

Section 1

General Information

1.1 Introduction

The Model 500 and 500AN Series Laser Diode Drivers are low noise, highly stable current sources for use with laser diodes. Selectable output current ranges allow you to choose the laser current range having the optimum resolution for your application. Two operating modes, constant current and constant laser power are available. A monitor photodiode can be zero biased or reverse biased up to –5 volts without resorting to external power supplies. Redundant FET and relay shorting circuits protect the laser diode during the beginning of a soft-start sequence. After a short delay the output current slowly ramps up to the operating set-point. A current LIMIT setting unconditionally protects the output from exceeding the laser diode's maximum specified operating current independent of operating mode. An external analog modulation input allows voltage control of the output. Model 500AN Series Laser Diode drivers are equipped with an Analog Interface, enabling remote control and monitoring of the laser diode.

1.2 Specifications

	Model 501 Model 501AN		Model 505 Model 505AN		Model 525 Model 525AN		Model 560 Model 560AN	
Output Current								
Output Current Range (mA)	0 to 50	0 to 100	0 to 200	0 to 500	0 to 1000	0 to 2500	0 to 3000	0 to 6000
Set-point Resolution (mA)	0.005	0.010	0.020	0.050	0.100	0.250	0.300	0.600
Set-point Accuracy	±0.1 % FS		±0.1 % FS		±0.1 % FS		±0.1 % FS	
Compliance Voltage (Volts)	7 Volts		7 Volts		7 Volts		5 Volts	
Temp. Coefficient	<50 ppm/°C		<50 ppm/°C		<50 ppm/°C		<100 ppm/°C	
Short Term Stability (30 min.)	<10 ppm		<10 ppm		<10 ppm		<20 ppm	
Long Term Stability (24 hr.)	<25 ppm		<25 ppm		<25 ppm		<50 ppm	
Noise/Ripple (rms)								
Hi Bandwidth	<2 µA	<2 µA	<4 µA	<6 µA	<10 µA	<20 µA	<20 µA	<25 µA
Lo Bandwidth	<1 µA	<1 µA	<2 µA	<2 µA	<4 µA	<10 µA	<10 µA	<20 µA
Current Limit								
Range (mA)	0 to 50.00	0 to 99.99	0 to 200.0	0 to 500.0	0 to 999.9	0 to 2500	0 to 3000	0 to 6000
Resolution (mA)	0.01	0.01	0.1	0.1	0.1	1.0	1.0	1.0
Accuracy (mA)	±0.1	±0.1	±0.5	±0.5	±1	±3	±5	±10

	Model 501 Model 501AN	Model 505 Model 505AN	Model 525 Model 525AN	Model 560 Model 560AN
External Analog Modulation				
Input	0 to 10V, 10 k Ω	0 to 10V, 10 k Ω	0 to 10V, 10 k Ω	0 to 10V, 10 k Ω
Transfer Function	5 mA/V 10 mA/V	20 mA/V 50 mA/V	100 mA/V 250 mA/V	300 mA/V 600 mA/V
Bandwidth				
Hi BW (kHz)	DC - 800 DC - 600	DC - 500 DC - 350	DC - 300 DC - 150	DC - 100 DC - 50
Lo BW (kHz)	DC - 10 DC - 10	DC - 10 DC - 10	DC - 10 DC - 10	DC - 10 DC - 10
Photodiode Input				
Monitor Current				
Range	0 to 5 mA	0 to 5 mA	0 to 50 mA	0 to 50 mA
Stability	± 0.02 %	± 0.02 %	± 0.02 %	± 0.02 %
Accuracy	± 0.1 %	± 0.1 %	± 0.1 %	± 0.1 %
Photodiode Bias Voltage	0 to 5 Volts	0 to 5 Volts	0 to 5 Volts	0 to 5 Volts
Measurement Display				
Output Current Range (mA)	0 to 50.00 0 to 99.99	0 to 200.0 0 to 500.0	0 to 999.9 0 to 2500	0 to 3000 0 to 6000
Output Current Resol. (mA)	0.01 0.01	0.1 0.1	0.1 1.0	1.0 1.0
Output Current Accuracy	± 0.1 % of full scale	± 0.1 % of full scale	± 0.1 % of full scale	± 0.1 % of full scale
Photodiode Current Range (μ A)	0 to 5,000	0 to 5,000	0 to 50,000	0 to 50,000
Photodiode Current Resol. (μ A)	1.0	1.0	1.0	10
Photodiode Current Acc.	± 0.1 % of full scale	± 0.1 % of full scale	± 0.1 % of full	± 0.1 % of full

General

Input Power 90–125, 180–250 V_{AC}, 50–60 Hz

Chassis Ground 4 mm banana jack

Size, H x W x D 88 x 215 x 280 mm
(3.5" x 8.5" x 11")

Weight 2.9 kg (6.5 lbs.)

Operating Temperature 0°C to +50°C

Storage Temperature –40°C to +70°C

Humidity <90% relative, non-condensing

Laser Safety Features Output On/Off Keyswitch

(Meets CDRH US21 CFR 1040.10) Rear Panel Interlock

Output Delay

Connectors

Laser Diode & Photodiode 9-pin, D-sub (female)

External Photodiode BNC

External Analog Modulation BNC

Analog Interface 15-pin, high density D-sub (female)

(Models 501AN, 505AN, 525AN & 560AN)