

## 685-02 ComboPak, 2A/3.5V Laser, 3A/3.5V TEC



The **685-02 ComboPak** offers excellent laser performance for pump lasers, higher power LEDs, and other devices requiring up to 2A of drive current. With 100uA set point resolution and less than 40uA of noise, the 685-02 provides a transparent driver that won't interfere with the performance of your laser or LED devices. Couple that with a high performance TEC controller that supports excellent long term stability and high resolution.

### Develop with a ComboSource, Deploy with a ComboPak

The ComboPak is command-set compatible with the ComboSource and also features the same laser and TEC interfaces. This means you can start your development with the ComboSource, a robust benchtop instrument with a full user interface and display, then move to the lower cost ComboPak as you roll out the application to production or your end-users.

- Laser
  - 2A / 3.5V
  - 0.1mA resolution
  - <40 uA noise
  - Analog modulation
- TEC
  - 3A / 3.5V / 10.5W
  - Thermistor input
  - Fully adjustable PID
- USB interface

### Analog or Computer -- Your Choice

The 685 Series ComboPaks provide both a robust analog interface as well as USB computer control for precise remote operation (you can even use both interface simultaneously). The analog interface provides on/off control and status, while the computer interface provides complete control over all operating parameters.

### Analog Modulation

The 685-02's analog interface supports modulation rates up to 100kHz.

### Simple Multi-Channel System

Using the [1402C-RM Rack Mount Tray](#), you can quickly rack groups of 3 or 5 Paks into a rack for a quick multi-channel system.



### Universal AC Input

The ComboPak features a universal AC input, eliminating the need to reconfigure the instrument when moving your application internationally.

## Specifications

### Summary

Laser Driver	2 Amp, 3.5 Volt
Temperature Controller	3 Amp, 3.5 Volt, 10.5 Watt

### Laser Driver

<b>LASER CURRENT</b>	
Range (mA)	0 – 2000
Resolution (mA)	0.04
Accuracy ( $\pm$ [% set + mA])	0.025% + 0.5
Stability (ppm, time)	< 10, 1 hour
Temperature Coeff (ppm/°C)	50
Noise/Ripple ( $\mu$ A rms, low BW)	< 40
Transients ( $\mu$ A)	< 200
Compliance Voltage (V)	3.5
Modulation Bandwidth (kHz)	100
Modulation Input Range	0 – 10V, 10k $\Omega$
<b>PHOTODIODE CURRENT</b>	
Range ( $\mu$ A)	5 – 5,000
Resolution ( $\mu$ A)	0.1
Accuracy ( $\pm$ [% set+ $\mu$ A])	0.05% + 1
Stability (ppm, time)	< 200, 24 hours
Temperature Coeff (ppm/°C)	< 200
PD Bias (V)	-2.5V, fixed
<b>LASER VOLTAGE</b>	
Range (V)	0 – 3.5
Resolution (V)	0.001
Accuracy ( $\pm$ [% set+V])	0.05% + 0.005
Stability (ppm, time)	< 50, 1 hour
Temperature Coeff (ppm/°C)	< 100
Four-wire Measurement	Yes
<b>LIMITS</b>	
Current Limit Accuracy (mA)	20
Voltage Limit Accuracy ( $\pm$ % FS)	2.5%

### Temperature Controller

Power (A, V, W)	$\pm$ 3A, $\pm$ 3.5V, 10.5W
<b>TEMPERATURE</b>	
Stability (1 hour, °C)	0.002
Stability (24 hours, °C)	0.005
Range (°C)	-99 to 250
Resolution (°C)	0.01
Temperature Accuracy at 25°C (°C)	0.03
<b>Sensor</b>	
Type	Thermistor
Accuracy ( $\pm$ [% reading + k $\Omega$ ])	0.05 + 0.005
Range (k $\Omega$ )	0.02 – 45
Resolution (k $\Omega$ )	0.001
Bias ( $\mu$ A)	100
<b>CURRENT</b>	
Range (A)	$\pm$ 3
Compliance Voltage (V)	> $\pm$ 3.5
Max Power (W)	10.5
Resolution (A)	0.01
Accuracy ( $\pm$ [% value + A])	0 + 0.03
Noise/Ripple (A, rms)	< 0.005
Current Limit Accuracy (A)	0.05
<b>VOLTAGE (measurement only)</b>	
Accuracy ( $\pm$ [% reading + V])	0 + 0.05
Range (V)	> $\pm$ 3.5
Resolution (V)	0.01

### General

Laser Connector	DB-9, female
TEC Connector	DB-15, female
Computer Interface	USB 2.0 Full Speed (USB Type B)
Power	Universal 90 - 250 VAC, 50/60 Hz
Size (H x W x D) [inches (mm)]	2.6 (66) x 4.5 (114.3) x 8.5 (215)
Operating Temperature	+10°C to +40°C
Storage Temperature	-20°C to +60°C