INSTRUCTIONS

R(evolution)²

RLC-1 DIGITAL LIGHTING CONTROLLER

INSTRUCTIONS

OVERVIEW

Congratulations on your purchase of the Revolution Micro RLC-1 Digital Lighting Controller. The RLC-1 is a dual channel (dual zone) controller which can control up to 512 lights (up to 256 in each zone).

Traditional lighting controls use mechanical relays to power ballasts on and off. The RLC-1 Digital Lighting Controller uses a low voltage digital data stream to switch, dim, and boost any Revolution, Phantom or other ballasts equipped with an RS-485 style data port. The controller has two temperature sensors (one for each zone), and has the capability of automatically dimming lights during high temperatures and even shutting down lights at extreme temperatures. Ballast control wiring is done with common telephone cables (RJ12 plugs) which can be used to daisy-chain the ballasts together. Compatible ballasts and lighting systems include a cable for the RS-485 style data port.

BOX CONTENTS

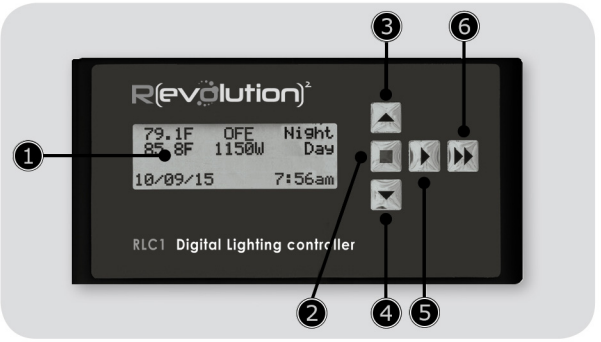
A. (1) RLC-1 Digital Lighting Controller unit
B. (1) Mounting hardware
C. (1) Mounting plate
D. (2) Temperature probes
E. (1) AC adapter (120–240V)
(1) Instruction booklet

SAFETY GUIDELINES

WARNING: Do not allow the RLC-1 to be exposed to water or excessive heat. Do not open or attempt to repair or disassemble the controller, as there are no user-serviceable parts inside. Opening the controller will void the warranty.

FRONT PANEL

1. Screen
2. ENTER
3. UP
4. DOWN
5. NEXT
6. PAGE



MOUNTING AND INSTALLING THE CONTROLLER

The RLC-1 should be wall mounted. This is easy to do using its removable back plate, which has four holes that can be used for mounting. The top center hole is a “keyhole” style hole which can be used with a single large screw, so that the plate is hung on the screw head. For a more secure alternative, there are also three smaller holes in the plate which can be used to screw it tightly to a wall surface. The lateral measurement between the top two of these holes is 3⅛", and the lower hole is ¾" below the top two, centered between them. Once the back plate is secured to the wall surface, the RLC-1 unit can be snapped onto the back plate.

Once the RLC-1 is securely mounted to the wall, plug the included AC adapter into a power outlet and connect the other end to the RLC-1’s AC input jack on the bottom panel. Next plug the temperature probes into the corresponding jacks on the bottom panel and run your probe cables their full length up to and across the ceiling if possible, toward the center of the grow space. Ideally, suspend the probes down into the space above the plant canopy if possible. Take care not to stress or damage the probe cables when securing them to walls and ceilings.

NAVIGATION AND MENU STRUCTURE

The RLC-1 has a four-line green display controlled by a five button navigation control (Up/Down/Next/Page/Enter). Menu items are listed in the table below. There are four menu pages: a status display page (the default display when the RLC-1 is powered up); the Zone A settings page; the Zone B settings page; and the date/time page.

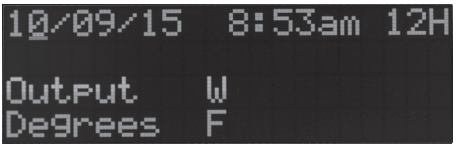
Menu	Element	Values
SET	Date	MMDDYY
	Time	HHMM
	Time Format	12/24
	Temp Units	C/F
	Output Units	%/W
ZONE A	Set Output	% = 60/75/82.5/100/105/115/OFF (if % chosen) W = 1150/1050/1000/750/600/OFF (if W chosen - 1000W ballasts) W = 825/750/600/OFF (if W chosen - 750W ballasts)
	Ballast Type	400/600/1000/750W
	Lights On	HHMM
	Lights Off	HHMM
	Sunrise/Sunset	OFF/5/10/15/20/30 Min
	Overtemp Dim Limit	68°F-105°F
	Overtemp Shutdown Limit	85°F-140°F
	Hot Start Delay	OFF/5/10/15/20/30
ZONE B	Set Output	% = 60/75/82.5/100/105/115/OFF (if % chosen) W = 1150/1050/1000/750/600/OFF (if W chosen - 1000W ballasts) W = 825/750/600/OFF (if W chosen - 750W ballasts)
	Ballast Type	400/600/1000/750W
	Lights On	HHMM
	Lights Off	HHMM
	Sunrise/Sunset	OFF/5/10/15/20/30 Min
	Overtemp Dim Limit	68°F-105°F
	Overtemp Shutdown Limit	85°F-140°F
	Hot Start Delay	OFF/5/10/15/20/30

The menu is designed to be simple and easy to navigate. **Page** ⏩ moves from page to page; **Next** ▶ moves from field to field, **Up** ▲ and **Down** ▼ make changes. **Enter** ■ saves the data. (If you make a change but then decide not to enter it, simply press **Page** to go to another page without saving.) A blinking underline indicates the cursor position.

INITIAL SETUP

STEP 1: Set up the date and time page

When the RLC-1 is first powered up, the display will default to the status page. Bypass this page for the moment by pressing the **Page** button three times to get to the date and time page. The cursor will be blinking beneath the month numeral in the display.



A. SETTING THE DATE: Set the month to setting to the current month by pressing **Up** or **Down** to select the correct month. Press **Next** once to move the cursor under the day field and press **Up** or **Down** to select the correct day. Press **Next** again to place the cursor under the year field and select the correct year if necessary.

B. SETTING THE TIME: Press **Next** once to move to the hour field of the time setting. Press **Up** or **Down** to select the correct hour of your local time. Press **Next** once to move to the minutes field of the time setting field and press **Up** or **Down** to select the correct minutes of the hour. Press **Next** once again to move the cursor to the a.m./p.m. field of the time setting and select the correct choice for your current time. *Note: a.m./p.m. settings do not apply if 24-hour time format is chosen.*

C. SETTING THE 12/24 HOUR FORMAT: Press **Next** once again to move the cursor to the 12H/24H field and select either 12H (standard/civilian time) or 24H (military time).

D. SETTING THE OUTPUT DISPLAY FORMAT: Press **Next** once again to move the cursor down to the Output field and press **Up** or **Down** to select either W (Watts) or % (percentage of ballast output).

E. SETTING THE TEMPERATURE FORMAT: Press Next once again to move the cursor down to the Degrees field and press **Up** or **Down** to select either F (Fahrenheit) or C (Celsius).

F. Press **Enter** to save all settings on this page.

STEP 2: Set up desired ballast output level (dimming) for each zone

Each zone's status line displays:

- Temp in degrees **C** (Celsius) or **F** (Fahrenheit)
- Power output setting (default cursor position):

  1150/1050/1000/750/600/OFF *for 1000W ballasts,* **825/750/600/OFF** *for 750W ballasts (the 600W and 400W models do not dim). This will show* **%** *if* **%** *is selected during intial output units setup.*
- Dim status:

  - Day/**Night** indicates status of timer. **Day** means lights should be on

  - > **nnC** or > **nnF** indicates that ballast is dimmed because of overtemperature condition

- **mm:ss** (example: 10:35) counts down during restrike delay if configured. **NOTE: The restrike delay period is configurable, and starts counting down when the power goes out (not when the power is restored). If the power has been out longer than the restrike delay setting, the lights will come on immediately when power is restored.**

Power can be adjusted right on this screen by using **Next** from field to field, and **Up** or **Down** to adjust.

NOTE: Power level adjustments are "sticky," meaning that any changes made to them are saved by default and will return again on power-up.

A. Press **Page** once to get to the status display page. The cursor will be blinking under the wattage setting for Zone A. With this setting you will determine the output level (dimming stage) at which you wish to operate your ballasts. Press **Up** or **Down** to select your desired wattage output for this zone (available settings are OFF, 600W, 750W, 825W, 1000W, 1050W, and 1150W, depending on the lamp wattage).
B. Press **Next** once to move to cursor down to the wattage setting for Zone B. If you will not be running lights in Zone B, set the wattage field to OFF.
C. Note that this page also displays the temperature as read by the temperature probes, the status of the "Day" or "Night" setting for each zone, the date, and the time.

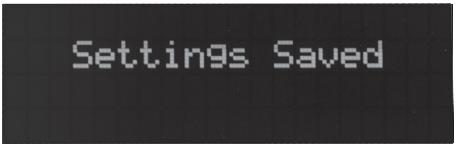
STEP 3: Set desired settings for Zone A

A. Press **Page** once to get to the Zone A settings page. The cursor will be blinking under the ballast type field. Press **Up** or **Down** to select the wattage setting that matches the wattage of the ballasts you will be running in this zone (available settings are 1000W, 750W, 600W, and 400W, depending on the lamp wattage). *NOTE: If you wish, you can create a name for the zone controlled by this channel. This name can be up to eight (8) characters in length (the default names are Zone A and Zone B on initial power-up).*
B. Move the cursor to the hour field in the On time setting. Press **Up** or **Down** to select the hour of the time you want the ballasts to turn on.
C. Move the cursor to the minutes field and select the appropriate minutes setting.
D. Move the cursor to the a.m./p.m. setting and select "a" or "p" accordingly.
E. Move the cursor to the hour field for the Off time setting. Press **Up** or **Down** to select the hour of the time you want the ballasts to be turned off.
F. Move the cursor to the minutes field and select the appropriate minutes setting for the time you want to ballasts to be turned off.
G. Move the cursor to the a.m./p.m. setting and select "a" or "p" accordingly.
H. Move the cursor to the temperature setting for automatic dimming on overtemperature. The temperature that you set here will be that which, if sensed by the probe, triggers dimming of all connected ballasts in Zone A in order to reduce the temperature of the grow environment.
I. Move the cursor to the Sunrise/Sunset setting ("S/R" in the display) and choose your desired setting for the period of time during which the RLC-1 will increase power to the ballasts in Zone A at the beginning of the lighting cycle from zero to full power to simulate a natural sunrise, and decrease power to the ballasts at the end of the lighting cycle from full power to zero to simulate a natural sunset. The settings available are 0, 5, 10, 15, 20, or 30 minutes (0 = off).

J. Move the cursor to the field for the overtemperature shutdown setting. Press **Up** or **Down** to set the desired temperature. The temperature that you set here will be that which, if sensed by the probe, triggers automatic shutdown of all connected ballasts in Zone A in order to quickly reduce the temperature of the grow environment and prevent crop damage. In this event, the RLC-1 will not return power to the ballasts until the probe reports at least a 3-degree drop in room temperature.

K. Move the cursor to the field for enabling hot start delay time. This is the number of minutes the RLC-1 will delay the return of power to the ballasts after a brief power interruption. This feature prevents a potentially damaging "hot restrike," which is the reignition of HID lamps while they are still hot from prior operation. The settings available (in minutes) are 0, 5, 10, 15, 20, and 30 (0 = off).

L. Press **Enter** to save all settings on this page. When saving settings on this page, a display reading "Settings Saved" appears for 750 ms (three quarters of a second) announcing that the data has been saved:



STEP 4: Set desired settings for Zone B

A. From the Zone A settings page, press **Page** once to get to the Zone B settings page. The cursor will be blinking under the ballast type field. Press **Up** or **Down** to select the wattage setting that matches the wattage of the ballasts you will be running in this zone (available settings are 1000W, 750W, 600W, and 400W). *NOTE: If you wish, you can create a name for the zone controlled by this channel. This name can be up to eight (8) characters in length (the default names are One/Two on initial power-up).*

B. Move the cursor to the hour field in the On time setting. Press **Up** or **Down** to select the hour of the time you want the ballasts to turn on.

C. Move the cursor to the minutes field and select the appropriate minutes setting.

D. Move the cursor to the a.m./p.m. setting and select "a" or "p" accordingly.

E. Move the cursor to the hour field for the Off time setting. Press **Up** or **Down** to select the hour of the time you want the ballasts to be turned off.

F. Move the cursor to the minutes field and select the appropriate minutes setting for the time you want to ballasts to be turned off.

G. Move the cursor to the a.m./p.m. setting and select "a" or "p" accordingly.

H. Move the cursor to the temperature setting for automatic dimming on overtemperature. The temperature that you set here will be that which, if sensed by the probe, triggers dimming of all connected ballasts in Zone B in order to reduce the temperature of the grow environment.

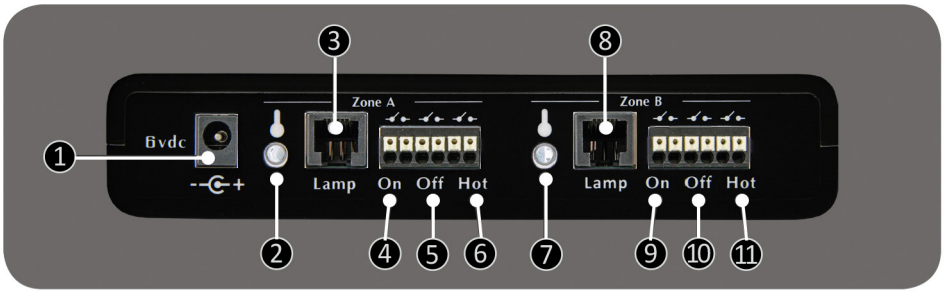
I. Move the cursor to the Sunrise/Sunset setting ("S/R" in the display) and choose your desired setting for the period of time during which the RLC-1 will increase power to the ballasts in Zone B at the beginning of the lighting cycle from zero to full power to simulate a natural sunrise, and decrease power to the ballasts at the end of the lighting cycle from full power to zero to simulate a

natural sunset. The settings available are 0, 5, 10, 15, 20, or 30 minutes (0 = off).

J. Move the cursor to the field for the overtemperature shutdown setting. Press **Up** or **Down** to set the desired temperature. The temperature that you set here will be that which, if sensed by the probe, triggers automatic shutdown of all connected ballasts in Zone B in order to quickly reduce the temperature of the grow environment and prevent crop damage. In this event, the RLC-1 will not return power to the ballasts until the probe reports at least a 2-degree drop in room temperature.

K. Move the cursor to the field for enabling hot start delay time. This is the number of minutes the RLC-1 will delay the return of power to the ballasts after a brief power interruption. This feature prevents a potentially damaging "hot restrike," which is the reignition of HID lamps while they are still hot from prior operation. The settings available (in minutes) are 0, 5, 10, 15, 20, and 30 (0 = off).

L. Press **Enter** to save all settings on this page. When saving settings on this page, a display reading "Settings Saved" appears for 750 ms (three quarters of a second) announcing that the data has been saved.



PHYSICAL INTERFACE (CONNECTIONS)

The bottom of the RLC-1 has eleven (11) connectors:

1. Power
2. Zone A Temperature
3. Zone A Ballast Control
4. Zone A Low-voltage external equipment trigger for Lights On (pair)
5. Zone A Low-voltage external equipment trigger for Lights Off (pair)
6. Zone A Low-voltage external equipment trigger for overtemperature (pair)
7. Zone B Temperature
8. Zone B Ballast Control
9. Zone B Low-voltage external equipment trigger for Lights On (pair)
10. Zone B Low-voltage external equipment trigger for Lights Off (pair)
11. Zone B Low-voltage external equipment trigger for overtemperature (pair)

Connector 1 accepts the power input jack from the AC adapter (6V DC).

Connectors 2 and 7 accept the plugs for the 16' temperature probes for Zones A and B.

Connectors 3 and 8 are the two main connectors for Zones A and B. They are for data transmission and accept RJ12 plugs.

NOTE: *Connectors 4, 5, 6 and 9, 10, 11 indicated in the diagram on the facing page make up two sets of low-voltage cage clamp connectors (one set for each zone). These connectors can be wired to the optional External Equipment Relay. The External Equipment Relay can power external devices, such as heaters, air conditioners, etc. The On connectors turn on external equipment (e.g. an air conditioning unit) during "lights on" settings. The Off connectors turn on external equipment (e.g. a dehumidifier) during "lights off" settings. The Hot connectors can turn on external equipment during overtemperature events.*

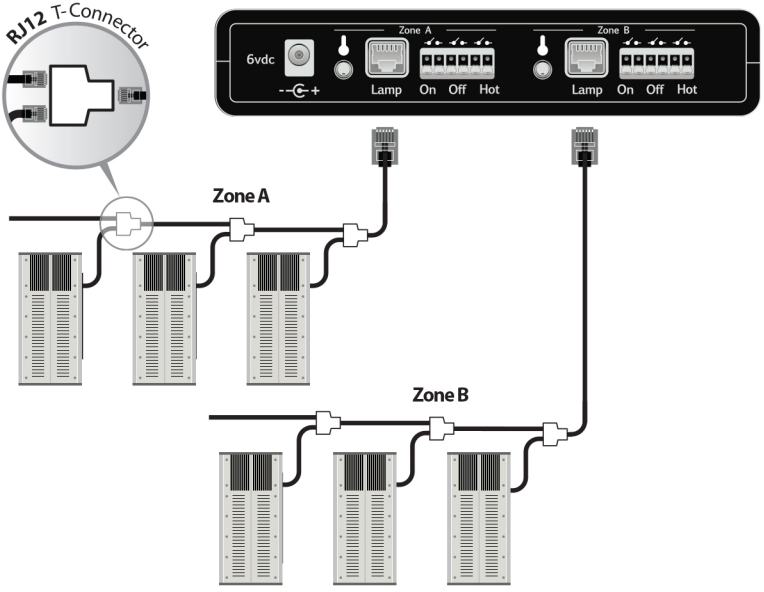
MULTIPLE BALLAST SETUP

To set up the RLC-1 for multiple ballast use, plug one end of an RJ12 to RJ12 data cable (included with compatible ballasts) into the jack marked Lamp (connector 3 in the diagram on the facing page) for Zone A. Insert the other end into the single-jack side of the included RJ12 T connector. Then connect another RJ12 cable from the T connector to the RS-495 data port on the first ballast in the group.

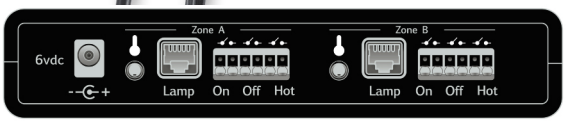
Each additional compatible ballast you purchase will include another splitter and RJ12 to RJ12 cable. The second ballast and every subsequent ballast in this zone will be connected in exactly the same way as described above, except that each new RJ12 plug will be inserted into an open jack on each new splitter to expand the trunk line up to 256 ballasts (see diagram below).

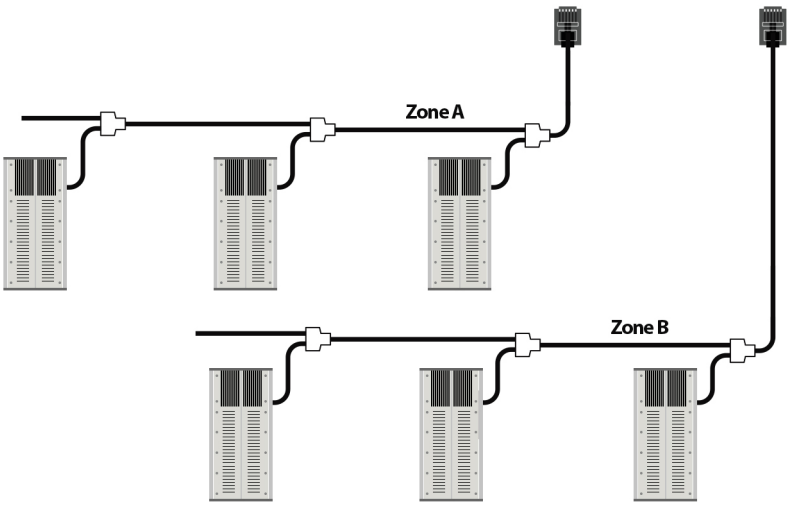
Physical setup of ballasts in Zone B is exactly as described above for Zone A. As the first step, plug one end of a RJ12 to RJ12 data cable into the jack marked Lamp (connector 8 in the diagram on the facing page) for Zone B.

NOTE: *We recommend that you keep all ballast power cords unplugged while connecting the ballast group together. Once the connections have been made and double-checked, connect the ballast power cords to the power source.*




R(evolution)²
78.8F OFF Night
86.2F 1150W Day
10/09/15 7:42am
RLC1 Digital Lighting controller
6vdc
Zone A
Zone B
Lamp On Off Hot


6vdc
Zone A
Zone B
Lamp On Off Hot
Lamp On Off Hot


Zone A
Zone B

ENVIRONMENT AND DISPOSAL

THIS PRODUCT CONTAINS A BATTERY AND OTHER COMPONENTS WHICH MUST BE DISPOSED OF PROPERLY.

This symbol displayed on a product, its accessories, or its packaging indicates that this product may not be discarded as household waste. Dispose of the equipment through a recycling center that handles electronics and electrical appliances. By disposing of the equipment in the proper and lawful way you will be helping to prevent possible damage to the environment and risk to public health.

WARRANTY

LIMITED WARRANTY

Revolution Micro warrants the ***RLC-1*** to be free from defects in materials and workmanship. The warranty term is for 3 years beginning on the date of purchase. Misuse, abuse, or failure to follow instructions is not covered under this warranty. Revolution Micro will, at our discretion, repair or replace the ***RLC-1*** covered under this warranty if it is returned to the original place of purchase. To request warranty service, please return the ***RLC-1***, with original sales receipt and original packaging, to your place of purchase. The purchase date is based on your original sales receipt.