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Model 8000

Modular Controller

Key Features

- *Comprehensive laser diode protection features*
- *Advanced 16-bit control technology*
- *Complete laser diode characterization (L,V,I) using 8500 modules*
- *Complete TE cooler characterization (I_{TE}, V_{TE}) using 8350 module*
- *Intuitive front panel controls*
- *Large graphics display, allowing full four channel visibility*
- *Standard GPIB/IEEE-488.2 and RS-232C interface*
- *LabVIEW drivers provided*
- *Four fully isolated module bays accept a variety of modules: 1) temperature controllers, 2) laser diode drivers, 3) combination LDD/TEC's*



The **Model 8000 Modular Controller** is a result of Newport's continuing commitment to provide advanced laser diode instrumentation at affordable prices.

The improved version includes a sophisticated microprocessor providing enhanced system control and data collection capabilities.

Four fully isolated bays accept a wide variety of modules. Many new laser diode applications, requiring multiple current sources and temperature controllers, are accommodated:

- Multiple beam, individually addressed laser diodes
- Multiple laser diode pumped fiber amplifiers
- 2-D vertical cavity surface emitting laser diode arrays.

The Model 8000 mainframe automatically detects which module is located in each bay and displays the entire system configuration on the large LCD display. All you do is follow on-screen instructions to configure and operate the modular system.

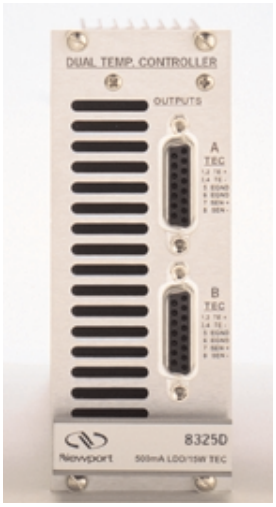
Advanced 16-bit technology coupled with careful designs that isolate digital and analog signals ensure precision control and measurement capabilities. GPIB/IEEE-488.2 and RS-232C interfaces are included with the Model 8000 mainframe for complete remote control and data collection. LabVIEW drivers are supplied with every Model 8000 Modular Controller.

The Model 8000 Modular Controller is a cost effective solution that meets your laboratory, production, and quality control applications. A flexible system design guarantees that the Model 8000 accommodate future modules making this controller the most complete instrument for laser diode control, characterization, and testing far into the future.

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Model 8350 Temperature Controller Module



Model 8325D Dual Temperature Controller Module



Model 8560 Laser Diode Driver Module

Controller Modules

Temperature Controllers

A 40 Watt Temperature Controller Module, the **Model 8350**, is offered for the Model 8000 to meet your most demanding TE cooling needs. Complete characterization of I_{TE}, V_{TE} and the sensor input is possible, making the 8350 module ideal for complete characterization of telecom laser diodes.

A dual output temperature controller, the **Model 8325D**, is also offered. It has two independent 15 Watt outputs that provide the same stability as the Model 8350.

Temperature controllers may be operated in one of three modes:

a. constant temperature,
b. constant resistance (thermistor and RTD), LM335 Voltage, or AD592 current,
c. constant TE Current (8350 only).

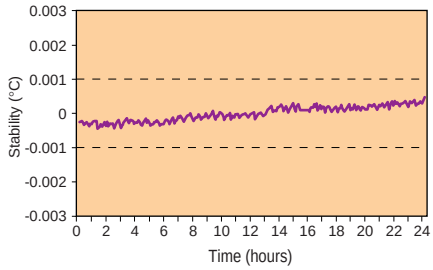
Short-term stability is better than 0.0005°C while long-term stability is better than 0.001°C.

Four sensor types are available:

a. thermistors,
b. AD590 Series (8350 only),
c. LM335 Series (8350 only),
d. 100Ω Platinum RTD's (8350 only).

IC sensors inherently display temperature while thermistors and RTD's display °C by entering a set of constants. Each sensor can be calibrated to increase its accuracy.

A temperature controller can be linked to a LDD module so that if the laser diode temperature exceeds a user-defined operating range, the output of the LDD turns off and an error message is displayed. Both T_{HI} and T_{LO} are set when configuring the TEC module.



Newport's temperature controllers have unparalled long-term stability of better than 0.001°C

An independent I_{TE} current limit protects the thermoelectric module from being damaged by current levels that exceed its maximum rating.

Laser Diode Driver Modules

Advanced circuit designs and careful layout of the **8500 Series** modules result in an extremely low noise, highly stable output current source. This coupled with a low bandwidth mode results in the lowest noise output of any modular laser diode system.

An external analog modulation input allows precision control of the laser output for a variety of applications. Modulation is available in both constant current (ACC) mode and in constant power (APC) mode.

A monitor photodiode may be zero biased for CW low noise applications or reversed biased up to 5 volts for high frequency modulation.

All laser diode parameters are accessible with 16-bit resolution including the laser diode's forward voltage. Full characterization of laser diode parameters is available with every current source module offered with the Model 8000 mainframe.



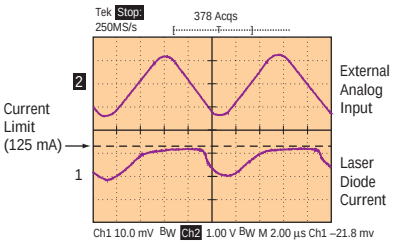
Model 8605 combination Laser Diode Drive/TEC Module

GPIB/IEEE-488.2 interface gives you the power to remotely control and collect data

A GPIB/IEEE-488.2 interface is included in the Model 8000 with all control and measurement functions accessible. The command set is the most comprehensive of any controller available and emulates GPIB commands of other manufacturers.



Model 8000 master screen presents entire system configuration and status.



Limiting circuitry unconditionally prevents laser diode current from exceeding limit setting independent of operating mode even during external analog modulation.

Combination LDD/TEC Modules

When temperature stabilization is required, the **8600 Series Combination LDD/TEC** modules give you full control of your laser diodes. A 15 Watt (2.5A/6V) TEC section is combined with a quiet current source for complete stabilization of your laser diode.

A single 8600 module is capable of providing the necessary control for wavelength tuning laser diodes. The TEC section is used for coarse tuning while the LDD section is used for fine tuning. The Model 8000 is capable of precision wavelength tuning due to the fine resolution capability resulting from 16-bit control technology.

Combo LDD/TEC modules are designed for use in communication applications and have an internal function generator for testing systems. The user only needs to program the frequency, I_{max}, and I_{min} to modulate the laser diode output. Both sinewave or squarewave (50% duty cycle) waveforms are available from 200 Hz–300 kHz. This range of frequencies meets today's low frequency single tone and high data rate test requirements for datacom and telecom.

So whether you are wavelength tuning your laser diode or require full characterization capabilities, the 8600 Series combination LDD/TEC modules provide complete control of your laser diode.

Comprehensive Safety Features Protect Your Laser Diode Investments

Time tested safety features are incorporated into the Model 8000 mainframe and each laser diode driver module to provide maximum protection to your laser diode. Input power module filters provide first stage protection against AC line transients. Secondary filtering and power regulation stages coupled with high speed transient detection circuits, plus a proprietary intermittent contact protection circuit are added resulting in the most sophisticated laser diode instrumentation available today. All this coupled with a slow turn-on sequence, multiple output shorting circuits, and an independent current limiting feature provide the superior protection you demand from all your laser diode instrumentation.

Intuitive Controls and Large Graphics Display Simplify Control and Test Procedures

Improved data presentation and system control are achieved using a large graphics display. The MASTER screen presents the entire system configuration as well as each module's status. "Soft Keys" guide you through initial system setup routines and operation of each module.

Real-time control of an output is accomplished either by entering a set point on the keypad or via the digitally-encoded control knob. "Soft Keys" access saves system configurations and repetitive procedures. User-defined mini-programs and control functions are entered using the FUNC key giving you maximum flexibility when using the Model 8000.

All controls are clearly marked and instructions easily defined. The Model 8000 Modular Controller lets you work with laser diodes easier and faster than any other controller on the market today.

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Temperature Controller (TEC) Module Specifications

	8350 TEC Module		8325D Dual TEC Module[1]	
TEC Output				
Type	Bipolar, Low Noise		Bipolar, Low Noise	
Maximum Current (A)	5		5	
Compliance Voltage (V)	>8		>6	
Typical Power (W)	40		15	
I_{TE} Current Resolution (mA)	0.153		0.076	
I_{TE} Current Accuracy[5]	±(0.02% + 4 mA)			
Current Limit				
Range (A)	0–5		0–2.5	
Accuracy (mA)	±20		±10	
Ripple/Noise (rms) (mA)	<1			
Short-Term Stability (1 h)	<0.0005°C			
Long-Term Stability (24 h)	<0.001°C			
Temperature Coefficient	<0.05°C/°C			
TEC Measurement Display				
Temperature	-100.00 to 240°C			
Resistance (10 µA) (kΩ)	0.01–495			
Resistance (100 µA) (kΩ)	0.001–49.5			
Range Resistance (RTD) (Ω)	20–192			
TE Current (A)	-5.000 to +5.000		-2.500 to + 2.500	
Range AD590 Current (µA)	248–378			
Range LM335 Voltage (mV)	2331–3731			
Range TE Voltage (V)	0.0–8.0			
Temperature	0.01°C			
Resistance (10 µA) (Ω)	10			
Resistance (100 µA) (Ω)	1			
Resolution Resistance (RTD) (Ω)	0.01			
TE Current (mA)	1			
Resolution AD590 Current (µA)	0.01			
Resolution LM335 Voltage (mV)	0.1			
Resolution TE Voltage (V)	0.1			
Temperature[4]	Typical ±0.1°C			
Resistance (10 µA)[5]	±(0.04% + 16Ω)			
Resistance (100 µA)[5]	±(0.05% + 8Ω)			
Accuracy Resistance (RTD)[5]	±(0.03% + 50Ω)			
TE Current[5]	±(0.09% + 2 mA)			
Accuracy AD590 Current[5]	±(0.005% +0.5 µA)			
Accuracy LM335 Voltage[5]	±(0.09% + 1 mV)			
Accuracy TE Voltage[5]	±(0.005% + 100 mV)			
Temperature Sensors	Thermistor (NTC 2-wire)	AD590	LM335	RTD (100Ω)[2]
Temp. Sensor Control Resolution	0.01°C	0.01°C	0.01°C	0.01°C
Temp. Sensor Control Accuracy	±0.05°C[3]	±0.05°C	±0.05°C	±0.05°C
Sensor Bias	10/100 µA	+5 V	1 mA	1 mA
Temperature Computation and Calibration				
Thermistor	$1/T = (C1 \times 10^{-3} + (C2 \times 10^{-4})(\ln R) + (C3 \times 10^{-7})(\ln R)^3$			
AD590	$T = C1 + C2 \times (I_{AD590}/1\ \mu A/K - 273.15)$			
LM335	$T = C1 + C2 \times (V_{LM335}/10\ mV/K - 273.15)$			
RTD (100Ω)	$R_T = Ro\ [1 + C1T + C2T^2]$; T ≥0°C, Ro = resistance at 0°C where Ro = 100Ω for a 100Ω Pt RTD. $R_T = Ro\ [1 + C1T + C2T^2 + C3T^3(T - 100)]$; T < 0°C			

1) The 8325D has two independent TEC outputs and supports thermistor sensors only
2) Accuracy is with lead wire resistance calibrated out
3) Thermistor accuracy will degrade at temperatures above 25°C
4) Temperature is a value derived from the sensor's parameter (resistance, voltage or current) using the above temperature computation equations. Accuracy can be computed by applying the sensor's parameter to the above equations at the temperature in question.
5) ± (x% Reading + Fixed Error)

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Laser Diode Driver (LDD) Module Specifications

	8505	8510	8530	8560
Laser Output				
Output Current Range (mA)	0–500	0–1000	0–3000	0–6000
Output Current Resolution (mA)	0.0076	0.0153	0.0458	0.0916
Output Current Accuracy[2]	±(0.03% + 15 µA)	±(0.03% + 30 µA)	±(0.03% + 90 µA)	±(0.03% + 180 µA)
Compliance Voltage (V)	7	5	5	5
Temperature Coefficient (ppm FS/°C)	<50			
Short-Term Stability (1 h) (ppm FS)	<10			
Long-Term Stability (24 h) (ppm FS)	<50			
Noise/Ripple (rms) (µA)[1]				
Hi BW	<8.0	<10	<15	<25
Lo BW	<4.0	<8.0	<10	<25
Current Limit				
Range (mA)	0–500	0–1000	0–3000	0–6000
Resolution (mA)	1			
Accuracy (mA)	±2	±2	±4	±6
Internal Function Generator				
Waveforms	Sinewave, Squarewave			
Frequency Range[3]	200 Hz –300 kHz			
Squarewave Duty Cycle	50 ±5%			
Independent Output Set Points	I_{max}, I_{min}			
Analog Modulation				
Input Range, Input Impedance	0–10 V, 10 kΩ			
Transfer Function (mA/V)	50	100	300	600
Bandwidth (3dB ±10%), Hi (APC mode only) (kHz)	DC to 350	DC to 250	DC to 100	DC to 100
Bandwidth (3dB ±10%), Lo (APC mode) (kHz)	DC to 10			
Bandwidth (3dB ±10%) (APC mode) (Hz)	DC to 20			
Photodiode Input				
Monitor Current Range (mA)	0–5	0–5	0–20	0–20
Monitor Current Stability (24 h)	±0.02% FS			
Monitor Current Accuracy[2]	±(0.004% + 0.5 µA)	±(0.004% + 0.5 µA)	±(0.004% + 1 µA)	±(0.004% + 1 µA)
Temperature Coefficient	<0.02% FS/°C			
Photodiode Reverse Bias	0–5 V ±10%			
Measurement Display				
Output Current Range (mA)	0–500.00	0–1000.0	0–3000.0	0–6000.0
Output Current Resolution (mA)	0.01	0.1	0.1	0.1
Output Current Accuracy[2]	±(0.02% + 20 µA)	±(0.02% + 200 µA)	±(0.02% + 200 µA)	±(0.02% + 200 µA)
Forward Voltage Range (V)	0.000–7.000	0.000–5.000	0.000–5.000	0.000–5.000
Forward Voltage Resolution (mV)	1			
Forward Voltage Accuracy[2]	±(0.005%+1 mV)			
Photodiode Current Range (µA)	5–5000	5–5000	15–20,000	15–20,000
Photodiode Current Resolution (µA)	0.1			
Photodiode Current Accuracy[2]	±(0.01% + 0.5 µA)	±(0.01% + 0.5 µA)	±(0.01% + 1 µA)	±(0.01% + 1 µA)
PD Response Range (µA/mW)	0.00–600.00			
PD Response Resolution (µA/mW)	0.01			
Optical Power Range (mW)	0.00–500.00	0.00–1000.00	0.00–3000.00	0.00–6000.00
Optical Power Resolution (mW)	0.01	0.1	0.1	0.1

1) True rms, 3 Hz–300 kHz, 1/2 FS, resistive load
2) ± (x% Reading + Fixed Error)
3) Output current may begin to roll-off at higher frequencies

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Dual Laser Diode Driver (LDD) Modules

	8501D[3]	8505D[3]	8510D[3]
Laser Output			
Output Current Range (mA)	0–100	0–500	0–1000
Output Current Resolution (mA)	0.0015	0.0076	0.0153
Output Current Accuracy[2]	±(0.03%+5 µA)	±(0.03%+15 µA)	±(0.03%+30 µA)
Compliance Voltage (V)		5	
Temperature Coefficient (ppm FS/°C)		<50	
Short-Term Stability (1 h) (ppm FS)		<10	
Long-Term Stability (24 h) (ppm FS)		<50	
Noise/Ripple (rms) (µA)[1]	<2.0	<2.0	<2.5
Current Limit			
Range (mA)	0–100	0–500	0–1000
Resolution (mA)		1	
Accuracy (mA)		±2	
Analog Modulation		None	
Photodiode Input			
Monitor Current Range (mA)		0–5	
Monitor Current Stability (24 h)		±0.02% FS	
Monitor Current Accuracy[2]		±(0.004%+0.5 µA)	
Photodiode Reverse Bias		None	
Measurement Display			
Output Current Range (mA)	0–100.00	0–500.00	0–1000.0
Output Current Resolution (mA)	0.01	0.01	0.1
Output Current Accuracy[2]	±(0.02%+10 µA)	±(0.02%+20 µA)	±(0.02%+200 µA)
Forward Voltage Range (V)		0.000–5.000	
Forward Voltage Resolution (mV)		1	
Forward Voltage Accuracy[2]		±(0.005%+1 mV)	
Photodiode Current Range (µA)		5–5000	
Photodiode Current Resolution (µA)		0.1	
Photodiode Current Accuracy[2]		±(0.01%+0.5 µA)	
PD Response Range (µA/mW)		0.00–600.00	
PD Response Resolution (µA/mW)		0.01	
Optical Power Range (mW)	0.00–100.00	0.00–500.00	0.00–1000.0
Optical Power Resolution (mW)	0.01	0.01	0.1

1) True rms, 3 Hz–300 kHz, 1/2 FS, resistive load
2) ± (x% Reading + Fixed Error)
3) Configured for Common-Cathode. Please call for Common-Anode configuration.

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Temperature Controller Specifications (all modules)

TEC Output	
Type	Bipolar, low noise
Maximum Current (A)	2.5
Compliance Voltage (V)	>6
Typical Power (W)	15
Current Limit	
Range (A)	0–2.5
Accuracy (mA)	±10
Ripple/Noise (rms) (mA)	<1
Short-Term Stability (1 h)	0.0005°C
Long-Term Stability (24 h)	0.001°C
Temperature Coefficient	<0.05°C/°C
TEC Measurement Display	
Temperature	-100.00 to +240.00°C
Resistance (10 µA) (kΩ)	0.01–495
Resistance (100 µA) (kΩ)	0.001–49.5
TE Current (A)	-2.500 to +2.500
Temperature	0.01°C
Resistance (10 µA) (Ω)	10
Resistance (100 µA) (Ω)	1
TE Current (mA)	1
Temperature[4]	Typical ±0.1°C
Resistance (10 µA)[3]	±(0.04% + 16Ω)
Resistance (100 µA)[3]	±(0.05% + 8Ω)
TE Current[3]	±(0.3% + 2 mA)
Temperature Sensor	
Sensor Type	NTC, 2-wire Thermistor
Sensor Bias (µA)	10/100
Thermistor Calibration	
$1/T = (C1\ 10^{-3} + (C2 \times 10^{-4})(\ln R) + (C3 \times 10^{-7})(\ln R)^3$	

1) True rms, 3 Hz–300 kHz, 1/2 FS, resistive load
2) Fixed—If desired, specify 0–5 V at time of order
3) ± (x% Reading + Fixed Error)
4) Temperature is a value derived from the sensor's parameter (resistance) using the thermistor calibration equations. Accuracy can be computed by applying the sensor's parameter to the above equation at the temperature in question.
5) May be lower with common anode/thermistor package
6) Output current may begin to roll-off at higher frequencies

Combination LDD & TEC Module Specifications

Laser Diode Driver Selection	8605 8605-SO 8605-5V	8610 8610-SO 8610-5V	8630 8630-SO 8630-5V
Laser Output			
Output Current Range (mA)	0–500	0–1000	0–3000
Output Current Resolution (mA)	0.0076	0.0153	0.0458
Output Current Accuracy[3]	±(0.03% + 15 µA)	±(0.03% + 30 µA)	±(0.03% + 90 µA)
Compliance Voltage (V)[5]	7	7	5
Temperature Coefficient (ppm FS/°C)		<50	
Short-Term Stability (1 h) (ppm FS)		<10	
Long-Term Stability (24 h) (ppm FS)		<50	
Noise/Ripple (rms) (µA)[1]	<2	<5	<10
Current Limit			
Range (mA)	0–500	0–1000	0–3000
Resolution (mA)		1	
Accuracy (mA)	±2	±2	±4
Internal Function Generator			
Waveforms		Sinewave, Squarewave	
Frequency Range[6]		200 Hz –300 kHz	
Squarewave Duty Cycle		50 ±5%	
Independent Output Set Points		I_{max}, I_{min}	
Frequency Jitter		<1%	
Frequency Accuracy		±5%	
Amplitude Accuracy		±5%	
Sinewave THD		<2%	
Squarewave Risetime (µsec)	<1	<5	<10
Photodiode Input			
Monitor Current Range (mA)	0–5	0–5	0–20
Monitor Current Stability (24 h)		±0.02% FS	
Monitor Current Accuracy[3]	±(0.004% + 0.5 µA)	±(0.004% + 0.5 µA)	±(0.004% + 1 µA)
Temperature Coefficient		<0.02% FS/°C	
Photodiode Reverse Bias[2]	5 VDC for "-5V" versions. The others have PD bias of zero.		
Measurement Display			
Output Current Range (mA)	0–500.00	0–1000.0	0–3000.0
Output Current Resolution (mA)	0.01	0.1	0.1
Output Current Accuracy[3]	±(0.02% + 20 µA)	±(0.02% + 200 µA)	±(0.02% + 200 µA)
Forward Voltage Range (V)	0.000–7.000	0.000–7.000	0.000–5.000
Forward Voltage Resolution (mV)		1	
Forward Voltage Accuracy[3]		±(0.005%+1 mV)	
Photodiode Current Range (µA)	5–5000	5–5000	15–20,000
Photodiode Current Resolution (µA)		0.1	
Photodiode Current Accuracy[3]	±(0.01% + 0.5 µA)	±(0.01% + 0.5 µA)	±(0.01% + 1 µA)
PD Response Range (µA/mW)		0.00–600.00	
PD Response Resolution (µA/mW)		0.01	
Optical Power Range (mW)	0.00–500.00	0.00–1000.00	0.00–3000.00
Optical Power Resolution (mW)	0.01	0.01	0.1

"-SO" Combo modules indicate the Sync Out version, enabling synchronized modulation among modules.

"-5V" Combo modules are provided with a permanent 5 VDC bias applied across the monitor photodiode pins. Note that this is not user adjustable.

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Mainframe Specifications

Display Type	LCD graphics display, 128 H x 240 W pixels
Display Backlighting	Green LED
Display Controls	Brightness, contrast (contrast optimizes viewing angle) and invert screen
Laser Diode On Indicator	Green LASER ACTIVE LED indicates at least one laser diode is on
Output Connectors TEC	15-pin female D-sub
Output Connectors Dual TEC	Two 9-pin female D-sub
Output Connectors LDD	9-pin female D-sub, BNC (external modulation), BNC (auxiliary photodiode input)
Output Connectors Dual LDD	Two 9-pin female D-sub
Output Connectors Combo LDD/TEC	9-pin female D-sub (LDD), and 15-pin female D-sub (TEC)
Chassis Ground	4 mm banana jack
GPIB	24-pin IEEE-488
RS-232C	9-pin male D-sub
Power Requirements	90–132 V (max. 5 A), 198–250 V (max. 2.5 A), 50–60 Hz
Size (H x W x D) [in. (mm)]	5.25 (133) x 16.75 (426) x 14 (356)
Mainframe Weight [lb (kg)]	31.5 (14.3)
Module Weight [lb (kg)]	2.5 (1.1)
Operating Temperature	0°C to 40°C (<70% relative humidity non-condensing)
Storage Temperature	-20°C to + 60°C (<90% relative humidity non-condensing)
Laser Safety Features	Laser enable keyswitch, interlock, output delay (meets CDRH US21 CFR 1040.10)
Isolation/Crosstalk	All modules electrically isolated with respect to each other and from earth ground



Model 8000 Rear Panel

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Ordering Information

Model	Description	Option Code
8000 Series	Laser Diode Controller Mainframe[1]	
Model 8000 Temperature Controller (TEC) Modules		
8350	5A/8V TEC Module	01
8325D	2.5A/6V Dual TEC Module	02
Model 8000 Laser Diode Driver (LDD) Modules		
8505	LDD Module (500 mA)	11
8510	LDD Module (1000 mA)	12
8530	LDD Module (3000 mA)	13
8560	LDD Module (6000 mA)	14
Model 8000 Dual LDD Modules		
8501D	Dual LDD Module (100mA)	15
8505D	Dual LDD Module (500mA)	16
8510D	Dual LDD Module (1000 mA)	18
Model 8000 Combination LDD/TEC Modules		
8605	LDD (500 mA) & TEC (2.5A/6V) Combination Module	41
8610	LDD (1000 mA) & TEC (2.5A/6V) Combination Module	42
8630	LDD (3000 mA) & TEC (2.5A/6V) Combination Module	43
8605-SO	LDD (500 mA) & TEC (2.5A/6V) Combination Module, with Sync Out	44
8610-SO	LDD (1000 mA) & TEC (2.5A/6V) Combination Module, with Sync Out	45
8630-SO	LDD (3000 mA) & TEC (2.5A/6V) Combination Module, with Sync Out	46
8605-5V	LDD (500 mA) & TEC (2.5A/6V) Combination Module, with 5V PD Bias	47
8610-5V	LDD (1000 mA) & TEC (2.5A/6V) Combination Module, with 5V PD Bias	48
8630-5V	LDD (3000 mA) & TEC (2.5A/6V) Combination Module, with 5V PD Bias	49
Accessories		
300-02[2]	Temperature Controller Cable	
300-04[2]	TEC/Mount Cable	
300-16	10.0 kΩ Thermistor (±0.2°C)	
300-22	AD592CN IC Sensor (-45°C to +125°C Range)	
500-02[2]	Laser Diode Driver Cable	
500-04[2]	LDD/Mount Cable	
8000-RACK	Rack Mount Kit	

1) Blank plates provided with mainframe controller to cover unused bays.
2) Please see page 64 for cable diagrams.



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Model 8000 LDD, TEC, and combination LDD/TEC Modules are compatible with Newport's line of Temperature Controlled and Telecom Laser Diode Mounts, *see page 52.*

Ordering Instructions

There are two simple ways to order Newport's Model 8000 Modular Controller:

I. When ordering your customized system configuration, specify the following Model number:

8000-OPT-□□ - □□ - □□ - □□
Bay 1 Bay 2 Bay 3 Bay 4

Indicate the Option Code number for the specific Module you would like us to install in any one of the four available bays. Please indicate NN, if you do not require a module in a particular bay.

Example: 8000-OPT-11-01-41-NN

Model 8000 Modular Controller with Model 8505, 500 mA LDD Module, in Bay 1; Model 8350, 5A TEC Module in Bay 2; Model 8605, 500 mA/2.5A Combination LDD/TEC Module in Bay 3; and no Module in Bay 4.

II. Any one of Newport's Model 8000 Modules can be ordered separately, in the event that you would like to upgrade your Modular Controller in the future. Please use only the Model number as shown in the table above, for ordering stand alone modules.

For the modular system that best meets your laser diode control needs, call Newport's Application Sales Engineers.



Model 708 8-Channel Butterfly Telecom LD Mount is ideal for use with the Model 8000. *Please see page 55 for more information.*

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