

# **NuPhotonics**

## **Product Brief**

### **Inline Optical Power Meter OPM-12T16**

Final product dimensions and specifications are subject to change.

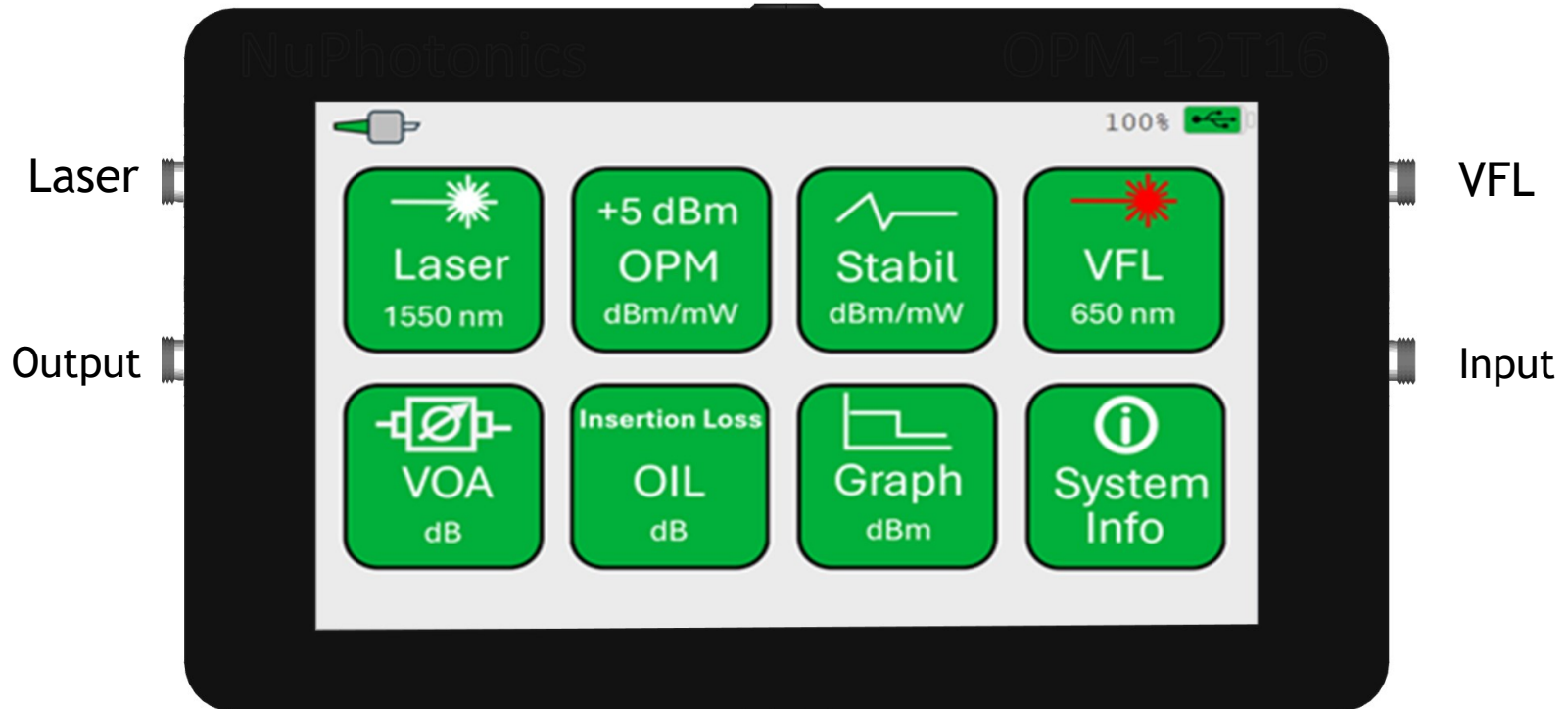
# System Specifications



- ▶ Capacitive Touchscreen
  - ▶ Toughened glass front panel
- ▶ 7" 800x480 IPS Display
  - ▶ 170° viewing angle
- ▶ Quad-core ARM Cortex-A72 processor
- ▶ 2 GB LPDDR4 RAM
- ▶ MODEOS
  - ▶ NuPhotonics Multi-Optoelectronic-Device-Engine Debian Linux OS
- ▶ 6 Hour battery life
  - ▶ Dependent on device usage

# Highlights

Power  
Button



USB-C

- ▶ 26 dBm maximum optical input
  - ▶ -60 dBm minimum detectable optical power
  - ▶ 1, 8, 16 Averaging options
  - ▶ Automatic gain control
- ▶ 30 mW VFL - 650 nm
- ▶ 40 dB MEMs Variable Optical Attenuator
  - ▶ 1260 - 1610 nm
- ▶ 5 mW adjustable laser
  - ▶ 1310 nm or 1550 nm
  - ▶ -40 - 6 dBm output power
- ▶ Full remote operation through USB-C

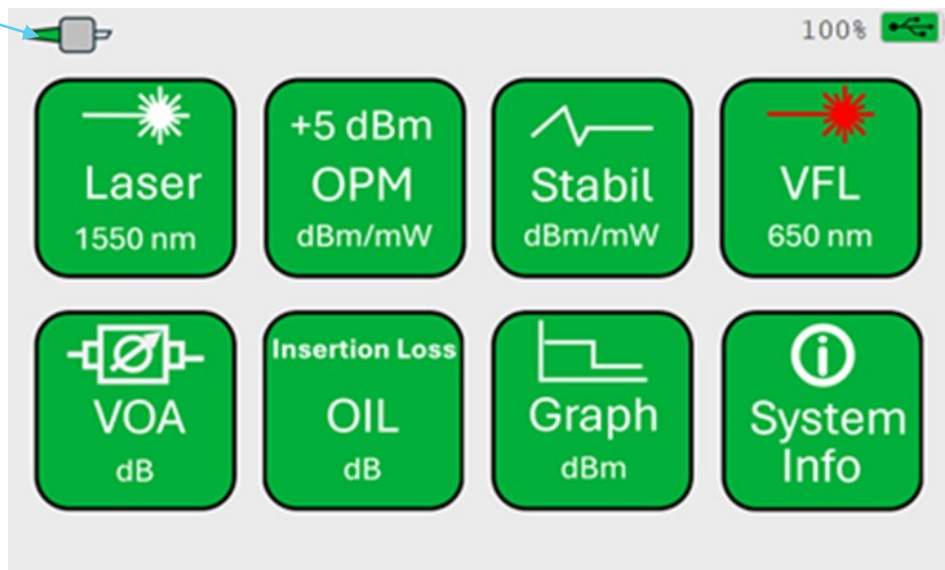
# Device Peripherals

- ▶ Optical connections can be customized to FC/APC, FC/PC, LC/APC, LC/PC
- ▶ Power Button
  - ▶ Solid LED indicates system is on
  - ▶ Flashing LED indicates system is charging
- ▶ USB-C Smart charging
  - ▶ System automatically adjusts input power to ensure USB port safety
  - ▶ NuPhotonics power adapter use is recommended
  - ▶ The system prioritizes system power over charging
    - ▶ If the system is **ON** and the device is plugged into a low power USB-hub, the device will utilize the USB-hub for system power
      - ▶ The device will still indicate charging
    - ▶ System will share load requirements between USB-C power adapter and built-in OPM-12T16 battery if the USB-C power adapter can not supply sufficient power
    - ▶ Minimum 5V-2A (10W) USB-C charging adapter recommended to sufficiently charge the system and maintain system power



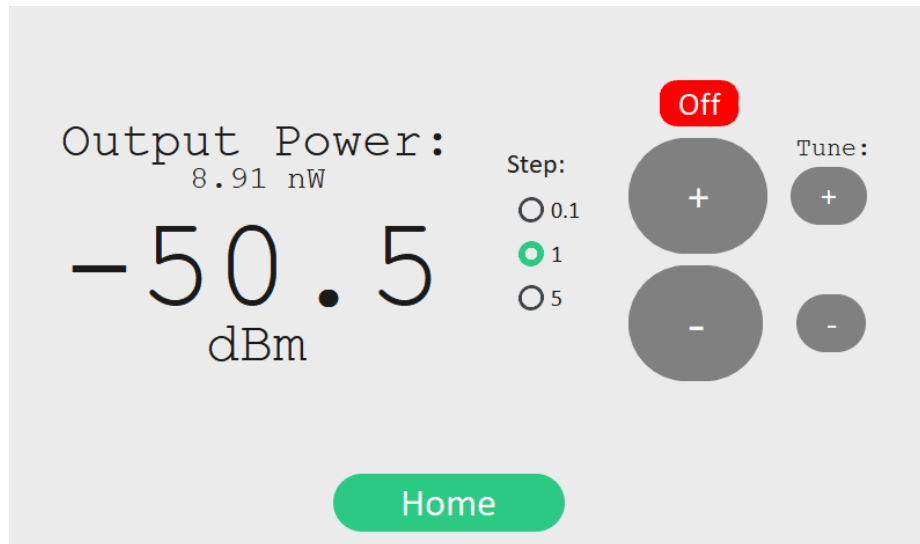
# Home Screen

Optical Connector



- ▶ Laser - Two wavelengths available
  - ▶ Variable power: -40 - 6 dBm/0.0001 - 5mW
  - ▶ 1310 nm - Option 13 / 1510 nm - Option 15
- ▶ Optical Power Meter - OPM
  - ▶ 1210 - 1650 nm response spectrum (VOA limited)
- ▶ Visual Fault Locator - VFL
  - ▶ 650 nm / 30 mW
- ▶ Variable Optical Attenuator - VOA - Option 01
  - ▶ 1210-1650nm response spectrum
- ▶ Optical Insertion Loss (OIL)
  - ▶ Single wavelength measurement - Dependent on laser option selected
- ▶ Stabil
  - ▶ Stabilized output power
- ▶ Graph optical power
- ▶ System Information - System Info
- ▶ Optical Connector identifies system optical connector
  - ▶ Must use matching optical connectors or damage to the optical ports may occur

# Laser

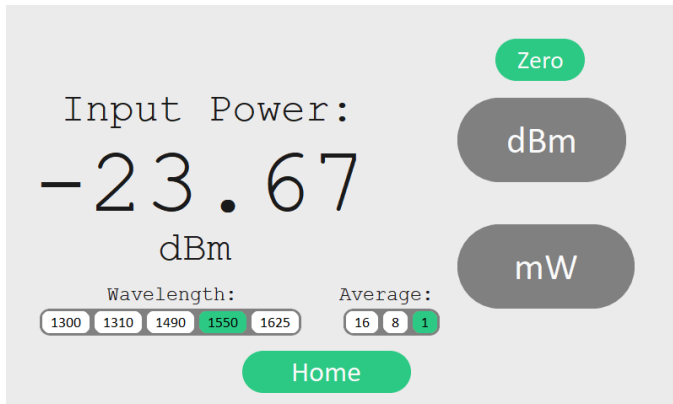


- ▶ Laser- Single wavelength variable power laser
  - ▶ 1310 nm - Option 13
  - ▶ 1550 nm - Option 15
- ▶ Easily increase and decrease desired output power
  - ▶ -40 dBm to 6 dBm
  - ▶ 0.0001 to 5 mW
- ▶ 3 step sizes to precisely control desired power level
  - ▶ Increases/Decreases the Optical output power to a calibrated level
  - ▶ Tune makes micro adjustments to achieve desired optical level.
    - ▶ -0.01 dBm steps
- ▶ On/Off button safely powers on and off the laser
  - ▶ Increases life expectancy of the laser

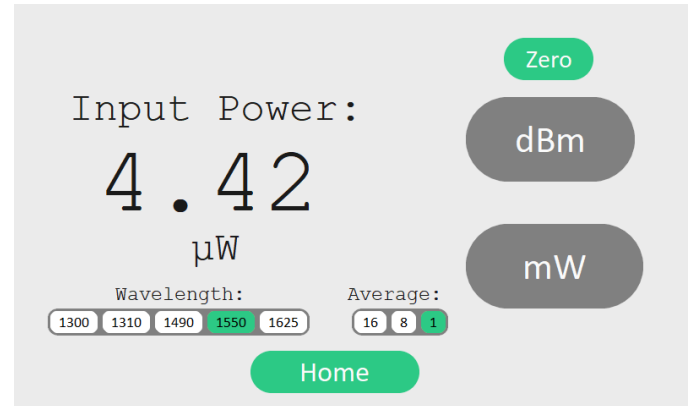


**Warning:** Lasers emit Visible and Invisible laser radiation. Avoid eye and skin exposure to direct or scattered radiation. Approved laser protective eyewear required for using the Laser.

# Optical Power Meter - OPM



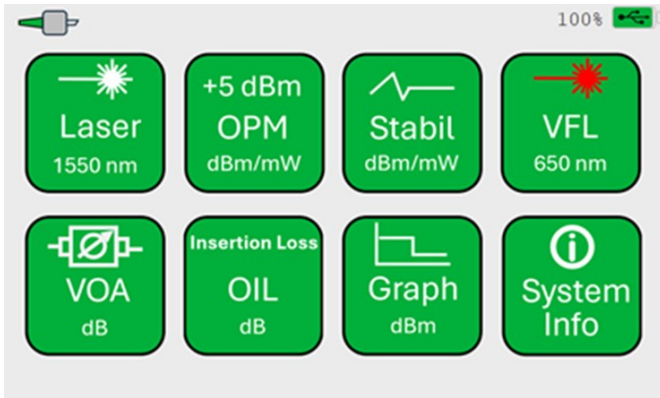
dBm



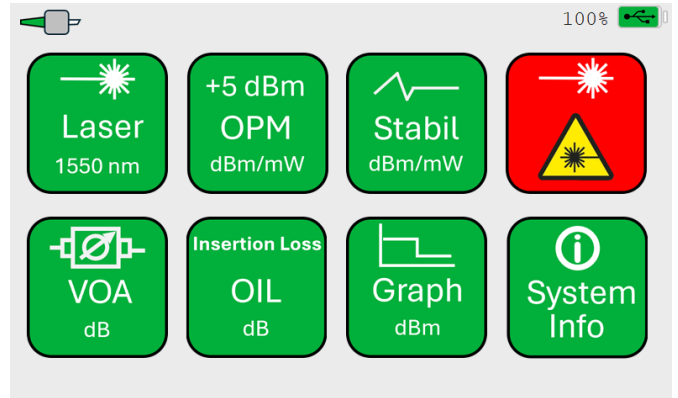
mW

- ▶ OPM- 1/99% Inline Optical Power meter tap photodiode.
- ▶ Easily Convert between dBm and mW
- ▶ Calibrated wavelengths 1300,1310,1490,1550,1625
  - ▶ Wavelength selection is stored and used across other apps
- ▶ Zero - Zero calibration procedure
  - ▶ Must be dark
    - ▶ The device will display error if optical input is present
- ▶ -60 dBm - 26 dBm Range
- ▶ 0.1 Second refresh rate
- ▶ +/- 0.1 dB accuracy
- ▶ 1, 8, and 16 Averaging Points
  - ▶ Number of points used to average

# Visual Fault Indicator - VFL



Off



On

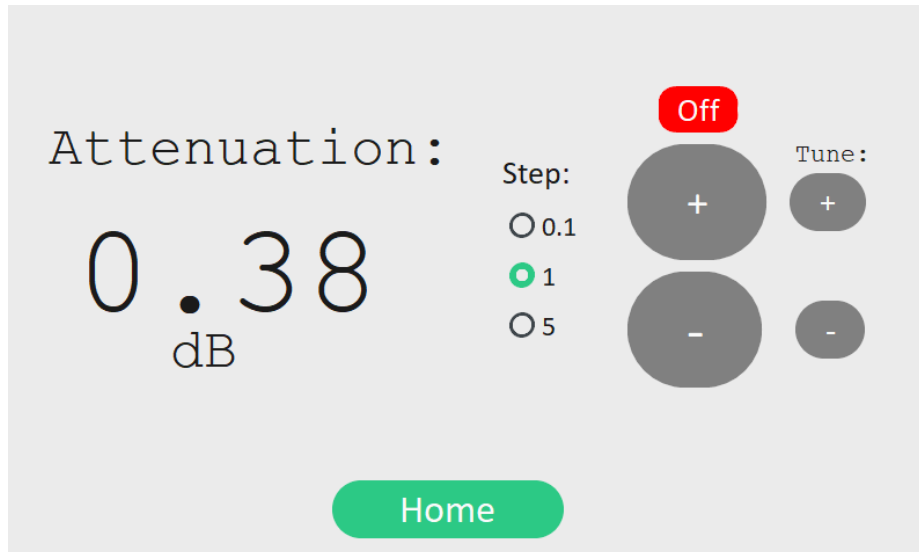
- ▶ VFL- Built in Visual Fault Indicator
- ▶ 650 nm wavelength
- ▶ 30 mW optical output power
- ▶ When selected the Green Icon will turn Red signaling VFL Laser output is on
- ▶ Selecting any other feature will turn off the VFL laser
  - ▶ To lower the chances of unexpected laser radiation, the device will not allow the VFL to turn on if any other feature is being used. If the VFL is **ON** and another feature is selected, the VFL will be turned **OFF** and can not be turned on until the user returns to the home screen.



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# Variable Optical Attenuator - VOA

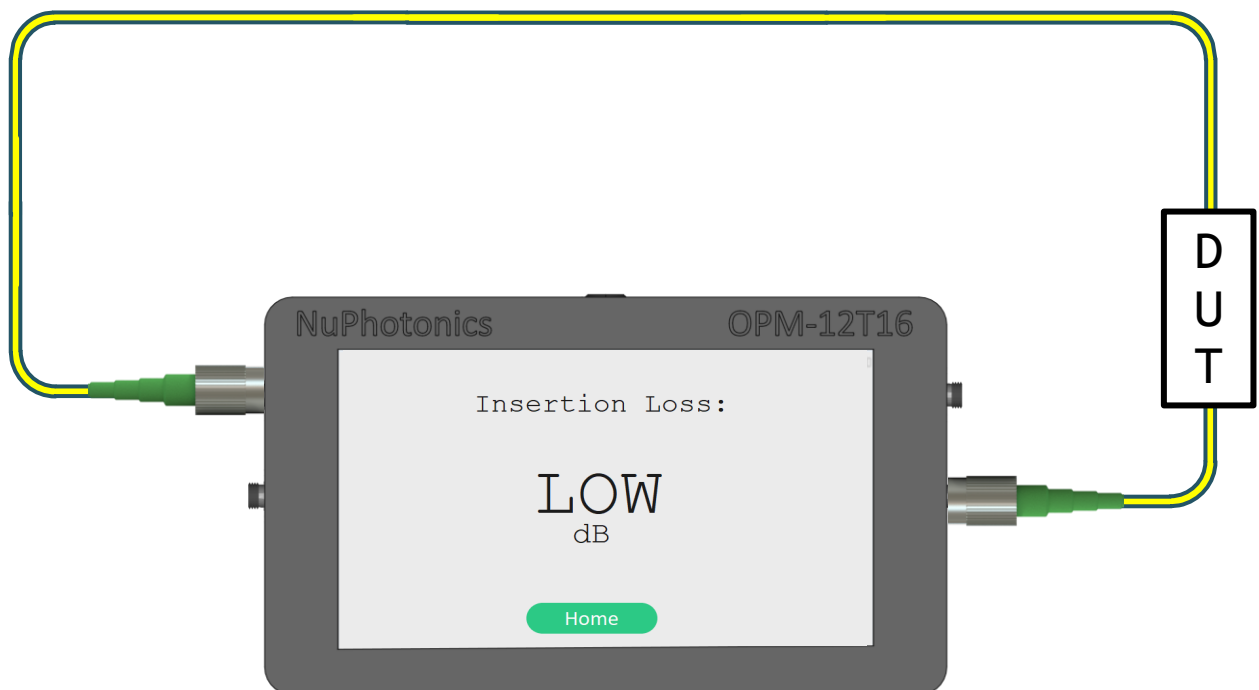


- ▶ VOA- Built in Inline MEMs Variable Optical Attenuator - Option 01
- ▶ 1250 - 1650 nm Response spectrum
- ▶ 0.3 dB Typical insertion loss in OFF state
  - ▶ The system will automatically set it to the calibrated Off state insertion loss
    - ▶ This is the system loss
  - ▶ Stable across temperature\time
- ▶ 3 step sizes to precisely control desired power attenuation level
  - ▶ Increases/Decreases the attenuation to a calibrated level
  - ▶ Tune makes micro adjustments to achieve desired attenuation.
    - ▶ -0.01 dBm steps
- ▶ On/Off button safely powers on and off the MEMs attenuator
  - ▶ Increases life expectancy of the attenuator

# Optical Insertion Loss - OIL

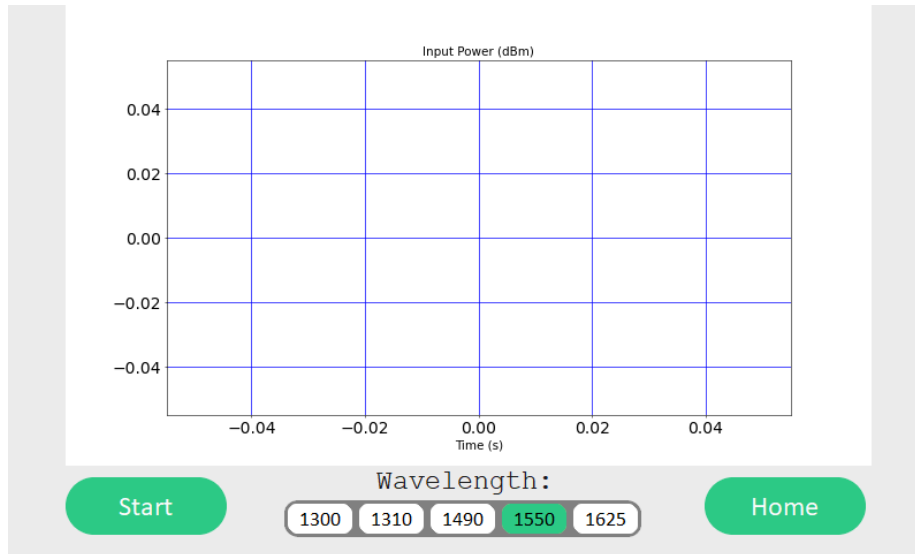


- ▶ OIL - Single wavelength Optical Insertion Loss measurement
  - ▶ Wavelength is set by the built-in Laser wavelength
    - ▶ Option 13 - 1310 nm
    - ▶ Option 15 - 1510 nm
- ▶ 0.1 Second refresh rate
- ▶ +/- 0.1 dB accuracy
- ▶ OIL configuration

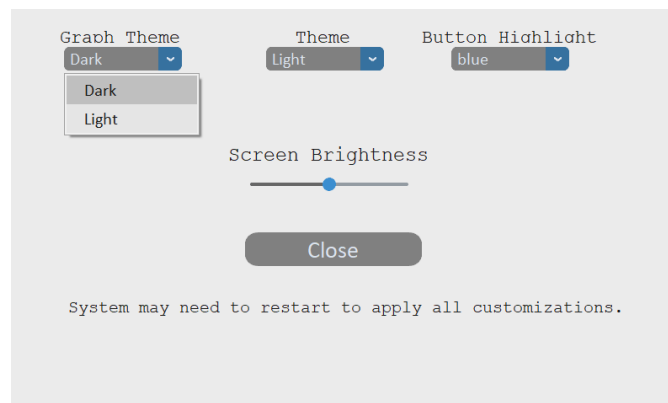


**Warning:** Lasers emit Visible and Invisible laser radiation. Avoid eye and skin exposure to direct or scattered radiation. Approved laser protective eyewear required for using the Laser.

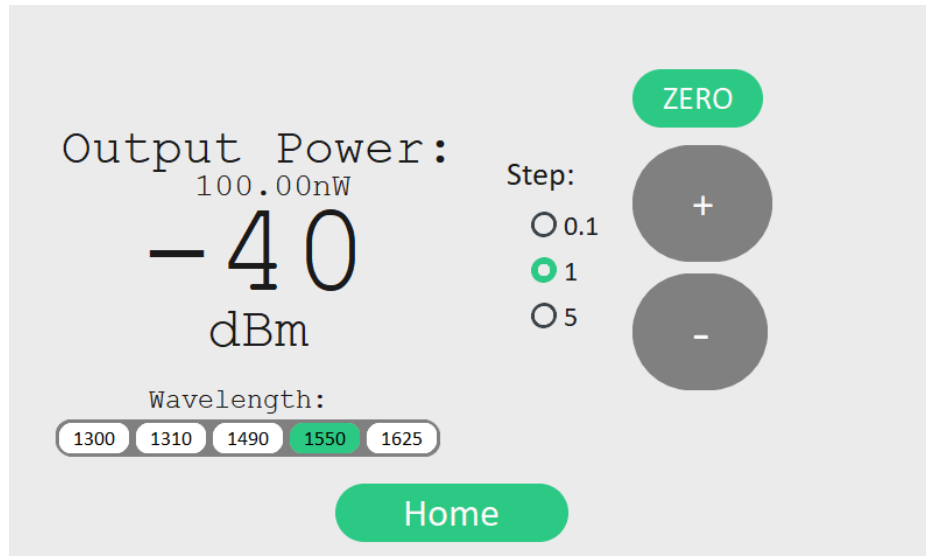
# Graph



- ▶ Graph - Input optical power vs. time
- ▶ Automatically applies wavelength selected
- ▶ Graph themes available under System info > Screen options > Graph Theme

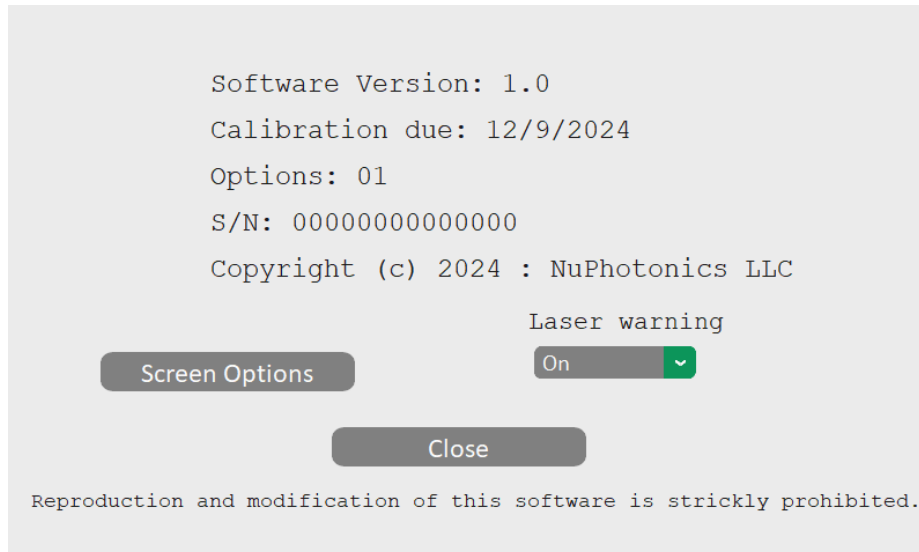


# Stabil - Stabilized Output

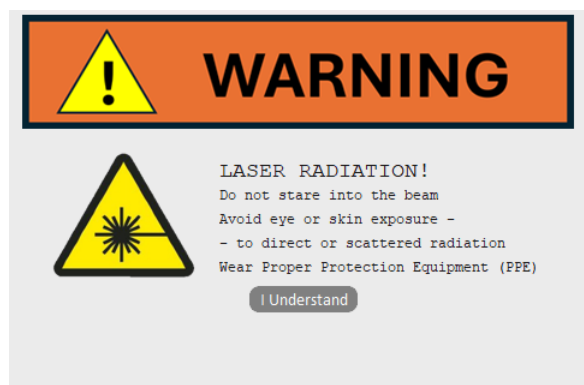


- ▶ System monitors input power and outputs stabilized output power
  - ▶ Desired optical output is selected, the system adjusts and maintains that output power
  - ▶ Can only attenuate the input signal
    - ▶ Recommended input power is 2 dBm+ higher than desired output power
    - ▶ System will display error if this 2 dBm+ separation is not met
  - ▶ Adjusts VOA to meet desired optical output
- ▶ Zero Button - Zero calibration
  - ▶ Must be dark to Zero

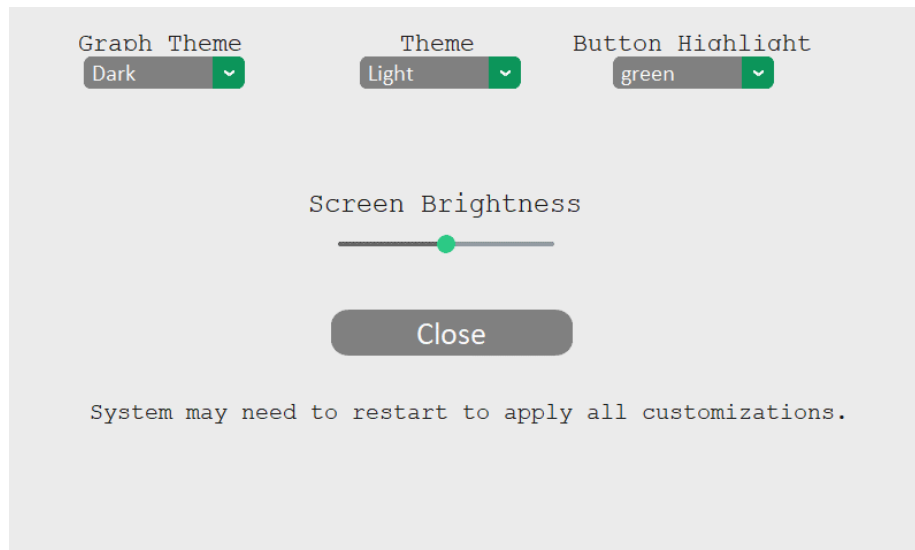
# System Info



- ▶ Gives the system information.
  - ▶ Software Version
  - ▶ Serial Number
  - ▶ Built-in Options
- ▶ Calibration date
  - ▶ Laser, OPM, and VOA must be calibrated to be within specifications
  - ▶ Recommended 1 year calibration cycle
- ▶ Laser Warning
  - ▶ Displays warning message on boot
  - ▶ Recommended to keep On

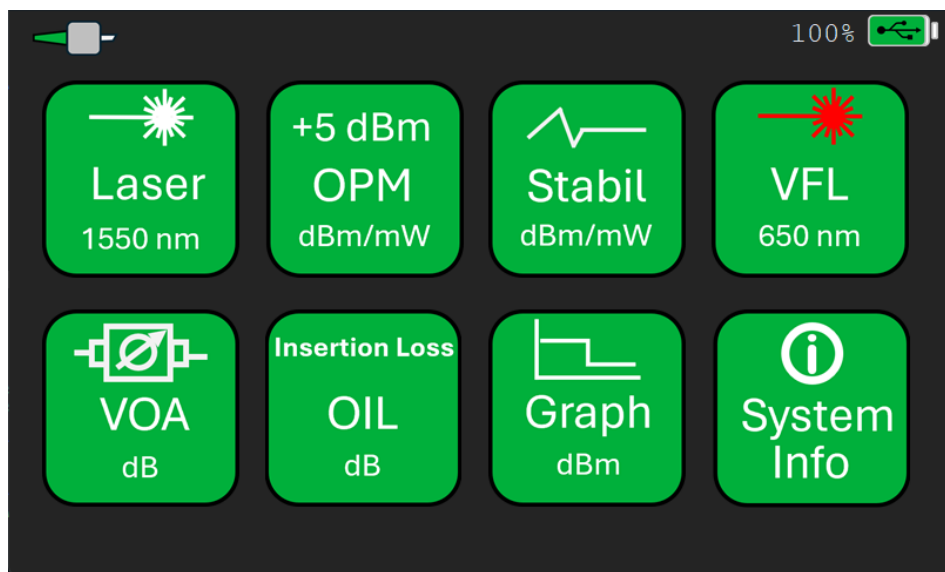
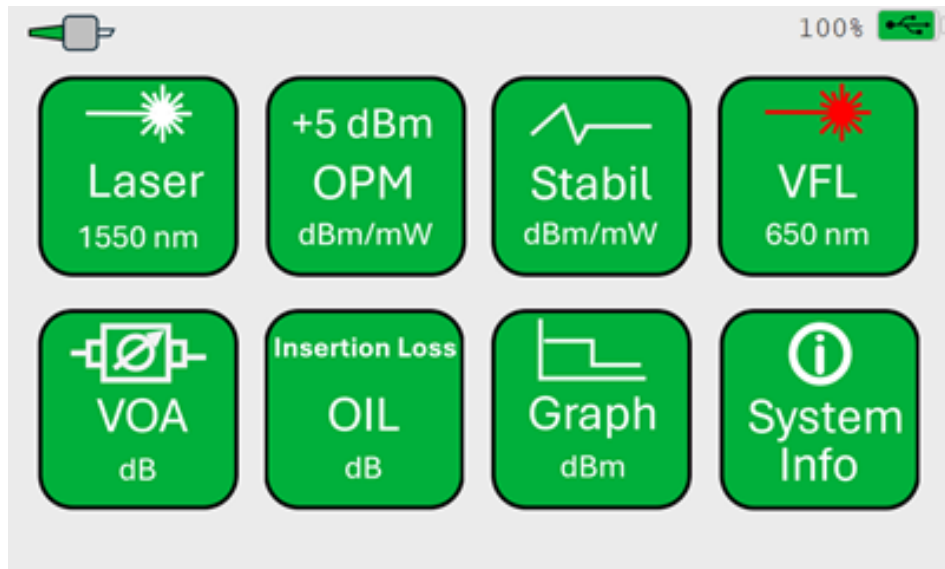


# Screen Options



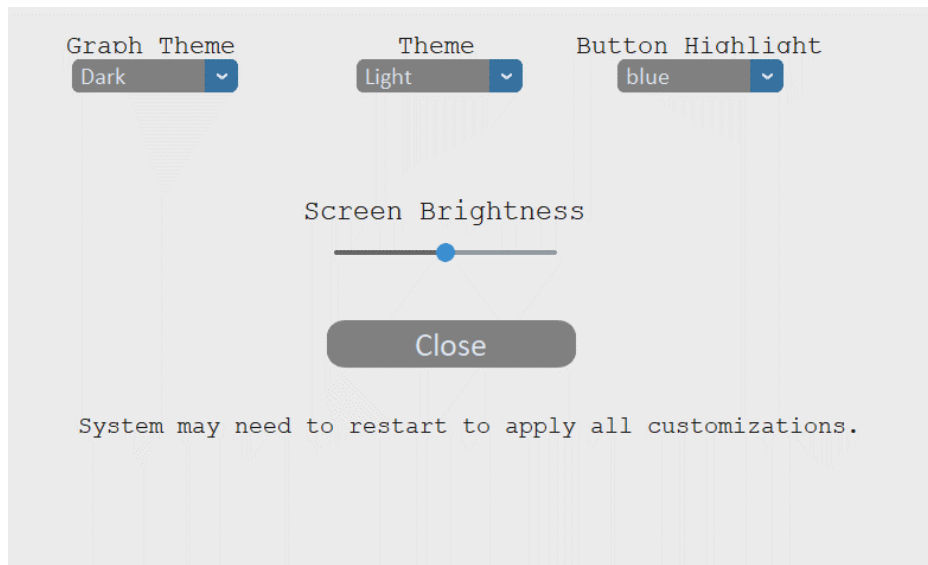
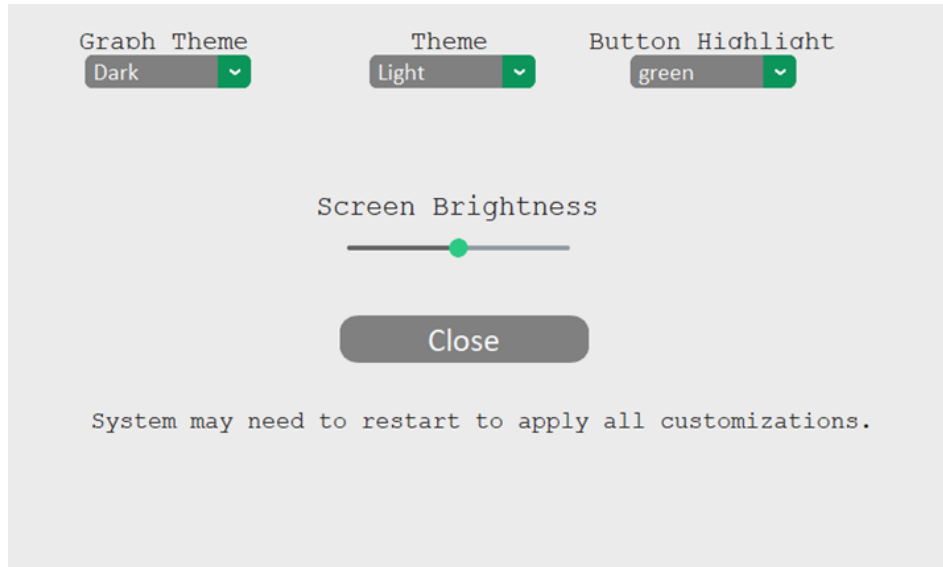
- ▶ Customizations
  - ▶ Theme options
    - ▶ Light (Shown)
    - ▶ Dark
  - ▶ Button Highlights/Accents
    - ▶ Green (Shown)
    - ▶ Blue
  - ▶ Graph Theme
    - ▶ Light
    - ▶ Dark
  - ▶ Screen Brightness
  - ▶ Settings are saved

# Theme Options



- ▶ Light (Top) - Dark (Bottom)

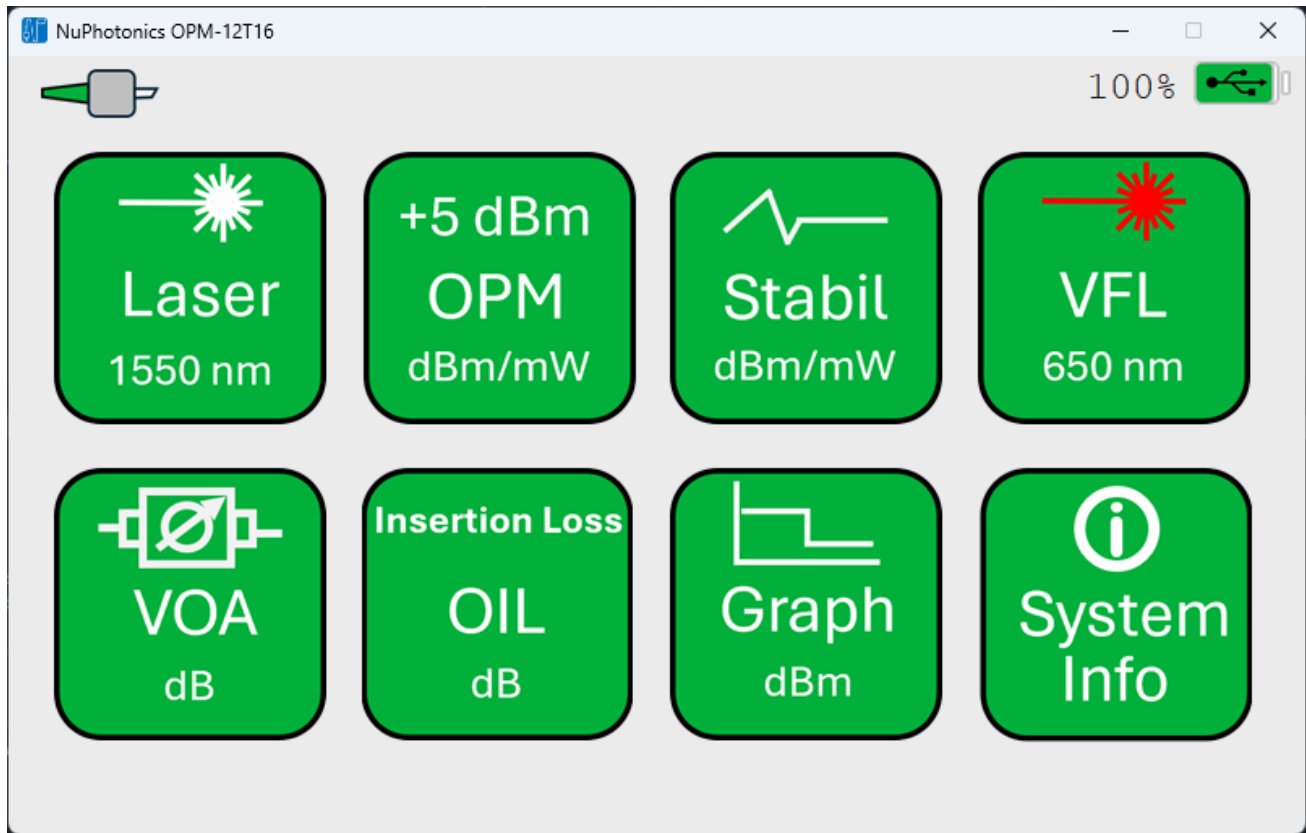
# Button Highlight



- ▶ Button Color
  - ▶ Accent color changes



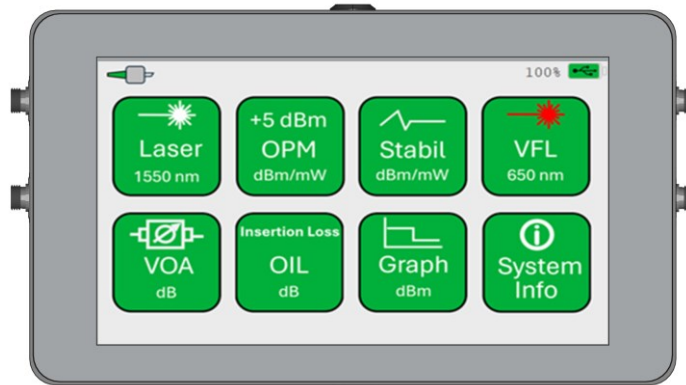
# Remote Operation Software



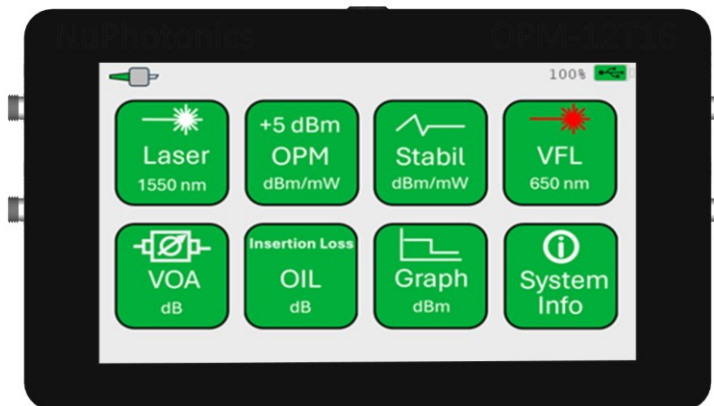
- ▶ System requirements - Minimum computer specifications
  - ▶ Windows 10/11
  - ▶ Dual Core Processor
  - ▶ 4 GB RAM
- ▶ Remote operation software matches OPM-12T16 System software
  - ▶ While connected to remote operation, OPM-12T16 will disable touchscreen inputs
- ▶ If OPM-12T16 is powered **OFF**, remote operation software will power on the system when launched
  - ▶ When the remote operation software is closed the OPM-12T16 will power down

# Protective Cover

- ▶ Without protective cover



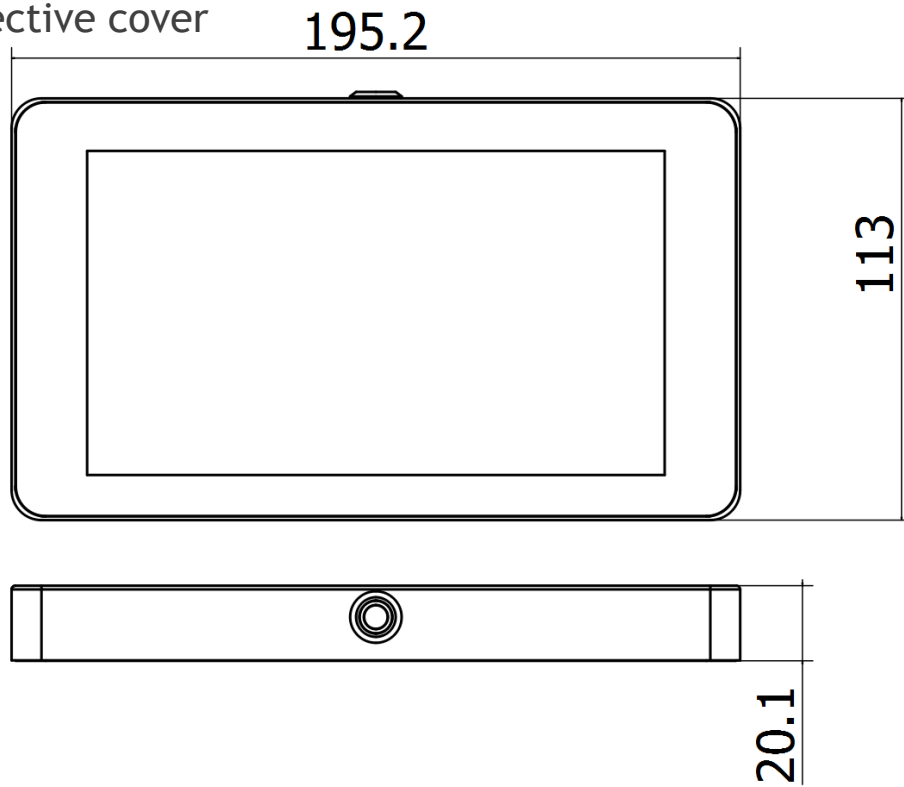
- ▶ With protective cover on



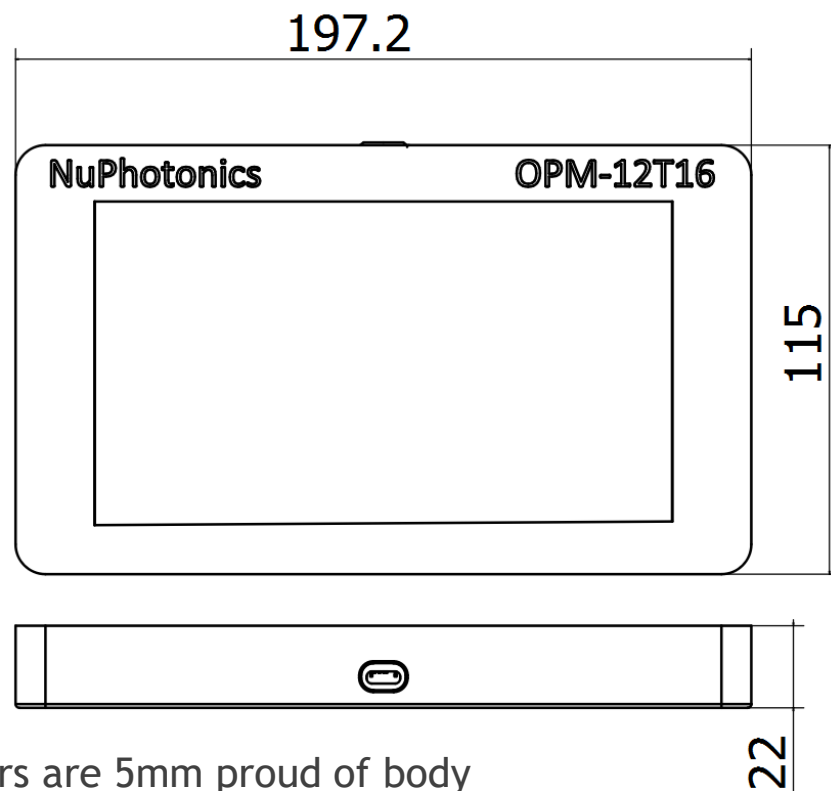
- ▶ NuPhotonics recommends to always maintain the protective cover on the OPM.

# Device Dimensions

- ▶ Without protective cover



- ▶ With protective cover



- ▶ FC connectors are 5mm proud of body