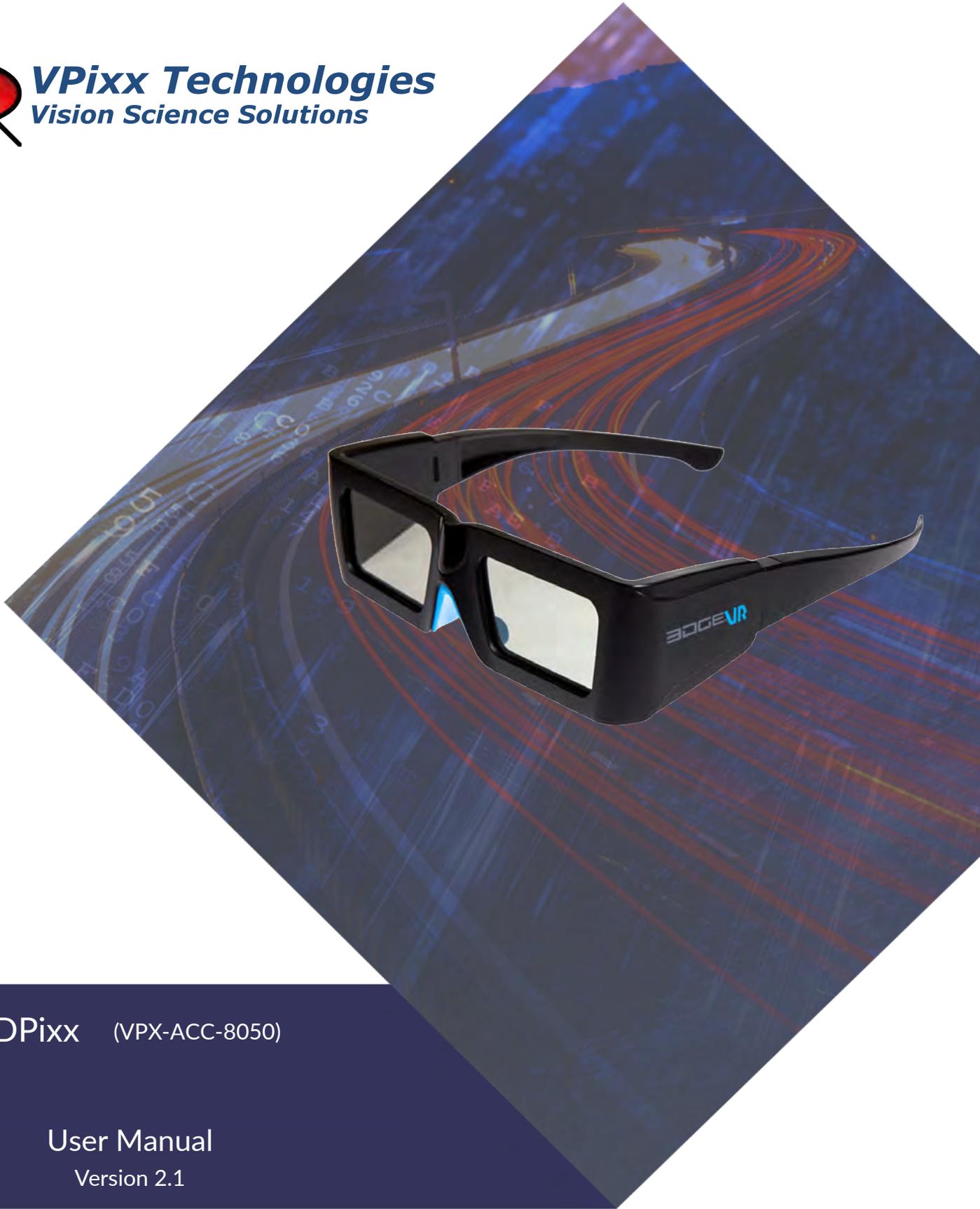




VPiXX Technologies
Vision Science Solutions



3DPiXX (VPX-ACC-8050)

User Manual
Version 2.1

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For more information about our company and products, visit our Web site at www.vpixx.com

For information, comments or suggestions, please contact us by e-mail at support@vpixx.com

Our offices are located at:

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Version History of this document

Version Updated to	Date	Author	Reason
1.0	2014/11/03	P.Kakos	v1.0 release
2.0	2022/01/18	P.Kakos	Major document overhaul
2.1	2022/03/25	P.Kakos	Modification to RF emitter

Document Icons

The use of icons emphasizes helpful, caution or warning notes. Below is a list of the icons available.

Icon	Type	Description
	Helpful Hint	<i>Information to help out during assembly, installation or usage</i>
	Caution Notice	<i>Important Information to prevent misuse and/or damage to equipment</i>
	Warning	<i>Critical information to prevent damage to equipment and/or personnel</i>

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Overview

This manual provides installation, usage and maintenance information for VPixx Technologies Inc.'s 3DPixx system.

For technical questions or product support information, do not hesitate to contact the VPixx support team by phone or via E-mail at support@vpixx.com



By creating your *MyVPixx* account on the VPixx Technologies website, you will have access to additional product documentation, demos, source code examples, and the latest firmware and software drivers.

WARNING - SAFETY INFORMATION & PRECAUTIONS



FOR INDOOR USE ONLY. NOT FOR USE AS SUNGLASSES.



IMPORTANT! REVIEW THE FOLLOWING WARNINGS PRIOR TO USING 3DPIXX. ENSURE YOU UNDERSTAND AND OBEY THE FOLLOWING PRECAUTIONS WHEN USING 3DPIXX.

THE 3D KIT CONTAINS ELECTRONIC DEVICES AND THE FOLLOWING PRECAUTIONS SHOULD BE FOLLOWED:

- Normal vision may be impaired while wearing these glasses. Do not wear 3D glasses for any other activity except viewing 3D images in a safe environment intended for viewing 3D images.
- Do not attempt to use 3D glasses as sunglasses. 3D glasses offer no UV protection and direct sunlight may damage them.
- Excessive force can easily damage this product. Do not flex the glasses. Handle the lenses carefully, especially when cleaning. Do not drop the RF emitter or glasses.
- Do not expose the 3D glasses to chemicals containing alcohol, solvents, surfactants, wax, benzene, thinner, lubricant, or cleaners. These may result in discoloration or cracks on the product surface and cause the indication labels to peel from the product surface. Use only products designed for cleaning LCD screens and use them in accordance with the manufacturer's recommendations.
- Parental supervision is required when persons under the age of 18 years old use this product. You may choose to consult a physician before allowing young children to use this product.

- 3D display devices use high speed flashes of light to generate a 3D perceptual effect. The light flash may produce non-epileptic or epileptic seizures in certain individuals in addition to the following:
 - High speed flashing light may elicit a stroke in certain individuals. You should consult a physician before using this product if you or any of your immediate relatives have a history of stroke.
 - *Photosensitive epileptic seizures* (epileptic seizures induced by flashes of light) can be experienced by individuals without a diagnosis of epilepsy and whose family have no history of epilepsy. You should consult a physician before using this product if you or any of your immediate relatives have a history of epilepsy.
 - Immediately stop using this product and consult a physician or other medical professional if you experience any of the following symptoms: altered vision, light-headedness, dizziness, confusion, disorientation, nausea, muscle cramps, and/or convulsions. Parents should monitor their children for the above symptoms. Children and teenagers may be more susceptible than adults to experiencing these symptoms.
 - Do not use this product if you feel delirious, sleepy, tired, or sick. Avoid using this product for long periods of time. Take regular breaks, especially during long periods of use.
- Watching a computer monitor while wearing 3D glasses for an extended period of time may cause headache, fatigue, or dizziness. Remove the 3D glasses and stop watching the monitor immediately if you experience these symptoms.
- You should not use 3D glasses if you are under the influence of alcohol, sleep deprived, or in poor physical condition.
- Some 3D images may startle viewers due to the immersive and compelling nature of 3D technology. A startle response may elicit rapid and reflexive bodily movements, which could be potentially harmful to oneself or others. As such, pregnant women, young children, the elderly, people with epilepsy, and people in frail physical condition are advised not to use 3D glasses
- Do not use 3DPixx for any purpose other than viewing 3D images in a safe, designated environment. Wearing the 3D glasses for any other purpose (as general spectacles, sunglasses, protective goggles, etc.) may result in physical harm, visual impairment, or damage to the glasses.
- Some light sources, such as compact fluorescent, fluorescent, and LED, may flicker at rates that are not perceptible to the naked eye but that are perceptible when using this product, especially when the light sources are particularly bright. DO NOT look directly at bright light sources while wearing the 3D glasses. If you observe lights that flicker while wearing the 3D glasses, take off the glasses immediately and turn off or move the light source. Ensure that there is no visible flicker while wearing the 3D glasses.

FIRE AND INJURY

DO NOT puncture, pierce, damage, destroy, or modify the battery contained in the glasses. Puncturing the battery creates a fire hazard, which may result in combustion and could lead to severe injury. DO NOT expose the battery to hot or cold temperature extremes. If there are any signs of damage to the battery, discontinue use of the 3D glasses immediately.

Compliance Information

For European Countries



DECLARATION OF CONFORMITY

Manufacturer's Name: VPixx Technologies Inc.

Manufacturer's Address: 630 Clairevue West suite 301
Saint-Bruno, Qc
Canada, J3V 6B4

Product Name: 3DPixx

Part Numbers: VPX-ACC-8050

Application of Council Directive:

2014/30/EU	-Electromagnetic Compatibility directive
2015/863/EU	-Restriction of Hazardous Substances directive
2012/19/EU	-Waste Electrical and Electronic Equipment directive

The following harmonised standards have been used:

IEC 60950-1	- Information technology equipment
--------------------	------------------------------------

Supplementary Information:

To remain CE compliant, only CE compliant parts should be used with this product. Maintaining CE compliance also requires proper cable and cabling techniques. VPixx Technologies will not retest systems or components that have been modified by customers.

Signature: 

Printed name: Jean-François Hamelin, Eng

Title: Vice President

The following information is only for EU member states:



The mark shown to the left is in compliance with the Waste Electrical and Electronic Equipment directive 2012/19/EU (WEEE). The mark indicates the requirement NOT to dispose of the equipment as unsorted municipal waste. For more information call VPixx Technologies Inc. or email us at support@vpixx.com

For the United States of America

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interferences that may cause undesired operation.

For Canada

This Class A digital apparatus complies with Canadian ICES-003.

Declaration of RoHS Compliance

RoHS This product has been designed and manufactured in compliance with Directive **2015/863/EU** of the European Parliament and the Council on restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive).

General specifications



Figure 1. RF emitter and RF glasses

This product is comprised of two pairs of 3D EDGE™ VR glasses and an ActiveHubRF50™ RF emitter. The system is designed to function in conjunction with your VIEWPixx, PROPixx or DATAPixx system to provide the ultimate in 3D stereoscopic viewing. This document describes the features, connections, setup, and operation of the EDGE™ VR glasses and ActiveHubRF50™ RF emitter.

RF Emitter Features

- Signal has 30 m (98 ft) maximum range and 2.4 GHz frequency (ISM band)
- Emitter receives 3D synchronization data via VESA-DIN3 connector and wirelessly transmits 3D synchronization data to 3D glasses via RF link
- Easy integration with VIEWPixx, PROPixx and DATAPixx using Psychtoolbox for MATLAB

RF Glasses

- Ultra-fast-response liquid crystal lenses create superior image quality
- No silver screen required
- High image quality preserved at all seating positions
- Allows bright images and natural colors
- Ergonomic design
- Light weight (56 g)
- Rubberized nosepiece
- Adjustable arms that come in 3 sizes
- Best-in-class lenses with high contrast and light efficiency
- Extremely stable images even at long-range (5 m)
- Radio frequency synchronization avoids interference from other wireless devices
- Programmable
- Automatic power-off function saves energy
- Rechargeable glasses / Battery life up to 75 hours

Installation and setup

Unpack and place the equipment on a flat, stable surface. The equipment includes:

- RF emitter with VESA cable
- Glasses (2 pairs)
- MicroUSB cable
- Removable arms (S, M, L)
- Microfiber cleaning wipe

During installation and setup, ensure you do not:

- Drop the RF emitter/3D glasses
- Scratch the glasses.

Assembling the arms

The glasses come with three interchangeable sets of arms (small, medium, and large sizes). Changing one set of arms for another is simple and quick. Select and assemble the arms that best fit the participant's head.

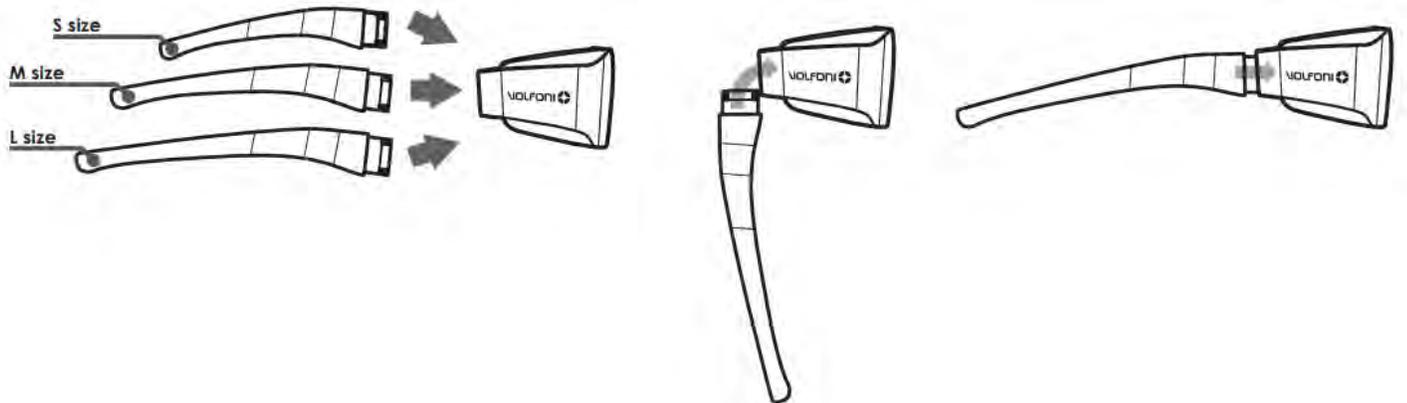


Figure 2. Changing the arms of the RF glasses

Prepare the location

Ensure that the location where you place the 3DPixx components meets the following requirements:

- The RF emitter has a clear line of sight to the intended location where the 3D glasses will be used
- The RF emitter rests on a stable surface

Connections

To connect the RF emitter to a DATAPixx or VIEWPixx, insert one end of the RF emitter cable into the port labelled **VESA 3D** on the back of the DATAPixx or VIEWPixx and the other into the RF emitter's **3D sync input** (see Figure 3).



Figure 3. 3DPixx VESA connection and RF Emitter 3D sync input

Using the 3DPixx system

Before using your equipment, familiarize yourself with the RF Emitter and RF glasses.

RF emitter

The RF emitter is intended for use with the 3D active glasses to view 3D image content displayed on a PROPixx, VIEWPixx, VIEWPixx/3D, or VIEWPixx/EEG. The RF emitter receives a 3D synchronization signal from a VESA-DIN3 connector and then wirelessly transmits this signal in the RF band to the 3D active glasses.

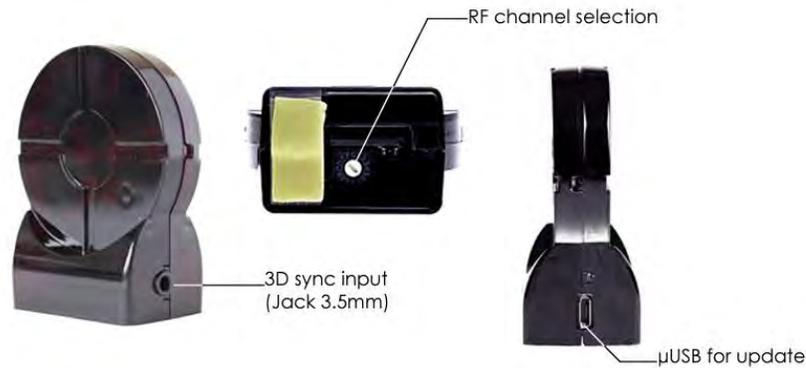


Figure 4. RF emitter

The RF emitter is powered from the VESA-DIN3 connector located on the DATAPixx or the VIEWPixx /3D. Once powered, synchronization sources such as VESA, DLP-Link and IR are automatically checked by the RF emitter. If one of these three signals is detected, the RF emitter will focus exclusively on it until its next full power cycle. To switch to another synchronization source, you must power off the RF emitter. The scan priority order is:

1. Wired 3D signal
2. DLP-link 3D signal
3. IR 3D signal

Channel Selection

The emission mode is determined by the position of the RF channel selection switch underneath the emitter:

Switch position	Emission mode
0	Autotest mode
3 to E	RF channels
8	Default RF channel
F	VESA channel

LED information

LED status	Information
OFF	No power
Solid	The RF emitter is powered but is not receiving a synchronization signal
Blinking	The RF emitter is powered and receiving a VESA 3D synchronization signal

RF glasses

RF 3D glasses are active (i.e., they require power) and use radio frequency technology to synchronize with and receive data from the RF emitter.

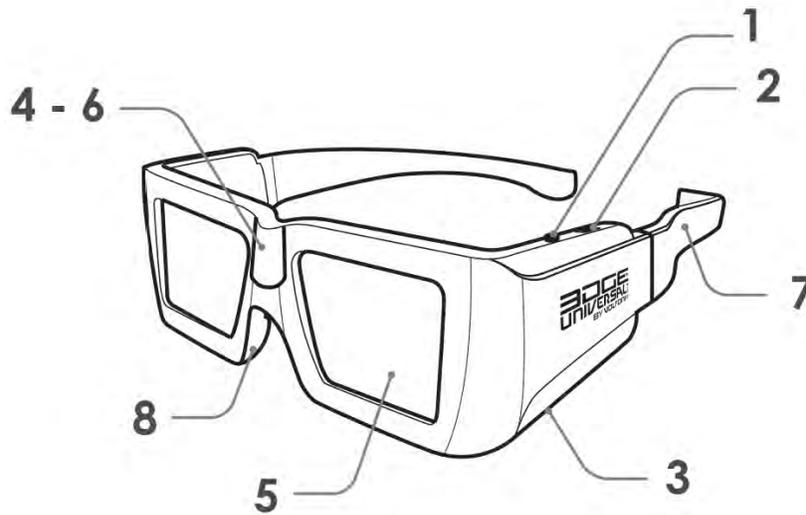


Figure 5. RF glasses

1. ON/OFF button
2. Programmable 3-position switch (factory)
3. MicroUSB (μ USB) connection (recharging and updating)
4. Electronic component (with RF receiver)
5. Liquid crystal lenses (STN)
6. LED light
7. Interchangeable arms
8. Rubberized nosepiece

1. ON/OFF button

Turn the glasses ON by pressing and then quickly releasing the ON/OFF button. When switched ON, the left and right lenses will each flash once in sequential order to indicate to the user that the glasses are powered ON.

Hold down the ON/OFF the button to turn the glasses OFF.



The glasses will automatically turn off in the following cases: No movement of the glasses for 5 minutes or loss of RF synchronization for 10 minutes.

2. Switch button

The glasses have a switch (for factory programming) which is also a pressable button. A quick press of this button will show the current level of battery life, indicated by the number of times the LED light (see point 6 in Figure 5, above) blinks.

LED battery charge information

LED status	Information
One flash	Low battery level (less than 30%)
Two flashes	Battery level between 30% and 90%
Three flashes	Battery level higher than 90%

Battery charging

The LED (see point 6 in Figure 5, above) indicates when the microUSB cable is connected and the battery charging status.

LED charging status information

LED status	Information
Steady light	Charging
OFF	Charging complete

Specifications - RF glasses

Specification	Value
Sync operation	Radio-Frequency
Frequency	2.4Ghz
Refresh rate compatibility	all refresh-rates up to 220Hz
Optical Transmission	38%
Residual light	18.5%
Contrast	> 940:1 (no ghosting)
Chromacity	Color correction not mandatory
Weight	56 g
Autonomy	75 hours of usage
Range	5 m
Operating temperature	0°C ~ +40°C (32F-104F)
Storage temperature	-10°C ~ +50°C (14F-122F)
Certification	CE certified

3D Demo

This demo is made for the VPixx Technologies 3DPixx RF emitter and glasses.

```
% This demo demonstrates how to use 3DPixx and the VPixx "blueLine" software feature to render different images
% in either eye of the 3DPixx. When "blueLine" is enabled, the VIEWPixx/3D will scan the bottom row of blue
% channel pixels. When it detects high pixel values in the first 1/4 of this row and low pixel values in the
% second 1/4 of this row, this indicates that the left eye receives the current screen image. When it detects
% high pixel values in the third 1/4 of this row and low pixel values in the fourth 1/4 of this row, this
% indicates that the right eye receives the current screen image.
%
% Here, we will draw a red circle visible in just the left eye, a yellow circle visible to both eyes, and a
% green circle visible to just the right eye.

%% Setup
% Enable DATAPixx blueLine support and VIEWPixx scanning backlight for optimal 3D
Datapixx('Open');
Datapixx('EnableVideoScanningBacklight');
Datapixx('EnableVideoLcd3D60Hz');
Datapixx('EnableVideoStereoBlueLine');
Datapixx('SetVideoStereoVesaWaveform',5);
Datapixx('RegWr');

% Open PTB window
screenNum = max(Screen('Screens'));
screenCol = 0;
[windowPtr, windowRect]=Screen('OpenWindow', screenNum, screenCol);

% Define left/right eye stereo codes
blueRectLeftOn = [0, windowRect(4)-1, windowRect(3)/4, windowRect(4)];
blueRectLeftOff = [windowRect(3)/4, windowRect(4)-1, windowRect(3), windowRect(4)];
blueRectRightOn = [0, windowRect(4)-1, windowRect(3)*3/4, windowRect(4)];
blueRectRightOff = [windowRect(3)*3/4, windowRect(4)-1, windowRect(3), windowRect(4)];

%% Create stimulus
radius = 200; % 200 pixels
screenCenter = windowRect(3:4)/2;
circRect = repmat(screenCenter,1,2)+[-1 -1 1 1]*radius; % Bounding rectangle around circle in middle of screen
circRect = repmat(circRect,3,1); % 3 circles, split by row
circRect = circRect + [-1 0 -1 0; 1 0 1 0; 0 0 0 0]*400; % Offset the horizontal centers by 400 pixels
col = [0 200 0; ... % Green (left eye)
      200 0 0]; % Red (right eye)

%% Draw stimulus
while ~KbCheck % Press any keyboard button to quit
    Screen('FillOval',windowPtr,col(1,:),circRect(1,:)); % Green (left eye)
    Screen('FillRect', windowPtr, [0, 0, 255], blueRectLeftOn); % Use blue line to indicate which eye to draw to
    Screen('FillRect', windowPtr, [0, 0, 0], blueRectLeftOff);
    Screen('FillOval',windowPtr,sum(col),circRect(3,:)); % Yellow (both eyes)
    Screen('Flip', windowPtr);

    Screen('FillOval',windowPtr,col(2,:),circRect(2,:)); % Red (right eye)
    Screen('FillRect', windowPtr, [0, 0, 255], blueRectRightOn); % Use blue line
    Screen('FillRect', windowPtr, [0, 0, 0], blueRectRightOff);
    Screen('FillOval',windowPtr,sum(col),circRect(3,:)); % Yellow (both eyes)
    Screen('Flip', windowPtr);
end

%% Wrap up
Datapixx('DisableVideoLcd3D60Hz');
Datapixx('RegWr');
Screen('CloseAll');
```



For more information, please refer to the **Application Guide for VPixx Products on MyVpixx**

Maintenance

Exposure to direct sunlight, heat, or water may alter or damage the product. Ensure you protect the 3DPixx from these elements.

Cleaning the 3DPixx glasses and RF emitter

Use the supplied microfiber cleaning wipe to clean the glasses as needed.

As specified in the WARNING section at the beginning of this document, do not expose the RF emitter or 3D glasses to chemicals containing alcohol, solvents, surfactants, wax, benzene, thinner, lubricant, or other cleaners. This may result in discoloration or cracks on the product surface and cause the indication labels to peel off of the product surface. Use only products designed for cleaning LCD screens and use them in accordance with the manufacturer's recommendations.



Do not soak or immerse the glasses in liquids since they are electronic devices and moisture can damage or impair their function. Do not apply pressure to, impact, or rub, the sensitive product surface.



Do not use cleaners that contain any petroleum-based materials such as benzene, thinner, or any other volatile substance to clean the 3DPixx components.

Warranty

The 3DPixx is warranted against manufacturing defects in materials and workmanship for two years for parts and labor from the date of purchase.

Troubleshooting

Problem	Solution
The image flickers in the RF glasses.	Ensure there is no other wireless devices using the same RF band (2.4 GHz) within 30 meters of the RF emitter.
The image blinks when I turn ON the RF glasses.	This indicates that the battery is low. Please recharge the glasses.



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