

# 1. General Information

## 1.1 Introduction

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This manual describes the features and specifications of the Newport Custom 128-Channel Chip on Carrier Laser Diode Burn-In System.

- Rack System Rack System Documentation (what you are reading now) contains information specific to your rack system.
- The *Model 8016/9008/9016 Modular Controller User's Manual* contains information about the care and use of the laser diode controller.
- The *Newport Laser Control System Software User's Manual* contains information about the rack system control software for laser diode test and measurement and calibration.
- The *PD Calibrate Software User's Manual* contains information about the photodiode calibration software.

## 1.2 Newport Custom Laser Diode Burn-In Rack System Description

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The Newport Laser Diode Burn-in System is designed to simultaneously burn-in up to 128 laser diode chip-on-carrier (COC) devices. It is a fully-integrated system constructed with all elements contained in a 34U rack. Each COC fixture houses a total of 16 devices. Laser diodes are aligned and secured to temperature-controlled mounts by means of a machined cover plate. Each fixture incorporates a precision milled recess for accurate location of customer COC devices. Spring probe pins are used to make electrical contact with each of the COC devices within the mount. A silicon photodiode array with colored glass neutral density filters is an integral part of the fixture cover for measurement of front facet optical power.

The system includes a rack-mounted computer with a complete package of control, measurement, analysis, and data exporting software. Full safety features are provided both for the operator and for the devices undergoing burn-in.

The system is comprised of dual output laser diode drivers (LDD) that provide 1,000 mA of current at a compliance voltage of 3.5 volts as measured at the devices. Both Constant Power (APC) and Constant Current (ACC) modes are available. Constant Power operation uses the front facet InGaAs photodiode, which is part of the test fixture. Forward current, forward voltage, and front facet power are all measured at a resolution of 16 bits.

High power 50-watt TEC modules provide temperature control of the device fixtures. Each fixture incorporates two active Peltier coolers for constant temperature control and stabilization. The temperature between each set of diodes is independently measured and recorded for increased temperature accuracy at the COC device. This is achieved using an external data acquisition unit.

An uninterruptable power supply acts as a continuous active voltage regulator and transient suppresser. Backup batteries provide emergency power in the event of

## 1.4 General Newport Custom Laser Diode Burn-In Rack System Specifications

### System Size

Rack Size	34U (Height) 19" (Width) Rack
Number of Racks	2
Total Device Capability	256
Device Type	ADC Chip on Carrier (CoC)

Table 1 – System Size

### Device Temperature Control

Temperature Range	25°C to 30°C
Temperature Stability	± 0.05°C

Table 2 – Device Temperature Control

### Operating Modes

Automatic Power Control (APC)	YES
Automatic Current Control (ACC)	YES

Table 3 – Operating Modes

### Photodiode (front facet)

Detector Type	Silicon Photodiode
Wavelength Range	980 nm
Maximum Input Power	500 mW
Attenuation	Neutral Density (ND) Filters

Table 4 – Photodiode, Front Facet

### Characterization Capabilities

I versus Time	YES
V-I (Current-Voltage)	YES
I versus Time (APC mode)	YES
L versus Time (ACC mode)	YES
L <sub>eff</sub> (Light Monitor Current)	YES

Table 5 – Characterization Capabilities

## 1.5 Dual Output Laser Diode Driver Specifications

### Laser Output (per output)

Output Current Range	0 to 650 mA
Output Current Resolution	0.0153 mA
Compliance Voltage	3.5 Volts
Temperature Coefficient (Full Scale)	< 50 ppm/ °C

Table 9 – Laser Output (per output)

### Current Limit (set in software)

Range	0 to 1,000 mA
Resolution	2 mA
Accuracy	± 0.1%

Table 10 – Current Limit

### Forward Current ( $I_f$ ) Measurement

Range	0 to 1,000 mA
Resolution (16-bit)	0.1 mA
Accuracy	0.03% ± 15 $\mu$ A

Table 11 – Forward Current Measurement ( $I_f$ )

### Front Facet Power Measurement (L)

Power Range	0 to 500 mW
Power Resolution	0.1 mW
Power Accuracy	± 7% (at 980nm)
Detector Area	Customer Calibrated Detectors using internal golden standard 0.441-in. (11.2 mm) Active Diameter

Table 12 – Front Facet Power Measurement (L)

### Forward Voltage ( $V_f$ )

Forward Voltage Range	0.000 to 3.5 V
Forward Voltage Resolution	1 mV
Forward Voltage Accuracy	± 0.5% ± 10 mV

Table 13 – Forward Voltage ( $V_f$ )

### NOTE

In accordance with ongoing efforts to continuously improve our products, Newport Corporation reserves the right to modify product specifications without notice and without liability for such changes.