



InfraRed Illuminators

Hardware Documentation

1 April, 2026

Table of Contents

1	Product Overview	3
2	Product Details.....	4
2.1	Infrared emitter	4
2.2	Interface cable	4
3	Assembly and Installation.....	6
3.1	What’s included.....	6
3.2	Mounting the illuminator on the TRACKPixx3 tabletop and screen mounts	7
4	Product Usage	9
5	Product Specifications	11
6	Cleaning and Maintenance.....	12
7	Troubleshooting your Device	13
8	Related Links.....	14
9	Compliance, Safety and Warranty Information.....	15
9.1	For the United States of America.....	15
9.2	For Canada.....	15
9.3	For European Countries.....	16
9.3.1	DECLARATION OF CONFORMITY	16
9.4	The following information is only for EU member states:.....	17
9.5	Declaration of RoHS Compliance	17
9.6	Safety precautions.....	18
9.7	Risk of fire and injury	18
9.8	Product care.....	18

1 Product Overview

The TRACKPixx3 2 kHz eye tracking system includes an infrared illuminator. During operation, the infrared lamp illuminates the eyes with invisible infrared light, which reflects off the cornea. This reflection, along with the darker pupil, is captured by the TRACKPixx3; our image processing algorithm converts this into an estimate of the participant's gaze. Infrared light is used because it reduces the influence of ambient lighting, is non-intrusive, and allows for precise tracking of eye movements.

This documentation focuses exclusively on the infrared illuminator. For our TRACKPixx3 camera hardware manual, see: [TRACKPixx3 Eye Tracker](#).

VPixx offers three different models of infrared illuminators, with different peak wavelengths and operational ranges:

Product code	Name	Application	Ideal operating range (measured from camera-eyes)	Recommended TRACKPixx3 lens
VPX-TRK-9000	InfraRed Short-Range 850nm illuminator	Humans	40 - 90 cm	50 mm
VPX-TRK-9002	InfraRed Short-Range 940nm illuminator	Non-human primates	40 - 90 cm	75 mm
VPX-TRK-9010	InfraRed Long-Range 850nm illuminator	Humans	100 - 180 cm	75 mm

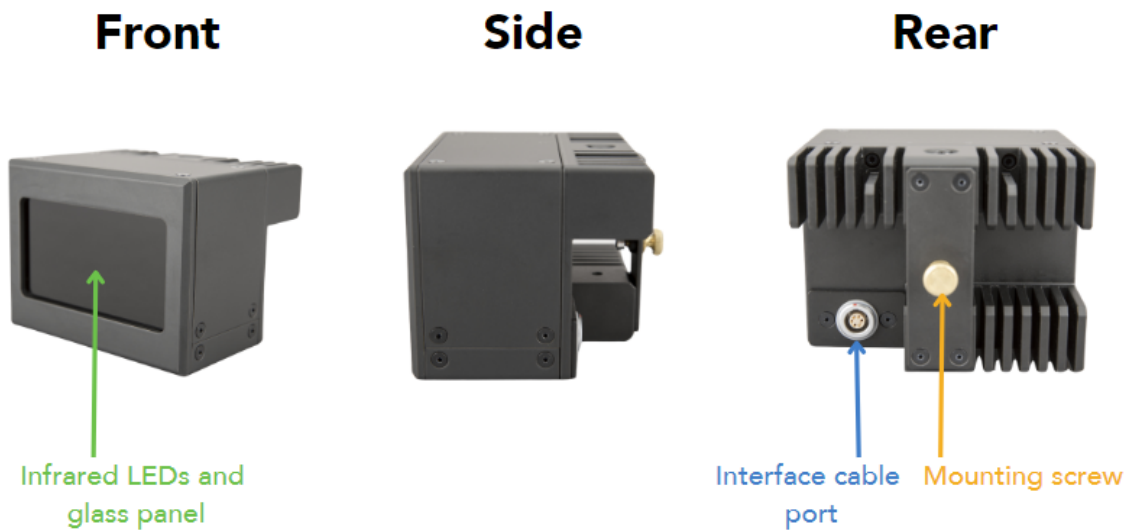
These units are interchangeable and may be used with the same TRACKPixx3 unit for different research configurations. Note that depending on the application, you may need to change the lens on the TRACKPixx3 in addition to the illuminator (see chart above). Illuminators and lenses may be purchased directly from VPixx Technologies as needed.

This page provides hardware, installation and safety information for all three of VPixx Technologies Inc.'s infrared illuminators. The information provided here applies to all three models unless otherwise specified.

2 Product Details

2.1 Infrared emitter

The infrared emitter contains an array of infrared light-emitting diodes behind a glass panel. The rear of the unit features a slot for mounting it on the TRACKPixx3 mounting bracket and a port for the LEMO interface cable.



1 Infrared illuminator front, side and rear views

2.2 Interface cable

The infrared illuminator has a 6-pin LEMO female port on the rear of the unit. The interface cable connects this port to a 7-pin LEMO port on the back of the TRACKPixx3 camera. The wiring is a straight connection (e.g., 1-1 mapping of pins) except for pin 7 on the TRACKPixx3 camera end, which is floating.

The connection from the TRACKPixx3 provides power and configuration settings to your illuminator. For pin assignment, expand the section below.

LEMO connector information

Pin #	Description	Additional information
1	+12 VDC power supply	Connect the +12 VDC input to a stable power supply. This pin requires 650 mA.

2	+5 VDC power supply	Connect the +5 VDC input to a stable power supply. This pin requires 50 mA.
3	Factory usage, do not connect	
4	PWM input	Drive PWM with a pulse-width modulated signal with a duty cycle ranging from 0% to 100% and a frequency range between 20 Hz and 50 kHz to control the brightness. If you leave this pin floating, the InfraRed illuminator will have full brightness at power up.
5	Factory usage, do not connect	
6	GND	Connect the GND input to the ground system.

Connector type: EGG.1B.306.CLL or equivalent.

Mating connector type from LEMO: FGG.1B.306.CLAD52Z or equivalent.



If you use the illuminator in stand-alone mode (without a DATAPixx3 system), ensure that your power source limits current to a maximum of 2.5A on the 12V and 5V rails

3 Assembly and Installation

3.1 What's included

The following components are included in your infrared illuminator purchase:

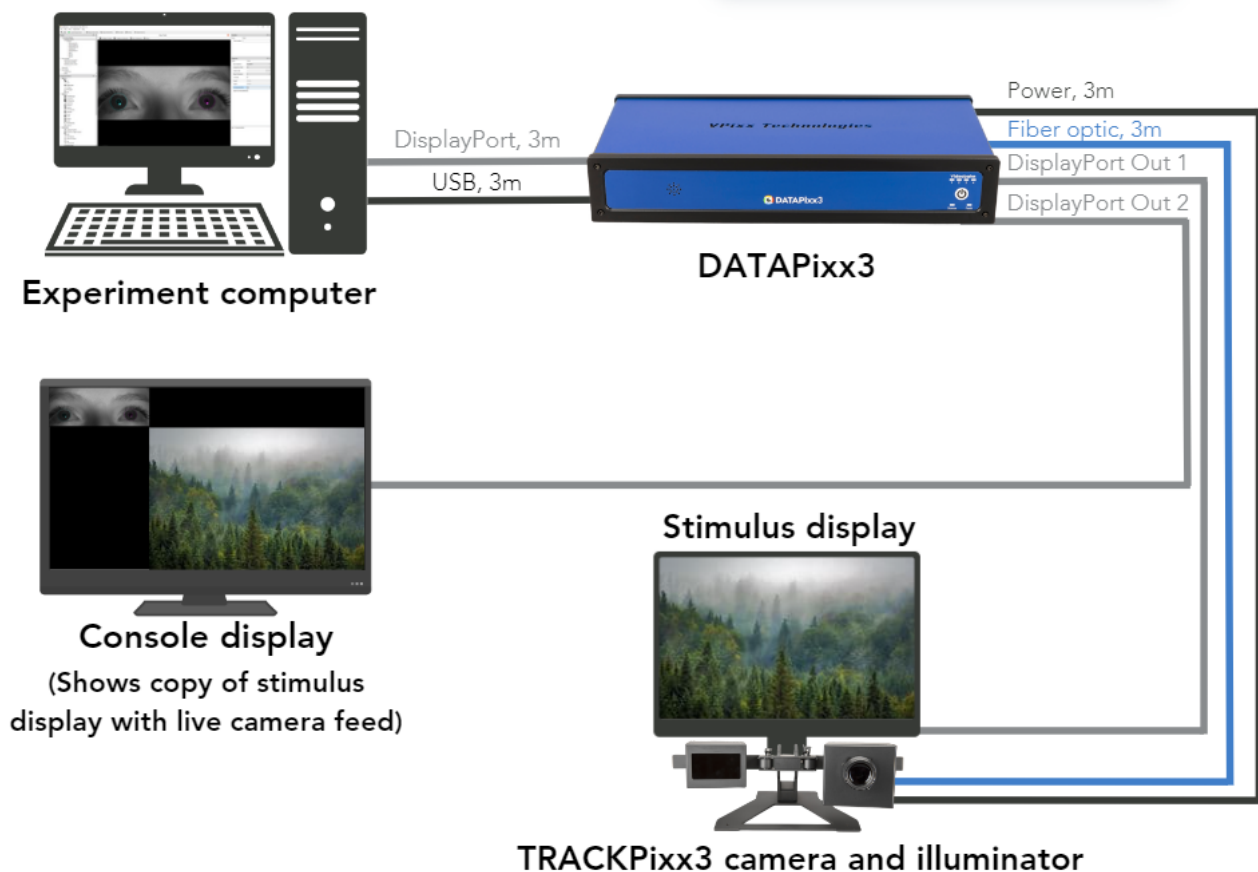
- One infrared illuminator (see Product Overview for the three options)
- An interface cable

General layout of the TRACKPixx3 system

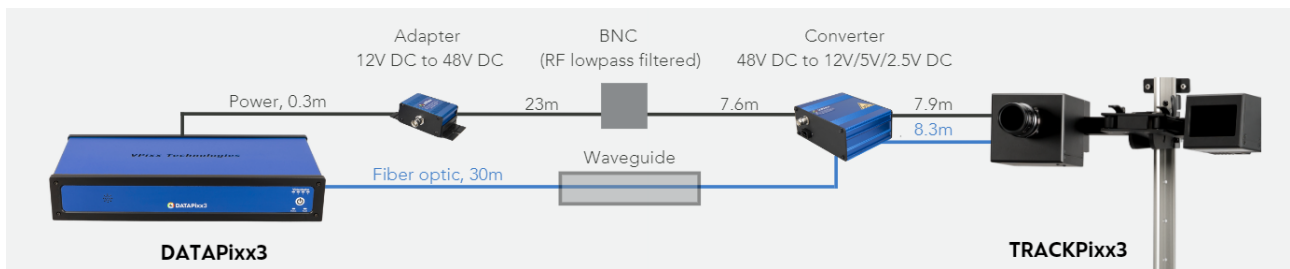
Below are two schematics showing the general layout of the TRACKPixx3 in the tabletop and MRI/MEG configurations. In both cases, the infrared illuminator is mounted opposite the camera on the provided mounting system, and an interface cable connects the two devices.

For more details on installing the full system, see our [TRACKPixx3 hardware manual](#).

Note that a screen mount, as shown in the MRI/MEG installation, can be used in behavioural settings as well. Simply ask our team for your preferred mounting solution when making your purchase.



2 TRACKPixx3 tabletop configuration



3 TRACKPixx3 MRI/MEG installation. Experiment computer, stimulus display and console monitor not shown

3.2 Mounting the illuminator on the TRACKPixx3 tabletop and screen mounts

The rear of the infrared illuminator has a mounting screw which can be loosened, allowing the illuminator to slide onto the mounting arm of either the tabletop or screen mount. *It does not matter which arm you mount it on, provided the camera is mounted on the other side.*

Once the illuminator is positioned on the arm, tighten the mounting screw to secure the illuminator in place.

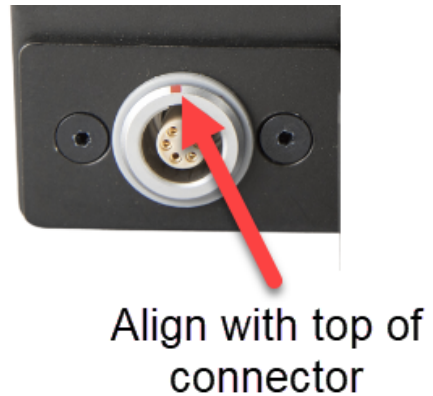
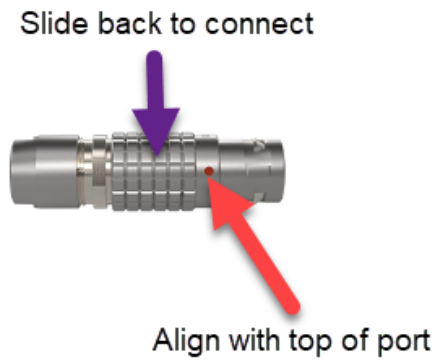


Ideally, the illuminator should be angled to beam directly into the participant's face. Due to differences in the height, face shape and positioning of different participants, you may be required to adjust the illuminator and camera position/angle for each data collection session. For more general tips on setting up your eye tracker, see our [TRACKPixx3 Calibration Walkthrough](#).

Connecting the LEMO interface cable

The LEMO connector is designed to fit securely in the illuminator's interface port. To attach the connector to the illuminator:

1. Identify the 6-pin end of the interface cable
2. Slide back the textured ring on the male connector and align the orange dots on the connector and port:



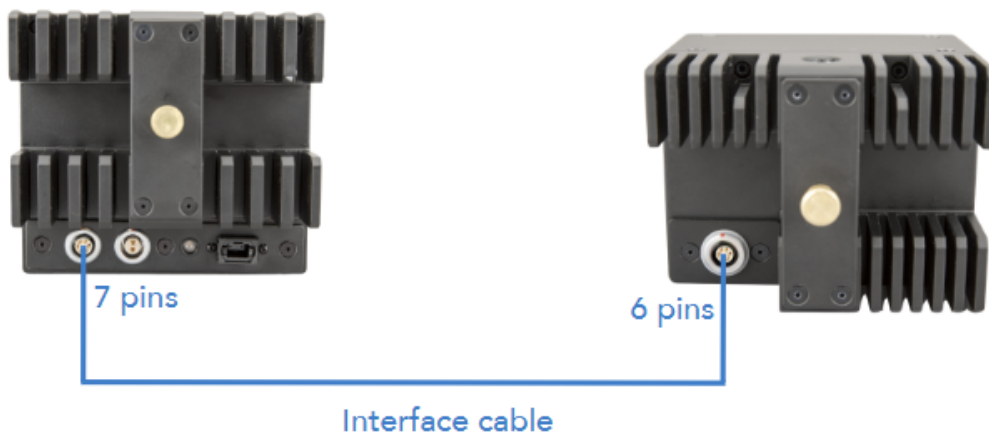
4 LEMO male connector details

5 LEMO female port details

3. Insert the connector firmly into the port
4. Release the textured ring to lock the connector in place.
5. Repeat this process to connect the 7-pin cable end to the corresponding port on the rear of the TRACKPixx3 camera.

TRACKPixx3 camera

Infrared illuminator



6 Interface cable details

4 Product Usage



Please read all safety information carefully before using this device.

The infrared illuminator is used in conjunction with the TRACKPixx3 eye-tracking system. Its settings can be configured via the [LabMaestro software suite](#) or our [MATLAB](#) and [Python](#) command libraries.

The infrared illuminator has 9 intensity levels, ranging from 0 (fully off) to 8 (fully on). **We recommend using a maximum intensity of 8 for all applications. This is the default intensity setting.**

MATLAB

```
%connect
Datapixx('Open');

%set intensity
myIntensity = 8;
Datapixx('SetLedIntensity', myIntensity);

%push new settings to hardware
Datapixx('RegWrRd');

%disconnect
Datapixx('Close');
```

Python

```
from pypixxlib import _libdpx as dp

#connect
dp.DPxOpen()

#set intensity
myIntensity = 8
dp.TPxSetLEDIntensity(myIntensity)

#push new settings to hardware
dp.DPxUpdateRegCache()

#disconnect
dp.DPxClose()
```

LabMaestro

1. In the Project menu, under Environment, double-click on the TRACKPixx3. This will open a settings panel.
2. In the Lighting section, adjust the slider to set the LED intensity:

The screenshot shows the TRACKPixx3 settings panel. At the top, there are buttons for 'Add to Project', 'Diagnostic...', 'Update Firmware...', and 'Sleep'. Below these is the 'Device Settings' section, which includes an 'Apply All' button and a message: 'Device must be added to project in order to specify and apply required settings.' The settings are organized into two main sections: 'General' and 'Lighting'. The 'Lighting' section is highlighted with a red box and contains an 'Infrared Intensity' slider set to 8. The 'General' section includes settings for 'Gaze Vector Mode' (Pupil with Corneal Reflection), 'Console Overlay Mode' (Full Stimuli No Tracker), 'Distance (cm)' (0), 'Species Optimizations' (Human), 'Fixation Detection' (44.85732DVA/s, 0.0125s), and 'Saccade Detection' (179.42928DVA/s, 0.005s). At the bottom, there is a 'Custom Name' field and an 'Edit' button.

3. You must add the TRACKPixx3 to a project to apply your settings. Once you have added the TRACKPixx3 to your project, click on Apply All to enable your settings changes.

5 Product Specifications

Specification	VPX-TRK-9000	VPX-TRK-9002	VPX-TRK-9010
Designation	Short-range		Long-range
Application	Human	Non-human primate	Human
Power requirement	+12 VDC – 650 mA +5 VDC – 50 mA		+12 VDC – 300 mA +5 VDC – 50 mA
Wavelength	850 nm	940 nm	850 nm
Maximum radiation	15 W/m ² @ 40 cm		15 W/m ² @ 100 cm
Optimal range of use	40 - 90 cm		100 - 180 cm
Illumination angle	20°		6°
Operating temperature	0° C to 70° C		

6 Cleaning and Maintenance



Do not use cleaners that contain any petroleum-based materials such as benzene, thinner, or any other volatile substance to clean any part of this product.



Do not soak or immerse the product in liquid, as it is an electronic device that can be damaged or impaired by moisture. Do not apply pressure to, impact, or rub the sensitive product surface.

Your infrared illuminator does not require calibration and contains no serviceable parts.

To clean, disconnect the power to the unit and wipe the metal chassis and glass surface with a damp microfiber cloth. The port may be optionally cleaned using compressed air.

7 Troubleshooting your Device

For troubleshooting your TRACKPixx3 eye tracking system, see the troubleshooting section of our TRACKPixx3 hardware documentation: [TRACKPixx3 Eye Tracker](#).

8 Related Links

- [Introduction to Eye Tracking with the TRACKPixx3](#)
 - [TRACKPixx3 Calibration Walkthrough](#)
 - [Using the TRACKPixx3 within LabMaestro](#)
-

9 Compliance, Safety and Warranty Information

Click on the sections below to expand the relevant information.

Compliance Information



Intertek Safety Mark: Compliance of this product with IEC 60950-1:2005, IEC 62471 is certified by Intertek, an independent testing body.

CLASS 1 LED DEVICE

IEC 62471 and IEC 60950-1:2005

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous infrared radiation exposure.

9.1 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.


9.2 For Canada

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

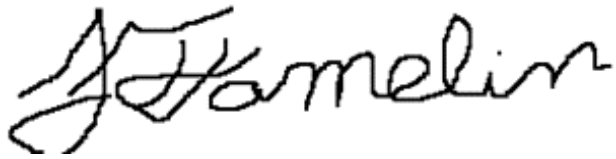
CISPR warning: This is a Class A product. In domestic environments this product may cause radio interference in which case the user may be required to take adequate measures.

9.3 For European Countries



9.3.1 DECLARATION OF CONFORMITY

	<p>Manufacturer's Name: VPixx Technologies Inc.</p> <p>Manufacturer's Address: 630 Clairevue West suite 301 Saint-Bruno, Qc Canada, J3V 6B4</p>
---	---

<p>Product Name: InfraRed Short-Range 850nm, InfraRed Short-Range 940nm, InfraRed Long-Range 850nm Part Numbers: VPX-TRK-9000, VPX-TRK-9002, VPX-TRK-9010 Product Options : All Application of Council Directive:</p>	
<p>2014/30/EEC 2015/863/EU 2012/19/EU</p>	<p>Electromagnetic Compatibility directive Restriction of Hazardous Substances Directive Waste Electrical and Electronic Equipment directive</p>
<p>The following harmonized standards have been used:</p>	
<p>EN 61326-1:2013 IEC CISPR 11 IEC 61000-3-2 IEC 61000-3-3 IEC 61000-4-2 IEC 61000-4-3 IEC 61000-4-4 IEC 61000-4-5 IEC 61000-4-6 IEC 61000-4-8 IEC 61000-4-11 IEC 60950-1 Ed.2 2005 IEC 62471</p>	<p>Electrical equipment for measurement, control and laboratory use. Radio frequency disturbance characteristics (Class A) Limits for harmonic current emissions (Class D) Limitation of voltage changes, voltage flicker ($\leq 16A$ per phase) Electrostatic discharge immunity test (Level 2 contact, air) (Perf Criteria B) Radiated, radio-frequency, electromagnetic field immunity test (Level 2, Perf Criteria A) Electrical fast transient/burst immunity test (Level 2, Perf Criteria B) Surge immunity test (Level 2, Perf Criteria B) Immunity to conducted disturbances, induced by radio-frequency fields (Level 2, Perf Criteria A) Power frequency magnetic field immunity test (Level 2, Perf Criteria A) Voltage dips, short interruptions and voltage variations immunity tests (Perf Criteria B and C) Information Technology Equipment - Safety Photo biological Safety of Lamps and Lamp Systems</p>

	<p>SUPPLEMENTARY INFORMATION</p> <p>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.</p> <p>Signature:</p>  <p><i>7 Jean-François Hamelin, Eng., Vice-President</i></p>
--	---

9.4 The following information is only for EU member states:

 	<p>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</p>
---	--

9.5 Declaration of RoHS Compliance

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

Safety and Warnings



Please review the following warnings before using this product. Ensure you understand and obey the following precautions when using this device.



The infrared light from the illuminator is invisible under most viewing conditions. It is still dangerous to look directly into the light source from a close distance.

The minimum safe distance for the short-range illuminators is 40 cm or greater.

The minimum safe distance for the long-range illuminator is 100 cm or greater.

These distances ensure an exposure of less than 15 W/m². Exposure decreases as the square of the distance, so even slightly larger distances will reduce exposure significantly.

UNDER NO CIRCUMSTANCE SHOULD a participant or researcher have their eyes closer than 10 cm (4 inches) from any of the illuminators.

9.6 Safety precautions

- As a Class 1 LED device, the illuminator is compliant with the IEC-62471 LED safety standard, which regulates LED and laser eye and skin safety. Class 1 LED devices are safe under most operational and testing conditions. As the infrared illuminator may be used in test and laboratory conditions where a subject may be exposed to its infrared emissions for protracted periods, precautions must be taken, mainly to ensure maximum subject comfort.
- Specifically, we recommend monitoring the participant's well-being with frequent checks regarding eye strain, fatigue and discomfort. Offer breaks as necessary.

9.7 Risk of fire and injury

- The infrared illuminator may become warm during operation. Be careful when handling the device, and power down/cool off the unit as needed.

9.8 Product care

- Do not expose any components of the illuminator to adverse weather conditions such as rain, water, heat, cold or abnormally high levels of humidity.
- Unplug the system before cleaning, and refer to the appropriate cleaning procedure in the maintenance section of this document to clean any component.
- Handle the interface cable carefully. Never use a damaged interface cable.
- Ensure that adequate air circulation surrounds the illuminator

- In the event of failure, the illuminator should be replaced. There are no user-serviceable/adjustable parts inside. Contact VPixx Technologies Inc. for repair or replacement as required.

Warranty Information

This product is warranted against manufacturing defects in materials and workmanship for two (2) years for parts and labour from the date of shipment.