

Reward System: Liquid Dispenser with Freestanding Control Module

(Model #: 5-RLD-E2)

Operating Instructions

Reward System: Liquid Dispenser with Freestanding Control Module (5-RLD-E2) includes:

- Mouthpiece (5-RLD-00A)
- Control Panel Module, Box Enclosed (5-RLD-E2B) includes:
 - Connect Cord 25 ft. (midi 5-pin cable) (5-RLD-E2C4) - connects control panel to dispenser unit
- Liquid Dispenser Unit (5-RLD-E2C) includes:
 - Solenoid (5-RLD-31119)
 - Tubing (5-RLD-TUB) - connects the dispenser bottle to mouthpiece
 - Bottle Assembly (5-RLD-BTL)

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WARNING

To minimize risk of fire and electric shock, protect control panel from exposure to moisture.

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN OR INSERT OBJECTS	
<p>CAUTION: THE CONTROL PANEL MODULE CARRIES UP TO 220 VOLTS OF ELECTRICITY.</p> <p>INSERTING FINGERS OR OTHER OBJECTS INTO THE CONTROL PANEL MODULE MAY RESULT IN SERIOUS BODILY INJURY AND / OR DEATH.</p> <p>NO USER-SERVICEABLE PARTS ARE LOCATED INSIDE.</p> <p>CONTACT MANUFACTURER FOR ANY AND ALL MODIFICATIONS AND SERVICING NEEDS</p> <p>IF THE ELECTRIC BOX IS OPENED, THE WARRANTY WILL BE VOLD.</p>		



This symbol is intended to alert the user to the presence of insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance.

INFORMATION- Test Results

The following test results (reward delivery amounts) were obtained with:

- The dispenser unit 69 inches from the ground
- The mouthpiece 10.5 inches below the lowest point of the reward reservoir bottle
- The 1/8th inch tubing coiled and hung with the 10.5 inches between the reward reservoir bottle and the mouthpiece

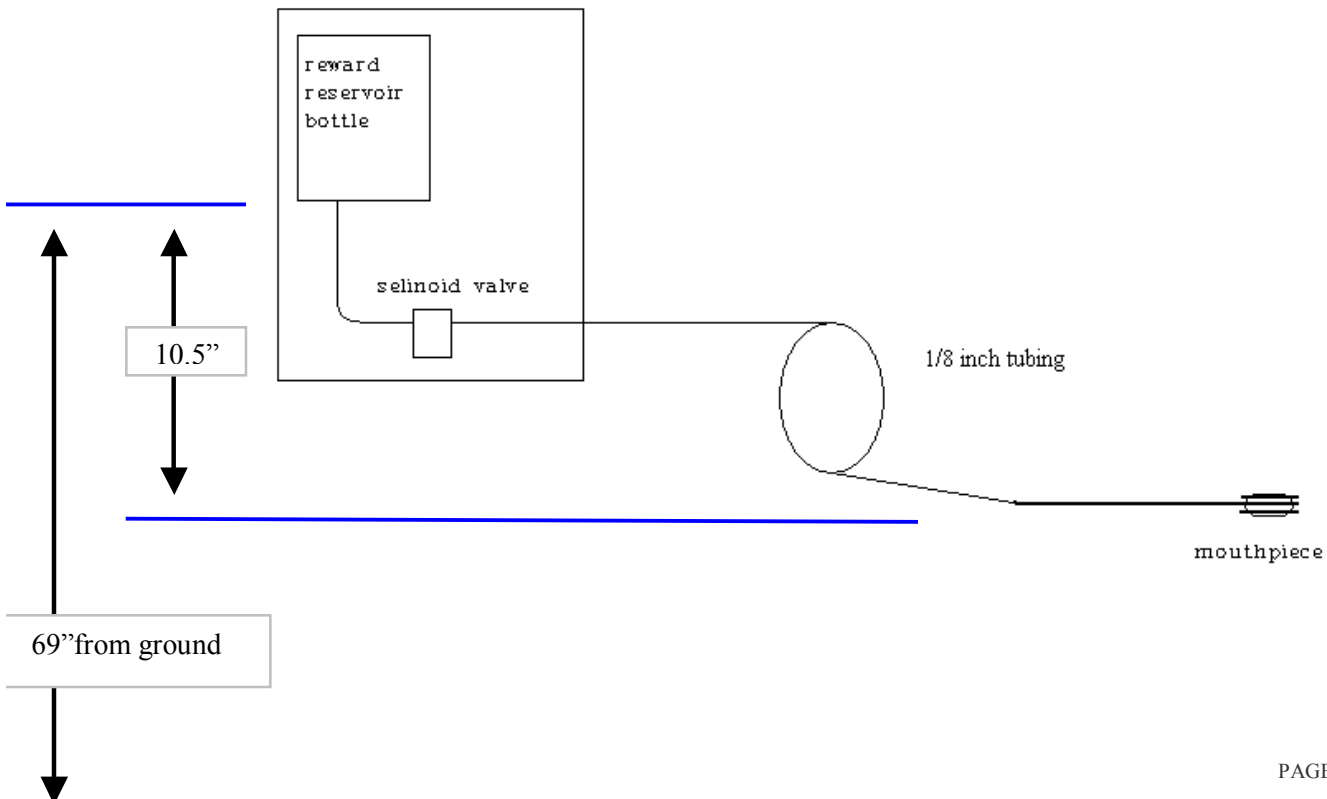
Any fluctuation in height / altitude may affect the amount of delivery, causing results to vary.

The 75 and 95 ms setting was measured using a 3cc syringe. All others settings were measured using a 1cc syringe.

Approximate calculated dispense amounts in cc

20	0.55
25	0.57
30	0.61
40	0.71
50	0.86
60	0.97
75	1.04
95	1.19

Measured amounts equal calculated amounts +5%, -5%



110V

Reward Button on Control Panel Pressed 100 times

Time (ms)	Measured Amount in cc
20	0.56
25	0.58
30	0.62
40	0.72
50	0.87
60	0.98
75	1.05
95	1.20

110V

Remote Control Button Pressed 100 times

Time (ms)	Measured Amount in cc
20	0.56
25	0.58
30	0.61
40	0.70
50	0.84
60	0.96
75	1.05
95	1.20

110V

Touch Panel (Norm) Remote Switch Input

Time (ms)	Measured Amount in cc
20	0.56
25	0.58
30	0.62
40	0.71
50	0.86
60	0.98
75	1.05
90	1.20

110V

Touch Panel (Invert) Remote Switch Input

Time (ms)	Measured Amount in cc
20	0.56
25	0.58
30	0.61
40	0.72
50	0.87
60	0.98
75	1.05
95	1.20

220V

Reward Button on Control Panel Pressed 100 times

Time (ms)	Measured Amount in cc
20	0.54
25	0.57
30	0.61
40	0.74
50	0.85
60	0.98
75	1.05
95	1.20

220V

Remote Control Button Pressed 100 times

Time (ms)	Measured Amount in cc
20	0.55
25	0.58
30	0.62
40	0.73
50	0.86
60	0.98
75	1.05
95	1.20

220V

Touch Panel (Norm) Remote Switch Input

Time (ms)	Measured Amount in cc
20	0.54
25	0.58
30	0.62
40	0.72
50	0.86
60	0.97
75	1.05
90	1.20

220V

Touch Panel (Invert) Remote Switch Input

Time (ms)	Measured Amount in cc
20	0.54
25	0.58
30	0.61
40	0.73
50	0.86
60	0.98
75	1.05
95	1.20

Before You Begin

Thank you for choosing Crist Instrument Co., Inc. We hope the reward system properly serves your biomedical research needs.

Before operating the reward system, please read these instructions thoroughly and retain them for future reference.


Your package should include the following:

- Control Panel Module (5-RLD-E2B)
- Dispenser Unit (5-RLD-E2C) w/ bottle assembly (5-RLD-BTL)
- Midi Cable 25 ft. (5-RLD-E2C4) - connects control panel to dispenser unit

- Solenoid (5-RLD-31119) - located on the on dispenser unit
- Tubing: (5- RLD-TUB) - connects the dispenser unit to mouthpiece
- Mouthpiece (5-RLD-00A)

Accessories (sold separately)

- Remote Control (5-RRC-EO1-25)
- Touch Panel System (4-TPS-E1)
- Additional Solenoid (RLD-31119)
- Additional Standard Mouthpiece (RLD-00A)
- Small Mouthpiece (5-RLD-00B)

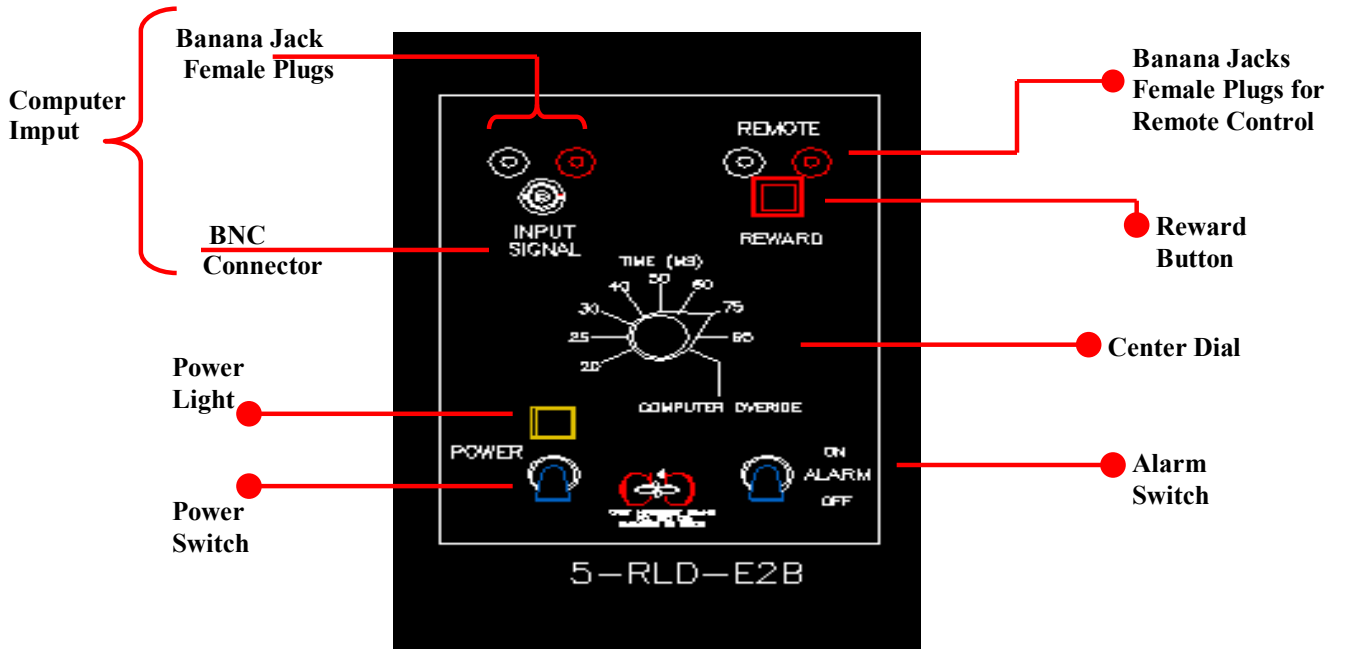
— *It is strongly suggested that a different mouthpiece be used for each subject.* 

Specifications

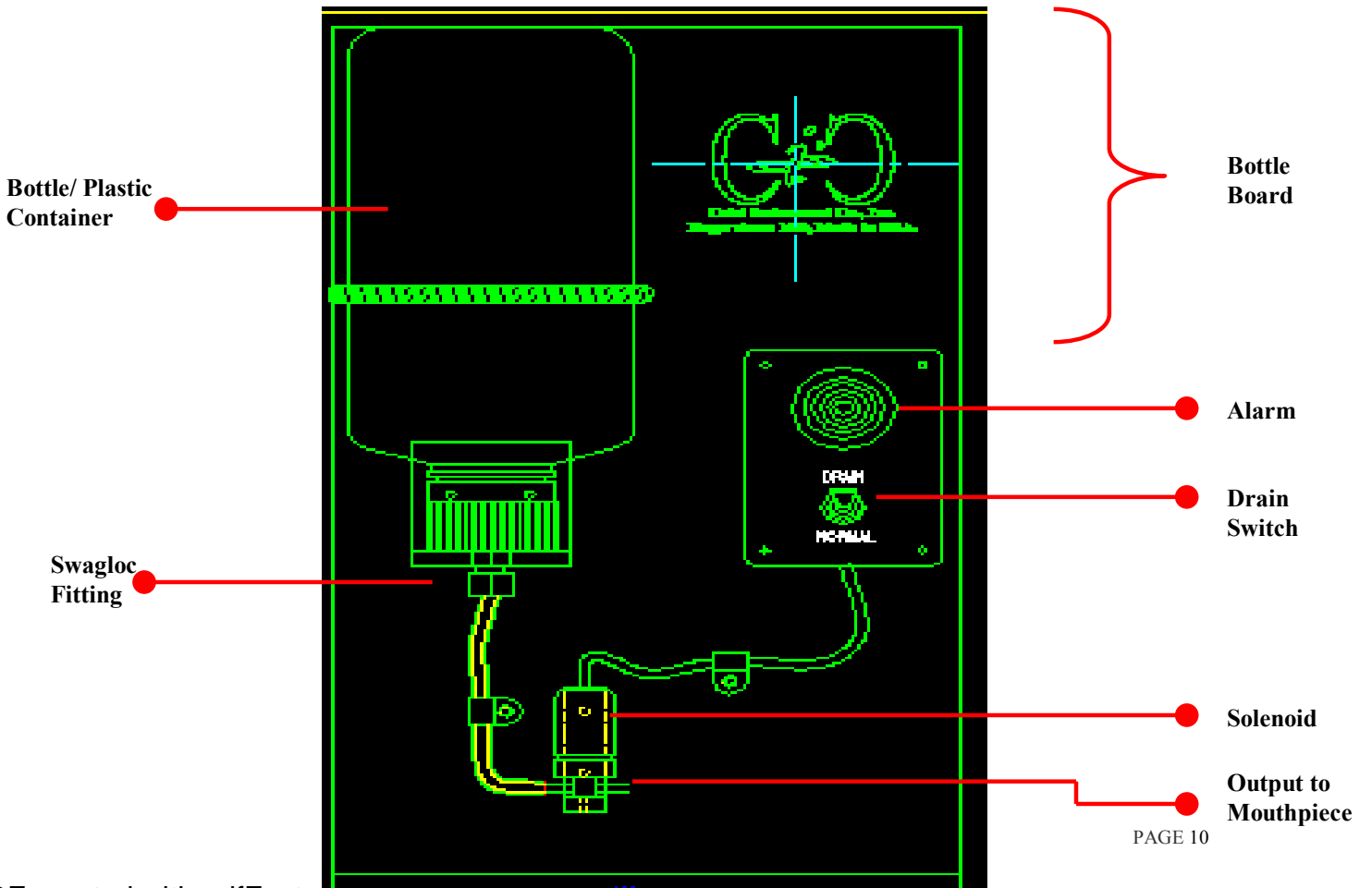
Power requirements:

- 110V or 220V (the unit is preset depending on your region's standards)
- The power cord has a standard US plug

Control Panel (Front)



Dispenser Unit




The Complete Liquid Delivery System

The complete liquid delivery system provides a variety of features designed to permit several modes of operation.

- The controller unit module is enclosed in a freestanding electronics box, which may be placed up to 25 feet away from the experimental setup.
 - It includes a dispenser unit, mounted on a stand, to be placed near the subject in the experimental setup
 - One mouthpiece is included, along with a mounting block and clamp for attaching it to the chair
 - When the power switch is placed in the “ON” position, the indicator light signals the system is ready for operation.
 - The center dial on the control panel allows the operator to choose between manual and computer control of the reward volume.
 - When using the manual control, the dial can be adjusted to dispense larger or smaller drops of liquid.
 - There is an audible signal that sounds when the reward is being administered. This feature can be turned either on or off by way of a switch on the control panel.
 - You have convenient choice of using either banana jacks or a BNC connector for computer input.
 - The control panel supports a connection for an optional remote control (5-RRC-E01-25). The remote control function allows the operator to administer the reward from a remote location (up to 20 feet from the control panel).
 - An optional touch panel system that connects with your computer may be added.
 - The dispenser unit is gravity fed through a low voltage, quick acting solenoid.
 - Putting the normal operation/ drain switch in the “drain” position allows the operator to flush the system.
 - The mouthpiece is designed to prevent system draining due to any sucking action on part of the subject
-

Precautions

- Operate the unit according to the power requirements specified in the “Specifications” section of these instructions.
- To disconnect the power cord, pull it out by the plug, not the cord
- Should any liquid spill on the control panel module, unplug the unit and have it checked by qualified personnel at Crist Instrument Co., Inc. before operating it any further.
- To clean the control panel, use a dry cloth. To clean the bottle board, use a soft cloth dampened with a mild detergent solution.

-  Under no circumstances should the bottle board switch be left in the drain position for longer than 10 minutes without fluid passing through the solenoid. This may cause overheating of and severe damage to the electrical component.
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Operating Problems

Should you encounter any operating problems after you have read the following operating instructions, please contact Crist Instrument Co., Inc:


Phone: 1-301-393-8615

Fax: 1-301-393-8618

E-mail: pat@crisinstrument.com

Mailing Address: 111 W. First Street, Hagerstown, MD 21742 USA

Before setting up the unit, make sure the following is intact:

- The swagloc fitting, connecting the plastic water container to the tubing, should be snug. **Do not over tighten.** Over tightening may cause damage and break the seal. 
 - The end of the 1/4" tubing from the solenoid should be connected to the 1/8" tubing from the mouthpiece
 - The dispenser unit should consist of a bottle, a solenoid, and a switch box.
-

Setting up the unit

1. Attach the smaller tubing to the mouthpiece.
2. The mouthpiece should be mounted so that the test subject's mouth is able to comfortably reach the mouthpiece.
3. Attach the 5-pin midi cable to the control panel and dispenser unit.
4. For basic installation, place the dispenser unit near the testing area. We recommend the unit be placed on a shelf that is a minimum of approximately 69 inches from the ground. Additionally, the mouthpiece should be approximately 10.5 inches below the reward reservoir bottle.
5. Fill 3/4 of the bottle with liquid. If using fruit juices, they should contain minimal pulp. Excess pulp may clog the system. A thorough cleaning after each use is essential to maintaining proper long-term function.

Summary of Control Panel Components and their Functions

FRONT PANEL:

TOP RIGHT

- Two **banana jack female plugs** for an optional remote control
- The red square **reward button**, when pressed, will signal the dispenser unit to provide a reward to the subject.

TOP LEFT

- The **computer input** can be hooked up with either banana jacks or a BNC connector

CENTER

- The **center dial** controls the time (20-95 milliseconds) that the solenoid will be open- (i.e. controls the amount of fluid the subject will receive).
- The “**computer override**” position of the **dial** enables the computer to have control over both the frequency and duration of administered reward.

BOTTOM RIGHT

- When the **alarm switch** is in the “ON” position, an audible alarm will sound when a reward is delivered.

BOTTOM LEFT

- When the **power switch** toggle is in the “UP” position, the power is on.
- The **red light**, when lit, indicates that the power is on.

BACK PANEL:

TOP RIGHT

- **Fuse holder**
- **Fuse** of 110V or 220V, 1 Amp

BOTTOM RIGHT

- The **power cord** has a standard US plug, but the device is wired for 110V or 220V, depending on your region’s standards.


TOP LEFT

- The **receptacle for the midi 5-pin cable** supports a connection to the dispenser unit


Summary of Operating Process Essentials

- After the system is properly setup, you may wish to manually test the system by pressing the reward button on the control panel or by using an extended remote switch. This should provide the subject with a reward.
- Because it has been found that new subjects learn faster when rewards are initially large, you may want to begin with the center dial on the control panel set between 75-95 milliseconds.
- If you are using the “computer override” feature, even larger rewards may be achieved by setting the computer to a desired time.
- When the dial is set to “computer override,” the computer has control over the frequency and duration of the rewards administered to the subject.
- When the dial is set to “computer override,” a reward may also be administered manually by pressing the red square reward button (top right).
- If the dial is set to computer override, and you wish to administer the reward manually, the amount of the reward administered will correspond to the duration of time that the reward button is held down.
- In order for the computer settings to take effect, the dial must be set to “computer override.”

Cleaning

- Proper cleaning involves the following:
 1. Flush the tube with 2 gallons of pure water.
 2. Flush the tube with a solution made of 1000 ml of water and 10 ml of bleach.
 3. Flush the tube with 2 gallons of pure water.
- When only using pure water as the reward, simply set the switch on the dispensing unit to “drain” in order empty the plastic container after use.
- After using any fluids other than water as a reward, thorough cleaning is very important. 
- Any pulp or sugars that are left in the tube for an extended period of time (e.g. overnight) can contaminate the unit. Continued use of a contaminated unit may affect experiment outcomes and/ or harm the subjects.
- To clean the control panel, use a dry cloth.

- To clean the bottle board, use a soft cloth dampened with a mild detergent solution.

 **Under no circumstances should the bottle board switch be left in the drain position for longer than 10 minutes without fluid passing through the solenoid. This may cause overheating of and severe damage to the electrical component.**