User Manual: Utility Hub for Zoë-CM1 and Zoë-CM2

Emulate Utility Hub software is used to update instrument firmware and to download operational log files for performance assessment and troubleshooting issues. This document provides step-by-step directions on how to use Utility Hub for these purposes.

Table of Contents

Required Components

Component	Description
PC / Laptop	Utility Hub is compatible with Windows 10 (or higher) only.
Utility Hub Software	Software application installed on a PC to update Zoë firmware & download log files
Zoë Display Update Cable	Emulate-provided cable to connect a PC to Zoë + Utility Hub for **display** firmware updates (Figure 1)
Zoë Core Update Cable	Emulate-provided cable to connect a PC to Zoë + Utility Hub for **core** firmware updates (Figure 2)
Utility Door Pry Tool	Emulate-provided tool for accessing the cable connection ports on Zoë (Figure 3)

Figure 1 | Emulate Display Update Cable

Figure 2 | Emulate Core Update Cable

Figure 3 | Utility Door Pry Tool

Please Note: *If you do not have these tools, or are unsure whether you have the appropriate tools, please contact Emulate support: support@emulatebio.com*

How to determine the versions of firmware on your Zoë-CM1 / Zoë-CM2

To determine the **display firmware** version *currently* installed on your Zoë:

1. If Zoë is ON, power OFF using the power button / rocker switch.
2. Power Zoë ON and pay close attention to the loading view with the Emulate logo (Figure 4), which briefly appears prior to launching into the Zoë Home view.
3. On this loading view (Figure 4) the display firmware version can be found at the bottom (see red outline in Figure 4).
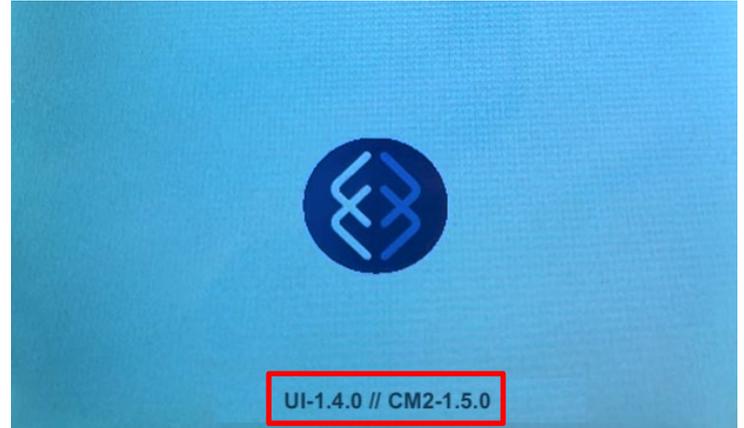

Figure 4 | Zoë-CM2 loading view, showing the Emulate logo, and the version of display firmware (left) and core firmware (right).

To determine the **core firmware** version *currently* installed on your Zoë:

1. On the Zoë Home view, use the Dial to highlight the System Information icon.
2. Click the System Information icon to display the System Information view (Figure 5).
3. The fourth option – called Software Version – will display the version of firmware installed on Zoë. See Figure 5 for reference.
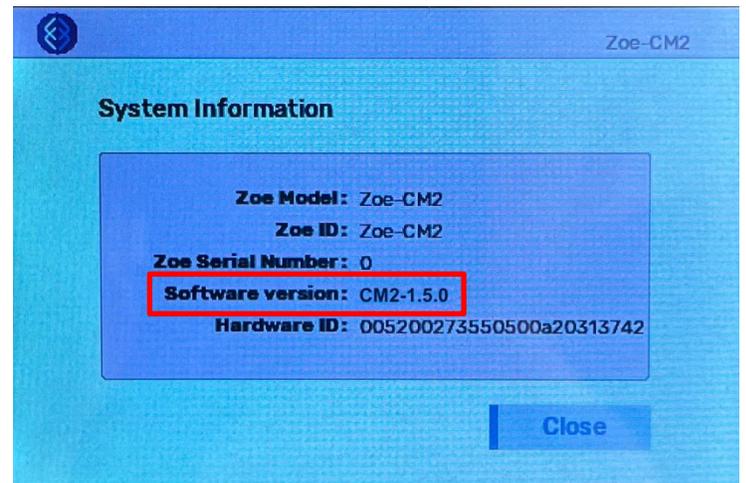

Figure 5 | Zoë-CM2 System Information view, showing the version of firmware currently installed (red outline).

*IMPORTANT! **Do not** attempt to perform the firmware upgrade if the below firmware version is installed on your Zoë. Please contact Emulate Support for further guidance.*

- For **Zoë-CM1**: **DO NOT** upgrade if your **Zoë-CM1** has firmware version **1.1.8** (or below).
- For **Zoë-CM2**: **DO NOT** upgrade if your **Zoë-CM2** has firmware version **1.3.0** (or below).

Download Utility Hub

1. Go to the Utility Hub download webpage: https://emulatebio.com/utility-hub.

2. Select your Zoë instrument – CM1 or CM2 (Figure 6).

   PLEASE NOTE! *Firmware packages for Zoë-CM1 and Zoë-CM2 are different! It is critical you select the appropriate Zoë firmware. Installing incorrect firmware on a Zoë can significantly impact device functionality.*

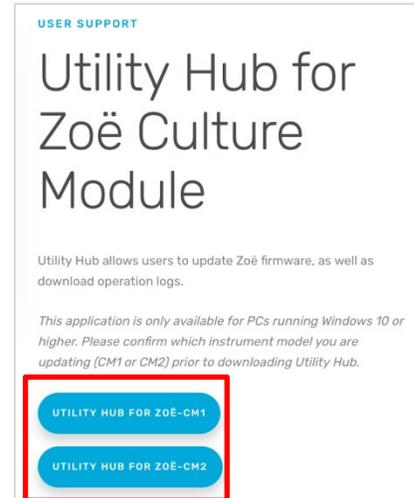3. Complete the registration form and click **Submit** to initiate the download.

Figure 6 | Zoë Instrument Selection

4. The firmware update is packaged in a compressed (zipped) folder (see Figure 7):

   ○ **Emulate-UtilityHub-Zoe-CM1-Firmware_v1-3-1** for <u>CM1</u>

   ○ **Emulate-UtilityHub-Zoe-CM2-Firmware_v1-5-3** for <u>CM2</u>

5. Once the download is complete, right-click on the compressed (zipped) folder and click **Extract All** (Figure 8).
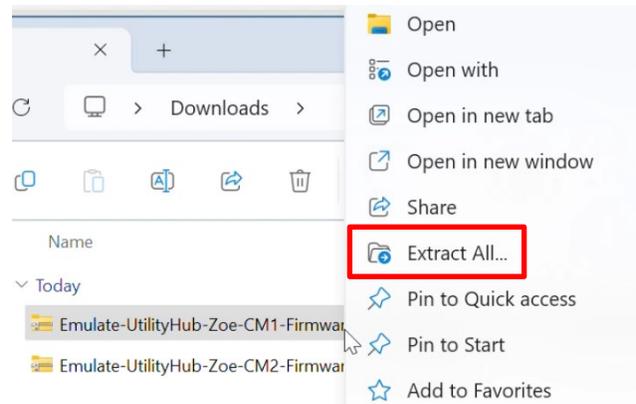

Figure 8 | Right-click the zipped folder and extract the contents

Update Zoë-CM1 / Zoë-CM2 Firmware

IMPORTANT! *It is critical that you connect Zoë to your PC in the **correct order** at the **correct timing** – only when prompted by this document & the firmware update screens – using Emulate-provided cables only. Following this document and the on-screen instructions in Utility Hub will ensure the highest rate of firmware update success. Failure to follow the firmware update instructions carefully will likely result in a failed firmware update.*

Time required: Approximately 20 minutes

1. Before starting the firmware update, power cycle (turn OFF / ON) your Zoë-CM1 / Zoë-CM2. Once the Zoë Home view is displayed, continue to step 2.
2. On your computer, open the unzipped folder to view the folder contents:

    -   For **Zoë-<u>CM1</u>** users: Double-click the file named **Emulate-UtilityHub-Zoe-CM1-Firmware_v1-3-1.exe**

    -   For **Zoë-<u>CM2</u>** users: Double-click the file named **Emulate-UtilityHub-Zoe-CM2-Firmware_v1-5-3.exe**

    Please Note: *If prompted by an anti-malware program, click **More info** and then click **Run anyway** (Figure 9) .*
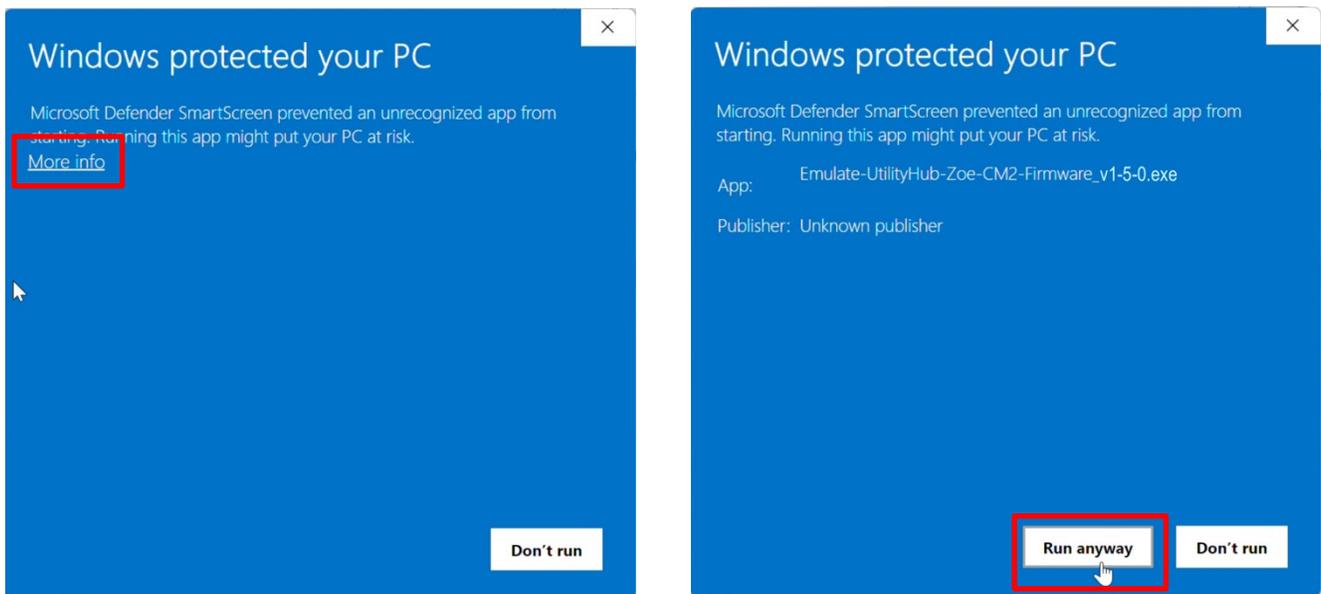

Figure 9 | Microsoft Defender preventing Utility Hub from running without additional user confirmation.

3. After clicking **Run anyway**, the Utility Hub home splash screen will appear (Figure 10).

4. Click **UPDATE FIRMWARE** (Figure 10).

Figure 10 | The Utility Hub home splash screen for Zoë-CM2 showing the option to **Download Logs** and **Update Firmware**. The Utility Hub home splash screen for Zoë-CM1 looks nearly identical, the only difference is the version numbers displayed in the center of the screen.

5. Carefully review the "Welcome" information (Figure 11) and ensure you have all components required to complete the firmware update. This firmware update is composed of two parts, a **display** update and a **core** update.

   When ready to begin, click **START**.

   Please Note: Do not perform the firmware upgrade if there is an active experiment running on Zoë-CM1 / Zoë-CM2. The upgrade should only be performed when Zoë-CM1 / Zoë-CM2 is not in use.
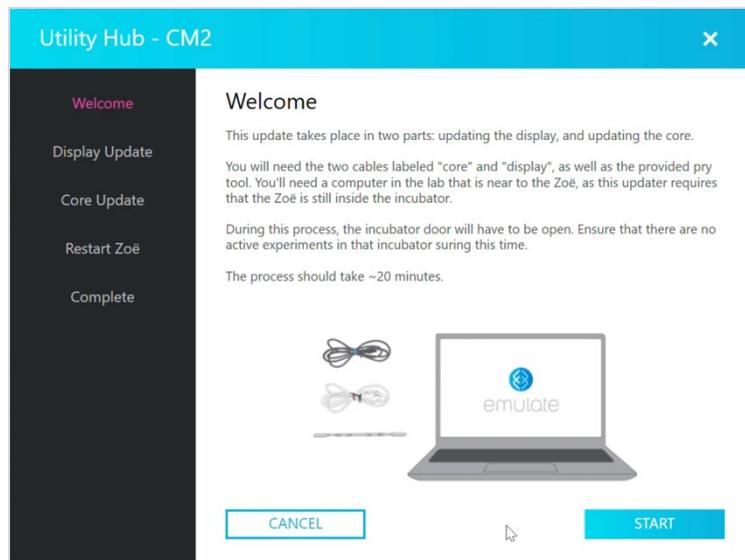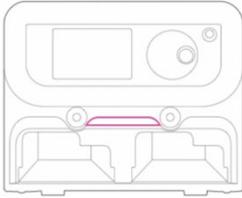

Figure 11 | The Utility Hub "welcome" screen that shows the components required to execute the Chip-R1 firmware upgrade.

6. Follow the Utility Hub instructions to remove the utility port cover (Figure 12).
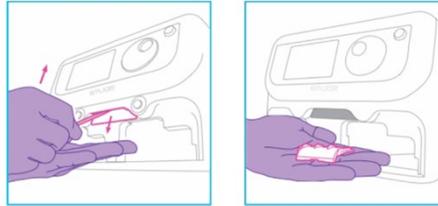

Locate Utility Door
The door is located between the two bay activation buttons, under the front panel.

Pry Open Utility Door
Use the pry tool to remove the utility door.
Be sure to catch the door with your other hand, as it will completely detach.

Locate Utility Ports
You should see two black connection ports side-by-side; a 5-pin and a 6-pin.
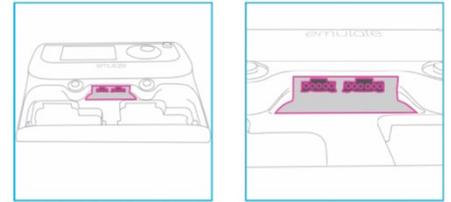If the Zoë is on a lower incubator, use a mirror to better view the ports.

Figure 12 | Utility Hub on-screen instructions for removing the Zoë Utility Door to connect the firmware update cables.

7. The first part of this update is for the **display firmware**. Once the utility port cover is removed, connect the **display update cable** to *Zoë only* (Figure 13) and then click **Next**. Do not connect to your PC until prompted!

   Please Note: When the display update cable is connected, the Zoë display will go dark, then will show the Emulate logo. Zoë will remain in this state until the firmware update is complete.
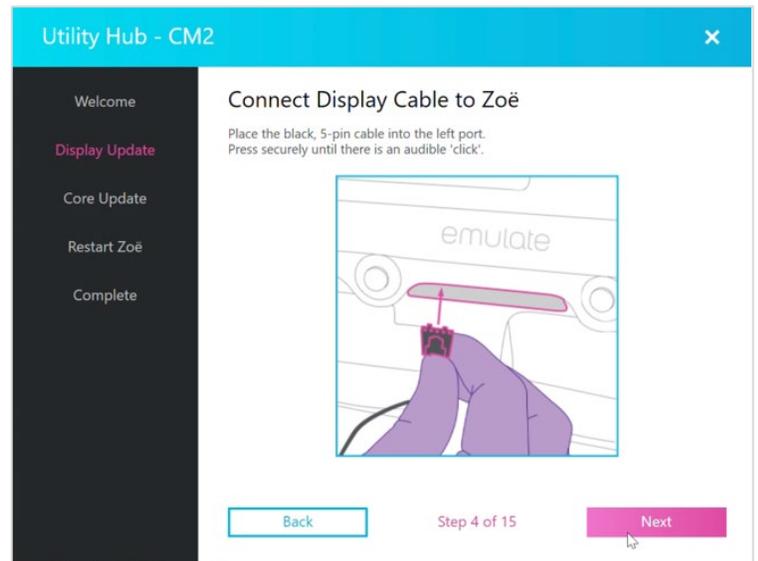

Figure 13 | Connect display update cable to Zoë

8. On the next dialog (Figure 14), you will be instructed to plug in the **display update cable** to an available USB port on your PC. Connect the cable to your PC and listen for the audible USB connection sound. **DO <u>NOT</u> CLICK NEXT.**

   Wait ~60 seconds after connecting the **display update cable** to your PC to allow for Windows to detect the serial device (Zoë) and install drivers, especially if this is the first time your PC has connected to Zoë.

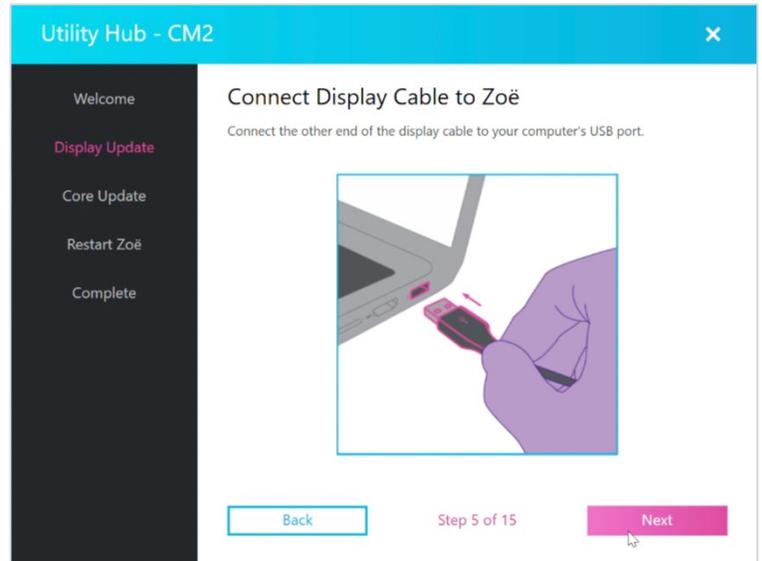   After ~60 seconds, click **Next** and the **display update** will begin automatically.

Figure 14 | Connect display update cable to PC

*Please Note: If the **display update cable** was plugged in to the PC before this step, an error will occur in Utility Hub (see troubleshooting section for more information). If this happens, disconnect the display update cable from Zoë and your PC and power cycle your Zoë. Close & reopen Utility Hub and restart the upgrade procedure.*

9. The **display update** progress bar will appear and will indicate installation progress (Figure 15). The **display update** takes approximately 5-10 minutes to complete.

   IMPORTANT! Do NOT click Next when the progress bar reaches 100%. Utility Hub will move to the next instruction prompt automatically once the display update has fully completed (Figure 16).

   Please Note: Disconnecting the display update cable during the update process can cause serious consequences to Zoë operation, potentially rendering the device inoperable.
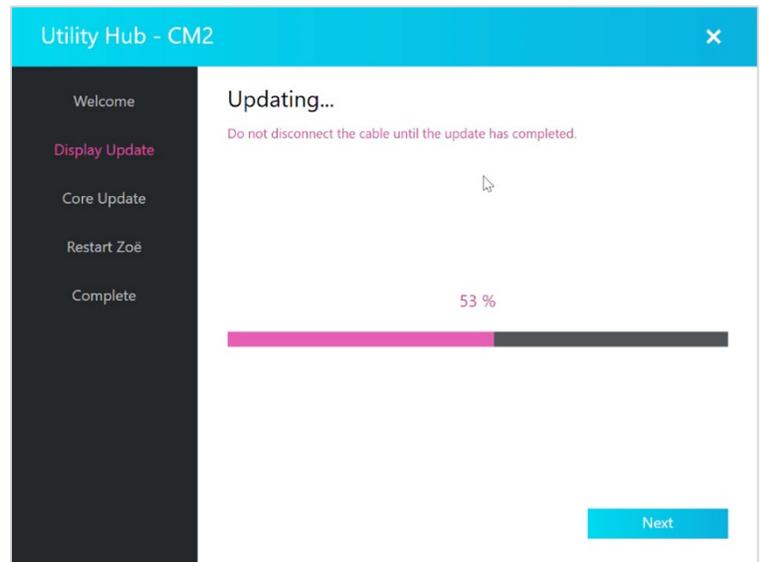

Figure 15 | Display update progress bar

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10. Once the display update has completed, you will be prompted to first disconnect the display update cable from Zoë, then disconnect the display update cable from your PC (Figure 16). Store the display update cable in a safe location for future reuse.
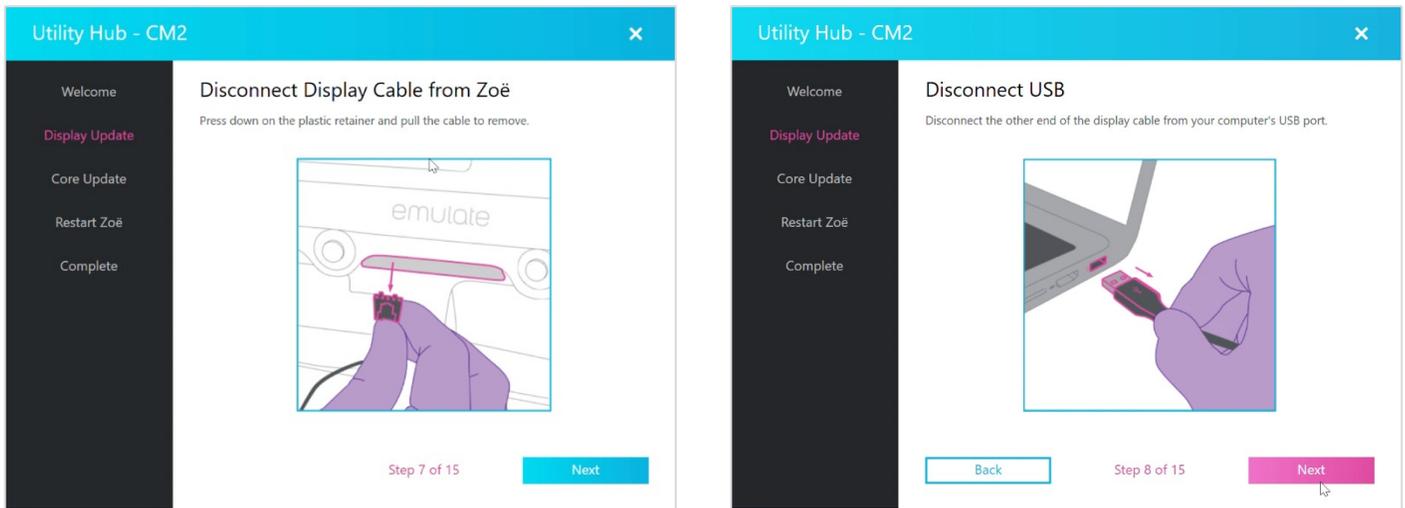

Figure 16 | Disconnecting the **display update cable** from Zoë (left) and the PC (right) after completing the display firmware update.

11. Click **Next** (Figure 16 above) to initiate the second part of the update for Zoë **core firmware**. When prompted, connect the **core update cable** to *Zoë only* (Figure 17), then click **Next**. Do not connect to your PC until prompted!
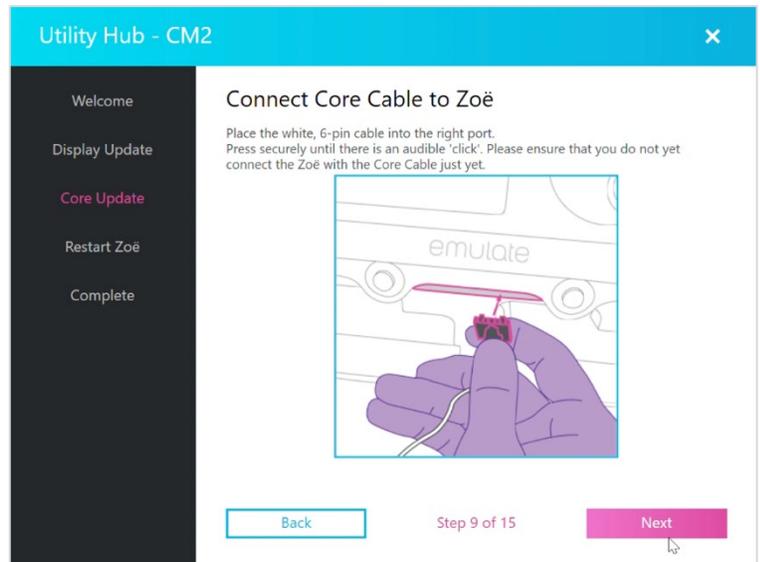

Figure 17 | Connect core update cable to Zoë.

12. On the next view (Figure 18), you will be instructed to plug in the **core update cable** to an available USB port on your PC. Connect the cable to your PC and listen for the audible USB connection sound. **DO <u>NOT</u> CLICK NEXT.**

Wait ~60 seconds after connecting the **core update cable** to your PC to allow for Windows to detect the serial device (Zoë) and install drivers, especially if this is the first time your PC has connected to Zoë.
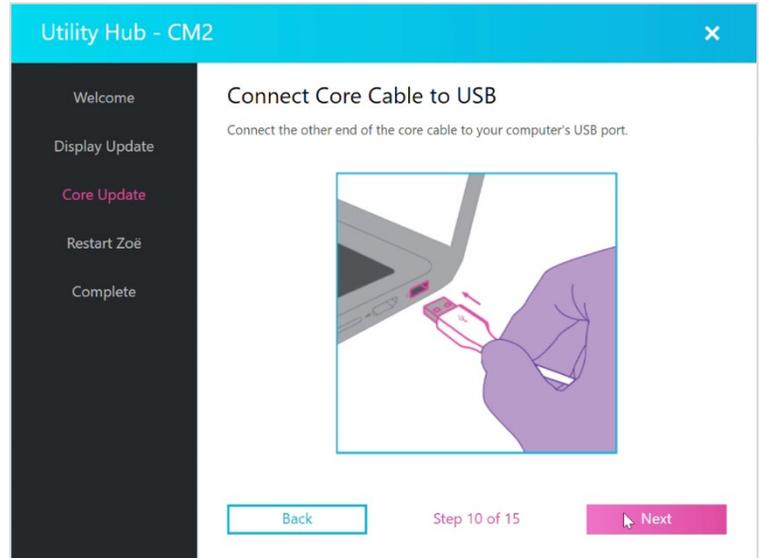
After ~60 seconds, click **Next.**

Figure 18 | Connect core update cable to PC.

13. On the next view you will be asked to run the **core update** (Figure 19), click **Next** when ready.

*Please Note: If the **core update cable** was plugged in to the PC before this step, an error will occur in Utility Hub (see [Troubleshooting](#) for more information). If this happens, disconnect the core update cable from Zoë and your PC and wait ~30 seconds. Reconnect the core update cable first to Zoë, then to your PC, and click **Retry**. If this is not successful, then power cycle your Zoë. Close & reopen Utility Hub and restart the firmware upgrade procedure.*
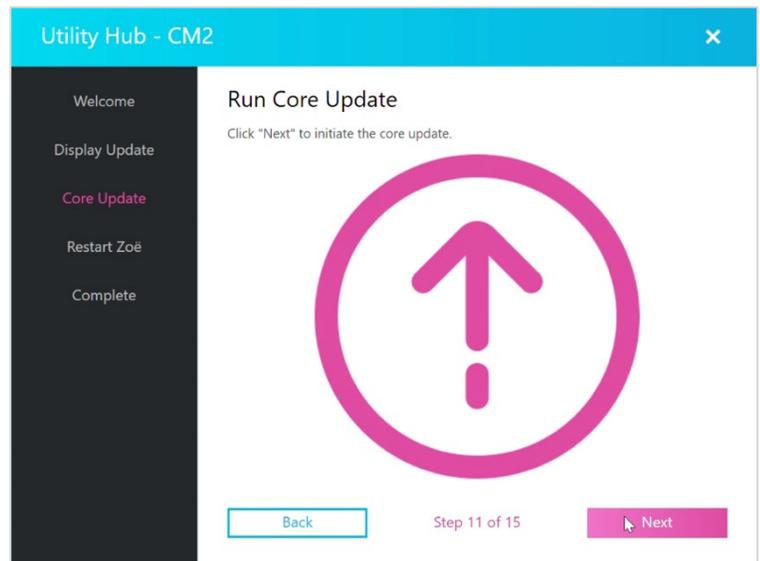

Figure 19 | Initiate the core firmware update.

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14. The **core update** progress bar will appear to indicate installation progress (Figure 20). The **core update** takes approximately 5 minutes to complete. Once the core update is complete, you will notice the Zoë display loads the Home view and no longer shows the Emulate logo.

    IMPORTANT! Do NOT click Next when the progress bar reaches 100%. Utility Hub will move to the next instruction prompt automatically once the display update has fully completed (Figure 21).

    Please Note: *Disconnecting the core update cable during the update process can cause serious consequences to Zoë operation, potentially rendering the device inoperable.*
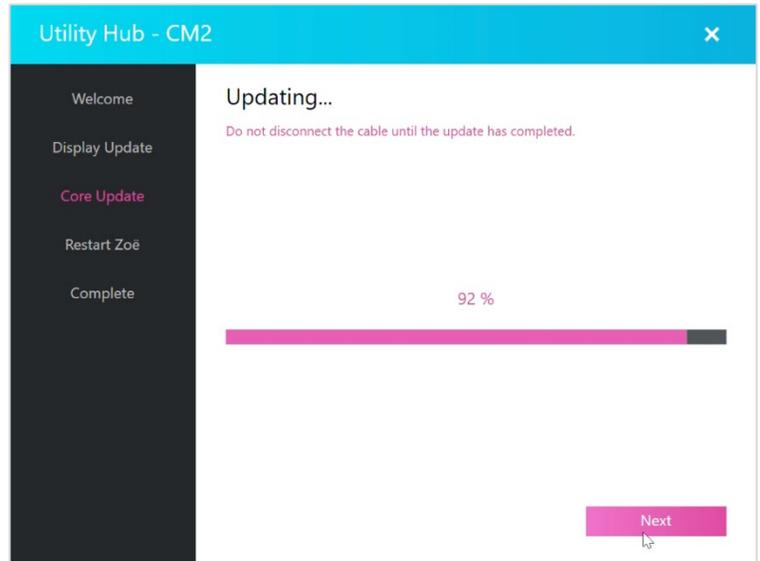

Figure 20 | Core update progress bar.

15. Once the core update has completed, you will be prompted to disconnect the core update cable from Zoë, then disconnect the display update cable from your PC (Figure 21). Store the core update cable with the display update cable in a safe location for future reuse.
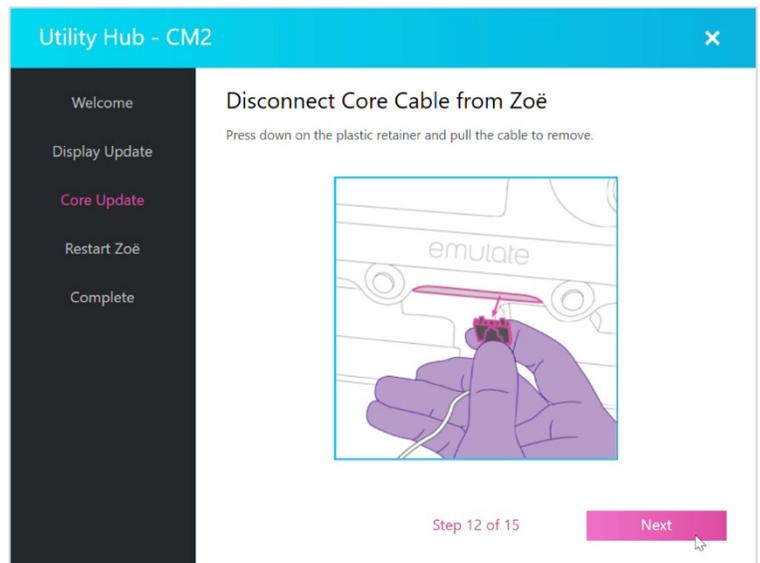
    Click **Next**.

Figure 21 | Disconnect core update cables from Zoë and your PC.

16. Replace the Utility Door on the front of Zoë (Figure 22). Once done, click **Next**.
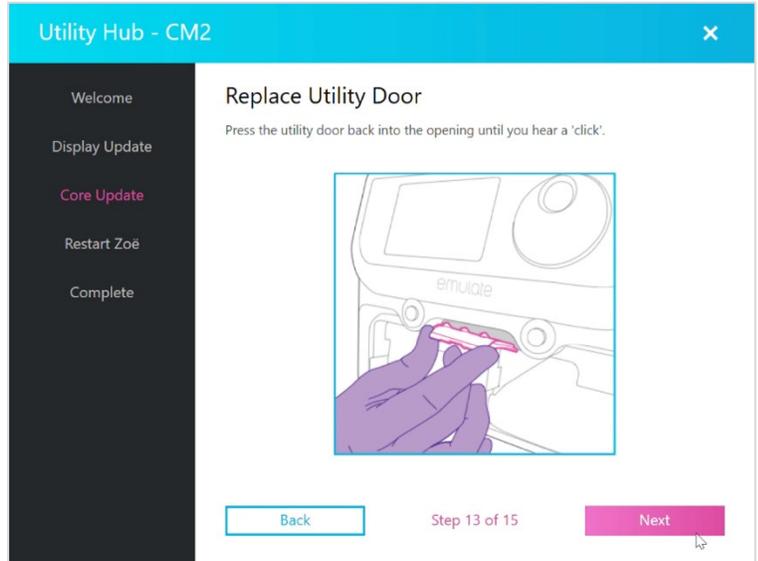

Figure 22 | Replace the Utility Door on Zoë.

17. It is critical to power cycle (turn OFF / ON) Zoë after the firmware update. Utility Hub will prompt the user to perform this step (Figure 23) during the update process. Simply press the power button / rocker switch to power OFF Zoë, wait 10-20 seconds, then power Zoë ON.
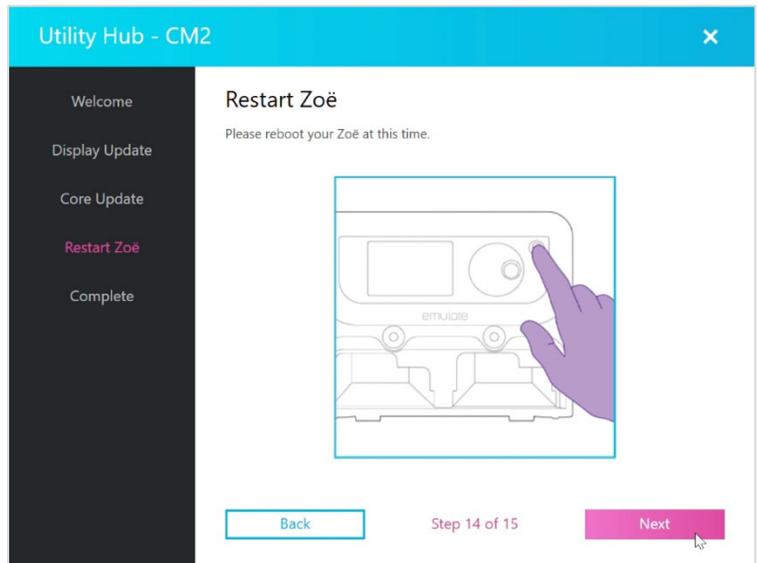

Figure 23 | Utility Hub prompt to power cycle Zoë after completing the firmware update.

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18. Click **Next** when ready, displaying the final Utility Hub firmware update window (Figure 24), indicating the firmware update process has completed. Click **Finish** to return to the Utility Hub home view.
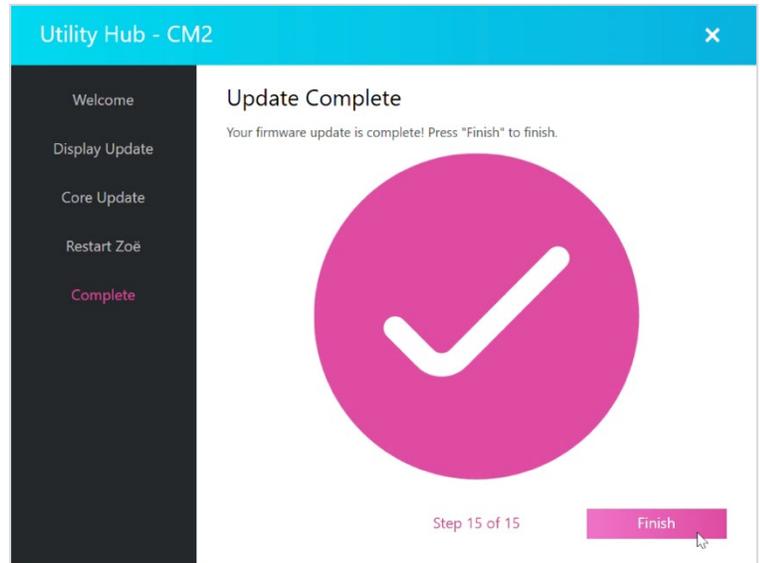

Figure 24 | Update complete prompt in Utility Hub.

Confirm Successful Firmware Update

After completing the firmware update process outlined above, you can confirm the firmware update was successful by following the steps below and referring to the table:

Zoë Model	Display Firmware	Core Firmware
Zoë-CM1	1.4.1	1.3.1
Zoë-CM2	1.4.1	1.5.3

To confirm the **display firmware** updated successfully:

1. If Zoë is ON, power OFF using the power button / rocker switch.

2. Power Zoë ON and pay close attention to the loading view with the Emulate logo (Figure 25), which briefly appears prior to launching into the Zoë Home view.

3. The **display** firmware version can be found at the bottom of this loading view (Figure 25). Ensure the display firmware version matches the above table. See red outline in Figure 25 for reference.
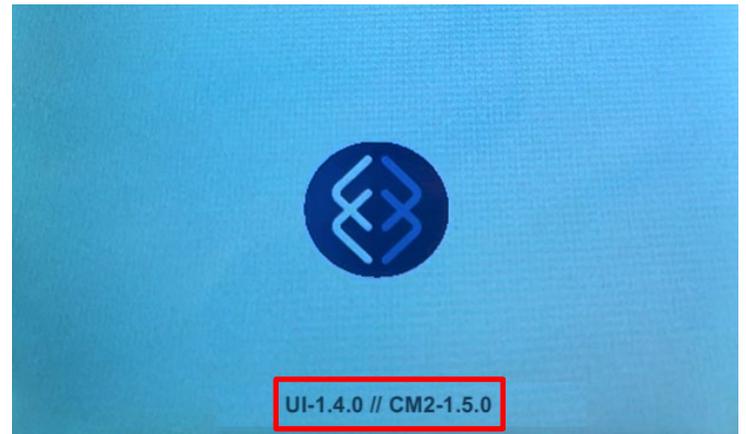

Figure 25 | Zoë-CM2 loading view showing the Emulate logo, and the version of display firmware (red outline).

To confirm the **core firmware** updated successfully:

1. On the Zoë Home view, use the Dial to highlight the System Information icon.

2. Click the System Information icon to display the System Information view (Figure 26).

3. The core firmware version will be displayed on this view (see red outline in Figure 26) can be found at the bottom of this loading view (Figure 25). Ensure the display firmware version matches the above table.
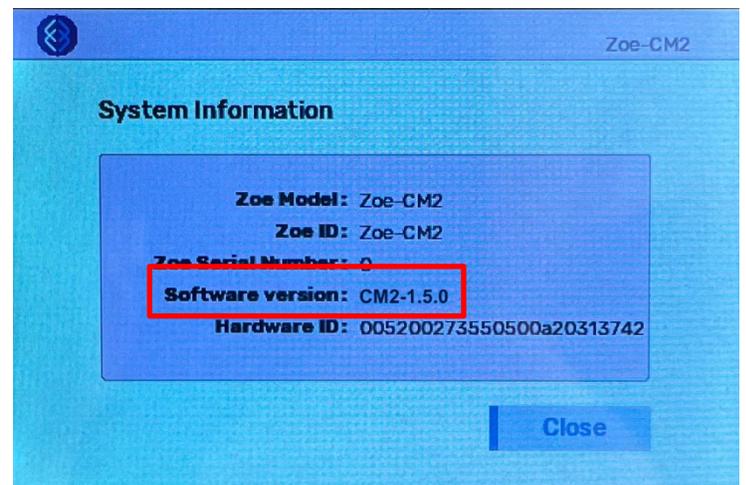

Figure 26 | Zoë-CM2 System Information view, showing the version of firmware currently installed (red outline).

Perform Regulate Cycle for Log File Download

After updating the system's firmware, Emulate strongly recommends running the Regulate Cycle once, which will take approximately 3 hours. If you do not have time to immediately complete this step, please do so as soon as possible. Once you have run the Regulate Cycle, please download the log file and send to support@emulatebio.com to confirm that your system is running as expected.

Time required: Approximately 20 minutes

Complete instructions for performing a Regulate Cycle can be found in the Zoë-CM1 / Zoë-CM2 User Manual. Abbreviated instructions are provided below:

1. Load empty trays (without Pods) into both bays of Zoë-CM1 / Zoë-CM2.

2. Enter the following settings:

Zoë Setting	Value	
Chip Type	Chip-S1	Chip-R1
Top Channel	80 μL / hr	80 μL / hr
Bottom Channel	80 μL / hr	80 μL / hr
Stretch	10 %	0 %
Frequency	0.1 Hz	0 Hz

*IMPORTANT: It is <u>crucial</u> that you identify the correct **Chip Type** (Chip-S1/A1 **or** Chip-R1) and **Pod Type** (Pod-1 **or** Pod-S1/A1; only displayed if Chip-S1/A1 is selected as the Chip Type). Select the Chip type and Pod type that reflect what is used in your experiment; if your experiment uses Chip-S1 with Pod-S1/A1, select Chip-S1/A1 and Pod-S1/A1 respectively using the Zoë UI.*

3. Highlight the Regulate Cycle on the Zoë Home view and rotate the dial to toggle **Start**, then press the Dial to initiate the Regulate Cycle.

4. A chip selection warning dialog will appear, ensure the chip type in the warning dialog matches the chip type used in your study. If correct, use the Dial to select & click **Start**.

   *Please Note: If the wrong chip type is selected/displayed in the warning dialog, use the Dial and click **Cancel** to return to the Home view. From the Home view, use the chip selection feature to select the correct chip type, then re-initiate the Regulate Cycle.*

5. After clicking **Start** on the warning dialog, the Regulate Cycle will begin. You will see a progress bar on the Zoë Home view indicating the progress of the Regulate Cycle.

   *Please Note: It is strongly encouraged that you always pay close attention to the flow settings on your Zoë, ensuring the reservoirs are **never fully depleted of liquid**. After completion of a Regulate Cycle, Zoë will resume flow based on whatever flow settings are currently configured on Zoë.*

6. After the Regulate Cycle is complete, press the Bay Activation Buttons to raise the manifolds. Proceed to the next section to download log files.

Download Zoë Log Files

Time required: Approximately 20 minutes

1. Ensure Zoë-CM1 / Zoë-CM2 is powered ON and responsive (e.g., responsive to input from the Dial)

2. Open Utility Hub.

   *Please Note: If prompted by an anti-malware program, click **More info** and then click **Run anyway** (Figure 27).*
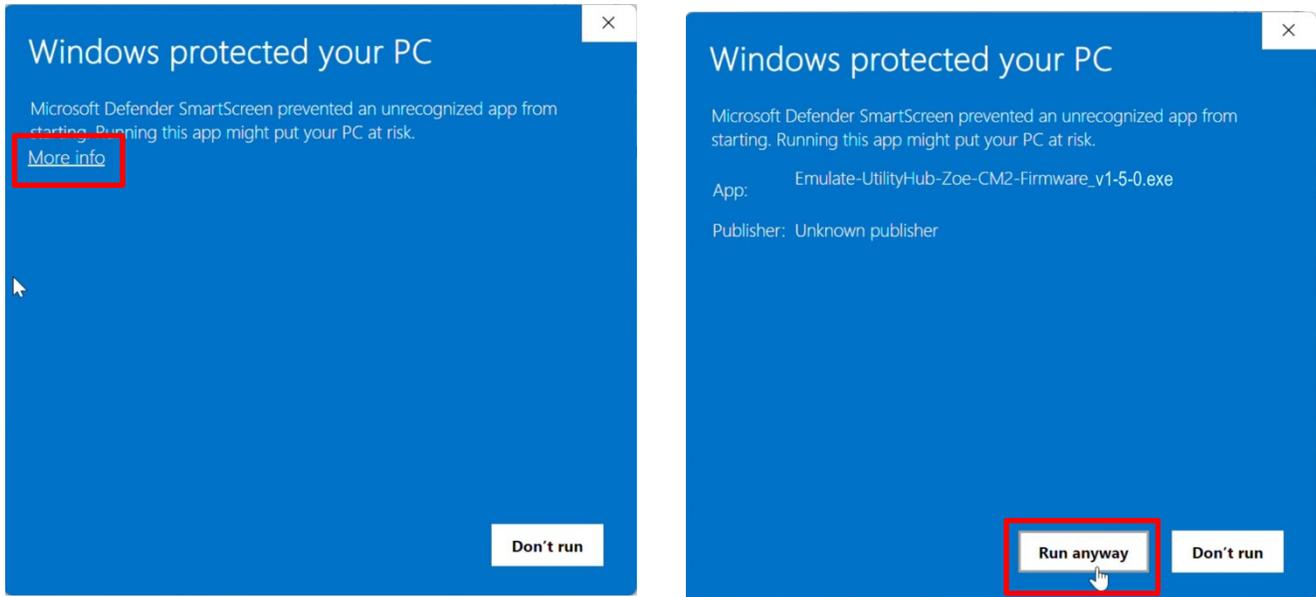

Figure 27 | Microsoft Defender preventing Utility Hub from running without additional user confirmation.

3. Click **DOWNLOAD LOGS** from the Home view (Figure 28).

Figure 28 | The Utility Hub home splash screen for Zoë-CM2 showing the option to **Download Logs** and **Update Firmware**. The Utility Hub home splash screen for Zoë-CM1 looks nearly identical, the only difference is the version numbers displayed in the center of the view.

4. Carefully review the "Welcome" information (Figure 29) and ensure you have the components required to download log files.

   When ready to begin, click **START**.

   Please Note: *Do not attempt to download log files if there is an active experiment running on Zoë-CM1 / Zoë-CM2. Log file download should only be performed when Zoë-CM1 / Zoë-CM2 is not in use.*
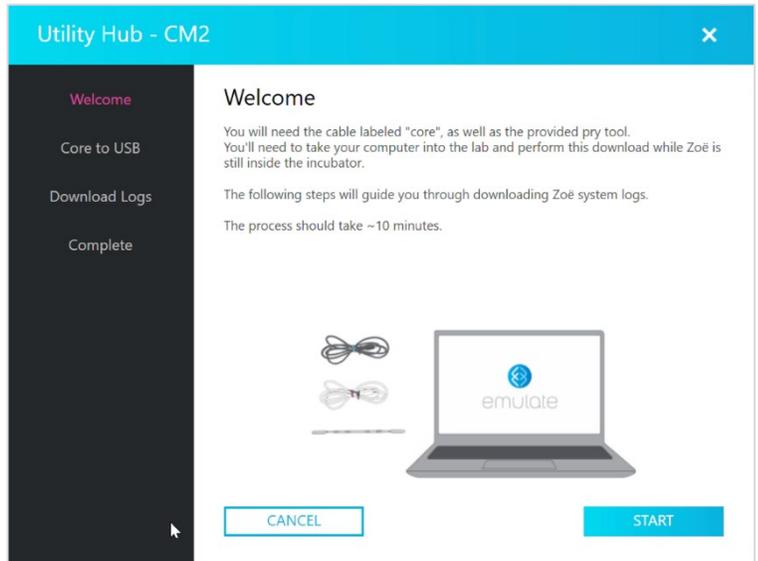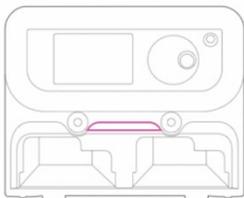

Figure 29 | The Utility Hub "welcome" view that shows the components required to execute log file download.

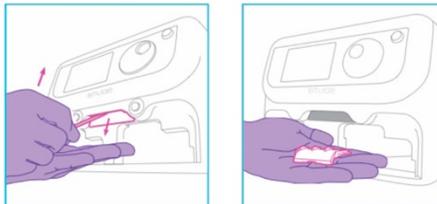5. Follow the Utility Hub instructions to remove the utility port cover (Figure 30).
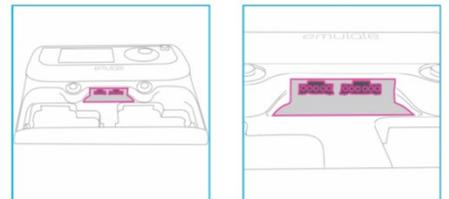

Figure 30 | Utility Hub on-screen instructions for removing the Zoë Utility Door to connect the firmware update cables.

6. After removing the utility door from Zoë, connect the **core update cable** to Zoë *only* (Figure 31), then click **Next**. Do not connect to your PC until prompted!
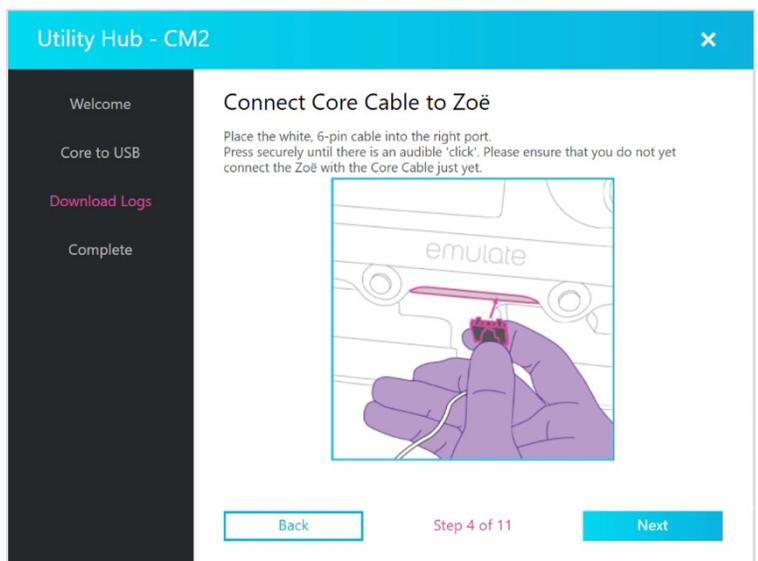

Figure 31 | Connect core update cable to Zoë prompt.

7. When prompted (Figure 32), plug the **core update cable** into an available USB port on your PC. Connect the cable to your PC and listen for the audible USB connection sound. **DO <u>NOT</u> CLICK NEXT.**

Wait ~60 seconds after connecting the **core update cable** to your PC to allow for Windows to detect the serial device (Zoë) and install drivers, especially if this is the first time your PC has connected to Zoë.

*Please Note: If the **core update cable** was plugged in to the PC before this step, an error will occur in Utility Hub (see troubleshooting section for more information). If this happens, disconnect the core update cable from Zoë and your PC and wait ~30 seconds, then reconnect to Zoë and then to your PC and click **Retry**. If this is not successful, then power cycle your Zoë. Close & reopen Utility Hub and restart the log download procedure.*
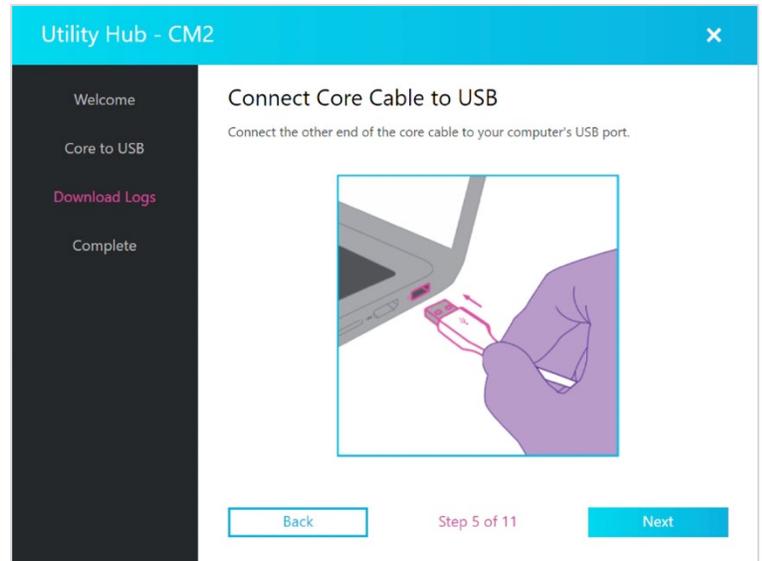
Figure 32 | Connect core update cable to PC prompt.

8. After ~60 seconds, click **Next.**

9. The *Initiate Download* dialog will appear next (Figure 33), click **Next** to select your save location and file name(s).

*Please Note: The **Initiate Download** dialog can take up to ~90 seconds to display, this is normal. In most cases, it should show up almost immediately.*

Figure 33 | Initiate Download dialog in Utility Hub. This may appear instantly or can take up to 90 seconds to appear.

10. The *Save As* Windows dialog will appear (Figure 34), allowing you to choose the location and folder name for your log file download. Suggested file names include:
    - Zoë-CM1-Log-File-YYYY-MM-DD
    - Zoë-CM2-Operational-Log-File-YYYY-MM-DD
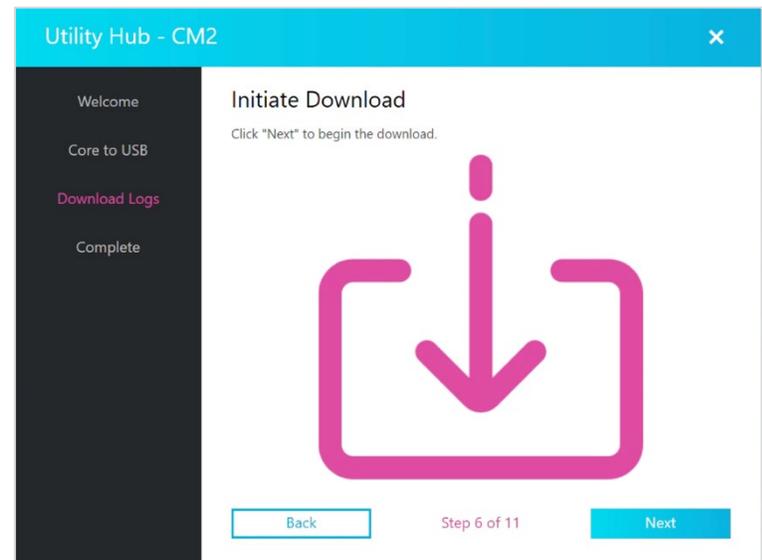   - Zoë-CM2-Pressure-Log-File-YYYY-MM-DD

    After choosing a save location and file name, click **Save** (repeat twice for Zoë-CM2 users).

    Please Note: *For Zoë -CM1 users, there is one log file downloaded following this procedure. For Zoë - CM2 users, two log files are downloaded following this procedure (operational logs and pressure logs). Therefore, you will see two Save As prompts for Zoë-CM2.*
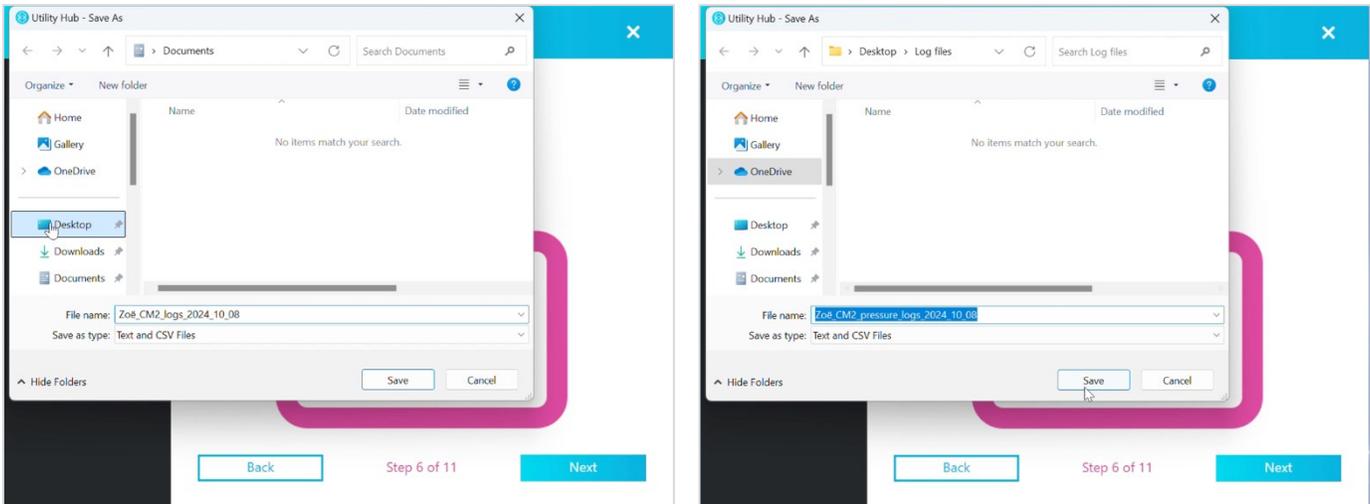
Figure 34 | Choose the file name and save location for your Zoë-CM1 or Zoë-CM2 log file(s). There are two **Save As** prompts for the Zoë-CM2 log file download process, operational logs (left) and pressure logs (right). For Zoë-CM1 users, there is only one log file download and accompanying **Save As** prompt.

11. The log file(s) will automatically begin to download. The Utility Hub UI will indicate the log file is being downloaded (Figure 35).

    Please Note: *Disconnecting the core update cable during the log file download will result in an error message and an incomplete log file download. If this occurs, the log file download process must be restarted.*
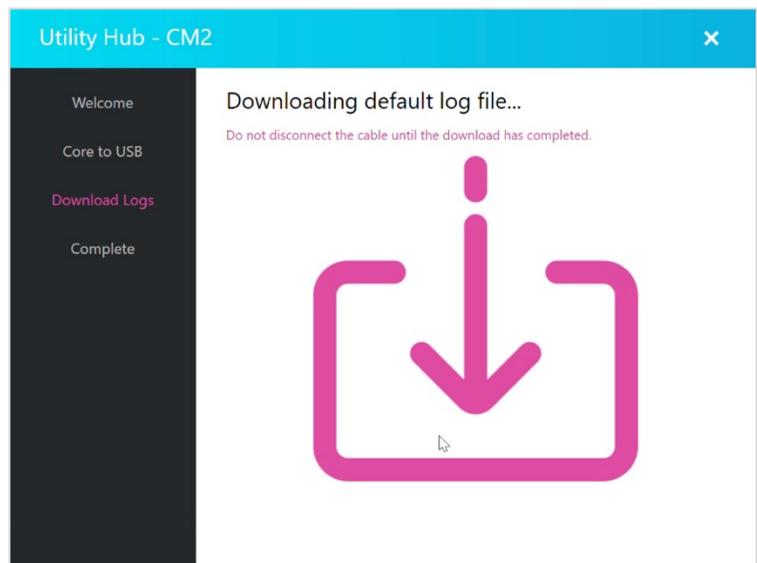
Figure 35 | Utility Hub UI when a log file download is in progress.

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12. When the **Next** button appears (Figure 36), this indicates the log file download has completed. It is normal for the log file download process to take less than 20 minutes. In most cases, the log file download should be very quick.

Click **Next**.
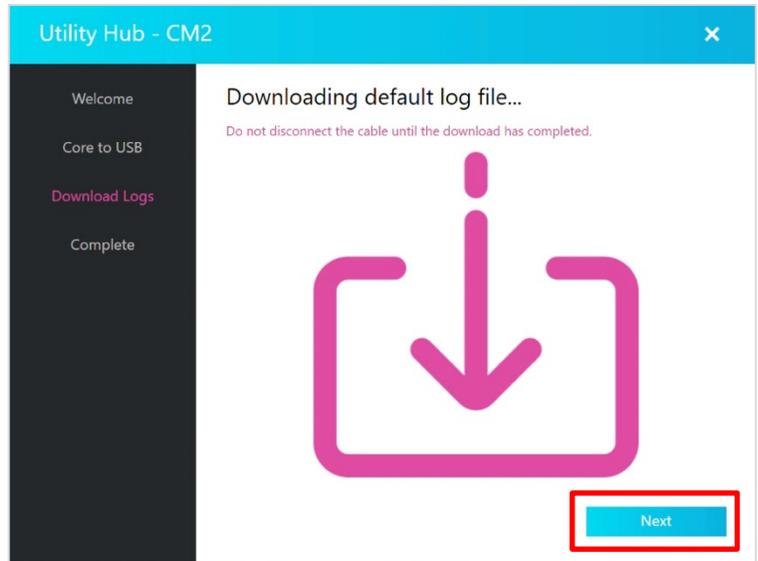
Figure 36 | Utility Hub UI will show the **Next** button when the log file download has completed.

13. Disconnect the core update cable from Zoë and your PC when prompted (Figure 37), then click **Next**.
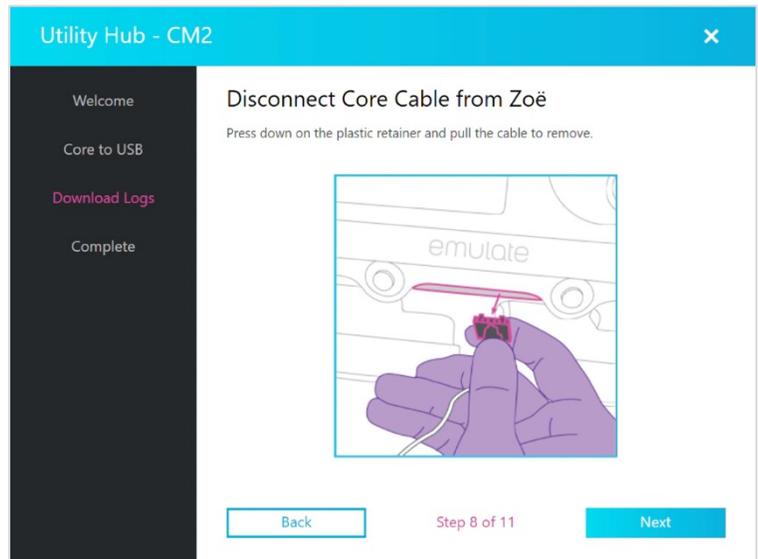
Figure 37 | Disconnect core update cable prompt.

14. Replace the utility door on the front of Zoë when prompted (Figure 38), then click **Next**.
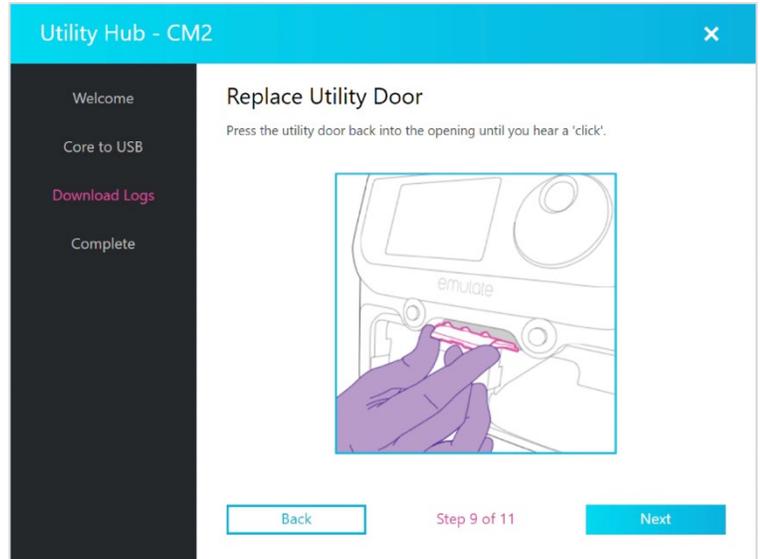
Figure 38 | Replace utility door prompt.

15. It is critical to power cycle (turn OFF / ON) Zoë after downloading log files. Utility Hub will prompt the user to perform this step (Figure 39) during the log download process. Simply press the power button / rocker switch to power OFF Zoë, wait 10–20 seconds, then power Zoë ON. It is recommended to perform this power cycle after the final step in this process.

Click **Next** when ready.
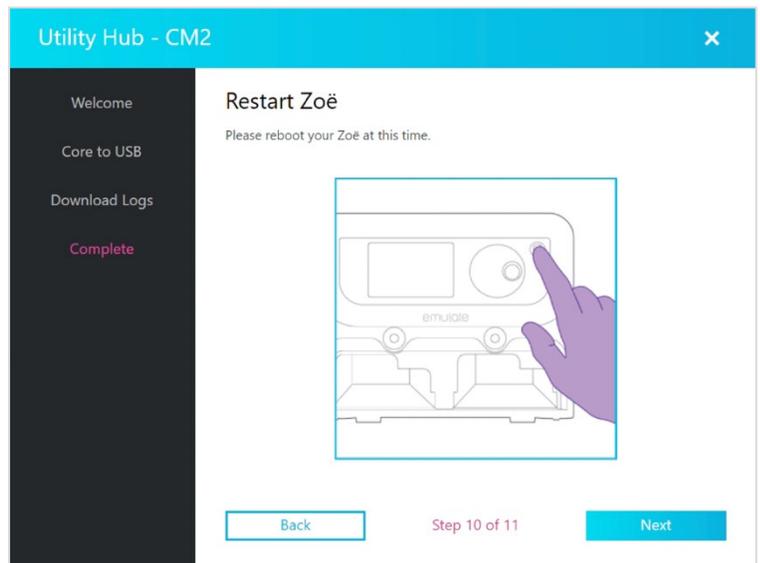
Figure 39 | Restart Zoë prompt.

16. The final Utility Hub log file download dialog will appear (Figure 40), indicating the process is complete. Click **Finish** to return to the Utility Hub home view.
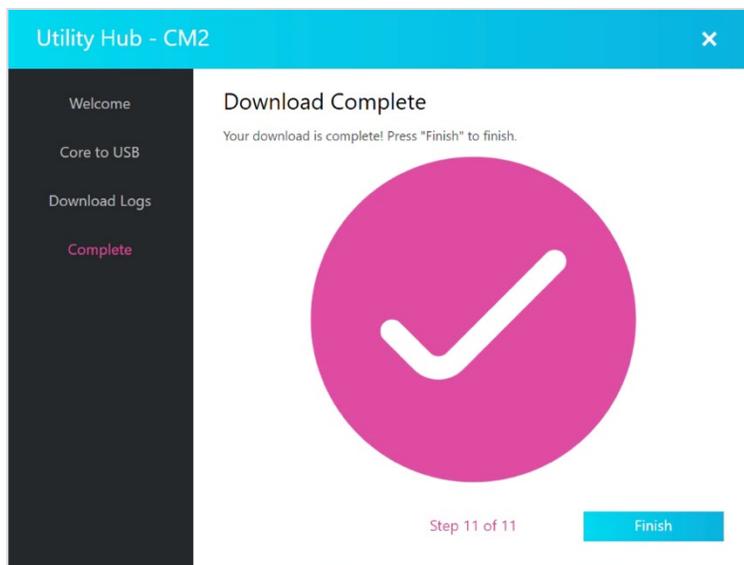
Figure 40 | Log file download complete prompt.

17. Send downloaded logs to Emulate Support (support@emulatebio.com) for Zoë-CM1 / Zoë-CM2 instrument performance review.

Troubleshooting

This section outlines possible problem situations that may arise during a firmware update or log download, and subsequent troubleshooting actions to try resolving the situation. If you are unable to resolve the problem following the content in the troubleshooting section, please contact Emulate Support at support@emulatebio.com

Issue	Troubleshooting Steps
Utility Hub is displaying an error message to "Retry" the firmware update or log file download. Oops, Something Went Wrong... It looks like there was an [error]. Ensure the cable is securely connected to the Zoë. Click "retry" to try again, or "cancel" to restart. Additional Info: No new connections have been made to the PC. Cancel Retry	1. Disconnect the display update cable or core update cable from your PC. 2. Close Utility Hub. 3. Power Zoë OFF and wait ~20 seconds. 4. Power Zoë ON and wait until the Home view appears. 5. Ensure the UI is responding to Dial input. 6. Launch Utility Hub and repeat the firmware update or log file download process. 7. If the error continues to persist, try a different USB port on the PC connecting to Zoë.
Zoë-CM1 / Zoë-CM2 display is unresponsive after power cycling with the display update cable or core update cable connected to both Zoë and the PC.	1. Disconnect the display update cable or core update cable from your PC. 2. Close Utility Hub. 3. Power Zoë OFF and wait ~20 seconds. 4. Power Zoë ON, wait until the Home view appears. 5. Ensure the UI is responding to Dial input. 6. Launch Utility Hub and repeat firmware update / log file download process. *Please Note: If the display update cable or core update cable is connected to Zoë and the PC when powering Zoë ON, this problem will continue to reappear. The display update cable and the core update cable can remain plugged into Zoë, but they MUST be unplugged from the PC after use or when retrying a log download / firmware update.*

Issue	Troubleshooting Steps
Zoë-CM1 / Zoë-CM2 cannot connect / remain connected to my PC. **I am unsure whether Windows / my PC has detected Zoë as a USB serial device.**	1. Disconnect the display update cable or core update cable from the PC first, then disconnect from Zoë. 2. Power Zoë OFF and wait ~20 seconds. 3. Power Zoë ON and wait until the Home view appears. 4. Ensure the UI is responding to Dial input. 5. Launch Utility Hub and repeat the firmware update or log file download process. 6. When prompted, reconnect the display update cable / core update cable to Zoë. 7. When prompted, reconnect the display update cable / core update cable the PC (*connection order is important*). 8. Press the **Windows** key ⊞ or press the Windows icon in the lower left corner of the screen on the Task Bar. 9. Click on the **Settings** icon ⚙ to enter Windows Settings. 10. Click the search bar with the text "Find a Setting" written in it and type "Device Manager". Select the Device Manager result from the list with an icon of a printer and a camera. 11. In the Device Manager window, find the expandable listing **Ports (COM & LPT)**. 12. If **Ports (COM & LPT)** is found, then click on the small arrow icon ">" to expand the listing. Ensure that there is at least one item in the listing that begins with "USB Serial Port". This indicates that the serial port is properly connected. 13. If **Ports (COM & LPT)** is NOT found, this indicates Windows has not detected the serial device. Try a different USB port on the PC and repeat the above process.
For owners of <u>multiple</u> Zoës – The firmware update succeeded on my first Zoë but failed to update the next Zoë.	1. Close Utility Hub. 2. Disconnect the display update cable or core update cable from the PC first, then disconnect from Zoë. 3. Power Zoë OFF and wait ~20 seconds. 4. Power Zoë ON and wait until the Home view appears. 5. Open Utility Hub and repeat the firmware update process.

My PC went to sleep during the firmware update and now I am unable to execute the update again using Utility Hub.	1. Disable the Sleep function on your PC.
	2. Close Utility Hub.
	3. Disconnect the display update cable or core update cable from the PC first, then disconnect from Zoë.
	4. Power your PC OFF, then power ON.
	5. Power Zoë OFF and wait ~20 seconds.
	6. Power Zoë ON and wait until the Home view appears.
	7. Open Utility Hub and repeat the firmware update process.

If your issue is not resolved by this troubleshooting guide, please contact Emulate Support at support@emulatebio.com

Disclaimer

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Utility Hub is for research use only. Not for use in diagnostic procedures.