

# PicoP<sup>®</sup> Display Engine Evaluation Kit, 3<sup>rd</sup> Generation (PEK3 with HDMI)

## User's Guide



P/N: AB0132186-001



### Contact info:

Technical Support

Phone: 1-866-662-3797 (Monday through Friday 6:00 am – 5:00 pm PST)

[techsupport@microvision.com](mailto:techsupport@microvision.com)

## PicoP® Display Engine EVALUATION KIT IMPORTANT NOTICE

The enclosed PicoP® Evaluation Kit (PEK3) is intended for use for **ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY** and is not considered by Microvision Inc., to be fit for commercial use. As a prototype, this device may not meet the technical requirements of the European Union directive on electromagnetic compatibility.

The user assumes all responsibility and liability for proper and safe handling of the PEK3. Also, be aware that the enclosed unit may not be regulatory compliant or agency certified (such as FCC, UL, CE, etc.) with the exception of IEC 60825-1 Laser Safety. It is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge. Microvision assumes no liability for application assistance, customer's product design, or software performance.

Please read the User's Guide and, specifically, the Warnings and Safety Information in the User's Guide prior to handling the enclosed unit. Persons handling the unit must have basic electronics training and observe good laboratory practice standards. For further concerns please contact Microvision's technical support at Tel: 866.662.3797 or e-mail [techsupport@microvision.com](mailto:techsupport@microvision.com).

Mailing Address: Microvision, Inc. 6222 185th Avenue NE, Redmond, WA 98052

**Limited Warranty.** The PEK3 is a prototype device. Microvision warrants that the PEK3 sold pursuant to this Agreement will be free of defects in material and workmanship for forty-five (45) days from the shipping date. Microvision will at its option, repair or replace the PEK3 or refund the purchase price paid by Customer for the defective PEK3. The repaired or replaced parts or PEK3 may include new, reconditioned or re-manufactured parts and equipment at Microvision's option. Such repair, replacement or refund shall be the sole remedy of Customer in the event of Microvision's breach of this limited warranty. All costs associated with shipment to Microvision for warranty service, including but not limited to freight, duties, insurance and customs fees are Customer's responsibility. Microvision will pay the freight costs (duties, insurance, customs and any other fees are Customer's responsibility) associated with the return shipment to Customer. The method of shipment will be at Microvision's discretion. Repair or replacement of any parts or equipment does not extend the period of warranty provided for herein. If a component Microvision bought from a third party fails and the component is still covered by a warranty from a third party, Microvision will take reasonable action to pass that warranty on to Customer. **THIS LIMITED WARRANTY IS MICROVISION'S ONLY WARRANTY. MICROVISION EXPLICITLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

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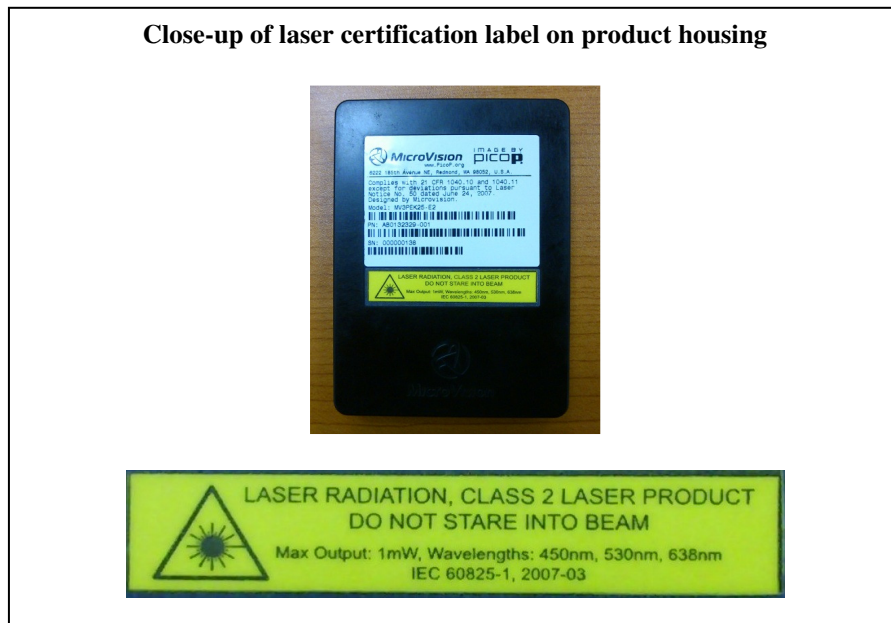
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# CHAPTER 1: IMPORTANT INFORMATION

## Safety Information

The PicoP® Evaluation Kit (PEK3) embeds a CLASS 2 LASER PROJECTOR MODULE as defined in IEC60825-1, 2007-03. The device complies with IEC 60825-1, 2007-03. The device also complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50 dated June 24, 2007.

**The following safety labels are affixed at the factory.  
DO NOT REMOVE THESE LABELS**



## Caution & Warnings

Each PEK3 user must read this guide and have it at hand for reference during operation.

### Warnings regarding use and care of the PEK3:



**Caution**

The PEK3 is a Class 2 Laser Product. AVOID DIRECT EYE EXPOSURE.

Do not point the projected image at people, moving vehicles or aircraft.

Use of controls or adjustments or performance of procedures other than those specified in this user guide may result in hazardous laser radiation exposure.

### Service & Maintenance



**Warning**

**THERE ARE NO OPERATOR SERVICABLE PARTS INSIDE THE PEK3.**

For preventive maintenance or repair of performance-related issues, the system must be returned to Microvision. Contact information labeled on the front of this guide to coordinate returns.

The PicoP Display Engine uses internal components that produce Class 2 visible and invisible laser radiation.

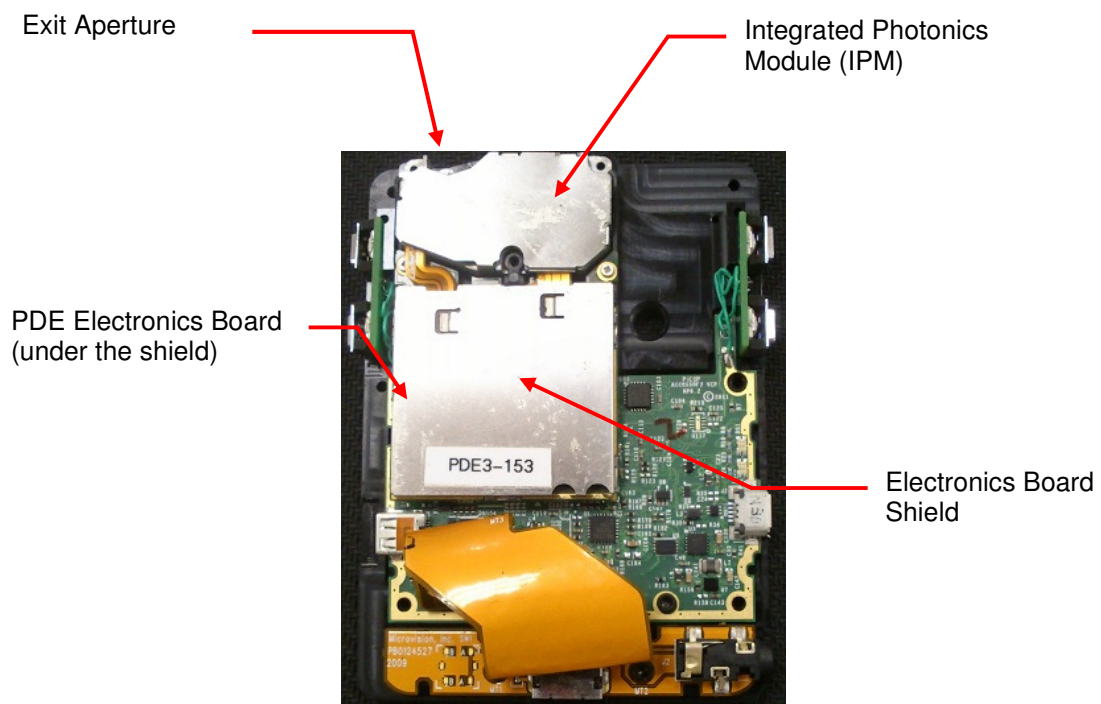
**Do not remove label or enclosure around the Projection Module.**

**Please do not disconnect the optical module from the electronics module.** Each PDE module is calibrated and optimized for the specific MEMS/Laser combination in the unit. These unique calibration settings are stored in the PDE's electronics and are key inputs into the individual PDE's system performance, image quality, & laser product classification rating. Combining the incorrect boards/optical modules, could damage the mirror. More importantly, this will invalidate the laser product classification certification for the module and will invalidate any warranties that may apply. The PicoP Display Engine is Microvision, Inc. Proprietary & Confidential under our Non-Disclosure Agreement (NDA).

## CHAPTER 2: DEFINITIONS

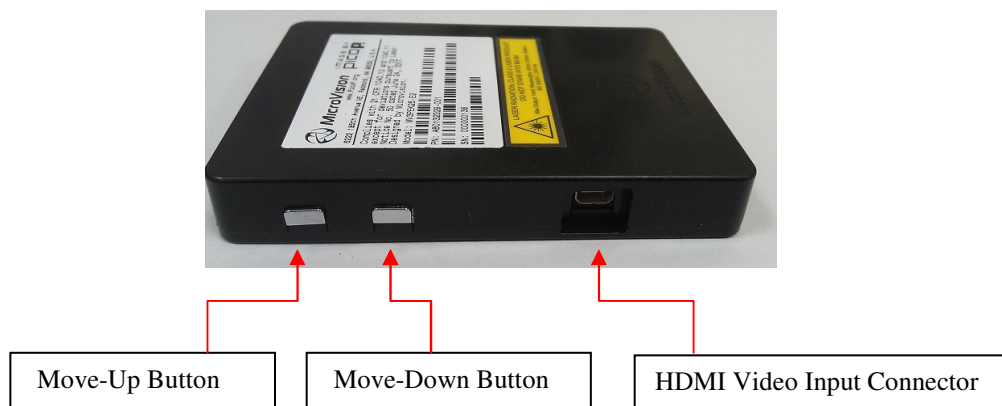
### PicoP<sup>®</sup> Display Engine (PDE)

The PDE consists of an Integrated Photonics Module (IPM) and drive electronics board. The PDE electronics is enclosed in EMI shield as shown below.



## PicoP® Evaluation Kit (PEK3)

The core of PEK3 is a PDE. PEK3 provides an enclosure and covers (mechanical case) for the PDE. The PDE interfaces to a media module that allows the customer to connect to their preferred video source. The video interfaces supported by PEK3 are HDMI and VGA.



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## CHAPTER 3: GENERAL INSTRUCTIONS

### Input Video

The PDE module accepts digital RGB (5-6-5) video input. PEK3 with HDMI is equipped with VGA and HDMI interface. VGA and a HDMI video cables are included with the shipping kit to enable user to connect it to a PC or other video host device.

### PEK3 Operation

**Turning ON:** PEK3 is powered through the USB port. After connecting the USB port to a computer or an external DC adapter, press and release the POWER switch once. After a few seconds, the SPLASH SCREEN will appear. The image may appear to fluctuate while the lasers are initializing; this may take up to 30 seconds in some cases.

**Turning OFF:** Press and hold the POWER switch for 1 second until the image disappears.

### How to connect a video source to PEK3

With the PEK3 powered OFF, insert the VGA or HDMI cable supplied in the kit into the VGA or HDMI connector on the VGA/HDMI Media Module. Make sure the connector is properly oriented as it only fits one way. Connect the other end of the cable into the video source.

#### NOTES:

- No manual configuration is required on the PEK3. PEK3 will automatically recognize input VGA or HDMI video format. Display settings will be adjusted on the PC to allow external display.

### How to use a PEK3 with a PC or a Mac

To operate the PEK3 with a laptop or a desktop computer please use the following instructions:

1. Verify the PEK3 is connected to a PC or a Mac per the above procedure. You can choose connect PEK3 to the VGA port or HDMI display port (if present).
2. Turn on the PEK3 and the PC or the Mac.
3. The PC or Mac will auto detect the acceptable PEK3 video input resolutions. The PEK3 acceptable input resolutions are 1280 x 720 pixels.
4. Select the video signal to display through the port which the PEK3 is connected to.

NOTE: The PEK3 operates in the “wide” video format (16:9 aspect ratio).

### How to Store & Transport

Store and transport the PEK3 in the case provided. Avoid exposure to extreme temperature and humidity. Take precautions not to drop the unit or place in an environment subject to spilled liquids.

### Thermal Management

A heat sink is included with the PEK3. If the PEK3 heat sink is not used, please provide appropriate thermal management to dissipate 3.5 W while not exceeding temperature at PDE case above 55 °C.

## Troubleshooting

Problem	Remedy
No power	Check if power cable is properly inserted. Microvision splash screen should come up.
No video(1)	Check if unit is turned on. Make sure video cable is inserted properly into the connector and blue LED is on.
No video(2)	If the PEK2 with HDMI is powered through the USB interface, check whether cable is a shielded cable or whether the cable is too long. Try to use a shielded USB cable with its maximum length per USB interface specification .

## CHAPTER 4: USE SOFTWARE DEVELOPMENT KITS

The PicoP<sup>®</sup> Display Engine SDK for Windows allows developers to quickly and easily integrate PicoP Projector control into a Windows/Linux/Mac application. The Windows/Linux/Mac Application can communicate with PicoP Display Engine over USB. The SDK package includes the Application Programming Interface (API), SDK libraries, documentation, and sample projects that demonstrate use of some basic PicoP Display Engine (PDE) functions.

The Windows SDK Libraries and Sample Console Application are built with Visual Studio 2010. The Linux and Max OS X SDK Libraries and Sample Console Application are built with gcc tools. The Sample Qt applications are built with QtCreator tools.