VPixx Technologies
Vision Science Solutions

VideoBahn™
The NEW fast road to SUPERIOR data

DATAPixx3 Full (VPX-DPX-1005C)
DATAPixx3 Lite (VPX-DPX-1004A)

Installation Guide

Version 1.0

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IMPORTANT

VPixx Technologies Inc. reserves the right to modify or otherwise update this document without notice as required by a constantly evolving marketplace, client requests or to adapt to new progress or constraints in engineering or manufacturing technology. The information contained in this document may change without prior notice.

For more information about our company and products, visit our website at ***www.vpixx.com***

For information, comments or suggestions, please contact us by e-mail at ***support@vpixx.com*** or through our offices:

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Version History of this document

Version	Date	Author	Changes
1.0	2019/07/25	P.Kakos	v1.0 release

Document Icons

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

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

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Overview

This manual provides installation and maintenance information for VPixx Technologies Inc.'s DATAPixx3 system.

For technical questions or product support information, do not hesitate to contact the VPixx support team by phone or by sending an E-mail to 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.

	**The DATAPixx3 device is suitable only for research and is not designed for medical applications or for diagnostic purposes.**

WARNING - SAFETY INFORMATION & PRECAUTIONS

Safety precautions

- Do not open the device. There are no user serviceable parts inside.
- Use only the power cable provided.
- Ensure that the power outlet includes a Ground connection, as this equipment MUST be grounded.
- Do not expose the DATAPixx3 to rain or moisture, and do not place any liquids on its top surface.
- Unplug the system before cleaning, and use a damp (not thoroughly wet) cloth.
- Handle the power cable carefully and avoid sharp bends. Do not use a damaged power cable.
- Do not cover or obstruct the ventilation outlets or inlets.
- Ensure that the total ampere rating of the products connected to the AC outlet does not exceed the current rating of the electrical outlet, and that the total ampere rating of the products connected to the power cord does not exceed the rating of the power cord. Look on the power label to determine the ampere rating (Amps or A) for each device.

Compliance information

The Videobahn interface on the TRACKPixx3 uses a fiber optic module. The manufacturer provides a certificate of conformance for standard IEC 60825-1 Ed. 3 (2014)

CLASS 1 LED DEVICE

IEC 60825-1 Ed. 3 (2014)

For the United States of America

This device complies with part 15 subpart B of FCC rules. Its 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 interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 subpart B of the FCC rules.

For Canada

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

CISPR warning

This is a Class A product. In domestic environments this product may cause radio interference in which case the user may be required to take adequate measures.

For European Countries

CE

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: *DATAPixx3 Full* and *DATAPixx3 Lite*
Part Numbers: VPX-DPX-1005C and VPX-DPX-1004A
Product Options : All
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

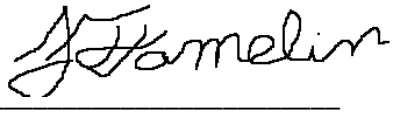
The following harmonised standards have been used:

EN 61326-1:2013 –Electrical equipment for measurement, control and laboratory use.

- **IEC CISPR 11** -Radio frequency disturbance characteristics (Class A)
- **IEC 61000-3-2** -Limits for harmonic current emissions (Class D)
- **IEC 61000-3-3** -Limitation of voltage changes, voltage flicker (≤16A per phase)
- **IEC 61000-4-2** –Electrostatic discharge immunity test (Level 2 contact, air) (Perf Criteria B)
- **IEC 61000-4-3** –Radiated, radio-frequency, electromagnetic field immunity test (Level 2, Perf Criteria A)
- **IEC 61000-4-4** –Electrical fast transient/burst immunity test (Level 2, Perf Criteria B)
- **IEC 61000-4-5** –Surge immunity test (Level 2, Perf Criteria B)
- **IEC 61000-4-6** –Immunity to conducted disturbances, induced by radio-frequency fields (Level 2, Perf Criteria A)
- **IEC 61000-4-8** –Power frequency magnetic field immunity test (Level 2, Perf Criteria A)
- **IEC 61000-4-11** –Voltage dips, short interruptions and voltage variations immunity tests (Perf Criteria B and C)

IEC 60825-1 Ed. 3 (2014) -CLASS 1 LASER PRODUCT

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

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

The DATAPixx3 is a complete multi-function data and video processing USB peripheral for vision research. In addition to a dual-display video processor, the DATAPixx3 includes an array of peripherals which often need to be synchronized to video during an experiment. These include a stereo audio stimulator, a button box port for precise reaction-time measurement, triggers for electrophysiology equipment, a complete analog I/O subsystem and an eye-tracking system. Because the video controller and peripheral control are implemented on the same circuit board, you can now successfully synchronize all of your subject I/O to video refresh with microsecond precision.

As with all VPixx Technologies products, the DATAPixx3 is field upgradable. If you need a new feature in order to follow some exciting new direction in your research, we are able to develop your functionality in our labs, and provide you with an update for your DATAPixx3 via email.

Figure 1 - DATAPixx3 unit

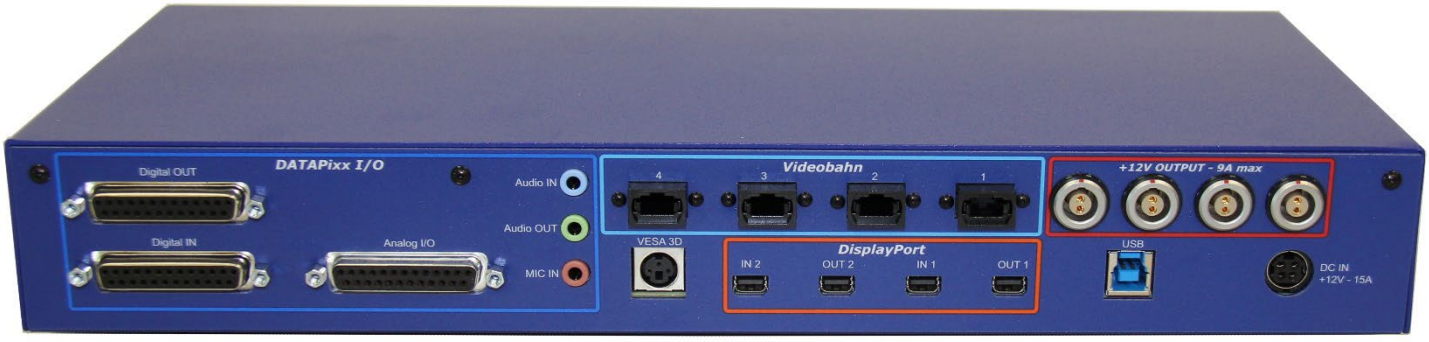


Figure 2 - DATAPixx3 rear panel connectors

Analog I/O connector

The following table shows the analog I/O pin assignment. If you use the analog breakout cable, refer to the associated user manual interconnection.

***Analog I/O functionalities are available only with DATAPixx3 Full version (VPX-DPX-1005C)**

Table 1 - Analog I/O pin assignment

Pin	Description	Pin	Description
1	ADC0	14	ADC1
2	ADC2	15	ADC3
3	ADC4	16	ADC5
4	ADC6	17	ADC7
5	ADC8	18	ADC9
6	ADC10	19	ADC11
7	ADC12	20	ADC13
8	ADC14	21	ADC15
9	REF0	22	REF1
10	GND	23	+5 VDC **
11	DAC0	24	DAC1
12	DAC2	25	DAC3
13	GND	Shield *	

Connector type: D-SUB, 25 pins
Gender: Female

* Shield is tied to the GND by a 0 Ohm resistor inside the DATAPixx3.
** Current limited (400mA).

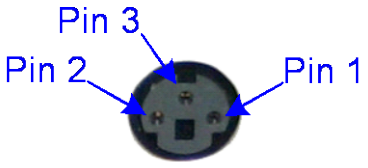
VESA 3D connector

Use this interface when using your VESA 3D glasses. The following table shows the VESA 3D pin assignment.

Table 2 - VESA 3D pin assignment

Pin	Description
1	+5 VDC **
2	GND
3	VESA_LR (+5 VDC)
Shield *	

Connector type: Mini-DIN, 3 pins
Gender: Female



* Shield is tied to the GND by a 0 Ohm resistor inside the DATAPixx3.
** Current limited (400mA).

Digital output connector

The following table shows the digital output pin assignment.

Table 3 - Digital Output pin assignment

Pin	Description	Pin	Description
1	Digital Out 0	14	Digital Out 1
2	Digital Out 2	15	Digital Out 3
3	Digital Out 4	16	Digital Out 5
4	Digital Out 6	17	Digital Out 7
5	Digital Out 8	18	Digital Out 9
6	Digital Out 10	19	Digital Out 11
7	Digital Out 12	20	Digital Out 13
8	Digital Out 14	21	Digital Out 15
9	Digital Out 16	22	Digital Out 17
10	Digital Out 18	23	Digital Out 19
11	Digital Out 20	24	Digital Out 21
12	Digital Out 22	25	Digital Out 23
13	GND	Shield *	

Connector type: D-SUB, 25 pins
Gender: Female

* Shield is tied to the GND by a 0 Ohm resistor inside the DATAPixx3.

Digital input connector

The following table shows the digital input pin assignment.

Table 4 - Digital Input pin assignment

Pin	Description	Pin	Description
1	Digital In 0	14	Digital In 1
2	Digital In 2	15	Digital In 3
3	Digital In 4	16	Digital In 5
4	Digital In 6	17	Digital In 7
5	Digital In 8	18	Digital In 9
6	Digital In 10	19	Digital In 11
7	Digital In 12	20	Digital In 13
8	Digital In 14	21	Digital In 15
9	Digital In 16	22	Digital In 17
10	Digital In 18	23	Digital In 19
11	Digital In 20	24	Digital In 21
12	Digital In 22	25	Digital In 23
13	GND	Shield *	

Connector type: D-SUB, 25 pins
Gender: Female

* Shield is tied to the GND by a 0 Ohm resistor inside the DATAPixx3.

Audio In / MIC In / Audio Out

Audio equipment may be connected through these jacks using standard 1/8” (3.5mm) stereo plugs.

***Audio IN, MIC In and Audio functionalities are available only with DATAPixx3 Full version (VPX-DPX-1005C)**

Audio In

Table 5 - Audio In pin assignment

Pin	Description
TIP	Audio In left
Ring	Audio In Right
Sleeve	GND
Shield *	

Connector type: Stereo 1/8” (3.5mm)
Gender: Jack (female)

* Shield is tied to the GND by a 0 Ohm resistor inside the DATAPixx3.

Audio Out

Table 6 - Audio Out pin assignment

Pin	Description
TIP	Audio Out left
Ring	Audio Out Right
Sleeve	GND
Shield *	

* Shield is tied to the GND by a 0 Ohm resistor inside the DATAPixx3.

MIC In

Table 7 - MIC In pin assignment

Pin	Description
TIP	MIC In left
Ring	MIC In Right
Sleeve	GND
Shield *	

* Shield is tied to the GND by a 0 Ohm resistor inside the DATAPixx3.

DATAPixx3 installation

Installation precautions

Ensure that the location where you place the device meets the following requirements:

- The DATAPixx3 vent is not blocked
- There is enough room behind the DATAPixx3 to allow for good airflow
- While manipulating the system, do not drop the DATAPixx3 or place it on an unstable surface
- Keep the DATAPixx3 in a well-ventilated area, away from excessive light, heat, or moisture
- For rack-mount installations, refer to the associated user manual and use the optional bracket
- All cables (e.g.: analog or digital interface) should be screwed onto the DATAPixx3

Cable installation

1. Connect the USB cable between the DATAPixx3 and your computer
2. Connect the DisplayPort cable between the DATAPixx3 and your computer. Be sure to use the **DisplayPort IN 1** connector on the DATAPixx3
3. Connect remaining components to the DATAPixx3 (TRACKPixx3 eye tracker, console monitor, etc.)
4. Connect the DATAPixx3 power cable to the wall outlet

System first power up and front panel LED information

After the DATAPixx3 is connected to your facility's power outlet, its front panel power button will be RED. This signifies that the system is powered but in an OFF/Standby state. Pressing the power button will activate the system and the power button will turn GREEN. The STATUS and FAULT LEDs should be unlit. If the FAULT LED is RED, it implies an internal fault that should be investigated.

Once the system is activated, one or more of the device's *Videobahn* LEDs will be GREEN indicating that it is connected by fiber optic cable to an appropriate device.

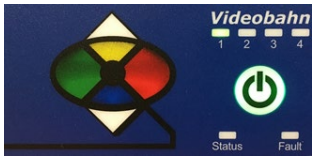


Figure 3 - DATAPixx3 front panel power button and LEDs

Device detection

After pressing the DATAPixx3 power button, your computer should detect the DATAPixx3 and prompt you for the installation procedure. On a Mac OS X system, no driver is required; under Microsoft Windows, a driver must be installed for the DATAPixx3.

For more information on software and driver installation, please refer to the **VPixx Products Application Guide**.

Maintenance and Calibration

The DATAPixx3 does not require periodic calibration activities.

Cleaning the DATAPixx3

Clean the surface of your DATAPixx3 as required and depending on usage.

	***Do not use cleaners that contain any petroleum-based materials such as benzene, thinner, or any volatile substance***

Warranty

The DATAPixx3 is warranted against manufacturing defects in materials and workmanship for a period of two years from the date of purchase.

Specifications

Video processing

- 2x DisplayPort 1.4 inputs (32.8 Gb/sec on each input)
- 2x DisplayPort 1.4 outputs (32.8 Gb/sec on each output)
- Video output format: mirror, haploscope mode, console mode

Videobahn

- 4 Videobahn interfaces are available. Each one can carry up to 48 Gb/sec of video and data in each direction.

Digital input

- Number of digital inputs: 24 on db-25 connector
- Input termination: >20 kΩ pull-up to 3.3 V
- Input tolerance: 5 V

Digital output

- Number of digital outputs: 24 on db-25 connector
- Output drive stage: 5 V through 25 Ω series resistor
- Maximum output current:
    - Source: 15 mA
    - Sink: 12 mA

Analog to digital converter

- Number of channels: 16 (or 8 differential), on DB-25 connector
- Converter resolution: 16 bits
- Maximum sampling rate: 200 kSPS per channel
- Frequency programming modes:
    - Samples per second
    - Samples per video frame
    - Nanoseconds per sample

- Simultaneous sampling across all channels
- Input range: ±10 V
- Input impedance: $1.6*10^8$ Ω //3 pF
- Absolute maximum input tolerance: ±12 V

***ADC functionalities are available only with DATAPixx3 Full version (VPX-DPX-1005C)**

Digital to analog converter

- Number of channels: 4 on DB-25 connector
- Converter resolution: 16 bits
- Maximum sampling rate: 1 MSPS per channel
- Frequency programming modes:

  - Samples per second
  - Samples per video frame
  - Nanoseconds per sample

- Simultaneous output updates
- Output range: ±10 V
- Drive capability: ±25 mA, 250 mW per channel

***DAC functionalities are available only with DATAPixx3 Full version (VPX-DPX-1005C)**

Audio CODEC

- Audio line in, microphone in, speaker out, on 3.5 mm jacks
- Stereo microphone input amplifier resistance: 20 kΩ
- Microphone sampling rate: 96 kHz
- Programmable microphone bias voltage range: 2.0 V to 3.1 V
- Stereo DAC sampling rate 96 kHz

***Audio CODEC functionalities are available only with DATAPixx3 Full version (VPX-DPX-1005C)**

Power input

- Power consumption: 50 Watts (DATAPixx3 only)
- Input voltage: 12 VDC
- International AC adaptor input: 90 VAC – 264 VAC (47 Hz – 63 Hz)

Power output

- 4 power output connectors. Each one can supply a stable +12 VDC. Maximum power output is 108 Watts (9 A)

Software

Software support includes a low-level ANSI C API as well as Psychtoolbox MATLAB / Octave and Python libraries for Mac OS X, Windows XP, Windows 7, Windows 10 and Linux. In addition, the DATAPixx3 is directly supported by VPixx high-level GUI applications.

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