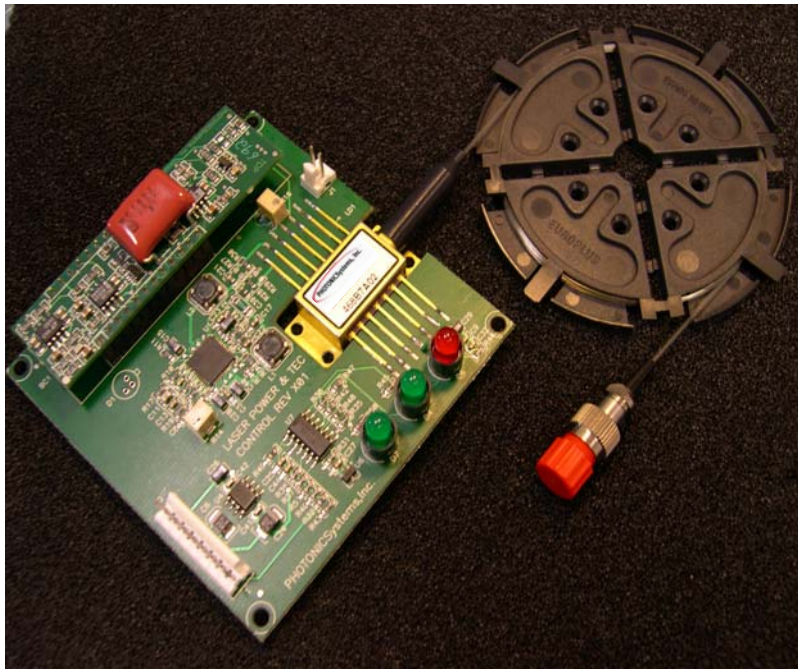


# **PSI-2600-11 PHOTONIC CONTROLLER BOARD**



## **PRODUCT DESCRIPTION**

The PSI-2600-11 Photonic Controller Board offers simple turn-up and test of optical systems which require a semiconductor laser light source. This product offers a universal replacement for power, thermo-electric and modulator bias control circuitry typically found in fiber optic transmitters.

The basic controller board offers feedback mechanisms for accurately monitoring laser power through the laser's internal back facet photodetector. This provides stable optical output power over system lifetime and operating temperature range. Also included is a high accuracy controller for the laser diode Peltier thermo-electric cooler (TEC). The user may adjust precise optical power and laser temperature operating points which the PSI-2600-11 will maintain over the device operating lifetime.

Also included is a facility for the PSI-0204-11 modulator bias controller. This device controls the operating bias point for a Lithium Niobate (LiNbO3) external modulator and provides precise tracking on a modulator's transfer function for analog or DPSK data transmission systems.

When used together, the PSI-2600-11 laser control board and PSI-0204-11 modulator bias controller provides all electronic circuitry needed for an externally modulated photonic transmitter.

## **PRODUCT BENEFITS**

- ✓ **SIMPLE CONTROL OF COMMON 14 PIN DIL LASER PACKAGES**
- ✓ **FLEXIBLE APPLICATION SPACE: USE IN BROAD RANGE OF EXTERNAL MODULATION FIBER OPTIC LINKS, TEST SYSTEMS OR OTHER LASER LIGHT SOURCES**
- ✓ **TEC CONTROL OVER WIDE TEMPERATURE RANGE**
- ✓ **BACK-FACET PHOTO DETECTOR LASER POWER CONTROL**
- ✓ **DIRECT INTERFACE WITH PSI-0204-11 MODULATOR BIAS CONTROLLER FOR EXTERNALLY MODULATED SYSTEMS**
- ✓ **DIRECT INTERFACE WITH MODULATOR OUTPUT OPTICAL POWER MONITOR**
- ✓ **ADJUSTABLE OPTICAL POWER OUTPUT**
- ✓ **STATUS INDICATORS FOR LASER, POWER AND FAULT**
- ✓ **AVAILABLE WITH 40 MW 1550NM LASER FACTORY INSTALLED**

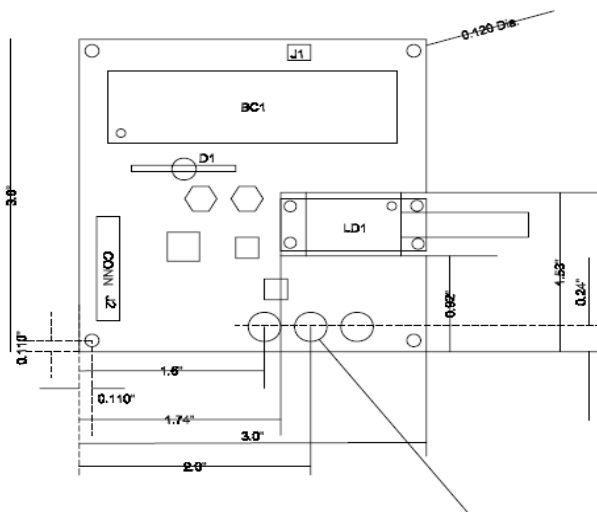
Beyond standard specifications, PSI can modify the PSI-2600-11 to meet the exact requirements of your application. Common modifications are adaptations for laser pin configuration or compliance with custom physical dimensions. Please contact PSI for additional information.

## **Applications**

- **Externally modulated photonic links**
- **Directly modulated photonic links**
- **Excitation laser for EDFA based systems**
- **Photonic test systems**
- **Spectroscopy systems**
- **Analog transmission systems**
- **Data transmission systems**

## PSI-2600-11 Photonic Controller Specifications

Parameter	Typical Value	Units
Laser diode forward voltage	2.5	Volts
Laser diode operating forward current range	400	mA
Back-facet laser monitor photodiode dark current	100	nA, max
Back-facet laser monitor photodiode current	0.15 to 3	mA
Thermo-electric controller operating current	1.2	Amps, max
Thermo-electric controller operating voltage	2.4	Volts, max
TEC thermistor resistance	10K	ohms
TEC thermistor B constant	3900	K
DC Power Supply	+/- 12, +5	volts
DC Operating Current	<250 (+/-12), <1500 (+5)	mA
Modulator Optical Power Monitor	Eigenlight series 100 M141A-115 or equivalent. Exact model and responsivity depends on laser optical power output and modulator insertion loss	
Operating Temperature Range	0 to +50	Degree C
Board Dimensions	3" x 3" outline, 1.25" x 0.625" cutout for 14 pin DIL laser package	in



PSI-2600-11 Photonic controller board mechanical drawing. Board is shown with laser installed at LD1. Modulator bias controller is shown at BC1 and modulator output power monitor is shown at D1.

### Optional laser, FITEF FOL15DC

The PSI-2600-11 may be ordered with a high power laser installed. This allows for immediate prototyping of medium power optical transmitters or test platforms. A complete externally modulated transmitter is formed when used in conjunction with the PSI-0204-11 modulator bias controller, and a

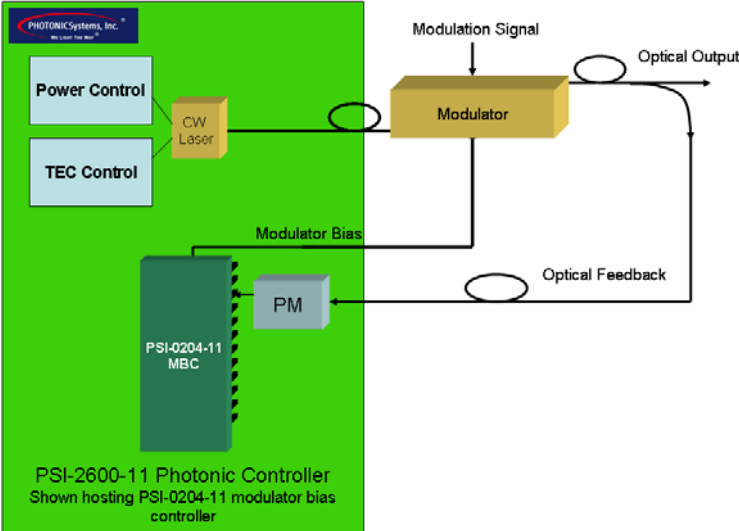
Parameter	Typical Value	Units
Optical Power Output	40	mW
Max LD Forward Current	300	mA
LD Threshold Current	15	mA
Peak Emission Wavelength <sup>1</sup>	1530-1611	nm
Spectral Linewidth	1	MHz
Optical Isolation	30	dB
Relative Intensity Noise (RIN)	-160	dB/Hz
Fiber type	PANDA PM, SM15-P-8/125UV	--

<sup>1</sup> Wavelength may be specified on the ITU 100 GHz grid

### Standard laser pin configuration

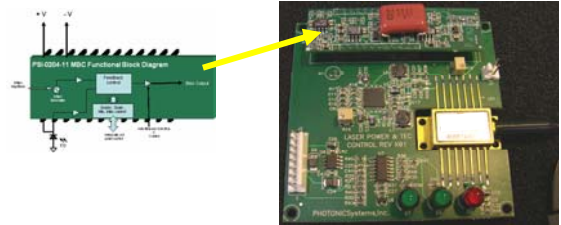
Pin #	Connection	Pin #	Connection
1	Thermistor	8	Case Ground
2	Thermistor	9	Case Ground
3	Laser Cathode (-)	10	NC
4	Monitor Diode Anode (-)	11	Laser Anode (+) (floating)
5	Monitor Diode Cathode (+)	12	Laser RF (NC on board)
6	TEC (+)	13	Laser Anode (+)
7	TEC (-)	14	NC

Rev.A 1/10/07 ; Specifications subject to change without notice



Externally modulated links may be controlled using the PSI-0204-11 modulator bias controller with the PSI-2600-11 Photonic controller board. When combined with a Lithium Niobate (LiNbO3) Mach Zehnder Modulator, these products provide a complete high performance photonic link for use in analog or data transmission applications.

PSI will customize these products to meet particular application needs. Contact us for more details.

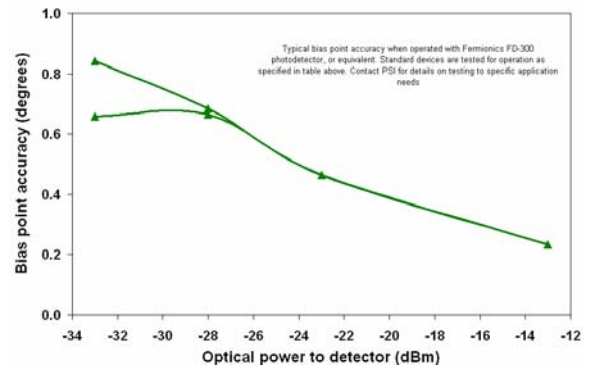


## PSI-0204-11 Modulator Bias Controller Specifications

Parameter	Typical Value	Units
Modulating Signal	Analog small or large signal or DPSK	—
Modulators Supported	LiNbO <sub>3</sub>	—
Output DC Bias Voltage	0.3v less than supply voltage	volts
Output DC Bias Port Impedance	<100	ohm
Dither Frequency	1	KHz
Dither Amplitude	20 to 200; user defined	mVpp
Bias Point Error @Quad + or Quad - point, -13dBm at optical detector	+/- 0.5 @1% dither of V <sub>π</sub>	degrees
Bias Point Error @Quad + or Quad - point, -28dBm at optical detector	+/- 1 @1% dither of V <sub>π</sub>	degrees
Bias Point Error @Max or Min point, -13dBm at optical detector	<0.1	degrees
Bias Point Error @Max or Min point, -28dBm at optical detector	<0.1	degrees
DC Power Supply	+/- 12 to +/-18	volts
DC Operating Current	<12	mA
Operating Temperature Range	0 to +50	Degree C
MBC Board Dimensions	2.5 x 0.7 (6.4 x 1.7cm) ; 24 pin dual in-line package, 0.6" width	in

Photonic Systems, Inc. (PSI) is a recognized expert in the design, analysis and implementation of high performance fiber optic systems.

With decades of collective experience, the PSI team offers comprehensive fiber optic engineering solutions to government, military and commercial customers.



### Ordering Information

The PSI-2600-11 Photonic Controller Board may be ordered in several standard configurations to match most applications. Please refer to the part numbers below when ordering. PSI also offers product customization services and will modify these products to match your needs. Please contact us for more details

<i>Option</i>	<i>Orderable Item Number(s)</i>	<i>Notes</i>
Photonic Controller Board	PSI-2600-11	Basic board without laser, modulator bias controller or optical power monitor.
Controller Board and Modulator Bias Controller	PSI-2600-11 PSI-0204-11	Photonic controller board and modulator bias controller. Excludes optical power monitor.
Controller Board with optical power monitor	PSI-2600-11-PMXX	Photonic controller board with optical power monitor (standard single mode fiber). Excludes modulator bias controller. Specify optical power in mW expected at power monitor.
Photonic Controller Board with 40 mW laser	PSI-2600-11-FOL15	Photonic controller board including 40 mW 1550nm laser. Excludes modulator bias controller or optical power monitor.
Photonic Controller Board with 40 mW laser and optical power monitor	PSI-2600-11-FOL15-PMXX	Photonic controller board including 40 mW 1550nm laser and optical power monitor. Excludes modulator bias controller. Specify optical power in mW expected at power monitor.