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| **Title:**<br>XO-Mattress v2 Assembly Instructions | | |
| **Revision:**<br>001 | **Creation Date:**<br>17 September 2024 | |
| **Author:**<br>Max Tree | | **Reviewer:**<br>Jake Sundet |
| **Purpose:**<br>Provide instructions required for system set up and use. | | |

| Revision History | | | | |
|---|---|---|---|---|
| **Revision:** | **Revised By:** | **Checked By:** | **Date:** | **Description:** |
| 001 | Max Tree | Jake Sundet | 17 Sept, 2024 | Initial Release |
| 002 | Jake Sundet | Max Tree | 01 Oct, 2024 | Added troubleshooting tips. |

**Introduction**

The XO-Mattress v2 is the second pressure sensing matt designed by XO-NANO Smartfoam for Stryker. This second sensing matt is more durable and accurate than the first iteration. This document goes over the materials required to assemble and use the mattress. Then important notes are presented, the instructions for assembly and use are recorded, and finally debugging recommendations are outlined.

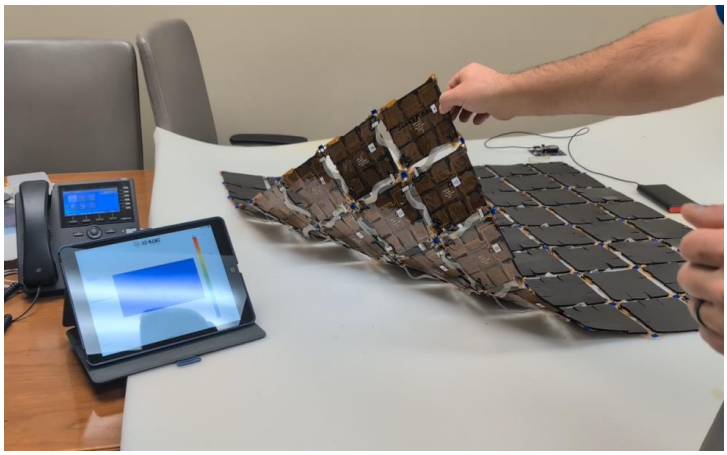


*Figure 1 Fully assembled XO-Mattress v2.*

***Links to Content:***



## Materials List

- I2C Primary MCU Adapter (purple PCB)
- ESP32 (preinstalled on the I2C Primary MCU Adapter)
- Liquid Wire I2C Cable
- USB-A to USB-micro B cable
- Power Source (laptop, computer, or a portable charger power bank)

iOS device

**Notes**

1. No Durability testing was performed on the XOS2_v2 FPCBs.
2. Glue holding the Liquid Wire cables and redundant I2C paths increase overall durability; but since mattress durability testing was not performed, care should be taken when moving or using the XO-Mattress v2 for the prototype to last a long time.
3. The power supply must be provided by a laptop, computer, or a portable charger power bank and plugged into the micro-USB port on the ESP 32. When using a wall charger, the noise from the environment is not accounted for by circuit GND and the noise becomes too large for sensor use.
4. The Liquid Wire cable might still have its plastic sheath attached. The sheath must be peeled off for the cable to be able to stretch properly.
5. The StrykerBed application will update the “Status” label to Connected when the Primary microcontroller connects to the app.

## Instructions

### *Assembly Instructions*

1. Lay out the mattress onto air bladder system or a foam mattress.
2. Connect the I2C Primary MCU Adapter PCB to an 8” Liquid Wire (LW) cable. See Figure 2, and **note** that the cable and PCB have white trace labels that need to line up. This is also true for the XOS2_v2 to LW cable connection.

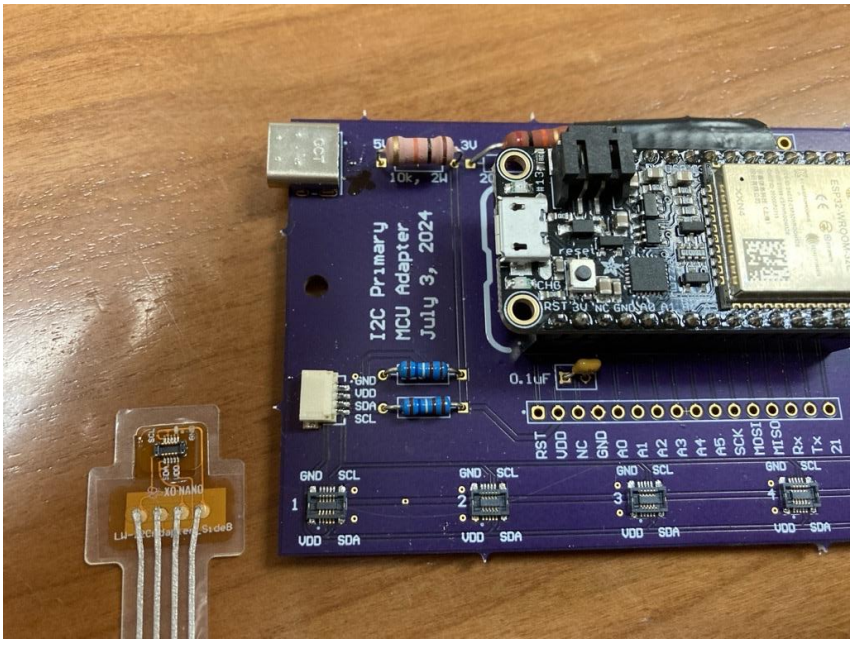



*Figure 2 Close up image of the I2C Primary MCU Adapter and a Liquid Wire cable end.*

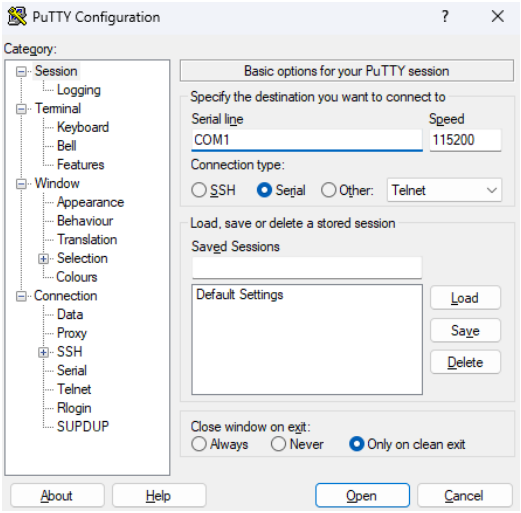
3. Connect the 8” LW cable to any available XOS2_v2 FPCB. Make sure the white trace labels line up.
4. Connect the micro-USB port on the ESP32 to desired power supply (laptop, computer, or a portable charger power bank).
5. Download TestFlight onto an iOS device via this link: https://testflight.apple.com/join/IpvgCWbH.
6. Click the same link in step 5 a second time to download the XO-NANO application, StrykerBed. The link can also update the StrykerBed application.

***Use Instructions***

1. Remove anything that is resting on the smartfoam. When the application is first started, the entire mattress is zeroed, and therefore no pressure should be exerted on the foam upon application startup. Open the StrykerBed app.
2. If the application opens, but says disconnected, then ESP32 is not being powered properly. Once everything is powered properly, the virtual bed will appear solid blue.
3. Before testing the bed, wait at least 5 seconds to allow for steady state signal and then press the “Calibrate” button in the app to adjust the sensor calibration for the current environment.
4. Begin using the XO-Mattress v2 sensors as desired.
   - Use the “Capture” button to take a screenshot. This should save the array of pressure data to the generic iOS photos application.
   - Use the “Record” toggle switch to start and stop recording data (psi). The data will be stored in the iOS device’s Files app. This can be found by swiping down at the top of the screen while on the iOS device’s home page and typing “Files” into the search bar.
5. If questions or concerns arise, please contact one of XO-NANO’s engineers,
   a. Maxwell Tree - maxwell.tree@xonano.com or 925-961-4097
   b. Jake Sundet – jake.sundet@xonano.com

## Debug Instructions

1. With the full bed assembled, plug the master device into a computer.
2. Next open Putty (or another serial viewer), enter the correct com number, and set the speed to 115200.




3. Now select “open” and view the terminal. The terminal output will write out which of the pods is not connected. Using the information from the terminal, a more targeted approach can be used towards investigating which of the pod connections is problematic.
4. If it appears as though a large section of the bed is not working, use one of the extra master ports to connect to the “dead” section of the system. This method will use the master device as the bridge between functional and “dead” portions.