



# A3000 Polarization Controller

Poincaré-Sphere



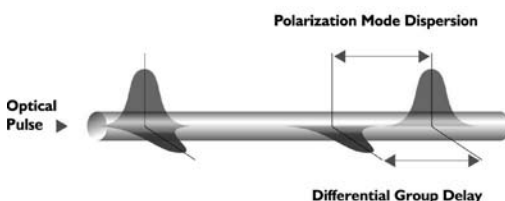
## PRODUCT HIGHLIGHTS

- Comprehensive Polarization Control and Management Capabilities
- Covers S-, C- and L-Band plus 1.3 $\mu$ m Window
- Compact Size
- Standalone Operation
- Robust, no Moving Parts
- PC Software: polarizationNAVIGATOR™



## APPLICATIONS

- Interferometry: Polarization Stabilization to Maximize Contrast Ratio
- Recirculating Loop Experiments: Loop-Synchronous Polarization Scrambling
- System Test: Polarization Sensitivity Analysis on Link /Transmission Quality
- Component Test: Measurement of PMD/PDL Characteristics of Optical Components

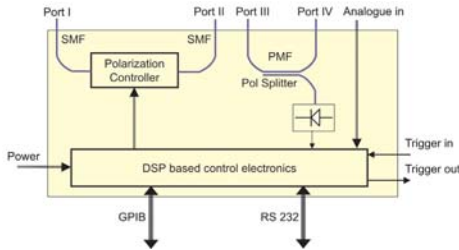
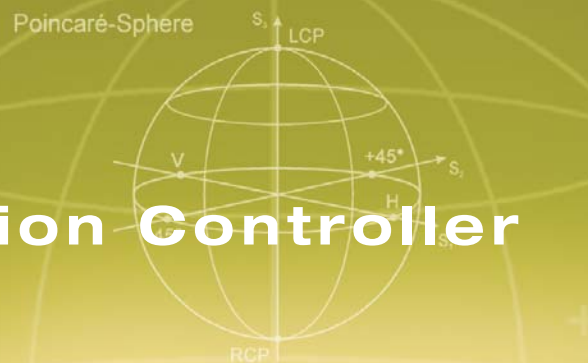


The A3000 contains a high-speed polarization controller plus microcontroller based driving circuitry. This unit can operate in various modes:

- As **Polarization Stabilizer** it provides a stable output State of Polarization (SOP) even with fluctuations and drifts of the input SOP as occurring for example through temperature drift and mechanical settling processes. The stabilized output signal is guided in a Polarization Maintaining Fiber (PMF). Alternatively an external electrical feedback signal can be provided for stabilizing the SOP. This signal can be provided either as analogue signal or as RS232/USB/GPIB data signal.
- As **Synchronous Scrambler** the device switches the SOP of the output signal in a (pseudo) random way. Switching of the SOP occurs within few microseconds. The SOP is stable for a predefined time until it again switches to a new SOP. During every switching operation the unit provides an electrical (TTL) trigger signal which allows synchronization of external processes. Alternatively an electrical trigger input can be used to synchronize the scrambler with external events.
- As **SOP Switch** the A3000 switches to a set of SOPs which allow PMD/PDL testing of optical components according to the Muller Matrix method or to the Jones-Matrix-Eigenanalysis (JME) method. The JME based measurements are in particular easily performed by using Adaptif Photonics' A1000 High Speed Polarization Analyzer as receiving unit.
- As traditional **Scrambler** the A3000 varies the output SOP in a completely random/pseudo random way.

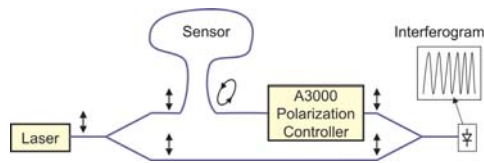
The unit does not contain any moving parts and therefore is robust and withstands even rough environmental conditions. All abovementioned applications of the A3000 are supported by Adaptif Photonics' polarizationNAVIGATOR™ PC based application software which comes along with this instrument. Other instrument drivers for various software interfaces are available.





## INSTRUMENT SETUP

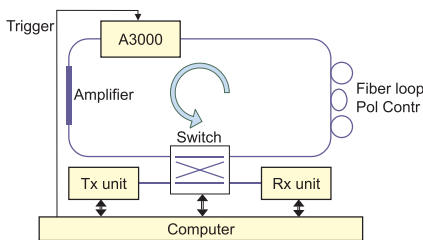
The instrument setup is shown in the figure on the left. If a scrambling or switching operation is desired, only Ports I and II are used. If the SOP of the signal shall be stabilized and the signal be fed in a PMF, then Port II and Port III have to be connected by a SMF and the output signal is available on Port IV. If an external feedback signal is available for stabilization, only Ports I and II are occupied.



## APPLICATION EXAMPLES

### Interferometry

Fiber optic based interferometers need polarization stabilization in order to avoid fading problems of the interferogram. These fading effects are caused by orthogonally polarized fractions of the light. The A3000 allows elimination of such effects by alignment of the signal polarization.



### Recirculating loop

The results obtained in recirculating loop experiments depend heavily on the PMD properties of the loop. In order to achieve results comparable with real deployed systems loop synchronous polarization scrambling schemes have proven to be advantageous. The A3000 is ideally suited to provide the synchronous scrambling capability in such experiments.

## CHARACTERISTICS

Wavelength Range	SOP scrambling and switching operation	1260 - 1640 nm
	SOP stabilization <sup>1</sup>	1550 ± 30 nm <sup>2</sup>
Speed	SOP Switching time	< 10 μs
	Scrambler	Up to 100K SOPs/s
Reset free, endless operation		Yes
DOP		< 5% (when working as scrambler)
Polarization Extinction Ratio (when working as stabilizer)		> 25 dB
		> 25 dB
Insertion loss	SOP scrambling and switching operation	< 3 dB
	SOP stabilization	< 5 dB
Max Input Power	Port I, II	20 dBm
	Port III	0 dBm <sup>3</sup>
Connectors		FC/PC or FC/APC, others on request
Trigger input/output		TTL
Analogue Input		0 ... 10V
Operating Temperature		+10°C .. 40°C
Interface		GPIB, USB, RS232
Power		100 - 240 VAC, <36W
Dimension		330 x 270 x 70 mm <sup>3</sup>

- <sup>1</sup> using the optical feedback signal through ports III and IV
- <sup>2</sup> Other wavelength ranges on request
- <sup>3</sup> other Max Input Power levels for Port III available upon request

## ORDER INFORMATION

### A3000-X

X: 0 for FC/PC  
 1 for FC/APC (recommended for Standard applications)

Comment: A state of the art PC with GPIB/USB/RS232 Interface is required; it is not included in Adaptif's delivery

Your local sales contact

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