BRILLIANCE

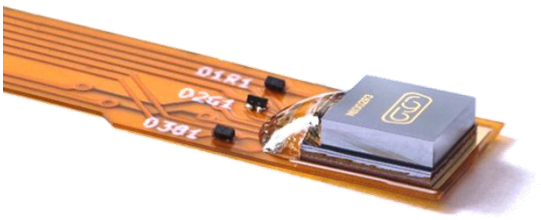
The future is visible

Neptune Demo Kit

Integrated Miniature RGB Laserchip “Neptune”

Overview

Neptune is the first monolithic Photonic Integrated Circuit (PIC) to combine RGB lasers into a single white beam. Neptune laserchip is ideally suited for AR displays and industrial applications requiring small form factors, high efficiency, low cost, and durability. Free of discrete components that require delicate alignment, Neptune is >10x smaller than conventional laser combiners with the added advantage of the ability to tune the numerical aperture of the exit pupil to minimize insertion loss in other optical elements. The Neptune Demo Kit allows you to quicky perform stand-alone experiments or integrate into your system design for quick and easy evaluation.





For orders and more information contact us at info@brillianceRGB.com
or visit www.brilliancergb.com

Kit Contents

- Two Neptune modules
- Demonstrator driver board
    - Includes push-button activation for predefined pulsed sequences
    - Settings configurable via Brilliance demonstrator software
- Ribbon flat cable FFC-FPC
    - 10-pin, 1 mm pitch
    - Length: 29.7 cm
    - Width: 1.1 cm
- Flex PCB
    - ESD protective diodes SP0201B-ULC-012UTG
    - 10-pin, 0.5 mm pitch
    - Length: 7.9 cm
    - Width: 6.3 cm
- Heatsink - Optional
    - Aluminum heatsink with size of 1.5 mm x 11.3 mm x 6.3 mm to help heat conduction.
- Breakout PCB
    - Interface between flex PCB and ribbon flat cable FFC-FPC
    - Molex 200528-0100 connector
    - Molex 503480-1000 connector

Neptune Demo Kit Details

Neptune Module

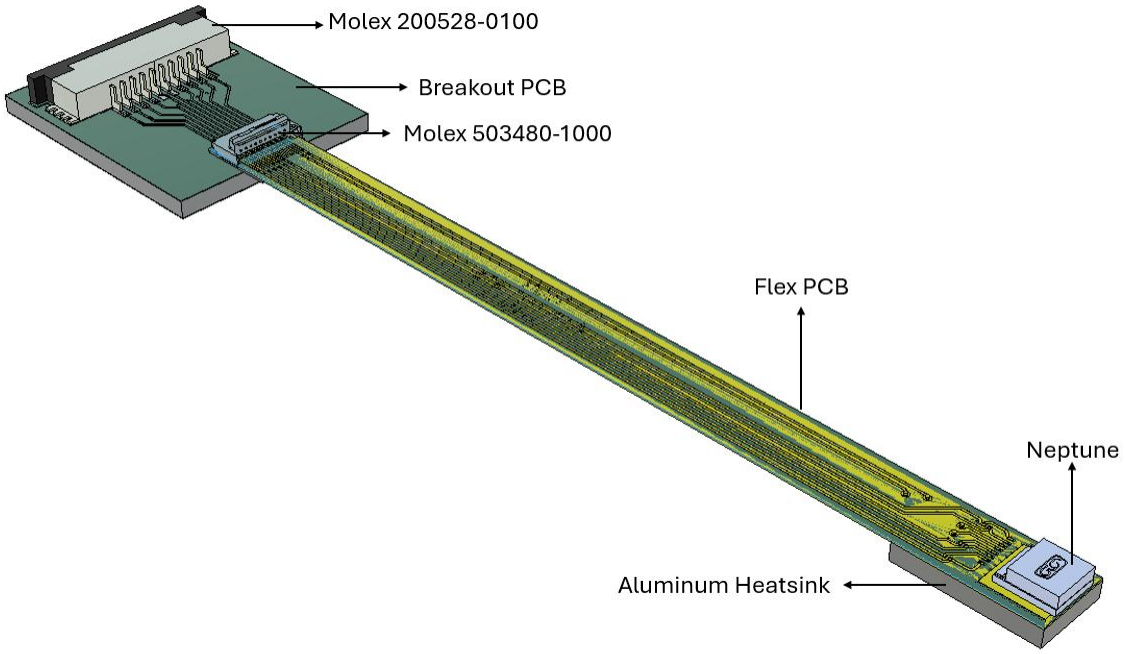


- PIC assembly – Neptune with cap
- Connections are provided via gold pads, designed for wire bonding. This setup ensures reliable electrical contact and allows for easy integration and handling by engineers during development and testing.
- Optical output directly from PIC.

Neptune Module on Demo Board

- Neptune laserchip is mounted on flex PCB, and connected to breakout PCB with ribbon flat cable connection to drive the electronics.
- ESD protection with SP0201B-ULC-012UTG diode series.

- Aluminum heatsinks underneath the flex PCB where Neptune can be mounted, to provide better thermal conduction, and to act as stiffener making the configuration more robust.



Demonstrator Driver

- RGB laser driver Hammond box (2.3cmx4.3 cmx6.6cm)
- Connects to Neptune Demo Board PCB through the flat ribbon cable
- USB-C connector for control and power
- Trigger button functionality



Brilliance demonstrator – Quick start guide on driver software

The Brilliance demonstrator software allows:

- Control laser current for 3 lasers on CW individually or simultaneously
- Readout of NTC temperature
- Demo mode (changing colours and power) for basic modulation

System Requirements: Windows 10 or newer

Note: To install the Brilliance Demonstrator, it is necessary to have .NET Desktop Runtime installed. Find more information in: https://aka.ms/dotnet/app-launch-failed .

Steps:

Step 1. Connect driver to the computer with USB-C port: launch the Brilliance demonstrator software → select the correct USB Serial Port → click connect

Step 2. Laser diode control – CW mode:

- Control Red, Green and Blue laser diodes individually.
- The slide bars per laser diode maximum correspond to 100 mA.
- To prevent damaging the lasers, the laser maximum currents should be set to:

	BRL-02a-P-L	BRL-02b-P-L	BRL-02c-P-L
Red	90 mA	225 mA	90 mA
Green	70 mA	110 mA	110 mA
Blue	45 mA	87 mA	87 mA

Step 3. Set current using:

- Slider bar
- Manual value input

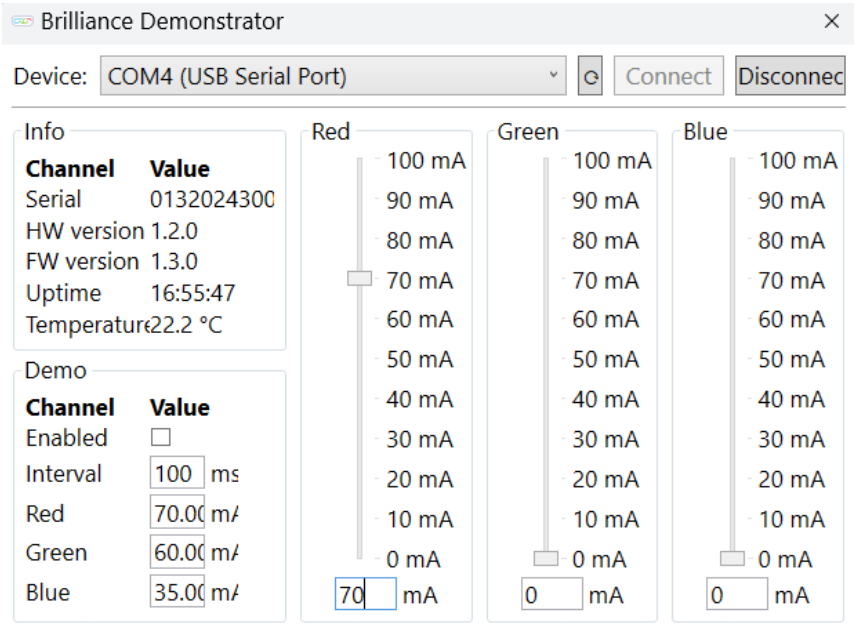


Figure 1- Frame of the Brilliance Demonstrator on CW mode. Only Red Laser Diode is activated in this scenario

Step 4. Info box displays:

- Serial number of the driver
- Uptime (time since powered ON)
- NTC temperature readout

Demo box – Basic modulation mode:

Allows activation of the Demo Mode (pre-defined loop) with basic laser modulation. For that, it is needed to:

- Check enabled → set interval (ms) → Set the current of each laser diode (mA)

> Note: The interval should be >3ms
> Note: When the Demo Mode is enabled, it overrides the CW mode settings

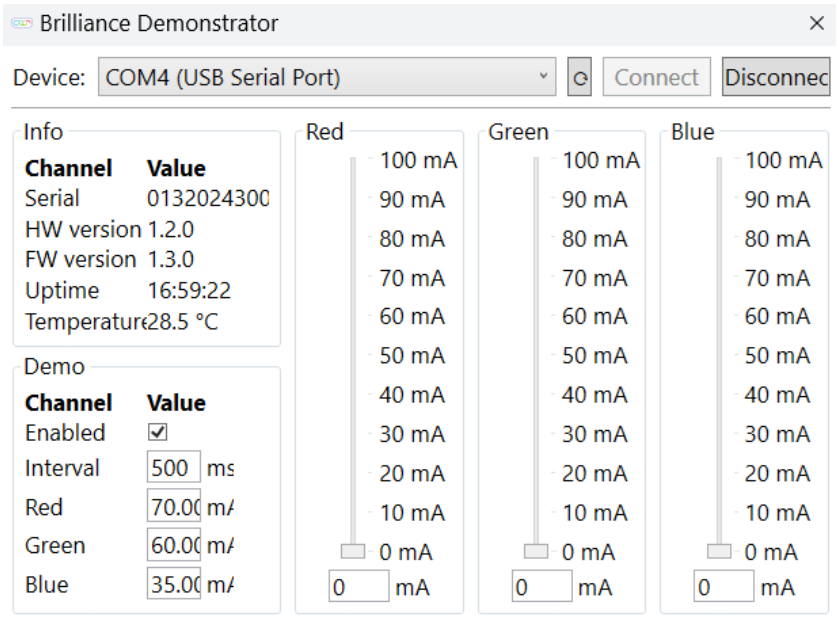
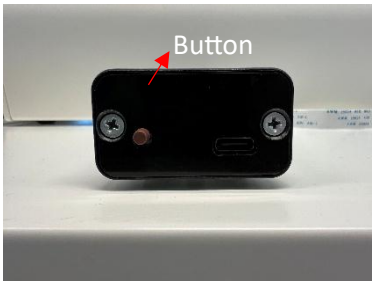


Figure 2- Demo mode with basic modulation. Loop with 500 ms interval between each laser diode channel.

To Exit → Click Disconnect → Close the software window

Trigger button functionality – how to use it?

As shown in the figure, the driver has a dedicated button. When pressed, this button activates the Neptune in a predefined sequence using the settings configured in the Demo Mode from Brilliance demonstrator software. Once the desired parameters have been set, they are stored for future use, allowing the user to simply press the button to start the sequence, without needing to reconfigure the software.



Common errors

The Brilliance demonstrator is stable, nevertheless, there can be some difficulties:

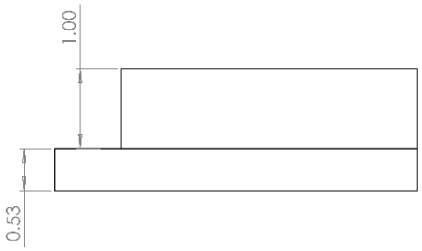
- Identifying the COM port number your device is using:
  - Open Device Manager → ports (COM & LPT) section → verify the COM port
- What if the device is not appearing under COM ports?
  - The device might not be properly connected, or it could need a driver update.
- Sometimes when connecting to the correct COM, an error message might appear:
  - It can be quite random and rare, but if appears, please disconnect, close the Brilliance demonstrator software and re-launch the software again.

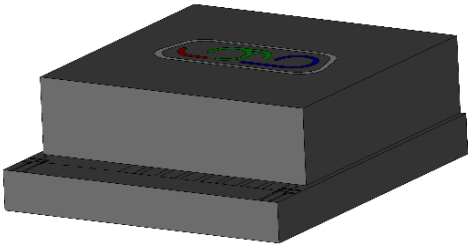
If any problems persist or new issues arise, please contact Brilliance RGB at support@brilliancergb.com

Neptune dimensions

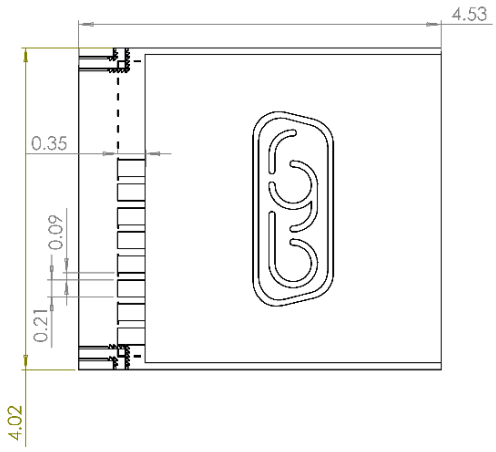
All dimensions are presented in mm.

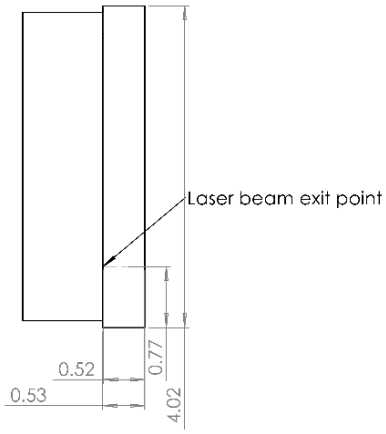
SCALE 20 : 1





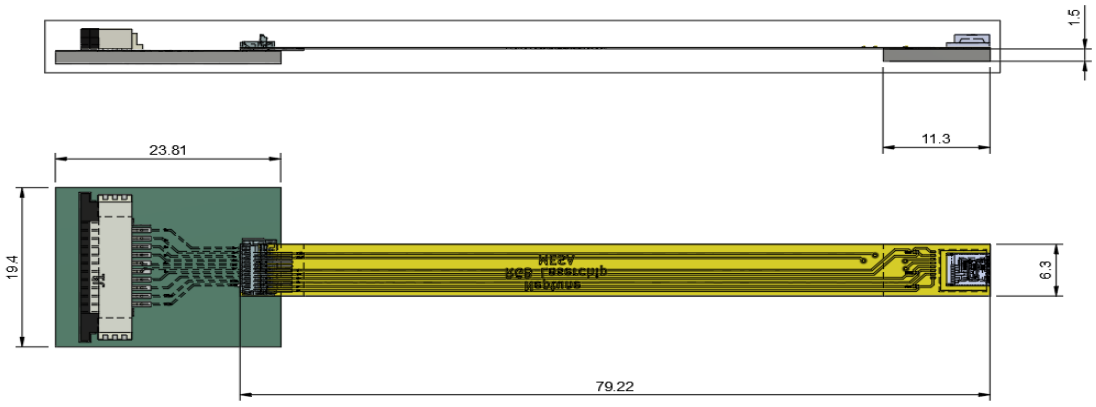
Pin-out:
R-
R+
G-
G+
NTC
NTC
B-
B+





Neptune Demo Kit Dimensions:

All dimensions are presented in mm.



Pin-out at PCB interpose:	Pin-out at FPCB:
B+	R-
B-	R+
G+	G-
G-	G+
R+	B-
R-	B+
-	-
-	-
NTC	NTC
NTC	NTC