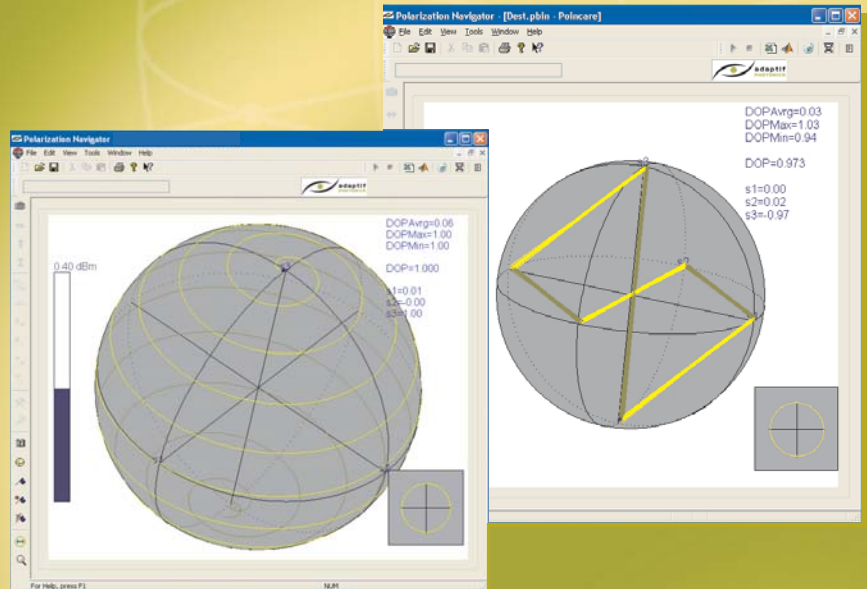




# A3300 Polarization Synthesizer

## PRODUCT HIGHLIGHTS

- Comprehensive Polarization Stabilization/Control/ Switching Capabilities
- Reset-Free/Endless Operation
- Covers Entire Range from 1.3 $\mu$ m Window up to the L-Band
- Compact Size
- Standalone Operation
- Robust, no Moving Parts
- PC Software: polarizationNAVIGATOR™



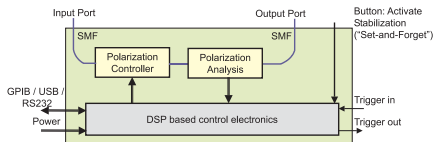
## APPLICATIONS

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

The A3300 contains a high-speed Lithium-Niobate based polarization controller and a polarization analyzer plus a 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. The stabilized output signal is guided in a Standard Single-Mode Fiber (SMF). The output SOP can be defined in following ways:
  - **Set-and-forget:** When the front button is pushed, the current SOP is stored and maintained, even if polarization changes occur on the instrument input.
  - **Defined Stokes:** The target output SOP can be defined by the user using the Stokes parameters
- As **Synchronous Scrambler** the device switches the SOP of the output signal in a (pseudo) random way with a cycling speed of up to 100 KSOPs/s. Switching of the SOP occurs within few microseconds. During every switching operation the unit can provide 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 A3300 cycles through a sequence of SOPs with a speed of more than 40KHz, which corresponds to a cycle time of less than 25 microseconds. The sequence of SOPs can easily be defined by the user using Stokes coefficients.
- As traditional **Scrambler** the A3300 varies the output SOP in a random way. Full coverage of the Poincaré Sphere is achieved within few ms.
- As **Polarization Analyzer** the instrument provides truly high-speed capabilities: More than 500 000 samples can be taken with a sample rate of up to 1 Megasample per second.

The unit does not contain any moving parts and therefore is robust and withstands even rough environmental conditions. All abovementioned applications of the A3300 are supported by Adaptif Photonics' polarizationNAVIGATOR™ PC based application software which comes along with this instrument. Instrument drivers compatible with LabVIEW® are provided. Connectivity to external applications (LabVIEW®, Excel, ERP Database, etc.) are provided through a DLL interface. Examples are provided in LabVIEW® and Excel.

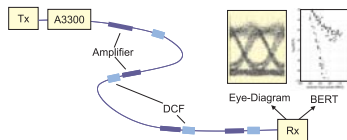


## INSTRUMENT SETUP

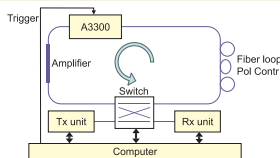
The instrument setup is shown in the figure on the right. A DSP based electronics controls the polarization analyzer as well as the polarization controller.

## APPLICATION EXAMPLES

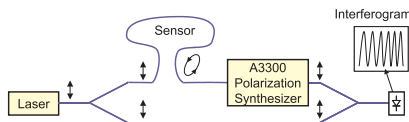
**Transmission Experiments** The transmission quality of links is known to depend on the state of polarization (SOP) of the launching signal. The A3300 is well suited to launch the modulated signal with predefined SOPs into the link. This allows probing for a range of SOPs on the Poincaré sphere to get information about particular polarization issues of a link.



**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 A3300 is ideally suited to provide the synchronous scrambling capability in the experiment.



**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 A3300 allows elimination of such effects by fast alignment of the signal polarization.



## CHARACTERISTICS

### Polarization Control and Stabilization

Wavelength range	1260 - 1640 nm <sup>1</sup>	
Speed	SOP Switching Time	< 10 $\mu$ s (non-deterministic)
	SOP Cycle Time	< 25 $\mu$ s (deterministic SOPs)
	Scrambler	Up to 100K SOPs/s
Reset-Free, Endless Operation	Yes	
DOP	< 5% (when working as scrambler)	
Remaining SOP Error (when stabilizing)	< 2°	

### Polarization Analysis

Wavelength Range	Operating Range	1260 - 1640 nm
	Factory Calibration Range	A3300-B: 1270 - 1375 nm A3300-C: 1460 - 1620 nm <sup>2</sup>
SOP Accuracy	< +/- 1° on Poincaré Sphere <sup>3</sup>	
DOP Accuracy	< +/- 2%	
	< +/- 0.5% (typ.) after calibration	
Input Power Range	-26dBm ... +19dBm <sup>4</sup>	
Sampling Rate	Up to 1MHz	
Internal Buffer	>500 000 samples	

### General

Insertion Loss	< 4 dB	
Connectors	FC/PC or FC/APC, others on request	
Trigger Input/Output	TTL	
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> in „Defined Stokes“ application: full accuracy is achieved only in factory calibration range of Polarization Analyzer
- <sup>2</sup> Other wavelength ranges on request
- <sup>3</sup> With respect to the signal at the Output connector of the instrument
- <sup>4</sup> Other input power ranges on request

## ORDER INFORMATION

### A3300-X-Y

X: indicates wavelength range  
 Y: 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

## CONTACT

Phone +49 -40 766 29 2160  
 Fax +49 -40 766 29 2161  
 sales@adaptif.de  
 www.adaptif.de