# Voxon VX2 Volumetric Display

## Introduction

Welcome to the Voxon VX2 — the world’s most advanced volumetric display. You are about to explore a revolutionary new medium that brings digital content to life in true three-dimensional space, viewable from any angle with the naked eye. No glasses, no headsets — just genuine 3D visuals that appear within a volume, viewable from any direction. Whether you're crafting interactive experiences, visualising complex data, or building real-time 3D applications, the VX2 opens up a new dimension of storytelling and engagement. This manual will guide you through setup, operation, and best practices to help you get the most from your VX2.

# Safety Information

Please read all safety instructions carefully before using the VX2 Volumetric Display. Failure to follow these instructions may result in electric shock, fire, injury, or damage to the device.

## ⚠️ General Safety Warnings

- **Only qualified personnel** should install, operate, or service the VX2. Improper handling may result in injury or equipment damage.
- Do not operate the device if it has been damaged or modified in any way.
- Always unplug the device from the power source before cleaning, moving, or performing maintenance.
- Do not operate the VX2 in wet or damp conditions. Keep liquids away from the device at all times.
- The VX2 is **not intended for use by children** or persons with reduced physical, sensory, or mental capabilities unless supervised by a responsible adult.
- Keep all ventilation openings free of obstructions. Overheating may lead to malfunction or fire.

## ⚡ Electrical Safety

- Ensure the VX2 is connected to a **properly grounded electrical outlet** that matches the rated voltage indicated on the device label.
- Always inspect power cables for signs of wear, fraying, or damage before use.
- If the unit emits smoke, a burning smell, or unusual noise, **disconnect it immediately** and contact support.
- Switch off the power switch on the rear of the display before removing the power cable.

## 🌀 Moving Parts Safety

- A safety enclosure is installed to shield the moving parts—**do not remove or modify** this protective cover. Doing so may result in damage to the LED matrix and / or personal injury.
- If vibration, abnormal noise, or imbalance is observed, **power off the unit immediately** and contact technical support.
- Do not attempt to move the VX2 whilst the LED Matrix is rotating.  The rotating matrix causes a gyroscopic effect which may cause you to drop the display causing damage to the display and /  or personal injury.

## 🔌 Connection and Installation

- Only use accessories and cables supplied or recommended by the manufacturer.
- Install the VX2 on a stable, level surface capable of supporting its weight.

## 🔧 Maintenance and Servicing

- Do not attempt to service or open the internal components of the VX2. There are **no user-serviceable parts inside**.
- All servicing must be performed by authorized Voxon Photonics personnel or approved service agents or under supervision by Voxon Photonics personnel.
- Do not clean VX2 with solvents or abrasive clean agents. Doing so may damage the enclosure. Cleaning should be performed with new micro-fibre cloth optionally damped with mixture of water and mild dish washing detergent. When cleaning the VX2, ensure that it is disconnected from the DC power adapter and that the connections remain dry.

# VX2 Quickstart Guide

**Please review the Product Warnings section of this manual before setting up the Voxon VX2 volumetric display.**

1. Visit Voxon.co/developers to download the VLED Environment. *(Page 9)*
2. Check Power switch is in the ‘off’ position
3. Insert the AC power cable into the 36V power adapter.
4. Insert the power cable into your regional power socket.
5. Insert the barrel jack plug into the back of the display.
6. Switch on the power socket switch and VX2 Power switch. The red LED power indicator on the rear panel should be on, and the display should show an animated Voxon logo tiled across both sides of the LED panel.
7. Perform the calibration test. *(Page 11)*

Once the Sample applications can be found in the vApps directory of your VLED installation folder. Audio Visualiser, Model View, and Aquarium come bundled with the VLED Environment.

**To run a VLED application, use the `VX.bat` file** located in the application's directory.

Please familiarise yourself with the contents of this manual to help ensure safe and reliable operation of your VLED system.

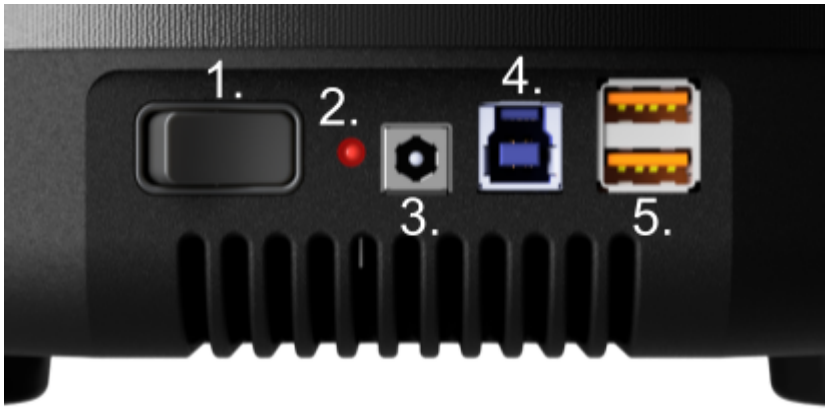
# Contents

# Hardware Components

The VX2 is shipped with the following components.

- 1x Voxon VX2 display
- 1x Connexion SpaceMouse
- 1x 36v AC-DC power adapter
- 1x USB 3.0 type-A to type-B cable
- 1x regional AC power adapter cable.


1. Enclosure
2. VLED Matrix
3. Rear Connection Panel (See below)
4. Stereo Speakers
5. Ventilation intake
6. Rubber Feet




1. Power Switch
2. Power Indicator LED
3. Barrel Jack
4. USB 3.0 type-B input port
5. 2x USB 2.0 type-A output ports.

# System Setup

## Connecting the AC Adapter

Please review the Product Warnings section of this manual before setting up the Voxon VX2 volumetric display.

1. Check Power switch is in the ‘off’ position
2. Insert the AC power cable into the 36V power adapter.
3. Insert the power cable into your regional power socket.
4. Insert the barrel jack plug into the back of the display.
5. Switch the power socket switch ‘on’
6. Switch the VX2 Power switch ‘on’

The red LED power indicator on the rear panel should be on, and the display should show an animated Voxon logo tiled across both sides of the LED panel.

## Connecting to a Windows PC

The included USB 3.0 Type-A to Type-B cable connects your Windows 10/11 PC to the VX2 display for data transfer. Insert the Type-A connector into a USB 3.0 (or compatible USB 3.1, 3.2, etc.) port on your computer, and plug the Type-B connector into the corresponding port on the rear panel of the VX2.

*Note: The VX2 includes two USB Type-A ports, allowing you to connect additional USB devices to your PC via an internal USB hub. Use of these ports is optional, but they can be helpful—for example, when connecting a* ***SpaceMouse****—especially if your PC is not positioned near the VX2.*

# System Operation

After completing the necessary connections as outlined in the System Setup section, ensure the VX2 is placed on a flat, stable surface with unobstructed airflow to the bottom of the device. Confirm that the enclosure is securely seated on the display and that there is no visible debris or any loose parts inside. Once the display is properly positioned, proceed with the instructions below.

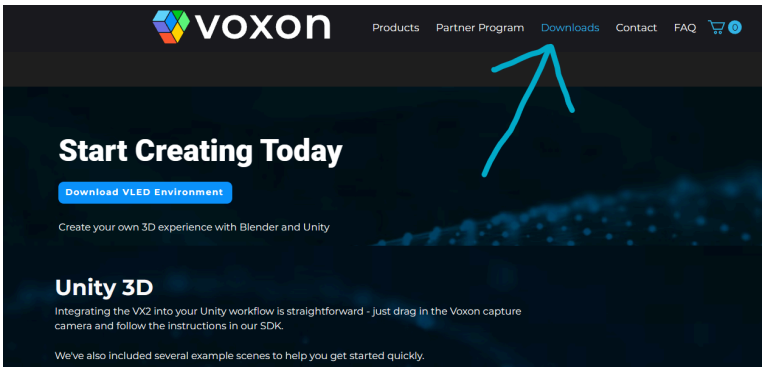
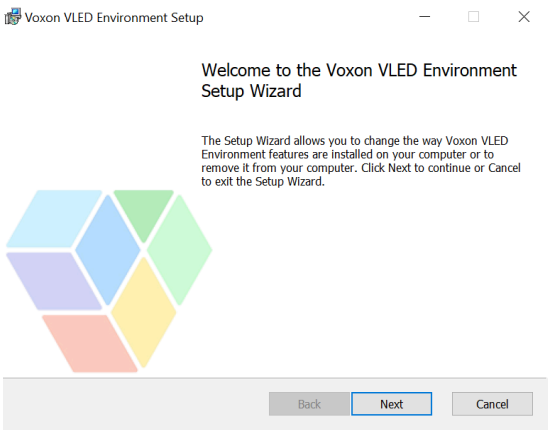
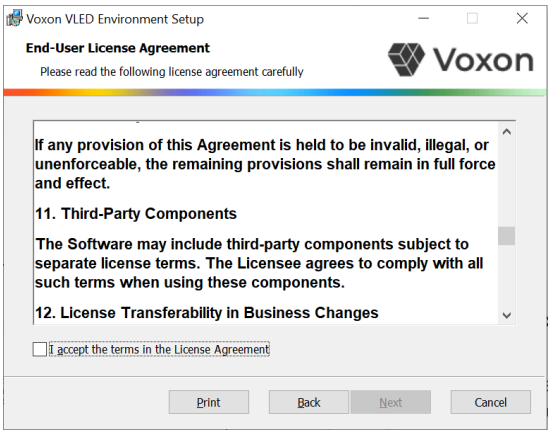
**Caution**
The VX2 display has intake/exhaust vents at the bottom of the display to provide adequate ventilation. Do not operate the system in any location where airflow to these vents may become obstructed.

Upon powering on the display, a repeating image of the Voxon logo will appear on the LED Matrix. If you don't see the Voxon logo over both sides of the LED panel, please check the Troubleshooting section on *page 10*.

# Voxon Runtime Environment

## Setup

Your Windows PC will need the Voxon Runtime Environment before you can run any VLED software.

| | |
|---|---|
| 1. Visit [Voxon.co/developers](Voxon.co/developers)<br>2. Click “Download VLED Environment” |  |
| 3. Run the Voxon VLED Installer. |  |
| 4. Read and accept the End User License Agreement, then click next. |  |

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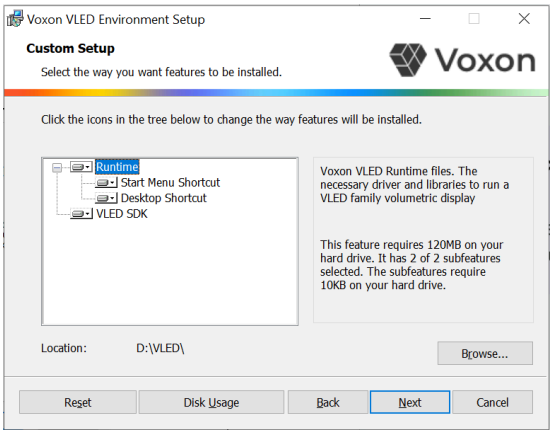
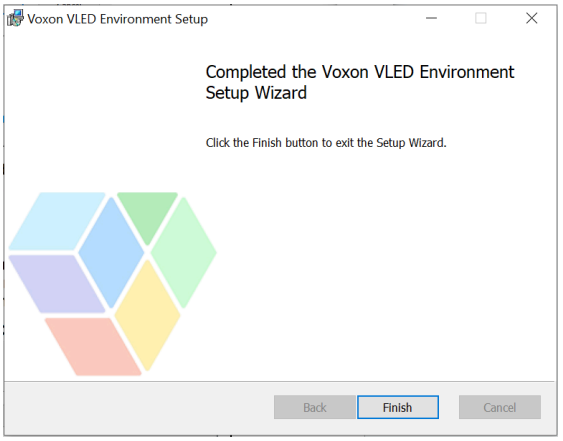
| 5. Choose an installation directory. Click Next, then Install. You may need to grant administrator permission to the installer. |  |
| 6. Once the installer has completed, click Finish to close the installer. |  |

# LEDHOST Calibration

Before using the VX2 for the first time, or after transportation or a prolonged period without us, as precautionary measure Voxon recommends doing a soft start test of the VX2 using LEDHOST.exe, a test program included in the VLED Environment download.

Find LEDHOST.exe in your Voxon installation directory. This should be located in ..\\VLED\System\Utilities\LEDHOST.exe


**At any time, press Space, or the STOP button in the lower right of the LEDHost window to stop the display motor.**

To begin, click on "300 RPM" on the right side of the window to set the motor's target speed. The display should begin spinning, and once it reaches 300 RPM, it will start rendering the initial volumes of the model shown in LEDHost.

Run the display at this speed for a minimum of 10 seconds. As the motor accelerates and decelerates, listen carefully for any unusual sounds that may indicate loose components inside the unit. Once the display has come to a complete stop, visually inspect the VLED Matrix to ensure they remain in full contact with the surrounding frame along their entire perimeter.

If at any point the display does not pass these visual or auditory checks, stop operation immediately and contact Voxon for technical support.

Repeat this process for 600 rpm before moving to 900 rpm which is the maximum speed for the VX2.  For the VX2-XL, the maximum speed is 600 rpm.

## VLED Applications

VLED applications are installed in the *vApps* folder by default (location: `..\VLED\vApps`).

**To run a VLED application, use the `VX.bat` file** located in the application's directory. This will launch a Command window. On Windows 11, you'll be prompted to press a key to start the application, whereas on Windows 10 the application will begin automatically after a brief delay.

Please note that only one VLED application can run at a time. If you attempt to launch another while one is already active, a system alert will appear. If no applications seem to be running but the system still behaves as if one is, check the Task Manager and end any lingering background processes related to VLED.

Some applications may automatically start the VLED motor.

The display will stop automatically after a short period of inactivity when no VLED software is running. There's no need to wait for it to come to a complete stop—if VLED software is launched again, the display will resume from its current speed.

Each application may use different control inputs. However, controls common to all applications are listed below in the *Hardware Keys* section.

# Keyboard shortcuts for VLED Unity Applications

You can make temporary changes to the display settings while running any VLED Software.

Hold the backslash（\）or F10 key to show the hardware key menu.

| Function | Key | Description |
|---|---|---|
| Adjust Gamma | Up: G. Down: H. | Changes the saturation of the color. |
| Dither threshold | Up: T. Down: Y. | Changes the number of voxels used to render the image. |
| Toggle Dither Mode | U | Toggles temporal or fixed dithering modes. |
| Toggle Texture Filter Mode | F | Toggles volume slice blending |
| Reset settings | R | Resents the Gamma Dither, Dither Mode, Texture Filter mode to default settings. |
| Adjust resolution | Increase: Z. Decrease: X. | Adjust the volume pixel capture density. Lowering may improve performance at the cost of visual density. |
| Adjust Horizontal aspect ratio | Increase: D. Decrease: A. | Re-scales the volume draw area along the XYZ axes. |
| Adjust Vertical aspect ratio | Increase: Q. Decrease: E. | |
| Adjust Depth aspect Ratio | Increase: S Decrease: W. | |
| Pause/Resume software | P | Pauses Voxon applications. |
| Toggle info display | I | Shows/hides the information panels in the VLED app window. |
| Adjust Motor Speed | Decrease: J. Increase: K. | Sets the target motor speed. |
| Start Motor | M | Starts the display to accelerate to the current motor speed (only updates |

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| | | the motor motor speed when pressed again). |
| Stop Motor | Space | Halts power to the motor. VLED Matrix will coast to a stop. |
| Toggle Occlusion | C | Show or hide hidden geometry |
| Capture & export volume | O | Save the volume as a .PLY file |
| Rotate display 'Front' | Left or Right using < > | Rotates the software 'front', indicated by blue dots. |
| Draw border | B | Draws border around volume |
| Change Aspect Ratio / Offset | W,A,S,D,Q,E | Move or change volume aspect ratio |
| Aspect / Offset selection | V | Toggle Aspect or Offset mode |

## VLED Simulator

While a VLED application is running, the VLED window also functions as a simulated view of the display. This simulation allows for easier testing and development when the hardware is not connected or when running the physical display is not practical.

Some applications may be configured to automatically disable the simulator while the display is active, in order to optimize software performance.

## Simulator Keys

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|---|---|
| Rotate Simulator view | Left: [, Right: ],<br>Up: Shift + [, down: Shift: ] |
| Zoom Simulator view | Out: Ctrl + [, In: Ctrl+] |
| Reset simulator view | Ctrl + shift + [ + ] |

# Troubleshooting

## Motor

| | |
|---|---|
| VLED Matrix spin slowly and target motor speed cannot be increased | Please contact Voxon for support |
| VLED Matrix is spinning, but no volumes are being drawn | Volumes will only be drawn when the VLED Matrix is faster than 300rpm |
| The display doesn't start when running specific applications. | Not all software will automatically start the motor at launch. You may need to start the motor using the key input ( "\ + M" ). |
| The motor doesn't start, even when pressing "\ + M" | Ensure **all** other VLED applications are closed, then re-open the desired software. |

Software

| | |
|---|---|
| When running a VLED application, the program starts, but the VLED Application window doesn’t appear. The display does not respond to the application at all. | Ensure that you use the VX.bat to start the application, not the .exe. |
| The VLED application is running and visible in the display, but the VLED Application window doesn’t appear. | Check if the application icon is visible in the taskbar. If it is present, check that it is selected and press Windows Key + left/right arrow, to try bring it back into view. |

## Display

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| The display appears flickery, or has a strobe effect. | Check that the display is running at 900rpm. Running at slower speeds may be required when filming to avoid strobing effects. |
| The display is too light, or too dark. | Adjust the display gamma settings. More information can be found in the Hardware Keys section of this document. |
| The volume is being drawn smaller, or larger than the display boundary, or the visible elements are flattened in some way. | Check ledhost.ini config file settings are using the options for your target display<br><br>Adjust the display aspect ratio settings. More information can be found in the Hardware Keys section of this document |
| The front of the application does not line up with the front of the display. | Adjust the display front rotation setting. More information can be found in the Hardware Keys section of this document |

## Misc.

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|---|---|
| Sound is not coming out of the speakers. | Check your PC volume is set correctly and the VX2 is set as the sound output. |
| I can't take a quality picture or video of the display. | If photographing the VX2 at 900 rpm, you need to use a 1/30th or 1/15th sec shutter speed. Failure to do so will result in missing volume data. Filming the VX2 requires the camera or app to use recording rates that are matched to the rotation rate. Please email contact@voxon.co for the latest filming guide. |
| **SpaceMouse** inputs are at a different axis to what's seen in the display. | Confirm that the cable from the **SpaceMouse**, and the cables from the back of the display are oriented in the same direction.<br><br>Confirm that you are facing toward the front of the display.<br><br>Adjust the display front rotation setting. More information can be found in the Hardware Keys section of this document |