Polarization Controller High Speed

4 element, 100 kHz

DATASHEET

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The NOPC polarization controller contains four high-speed electro-optical birefringence phase retardation plates, each independently controlled via analog inputs through four SMA connectors. It provides complete coverage of the Poincaré sphere, enabling the transformation of any input polarization state to any desired output state. Designed for continuous operation and fast response, it supports endless polarization control when integrated with sensors and auto-control firmware, ensuring stable output without manual resets. A wall-pluggable DC power supply is standard. A metal benchtop electrostatic protection enclosure, including a power supply, is an option for laboratory use. NOPC is ideal for applications requiring precise and reliable polarization management in dynamic environments.

Similar devices have passed full mil-spec and space qualifications by customers.

Due to electro-optical crystal drift, the repeatability is poor, it is designed for sensor-based feedback control.

Features

- No Moving Parts
- High Reliability
- Solid-State High Speed
- Low Insertion Loss
- Compact Size
- Low Power Consumption

Applications

- Polarization Scrambler
- Polarization Management
- Polarization Mode dispersion compensation
- Instrumentation

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength	1250		1650	nm
Insertion Loss [1]		1.8	3	dB
Polarization Dependent Loss			0.2	dB
Return Loss	45	50		dB
Response Time	0.3		1	µs
Operating Optical Power			500	mW
Operation Frequency	DC		100	kHz
Polarization Rotation	0		180	degree
Control Voltage	0		5	V
Operating Temperature	-50 ~ 70			°C
Storage Temperature	-40 ~ 85			°C
Input Fiber Type	SMF-28			
Output Fiber Type	PMF			

Notes:

[1]. Excluding connectors.

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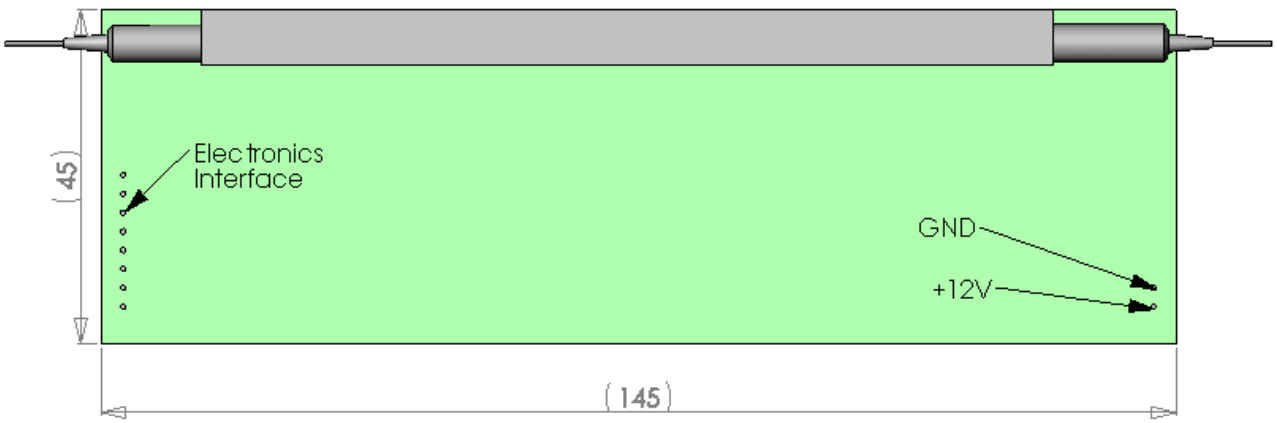
Mechanical Dimensions (mm)



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

Electrical Driver Inputs

Control Signal	**0-5V**
Power Supply	**12V, 0.3A**

Ordering Information (Part Number) System

	1 1	☐	1	☐	1	☐	☐	☐
Prefix	**Type**	**Wavelength**		**Package**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector** [1]
NOPC-	4 plate = 11	1310 = 3 1550 = 5 Special = 0		PCB = 1 Benchtop = 2	SMF-28 = 1 Special = 0	Bare fiber = 1 900um loose 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/PC = 7 LC/UPC = U Special = 0

[1]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

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Operation Instruction

1. Connect the 0–5 V individual control signals to the four SMA input connectors.
2. Plug in the provided DC power supply.
3. The unit will begin operating.

Q & A

Q: The polarization controller (PC) comes with a driver (4 inputs). We only need to have a 4-channel control signal (with SMA adapters?

A: Correct, you just need 4 controlling signals to the drivers through SMA.

Q: How much bandwidth can the drive signal be modulated? Is the driver board DC or AC coupled?

A: DC to 100kHz.

Q: The control signal is 0-5V. Does it accept negative voltage? If not, I assume we need bias tees to convert the control signal to a unipolar one.

A: Positive signal only.

Q: How much birefringence (the phase change of a retardation plate in one stage) is for the maximum control voltage at 5V?

A: > π

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