

# Stratalinker® UV Crosslinker

## INSTRUCTION MANUAL

Model 1800

Catalog #400071 (120 V), #400072 (230 V) and #400672 (100 V)

Model 2400

Catalog #400075 (120 V), #400076 (230 V) and #400676 (100 V)

Revision #122003

IN #70034-06

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# ORDERING INFORMATION AND TECHNICAL SERVICES

## United States and Canada

### Stratagene

11011 North Torrey Pines Road  
La Jolla, CA 92037

**Telephone** (858) 535-5400

**Order Toll Free** (800) 424-5444

**Technical Services** (800) 894-1304

**Internet** [tech\\_services@stratagene.com](mailto:tech_services@stratagene.com)

**World Wide Web** [www.stratagene.com](http://www.stratagene.com)

## Stratagene European Contacts

Location	Telephone	Fax	Technical Services
Austria	0800 292 499	0800 292 496	0800 292 498
			+ 43 (0)1795 67036
Belgium	00800 7000 7000	00800 7001 7001	00800 7400 7400
	0800 15775	0800 15740	0800 15720
France	00800 7000 7000	00800 7001 7001	00800 7400 7400
	0800 919 288	0800 919 287	0800 919 289



# Stratalinker® UV Crosslinker 1800 and 2400

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# Stratalinker® UV Crosslinker 1800 and 2400\*

## MATERIALS PROVIDED

Materials provided	Quantity
Stratalinker® UV crosslinker	1
254-nm UV light bulbs (model 1800: 8 watts each; model 2400: 15 watts each)	5

## ADDITIONAL MATERIALS REQUIRED

Hybridization membranes

Replacement UV bulbs

*Note* Replacing existing bulb with bulb of a different wavelength is a recalibration of the unit. Please refer to the user manual for details.

## INTRODUCTION

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The Stratalinker® UV crosslinker is designed to crosslink DNA or RNA to nylon, nitrocellulose, or nylon-reinforced nitrocellulose membranes. The crosslinking process takes only 25–50 seconds, in contrast to the traditional method of baking filters at 80°C for 2 hours. Additionally, crosslinking has been shown to significantly increase hybridization signals when compared to oven-baking. For optimal crosslinking performance, each Stratalinker UV crosslinker is equipped with an internal photodetector designed to compensate for the natural shift in power output of aging ultraviolet bulbs.

The Stratalinker UV crosslinker may be used for Northern, Southern, dot or slot blot analysis,<sup>1-3</sup> colony or plaque screening, nicking of DNA in agarose gels prior to blotting,<sup>4</sup> dimer formation to perform partial digests for rapid restriction mapping,<sup>5</sup> UV sensitivity testing for host strain verification,<sup>6</sup> and UV irradiation of PCR samples.<sup>7</sup> The Stratalinker UV crosslinker may be used in the *Auto Link*, *Time*, or *Energy* modes, and the apparatus is available in two convenient sizes—the Stratalinker 1800 UV crosslinker for smaller membranes and the Stratalinker 2400 UV crosslinker for larger membranes.

## SAFETY CONSIDERATIONS

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- ♦ Do not operate the Stratalinker UV crosslinker with the door open. Doing so will emit dangerous UV energy and seriously affect results.
- ♦ Do not look directly at the UV bulbs while the Stratalinker UV crosslinker is in use. Serious eye injury could result from overexposure to ultraviolet light.
- ♦ Do not tamper with the door seals or allow soil or residue from cleaning products to accumulate on the sealing surfaces.
- ♦ Do not disrupt the sensor in the rear of the unit when removing the UV bulbs.
- ♦ Be sure the electric cord plug fits snugly into the wall socket and is kept dry. Do not immerse the cord or plug in water or hang the cord over the edge of a counter.
- ♦ Do not use the Stratalinker UV crosslinker for any purposes other than those described in this manual.
- ♦ Do not expose the Stratalinker UV crosslinker to extreme temperatures.
- ♦ Do not attempt to service the Stratalinker UV crosslinker. Contact Stratagene's Technical Services Department for assistance.



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## EQUATIONS

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Joules (J) = Watts × time (sec)

Ergs = J × 10<sup>-7</sup>

## OPERATING INSTRUCTIONS

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*Note* The following guideline is recommended for Stratagene P iBl  $\epsilon$   $\epsilon$  bl  $\epsilon$  i h Stratagene Dial n-UV n l n membrane. Other  $\epsilon$  d c  $\epsilon$  echni e ma al  $\epsilon$  he  $\epsilon$  l .

### Assembling the Stratalinker<sup>®</sup> UV Crosslinker

1. Plug the power cord securely into the rear of the Stratalinker UV crosslinker. Connect the plug to an outlet of appropriate voltage that has been grounded to prevent shock.
2. Press the *P e* button. The digital display will read 0000. If this does not appear, press *Re e* . The beeper will sound and the display will read 0000.

### Selecting the Mode of Operation

The mode of operation selected depends on the specific results desired. Below is a brief explanation of each operating mode.

#### Energy Mode

When selecting the *Ene $\epsilon$ g* mode, the beeper will sound and the yellow indicator next to the digital display will illuminate. The numbers on the display represent microjoules/cm<sup>2</sup> × 100. Enter the specific microjoule level desired and begin the irradiation. Stratagene recommends 120,000 microjoules for most membranes; if selecting this amount, the LED display will read 1200. If an error is made while entering the energy level, press *Re e* to clear the display and then reenter the desired value.

## Irradiating Membranes

*Note*

## APPLICATIONS

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### Membrane Blotting

The Stratalinker UV crosslinker is used in place of the drying and vacuum baking step in Northern, Southern, and dot or slot blotting procedures.<sup>1-3</sup> For Northern blotting, Duralon UV membranes are recommended. Stratagene **does not recommend** Duralose UV membranes for Northern blotting.

DNA or RNA that has been blotted onto nitrocellulose, nylon, or hybrid membranes can be bound to that membrane using the Stratalinker UV crosslinker on the *Auto Link* setting.

### DNA Nicking

The Stratalinker UV crosslinker can also be used to nick ethidium bromide-stained DNA in the agarose gel, in place of the depurination wash.<sup>4</sup>

Depurination of high-molecular-weight DNA may be more efficient than nicking. HCl changes the purines and NaOH cleaves them during depurination, whereas nicking with UV also forms thymine dimers which interfere with hybridization. Stratagene recommends depurination for large DNA (2–10 Mb). Use 80,000  $\mu\text{J}/\text{cm}^2$  as a starting point for nicking. 150,000  $\mu\text{J}/\text{cm}^2$  is the recommended setting for megabase nicking.

### Gene Mapping

Partial digests can be generated using the Stratalinker UV crosslinker to create thymine dimers prior to digestion with restriction enzyme. The formation of dimers at or near the recognition site inhibits site cleavage.<sup>5</sup>

### RecA Screening

The Stratalinker UV crosslinker can also be used to screen *recA* mutations.<sup>6</sup> Mutations in *recA* prevent repair of UV-induced damage, preventing irradiated *recA*<sup>-</sup> cells from growing.<sup>8</sup> The *recA* genotype of a strain may be determined in the following manner:

1. Lightly touch a colony of the strain with a sterile toothpick and streak out the cells in a single line onto a fresh NZY plate.

*Note: Do not use the thick needle in the cloning rack.*

4. After the unit has prerun, place the NZY plate on the floor of the Stratalinker UV crosslinker. Cover the plate with the lid so that half of each line of cells is covered.
5. Expose the cells to 10,000–15,000  $\mu\text{J}$  (100-150 on the LED display).
6. Incubate the plates at 37°C overnight.

### **Expected Results**

A known *recA*– strain will **not** grow when exposed to UV radiation.

## TROUBLESHOOTING

Observation	Suggestion(s)
The display does not light	There is no power to the unit. Secure the plug into the back of the unit and into the wall socket, and then depress the circuit breaker on the back panel
The display does not count down after <i>Start</i> is pushed	The <i>Energy</i> or <i>Time</i> modes have not been selected. Select the desired mode ( <i>Autocross-link</i> selects <i>Energy</i> automatically)
	The door switch is not engaged. Close the door completely
	The UV sensor is not completely pushed into the connector on the interior sidewall. Ensure connections are secure
Countdown is slower than normal (e.g., <i>Autocrosslink</i> takes more than one minute)	UV bulbs are burned out. Check for burned-out bulbs and replace as necessary
	The starter is out. Replace the starter. Rotate the defective starter one-quarter turn counterclockwise and pull out
	The UV sensor is blocked and may need to be replaced. Contact the Stratagene Technical Services Department

## SPECIFICATIONS

### Weight

Model 1800: 9.7 kg  
 Model 2400: 15.5 kg  
 Model 2400 (220V): 18.9 kg

### Dimensions (in cm)

Model 1800, internal: 33.7 W × 18.1 D × 16.8 H  
 Model 1800, external: 46.2 W × 22.4 D × 26.7 H  
 Model 2400, internal: 47.7 W × 34.3 D × 16.8 H  
 Model 2400, external: 58.9 W × 38.9 D × 26.7 H

### Bulbs

Model 1800: 8 watts each  
 Model 2400: 15 watts each

### Power Delivered

Model 1800: ~3000 μwatts/cm<sup>2</sup>  
 Model 2400: ~4000 μwatts/cm<sup>2</sup>

### Starters

Sylvania starters (FS-5 for model 1800 and FS-2 for model 2400) may be used as replacement starters.





