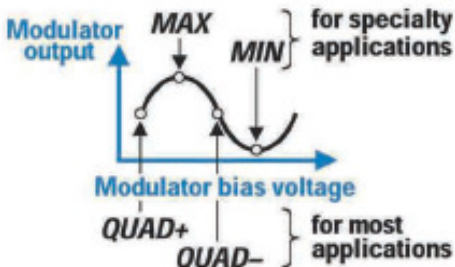


## PRODUCT DESCRIPTION

The PSI—0303 digital modulator bias controller is a full featured laboratory instrument designed for precise control of Mach-Zehnder interferometer fiber optic modulators. Designed to operate in the presence of a digital modulation signal, these controllers accurately prevent bias point drift from any of four preset or one user set modulator transfer function points. Through use of a proprietary control algorithm, the controller maintains bias control without the use of a dither signal.



## BENEFITS

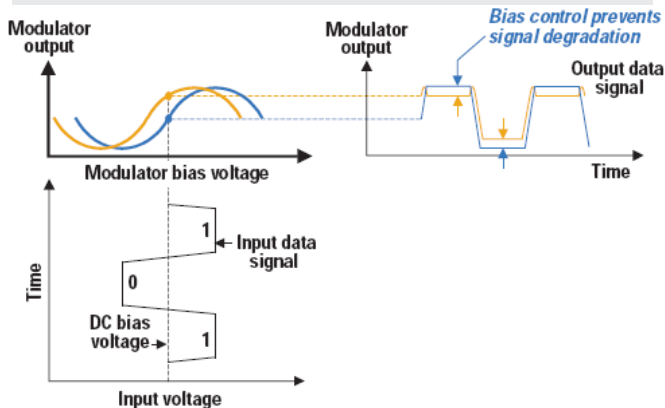
- ✓ **COMPLETE**— INCLUDES OPTICAL COUPLER AND PHOTO-DETECTOR
- ✓ **ACCURATE**— MAINTAINS DRIFT TO WITHIN 2° AT QUAD POINTS; +/- 0.2° AT MAX AND MIN POINTS
- ✓ **EASY TO USE**— FRONT PANEL OPTICAL AND BIAS CONNECTIONS, LCD READ-OUT OF BIAS VOLTAGE AND OPTICAL POWER

Measurements are simplified through use of the PSI-0303 in your link or component evaluation set-up. With an internal optical coupler and photo-detector an internal feedback path automatically establishes lock on the desired bias point.

Automatic control modes allow the operator to select Quad+, MAX, Quad- or MIN bias points. A 10-turn potentiometer provides manual control for fine tuning to a specific bias point. An LCD display shows the bias voltage and optical output power. All features allow for simplified characterization of a modulator's  $V_{\pi}$ , optical insertion loss, optical extinction ratio and rate of bias point drift.

## Why use a Modulator Bias Controller?

Ideally, the desired Mach-Zehnder modulator bias point—in this example, the blue point on the curve shown here—would occur at a specific DC voltage that remains constant despite any variation of environmental conditions. However, effects in the modulator's electro-optic material can cause the transfer function to "drift" to the left or right—see, for example, the orange curve—such that a specific DC bias voltage may yield a QUAD+ point on the transfer function curve now and a different point on the curve after a slight change in the environmental conditions. As the figure at right shows, this small bias point drift can have a large impact on signal fidelity.



## Applications

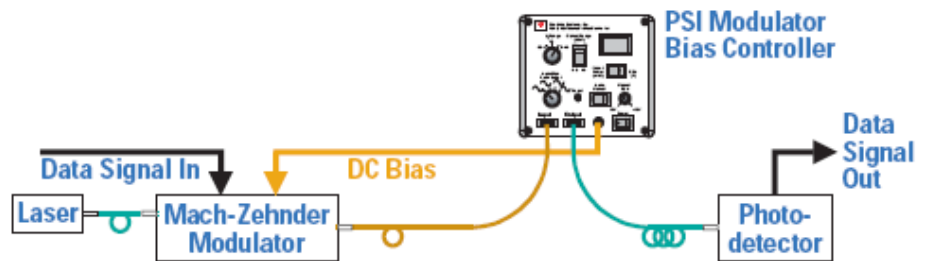
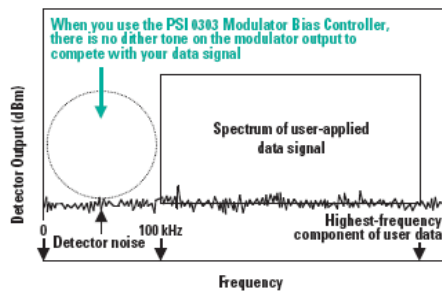
- Modulator design
- Fiber optic component evaluation
- Laboratory control
- Data communications systems

## Specifications

Parameter	Typical Value	Units
Fiber Type	SMF-28	—
Wavelength	1300-1550	nm
Optical Insertion Loss	0.8	dB
Input Optical Power	<i>Quad + or -</i> 0 to -15 <i>Max or Min</i> 0 to -10	dBm
Output DC Bias Voltage	+/-15	V
DC Bias Port Impedance	<1	$\Omega$
Modulator $V_{\pi}$ standard Range; unit may be factory set for other values as needed	2.4– 7.6	V
Dither Frequency	n/a	
Bias Point Error	<i>Quad+ or -</i> +/- 5 <i>Max or Min</i> +/-3	Deg.
Initial Auto Bias Point Acquisition Time	10	sec.
Drift Compensation Response Time	<i>0 to -10 dBm input power</i> 5 <i>-10 to -20 dBm input power</i> 5	sec. sec.
Case Dimensions (WxHxD)	5.75x5.25x8.75	In.
Optical Connectors	FC/APC	---
Storage Temperature	-25 to +60	$^{\circ}\text{C}$
Power	115v @25mA	—

The PSI 0303 Digital Signal Modulator bias controller (U.S. Patent pending) has a desirable spectral output: *none at all*.

When you apply digital data (at 2.5Gbps, 10Gbps, or any other data rate) to a modulator controlled by the PSI 0303, its output light is modulated by your digital data only: *there is no dither tone present!*



## Options

P/N suffix	Description
-019-xxxx	Custom Optical Wavelength (user specified, nm)
-003	High Optical Power
-018	Polarization maintaining fiber, coupler and connectors
-024	Polarization maintaining coupler & connectors combined with high optical power; input range 100uW to 10mW