



Agilent N7784B High Speed Polarization Controller

Data Sheet



Figure 1. N7784B polarization controller

Introduction

The Agilent N7784B polarization controller contains a high-speed polarization controller plus microcontroller-based driving circuitry. This unit can operate in various modes.

As a **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 aligned into a polarization maintaining fiber (PMF). Alternatively, an external electrical feedback signal can be provided for stabilizing the SOP.

As a **synchronous scrambler**, the device switches the SOP of the output signal in a random (pseudo) way. Switching of the SOP occurs within a few microseconds. The SOP is stable for a predefined time until it again switches to a new SOP. An electrical trigger input can be used to synchronize the scrambler with external events.

As an **SOP switch**, the N7784B allows switching the internal waveplates to user definable angles with very high speed and repeatability.

As traditional **scrambler** the N7784B varies the output SOP smoothly in a random/pseudo random way.

The unit does not contain any moving parts and therefore is robust and withstands even rough environmental conditions. All above-mentioned applications of the N7784B are supported by a PC software package.

- PC-based application software comes with this instrument.
- Other instrument drivers for various software interfaces are available.



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Specifications ¹ N7784B Polarization Controller

Wavelength		
Operating wavelength range	1260 nm to 1640 nm	
Wavelength range in stabilizer mode ²	1520 nm to 1580 nm	
Polarization control and stabilization		
SOP switching time (open-loop)	< 10 μ s	
PER at PMF output (typical)	> 23 dB	
Stabilizer response time (typical) ³	2 ms	
Optical power		
Insertion loss port I to port II ⁴	< 3.5 dB (< 3.0 dB, typical)	
Insertion loss port III to port IV ⁵	< 1.8 dB (< 1.4 dB, typical)	
PDL port I to port II (typical)	C/L-Band	< 0.2 dB
	O-Band	< 0.5 dB
Maximum safe input power	Port I	20 dBm
	Port III	3 dBm
Input power range in stabilizer mode	Port III	-30 dBm to 0 dBm
Ordering instructions		
Optical connector options		
N7784B-021	Straight contact connectors	
N7784B-022	Angled contact connectors	
Connector interface		
The N7784B should usually be ordered with four 81000xl connector interfaces, depending on desired connector type (not included).		
Accessories		
5063-9240	Rack mount kit for 1 unit with filler panel	
5063-9212 + 5061-9694	Rack mount parts for 2 units side-by-side	
Warranty		
All systems have 1 year warranty		
R-51B-001-3C	1 year Return-to-Agilent warranty extended to 3 years	
R-51B-001-5C	1 year Return-to-Agilent warranty extended to 5 years	
Calibration		
R-50C-011-3	Agilent calibration upfront support plan 3 year coverage	
R-50C-011-5	Agilent calibration upfront support plan 5 year coverage	

1. Ambient temperature change max. ± 0.5 °C since normalization. Specification valid on day of calibration.
2. Outside the stabilizer wavelength range, the PER at PMF output may be degraded.
3. Input power at port III > -30 dBm, response to an immediate step of 180° on the Poincaré sphere.
4. For SOP scrambling/switching, only ports I/II are used.
5. Valid for optimum input polarization at PBS input (Port III). Add insertion loss of port I/II and obtain total insertion loss for SOP stabilizing mode.

Specifications ¹ N7784B Polarization Controller (continued)

General characteristics	
Dimensions (D x W x H)	380 mm x 213 mm x 88 mm (excluding front and back rubber cushions and handle)
Weight	Approx. 4 kg
Recommended recalibration period	24 months
Operating temperature	+5 °C to +40 °C
Operating humidity	0% to 80%, non-condensing
Altitude	The maximum operating altitude is 2000 m.
Pollution protection	Pollution degree 2.
Warm-up time	20 minutes
Interfaces	The instruments can be controlled via USB or GPIB interfaces
Power consumption	Line power: AC 100 to 240 V \pm 10%, 50/60 Hz, 60 VA max.



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