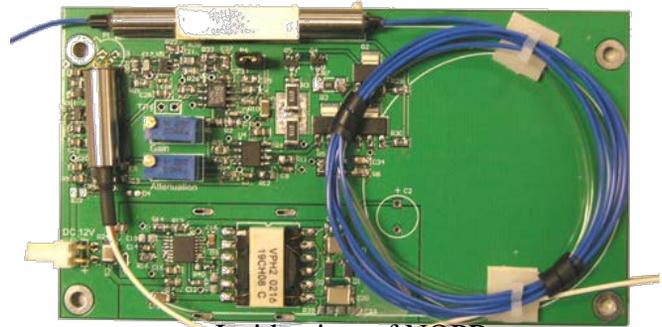


# High Speed Optical Power Regulator

## Product Description

The optical power regulator is a module that maintains a constant output power, regardless of the input fluctuations. This is achieved by using a detector to tap a small amount of light from the output and feed into a close-loop circuit to control a NS variable fiber optical attenuator connected between light input and output. The regulation output power range is preset according to customer spec. The module can also compensate slow polarization dependent loss changes and fast optical power surges. The optical power regulator provides an ultimate solution for optical power stabilizing and limiting. The non-mechanical device has passed the most stringent mil-spec and space flight qualifications, and is designed for over 20 years continuous operation. The module comes with a wall-plug 12V power supply.



Inside view of NOPR

## Performance Specifications

NOPR	Min	Typical	Max	Unit
Central Wavelength	760		2000	nm
Insertion Loss <sup>[1]</sup>	1260 -1650nm	1.0	1.4	dB
	960 - 1100nm	1.2	1.6	dB
	760 - 960nm	1.5	1.8	dB
Dynamic Range	18	25	30	dB
Return Loss	45	50		dB
Response Time			10	µS
Power Adjustment Resolution		Continuous		dB
Operating Optical Power (CW)		0.5	10 <sup>[2]</sup>	W
Operating Temperature		-5 ~ 70		°C
Storage Temperature		-40 ~ 85		°C

[1]: Excluding connectors. Including the power tapping for feedback control.

[2]: High power version > 2W may have the different arrangement in module package.

## Features

- No Moving Parts
- High Reliability
- High Speed
- Precision

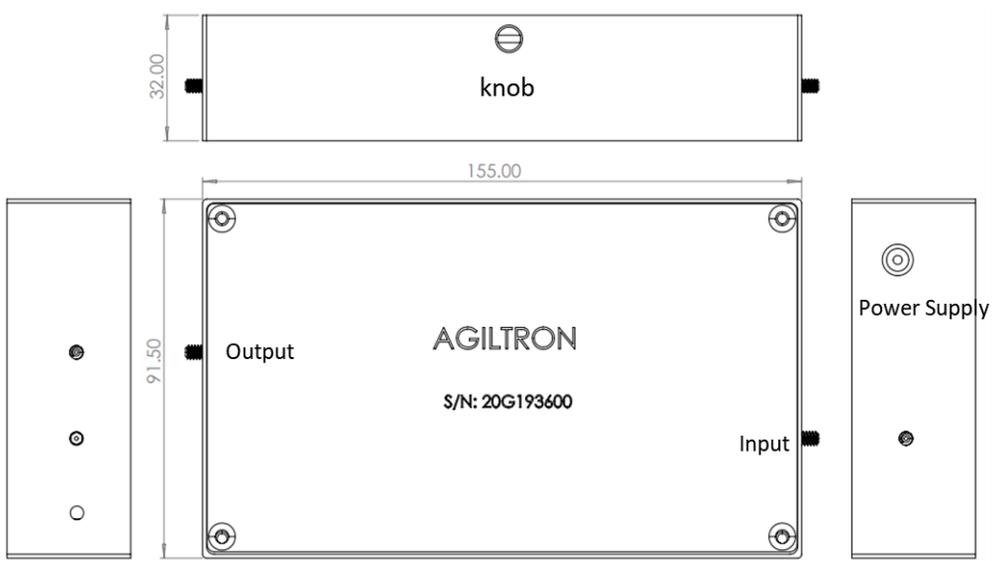
## Applications

- Laser Power Regulation
- Surge Power Prevention
- Power Balance
- Instrumentation

## Operation Instruction

- The output power level  $P_{Set}$  (dBm) is preset per customer's request or in default. The preset  $P_{Set}$  (dBm) can be adjusted manually through knob within +/-15dB range.
- Plug in the accompanied power supply.
- When the input power exceeds the power setting, the device starts regulating output to be constant.
- No response on the input power lower than the preset level.

## Dimension of Module (Unit: mm)



## Ordering Information

NOPR-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Input Power <sup>[1]</sup>	Wavelength	Output power <sup>[1]</sup>	Fiber Type		Fiber Length	Connector <sup>[2]</sup>
	0.5W or smaller = 11 10W = 10 1W = 01 2W = 02 5W = 05	1060=1 2000=2 1310=3 1480=4 1550=5 1625=6 780=7 850=8 650=E 550=F 400=G Special=0	0.001W =A1 0.002W = A2 ..... 0.01W = B1 0.02W = B2 ..... 0.1W= C1 0.2W = C2 ..... 1W = D1 2W = D2 ..... Special = S0	SMF-28=1 HI1060=2 HI780=3 PM1550=5 PM850=8 PM980=9 Special=0	900um tube=3 Special=0	0.25m= 1 0.5m = 2 1.0 m= 3 Special =0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC = 7 Special = 0

[1]: Output power must be smaller than input power within 30dB range.

[2]: High power connector may be available per request, please contact sales.

\*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

## Q&A

**Q:** Does NS device drift over time and temperature?

**A:** NS devices are based on electro-optical crystal materials that can be influenced to a certain range by the environmental variations. The insertion loss of the device is only affected by the thermal expansion induced miss-alignment. For extended temperature operation, we offer special packaging to -40 -100 °C. The extinction or cross-talk value is affected by many EO material characters, including temperature-dependent birefringence,  $V_p$ , temperature gradient, optical power, at resonance points (electronic). However, the devices are designed to meet the minimum extinction/cross-talk stated on the spec sheets. It is important to avoid a temperature gradient along the device length.

**Q:** What is the actual applying voltage on the device?

**A:** 100 to 400V depending on the version.

**Q:** How does the device work?

**A:** NS devices are not based on Mach-Zander Interference, rather birefringence crystal's nature beam displacement, in which the crystal creates two different paths for beams with different polarization orientations.

**Q:** What is the limitation for faster operation?

**A:** NS devices have been tested to have an optical response of about 300 ps. However, practical implementation limits the response speeds. It is possible to achieve a much faster response when operated at partial extinction value. We also offer resonance devices over 20MHz with low electrical power consumption.

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