

# Newport Custom Rack System User's Manual

## Introduction

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This manual contains documentation that will allow you to safely and efficiently operate your Newport custom rack system. The Model 8016/9008/9016 Modular Controller User's Manual contains information regarding the care and use of the laser diode controller. The Newport Laser Control System Software User's Manual and NLCS PD Calibrate User's Manual contain information regarding use of the rack system control software for laser diode test and measurement and calibration.

## Newport Custom Rack System Description

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Newport's Butterfly package Laser Diode Burn-In system houses 48 channels in a rack. Each rack contains control and measurement electronics, test fixtures, an integrated computer, and uninterruptable power supplies. A complete software package allows individual control and measurement capabilities of each device. Analysis of the laser diode includes standard L/V/I curves, threshold current, slope efficiency, as well as other calculated values.

Combo Laser Diode Driver (LDD)/Temperature Controller (TEC) modules provide 500 mA of current and a compliance voltage of 3.5 volts. Both Constant Power (APC) and Constant Current (ACC) modes are available. Constant power mode operation uses a Silicon photodiode that is part of the test fixture to measure the fiber output power. Forward current, forward voltage, monitor photodiode current and front facet power are all measured at a resolution of 16-bits. The thermistor resistance and the TE module current and voltage are also measured. The temperature of each device can be read via an external 10 k $\Omega$  resistor located under each device. This temperature is measured and recorded to the database file.

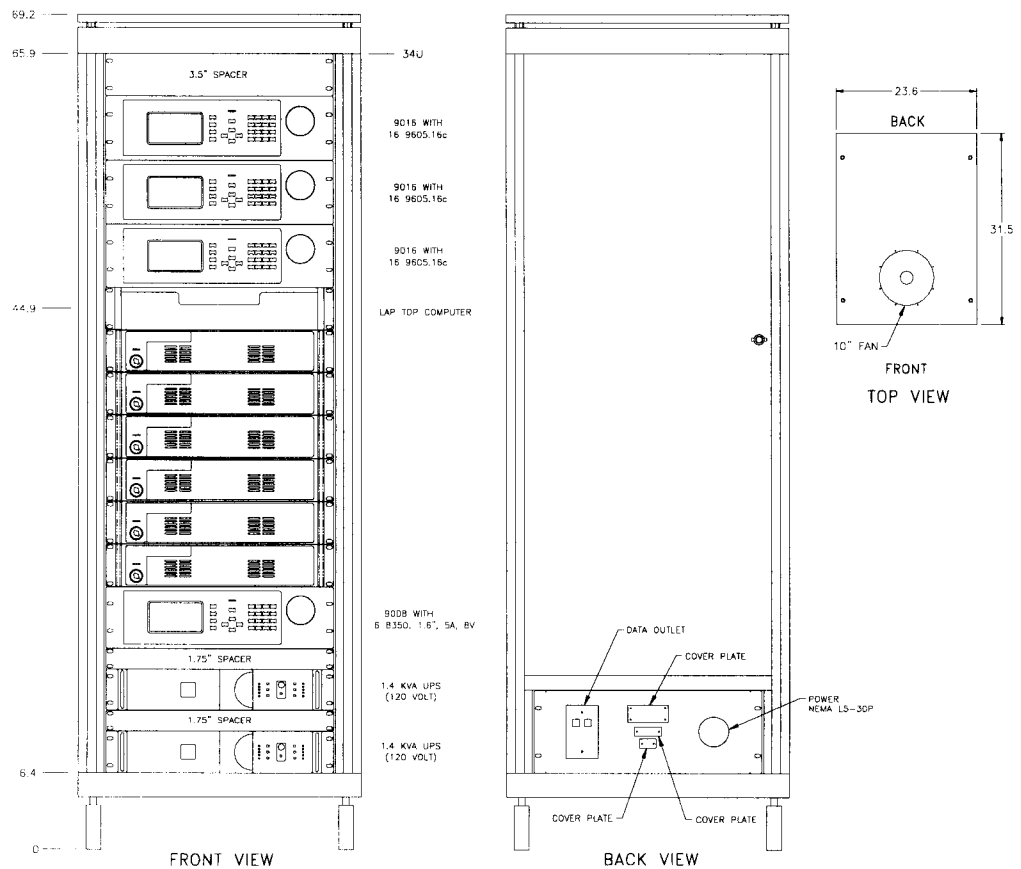
Fixtures are designed to hold SDL Optics 980nm butterfly packaged laser diodes for the purposes of burn-in. Active Peltier Cooler heating provides temperature control from 15 °C above ambient up to 85°C. Eight (8) butterfly packaged laser diodes are loaded into fixture trays using bare fiber adapters, air-cooled silicon photodiodes to collect the fiber output of each laser diode. The electrical interface to the laser modules shall be by Azimuth connectors. These connectors shall be attached to their board via sockets to allow their easy replacement when worn. Thermal fuses are used to ensure that the module case temperature does not exceed 97°C. The fuses are set to trip in the range of 95°C-97°C, and are easy to access without removing the main circuit board.

The Fixtures are designed so that the 8 module cartridges can be loaded into a benchtop docking station for further module characterization. The design of the fixtures includes heli-coil type screw downs and spring clamps as the mounting method.

The uninterruptable power supplies (UPS) are included to act as continuous active voltage regulators and transient suppressers. In the event of power failure the UPS switches to battery backup power and notifies the computer. The computer completes any data collection underway and turns off the outputs to the laser diodes and then shuts down the entire system.

## Custom Rack System Layout

The following diagram displays the layout of the test and measurement rack system components.



**Figure 1 – Rack System Layout Diagram**