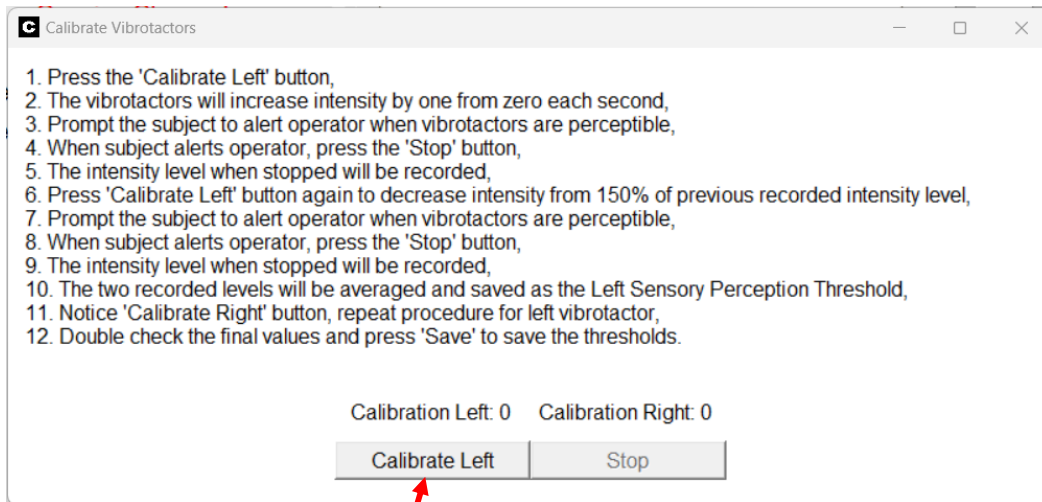
Add the protocol step



The screenshot shows a dialog box titled "Add BLE Step" with a close button (X) in the top right corner. It contains three input fields and an "OK" button. Red arrows from the text on the left point to each of these elements: the first arrow points to the "Step Duration" field (containing "5.0"), the second arrow points to the "Left Motor Level" field (containing "110.0"), and the third arrow points to the "Right Motor Level" field (containing "110.0"). A fourth red arrow points from the "Add the protocol step" text to the "OK" button.

Field	Value
Step Duration	5.0
Left Motor Level	110.0
Right Motor Level	110.0

## Section 20 BLE Peripheral Support



Press **Calibrate Left** to start the calibration process  
and follow the directions

## Section 21 Review Mode

**Session** | **Review**

Reviewer Name  
Walker Arce

Primary or Reliability Review  
☒ Primary   ☐ Reliability

Session Review: ☒ **Session 2 / 3**

Load Session

**Event 1 / 3**

Frequency Key Association  
q {Freq 1}

Duration Key Association  
None

Play Clip

3269

**Accept** **Reject**

Approve Session

**Walker Arce:** ☒ **Session 2 / 3**

**Review Mode** allows for recorded sessions to be expert validated.

The reviewer will put their name into the textbox.

The data type then will be selected and, if sessions exist, each session is selectable.

The status of the session (whether it's been reviewed and by whom) is shown above the session number.

The arrows allow switching between sessions.

When the correct session is selected, press the 'Load Session' button.

All the events in that session are now selectable and load in automatically.

The keystroke associated with each event can be changed, though only one keystroke is allowed per session.

Pressing 'Play Clip' will show the video segment that has been selected as representing the selected keystroke.

The two textboxes below are the 'To' and 'Frame' entries and display the corresponding start and end frames of the video clip.

When an event is accepted or rejected, the changes made will be saved and the next event will be loaded.

Once all events have been either accepted or rejected, the session can be approved, which will mark is as 'Reviewed' and save the reviewer's name with the session.

If a session is approved, the name of the reviewer will be shown along with a checkmark indicating approval.

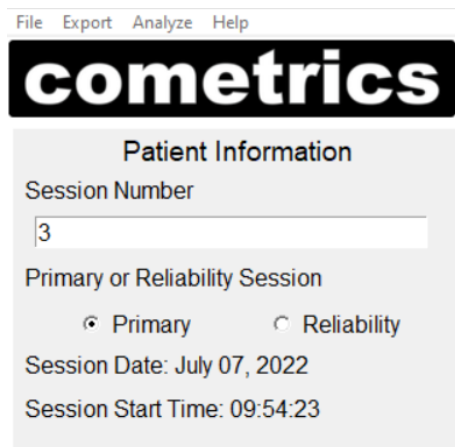
## Section 22 Loading Previous Sessions

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Previous sessions can be loaded by changing the session number in the Patient Information window. The session will be automatically loaded and the video file path will be assigned to the Video View panel so that when the Load Video button is clicked then the session video will load.

Edits to the events in the Video View event viewer will automatically save to the source session file so the session doesn't need to be started to make simple changes.

Changing the session number will either load an existing session or, if a session does not exist, will clear the previous loaded session to allow standard operation.



The screenshot shows the 'cometrics' software interface. At the top is a menu bar with 'File', 'Export', 'Analyze', and 'Help'. Below the menu bar is the 'cometrics' logo. The main window is titled 'Patient Information'. It contains a 'Session Number' field with the value '3'. Below this is a section for 'Primary or Reliability Session' with two radio buttons: 'Primary' (selected) and 'Reliability'. At the bottom, it displays 'Session Date: July 07, 2022' and 'Session Start Time: 09:54:23'.

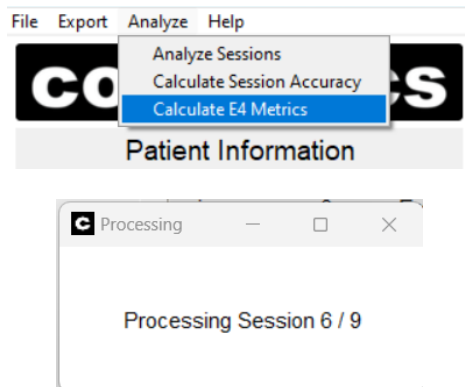
## Section 23      Calculating E4 Metrics

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A utility has been built in to the 'Analyze' menu tab to calculate statistical metrics from your collected Empatica E4 data. Both the photoplethysmography (PPG) and electrodermal activity (EDA) are processed for analysis purposes. The metrics are calculated on a 20 second interval and the corresponding frequency and duration measures are binned.

The EDA metrics are the total number of peaks and the average amplitude of the signal during the 20 second interval.

The PPG metrics are the heart beats per minute and heart rate variability metrics.



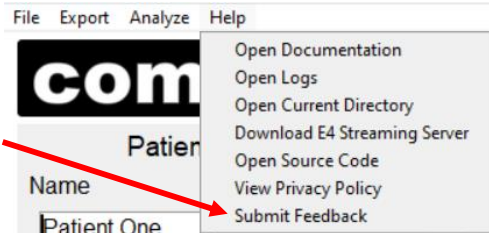
Once completed, the output directory will be opened. The files are saved as CSV files in the Export directory of your current patient.

## Section 24 Sending Feedback

In cometrics v1.3.0, a new user interface is available that allows an anonymous user to submit feedback.

To open this user interface, press the 'Submit Feedback' button under the 'Help' menu bar.

To understand this process and what data is sent, please read the privacy policy!



Feedback messages need a title, make it descriptive and simple.

 A screenshot of the 'Submit Feedback to Developer' dialog box. It contains a 'Feedback Title' text field, a 'Select a Label' dropdown menu with 'Bug', 'Enhancement', and 'Documentation' options, a large text area for the description, and 'Submit' and 'Cancel' buttons at the bottom. Red arrows point from the explanatory text below to these specific elements: one to the title field, one to the label dropdown, one to the description text area, and two to the 'Submit' and 'Cancel' buttons respectively.

Select a label for this feedback

**Bug** – A problem or error encountered in the software

**Enhancement** – A suggestion to improve the software

**Documentation** – When a function of cometrics is not well-defined

Enter a description for your feedback, the more detail added the easier it will be to address!

When all fields are complete, press 'Submit,' and it is sent to the developer on GitHub

Press 'Cancel' to close the window and lose any changes made to it