ROTEM®
Control & Management

RLD 7.2/RLD-14

Two Channel Light Dimmer

Installation and User Manual

P/N: 110036

www.rotem.com

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Warranty & Limitation of Liability

1. ROTEM warrants that the product shall be free of defects in materials or workmanship and will conform to the technical specification for a period of 1 (one) year from the date of initial installation on site (the "warranty period").

2. ROTEM warrants that during said warranty period, any item/items or part/parts of equipment found defective with respect to materials or workmanship or which do not conform to the technical specification shall be repaired or replaced (at ROTEM's sole discretion), free of charge.

3. During the warranty period, in the event of an alleged defect, authorized resellers in relevant regions should be notified as soon as possible from the date of noticing the said defect, but no longer than thirty (30) days from such a discovery. The report shall include (1) a short description of the defects noticed (2) type of card / component and its matching serial number.

4. ROTEM's sole liability under this warranty is the repair or replacement of the defective item of product.

5. Load cells are not covered by ROTEM’s warranty.

Conditions and Limitations

1. ROTEM will not be responsible for any labor costs or expenses associated with replacement of defective items or other parts of the product or repair.

2. This warranty shall not cover: (i) product or part therein which has been modified (without prior written approval of ROTEM), or (ii) product or part therein which has not handled or installed by an authorized reseller of ROTEM or (iii) product or part therein which has either handled or installed not in strict accordance with ROTEM's instructions, (iv) products which were used for function other than agriculture industry.

3. This warranty will not apply in the following cases: (i) if all components of the product are not originally supplied by ROTEM (ii) the defect is the result of an act of nature, lighting strikes, electrical power surge or interruption of electricity (iii) the defect is the result of accident, misuse, abuse, alteration, neglect, improper or unauthorized maintenance or repair.

ROTEM warns and alerts all users that the Product is inherently complex and may not be completely free of errors. ROTEM's products are designed and manufactured to provide reliable operation. Strict tests and quality control procedures are applied to every product. However, the possibility that something may fail beyond our control exists. Since these products are designed to operate climate control and other systems in confined livestock environments, where failure may cause severe damage, the user should provide adequate backup and alarm systems. These are to operate critical systems even in case of a ROTEM system failure. Neglecting to provide such a backup will be regarded as the user’s willingness to accept the risk of loss, injury and financial damage.

In no event will ROTEM be liable to a user or any third party for any direct, indirect, special, consequential or incidental damages, including but not limited to any damage or injury to business earnings, lost profits or goodwill, personal injury, costs of delay, any failure of delivery, costs of lost or damaged data or documentation, lost or damaged products or goods, lost sales, lost orders, lost income.

Except for the above express warranty, ROTEM makes no other warranties, express or implied, relating to the products. ROTEM disclaims and excludes the implied warranties of merchantability and fitness for a particular purpose. No person is authorized to make any other warranty or representation concerning the performance of the products other than as provided by ROTEM.

Software Version: **3.0/4.01**

Document Version: **3.2**

Table of Contents

1 FRONT MATTER

This section includes information on the manual and general information.

1.1 Introduction

Rotem manuals provide easy-to-use information regarding the installation, operation, long/short term planning and parts listing (this manual may not deal with all of the above subjects). The table of contents is an outline of the relevant information in this manual.

Read this manual before operating your Rotem product. Using this equipment for any other purpose or in a way not within the operating recommendations specified in this manual will void the warranty and may cause personal injury.

If you have any questions or comments regarding your product, please contact your local Rotem dealer.

1.2 Conventions

NOTE: Notes provide important details regarding specific procedures.

CAUTION **Cautions alert you to potential damage to the controller if the procedures are not followed carefully.**

WARNING! **Warnings alert you to potentially hazardous situations which, if not avoided could result in death or personal injury.**

1.3 Contact Information

Rotem Control and Management

Email: support@rotem.com
URL: www.rotem.com

1.4 Document Information

Revision History

Revision Level / Date	Section Affected	Description
2.0 / Feb 2011	Entire document	Rotem template
2.1 / March 2011	New lexan	
2.2 / June 2011	5.1	Corrected cold start procedure
2.3 / August 2011	Entire document	Added RLD 7.2
2.4 / Dec 2011	6.1 ,6.2	Corrected wiring documents
2.5 / May 2012	6.1.1, 6.1.2	Separated sections
2.6 / June 2012	4.1.1	Changed supported light bulbs
2.7 / August 2012	6.2.1	Add new wiring diagram for board ver 2.1
2.8 / April 2013	4.1.1/5	Added warning/impedance spec
2.9 / August 2013	4.1.1.1	Added 4.01 functionality/profiles
3.0 / November 2013	4.1.1.1	Removed
3.1 / December 2013	8	Added new part numbers
3.2 / October 2014	6.1	New wiring diagrams

Document Number: **110036** **Revision Number: 3.2**

2 PRECAUTIONS

CAUTION **The COM connection for communications is not the shield wire. The COM, RX and TX wires must connect to each other at all controllers.**

WARNING! **ONLY an authorized electrician may install the RLED. Power must be disconnected to avoid electrical shock and damage. To avoid exposing the RLED to harmful gases or high humidity, it is recommended to install it in the service room.**

3 INTRODUCTION TO THE RLD-7.2 AND RLD-14

The RLD-7.2 and RLD-14 units enable controlling the light and brightness in the poultry pen. The Rotem Platinum, AC-2000 and SuperGuard Controllers support the RLD. This manual is meant to be used by either a poultry farmer or authorized personnel who own a poultry pen.

- Device Description
- Software Type
- Abbreviations and Terms
- User Interface

3.1 Device Description

The RLD-7.2 and RLD-14 are two independent channel devices controlling all light functions inside the poultry house. These dimmers have unique features such as stable operation in low brightness levels and high flexibility.

Main features:

- Two independent channels
- Manual brightness control
- Programmable brightness control by analog signal 0 - 10 VDC and communication line from the controller
- *Automatic settings recovery after power failure
- Automatic settings save for each mode.
- Minimum and maximum light intensity settings
- Automatic shut down timer.
- Maximal output power for one channel
    - 230 VAC, 7200 VA (RLD-14)
    - 110 VAC, 3600 VA (RLD-7.2)

NOTE: *The settings are immediately saved after being defined

3.2 Software Type

Rotem currently supports two software versions:

- Version 3.0 supports:
    - CPU card version 1.3.1 (refer to Figure 6)
- Version 4.01 supports:
    - CPU card version 2.0 (refer to Figure 5)

3.3 Abbreviations and Terms

Abbreviations/Terms	Meaning Description
LED	**Light Emitting Diode**: An electronic device used to indicate the status of various functions on the front panel.
Default	A value permanently stored in memory and is used to define the parameter in the absence of a user-defined value.
Restart	The procedure that renews the device state.
Cold Start	The procedure that restores default (factory) values of the parameters
"bu"	**Bulb**: This parameter defines the bulb type (Incandescent, LED, fluorescent, cold cathode)
"ch"	**Channel**: This parameter can receive values between 0 – 8, since it can be connected to 8 matching lines of the Platinum Plus / AC-2000 controller.
"Lo"	**Low**: This parameter prevents lamps from burning out through defining a minimum brightness limit. This value cannot be higher than the Brightness Restriction.
"br"	**Brightness Restriction**: By this parameter one can restrict the upper limit of the output voltage. Its values can be within "On" (100) and "0" (0%), but it must be higher than the “Lo” parameter.

3.4 User Interface

The following section details the keypad.

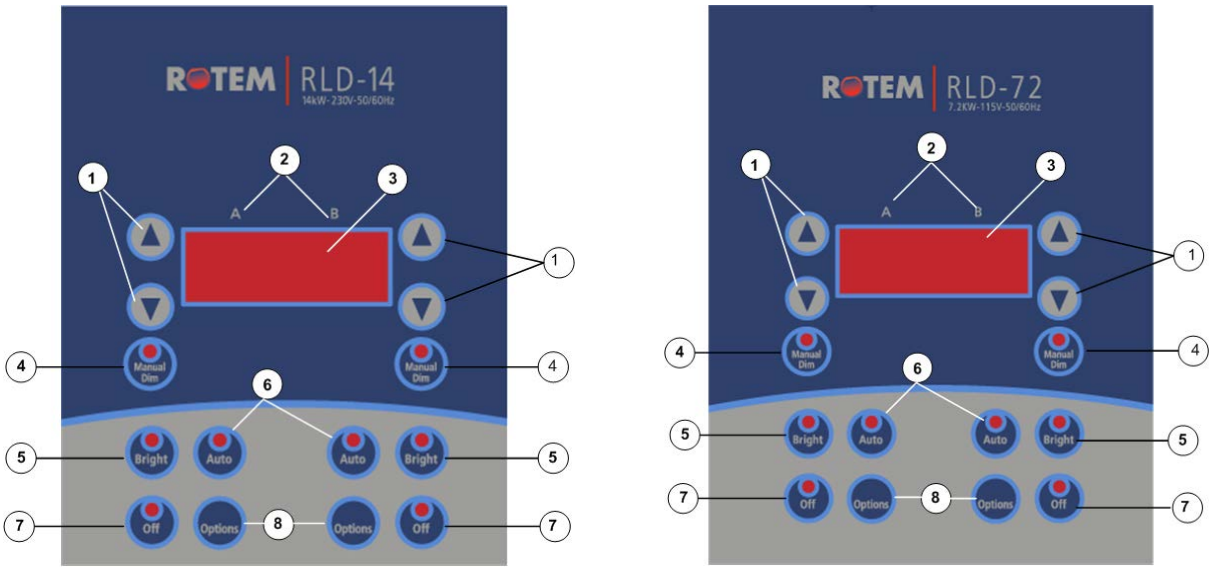


Figure 1: Front Panel

Note that the keypad is divided into two channels ('A' and 'B'), press the appropriate channel buttons. The relevant LED indicates the current active mode.

1. Arrow keys: These keys change values of output voltage (in percentage)

2. **Channels:** This specifies which channel is being dealt with. Note that the buttons are duplicated since each one is dedicated to each channel separately.

3. **Display:** Both values of voltage and parameters are displayed here.

4. **Manual Dim:** Pressing this button sets the RLD channel to manual mode. In manual mode you can set the light percentage using the arrow keys. Verify that you are changing the required channel.

5. **Bright:** Pressing this button gradually increases the channel to full brightness for a period of 20 minutes. Adjust the time period by pressing the up/down cursor keys. The display shows the remaining amount of time before the light begins to turn off. When this period ends, the decrease in light is gradual.

6. **Auto:** Pressing this button utilizes the analog input card 0-10 V output or communication card and is controlled via a lighting table program.

7. **Off:** Pressing this button gradually reduces the channel to 0% light intensity.

8. **Options:** Press this button to view the RLD system parameters menu.

4 USING THE RLD DIGITAL

The following sections detail how to use the RLD.

After setting the parameters, RLD automatically backs them up. In cases when the power shuts down and goes back on, the controller continues operating as in its last saved state.

- Preliminary Setup Options
- Bright Mode
- Manual Dim Mode
- Auto Mode
- Performing a Cold Start

4.1 Preliminary Setup Options

Press **Options** of either channel for three seconds to enter the system parameters menu. The first parameter is "bu." To navigate to the other three parameters, press the "Options" button. The sequence order of parameters to appear is as follows: **bu → Ch → Lo → br → Ig.**

NOTE: The **"Options"** button is also used to exit from this menu.

- System Parameter 1 – Bulb Type
- System Parameter 2 – Channel
- System Parameter 3 – Low Limit
- System Parameter 4 – Brightness Restriction
- System Parameter 5 – Ignition Pulse

4.1.1 System Parameter 1 – Bulb Type

The "**bu**" parameter defines the bulb type. It is important to correctly define the type of bulb since each type has different electrical properties. The options are:

- **Lb**: Incandescent (Tungsten)
- **CC**: Cold cathode
- **FL**: Fluorescent

CAUTION **To ensure proper operation, cold cathode and and fluorescent lamp infrastructures require the installation of one incandescent lamp in line with these lamps.**

NOTE: If you change the bulb type, the **Low Limit** and **Ignition Pulse** parameters return to their default settings.

4.1.2 System Parameter 2 – Channel

The "**ch**" (Channel) parameter sets the connection mode. **0** represents connection via voltage controlled mode using 0-10 VDC Analog input and **1-8** represents connection via the controller's communication feature.

- **Connecting via 0 – 10 VDC analog input**: Set the parameter to **0.** Refer to Using an Analog Output, page 18 for wiring information.
- **Connecting via the controller's communication feature**: Set the parameter from **1 – 8.** . Refer to Using a Communication Card, page 20 for further details regarding numbering.

NOTE: The unit must be set to Auto Mode when working with a controller (refer to Auto Mode, page 12).

CAUTION Platinum Controllers only suppport channels 1 – 4.

4.1.3 System Parameter 3 – Low Limit

The "**Lo**" parameter defines the minimum brightness limit (0%-99%). This parameter prevents lights burning out; the light only begins to operate when the brightness level reaches and exceeds this value. The light ceases to operate once the intensity level is 10% below the value in this parameter (for example: when set to 20% the light turns off at 18%). Default: 20%

NOTE: The **Lo setting** cannot be **higher** than the **br setting**. The **br** setting cannot be **lower** than the **Lo setting**.

4.1.4 System Parameter 4 – Brightness Restriction

This parameter restricts the maximal value of brightness according to the user's setting. The default value is "On" (100%). Adjust the desired limit through use of the "UP" and "DOWN" buttons. This feature is useful when there is no need for the maximal brightness and helps to save power.

4.1.5 System Parameter 5 – Ignition Pulse

When going from 0% brightness to any other brightness level, **some** cold cathode and fluorescent bulbs require full power for a brief period of time (milliseconds). This option supplies the required power. Since there are a large number of models on the market, each model having its own specifications, each user must test his model to verify if an ignition pulse is required and how long the pulse needs to run

- **Default**: None
- **1 – 5**: Pulse length. 1 is the shortest and 5 is the longest.

NOTE: Software versions 4.01 and higher support this option.

4.2 Bright Mode

The **Bright** mode gradually increases the light intensity to the maximum value set in the "**br**" parameter. This process takes 20 minutes

The feature is useful, for example, when a farmer needs to have the light ON for a specific period of time in the poultry house. After that time period, the light dims gradually down to the previous value.

NOTE: The system returns to the previous mode, at the point where it left off.

For continuous operation, set the unit to **Manual Dim Mode.**

4.3 Manual Dim Mode

Pressing "**Manual Dim**" enters the device into "Manual Dim" mode. The display changes and indicates the voltage percentage value for that channel. Manual Dim is used to override the Auto Mode settings.

In manual mode the user changes the light brightness by pressing the **UP** and **DOWN** arrow keys.

4.4 Auto Mode

Pressing the "**Auto**" button enables connecting the RLD-14 to a controller. There are two ways to connect the RLD-14 to a controller:

- Via an analog output card 0-10 VDC (All Rotem Controllers)
- Via a communication card (Platinum Controller only)

CAUTION **Connect the RLD to a controller using one option only! Connecting the RLD using both methods together results in faulty light levels.**

Refer to Configuring the Channel Levels, page 18 for information of connecting the unit to a controller.

4.5 Performing a Cold Start

Perform Cold Start to return the RLD to its default state:

1. Unplug the unit.
2. Reapply power; **simultaneously** press both arrow buttons**.**

The unit has been reset.

NOTE: To check the software version, press the RESET button.

5 SPECIFICATIONS

Input Voltage	
• RLD-14	One/Two phase, 230 VAC 50/60 Hz
• RLD-7.2	One phase,110 VAC 50/60 Hz
Output Maximal Load (Per Channel)	30 Amps
Maximal Power (Per Channel)	
• RLD-14	230 VAC, 7200 VA
• RLD-7.2	110 VAC, 3600 VA
0-10 VDC Analog Input Impedance	10 KOhm
Operating Temperature Range	0° to 60° C (32° to 140° F)
Humidity	85%
Enclosure	Water and dust tight (IP66)
Fuses	Main Fuse:315 mA slow blow

5.1 Environmental Protection

Recycle raw materials instead of disposing as waste. The controller, accessories and packaging should be sorted for environmental-friendly recycling. The plastic components are labeled for categorized recycling.

6 INSTALLATION

WARNING! ONLY an authorized electrician may install the RLD. Power must be disconnected to avoid electrical shock and damage. To avoid exposing the RLD to harmful gases or high humidity, it is recommended to install it in the service room.

NOTE: Installation Category (Over voltage Category) II

CAUTION The wires that supply power to the RLD schematics also supply power to the light. The cross-section of the copper cable must not be less than 10 mm^2. Make sure the correct wires for the load are in use.

1. Mount the RLD on the wall, using the four supplied screws through the mounting holes.
2. Place the required cables through the cable holders at the bottom of the unit. Connect the wires according to the wiring diagrams (see below).
3. To connect the "0 - 10" volt DC wire to the controller, use two conductor #18 - #22 gauge cable. Connect the minus (-) to the Common terminal on the controller terminal block, and the plus (+) to terminal #4 (0 - 10 volt output).
4. Close the RLD enclosure lid carefully and tightly.
5. Use RTV silicon or an equivalent sealant to seal the cable holders.
6. After installation has been completed, operate the RLD (and the controller, if connected) for a few hours and check for proper operation.
7. Continue the installation as detailed in the following sections.

- RLD Wiring Diagram
- Configuring the Channel Levels

6.1 RLD Wiring Diagram

The following diagrams how to connect the RLD to:

- Power source
- Lighting

The particular wiring depends on the unit and number of phases:

- RLD-7.2(single phase)
- RLD-7.2(triple phase)
- RLD- 14 (single phase)
- RLD-14 (three phase)

Refer to Configuring the Channel Levels, page 18 for instructions on wiring the unit to a controller.

6.1.1 RLD 7.2 Wiring

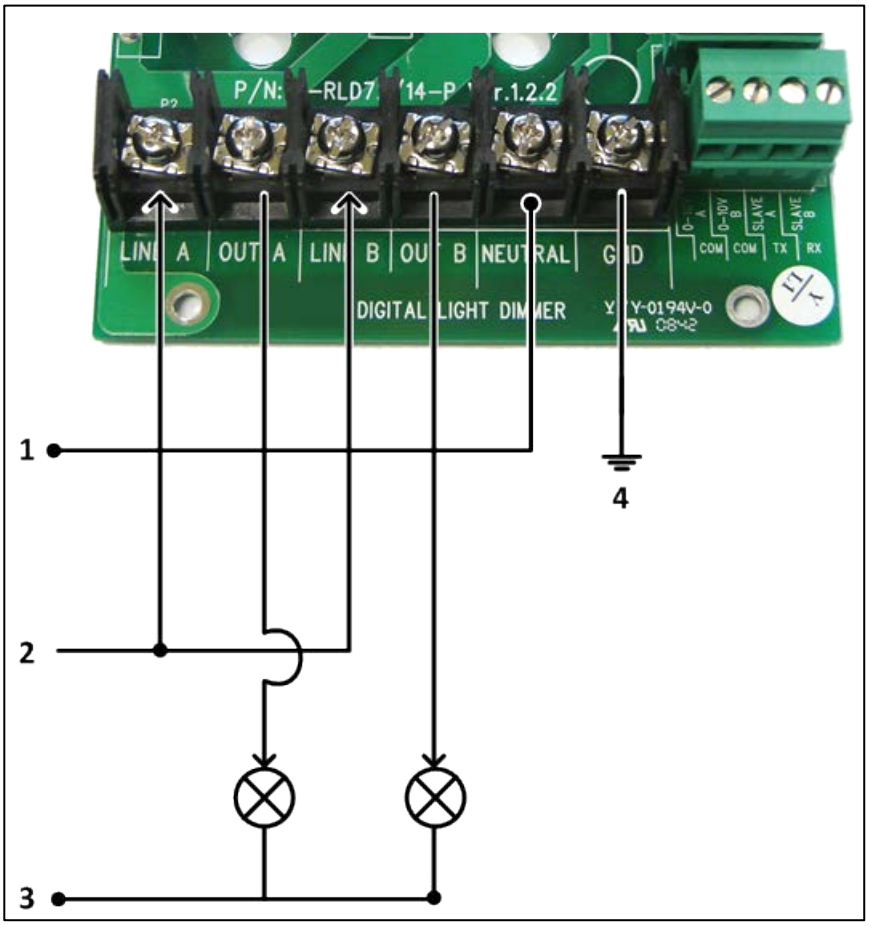


Figure 2: RLD 115V Single Phase Wiring

- Key:
  - 1: Neutral
  - 2: 115 VAC
  - 3: Neutral
  - 4: Safety ground

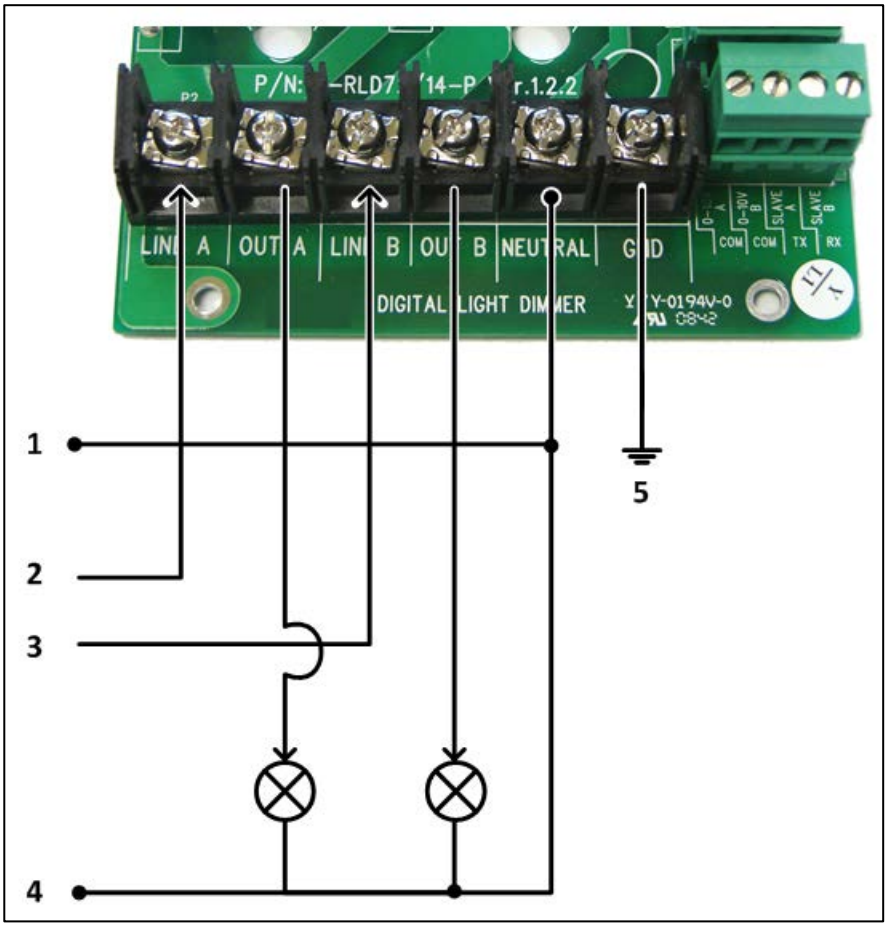


Figure 3: RLED 115V Two Phase Wiring

- Key:
  - 1: Neutral
  - 2: 115 VAC Phase A
  - 3: 115 VAC Phase B
  - 4: Neutral
  - 5: Safety ground

6.1.2 RLD 14 Wiring

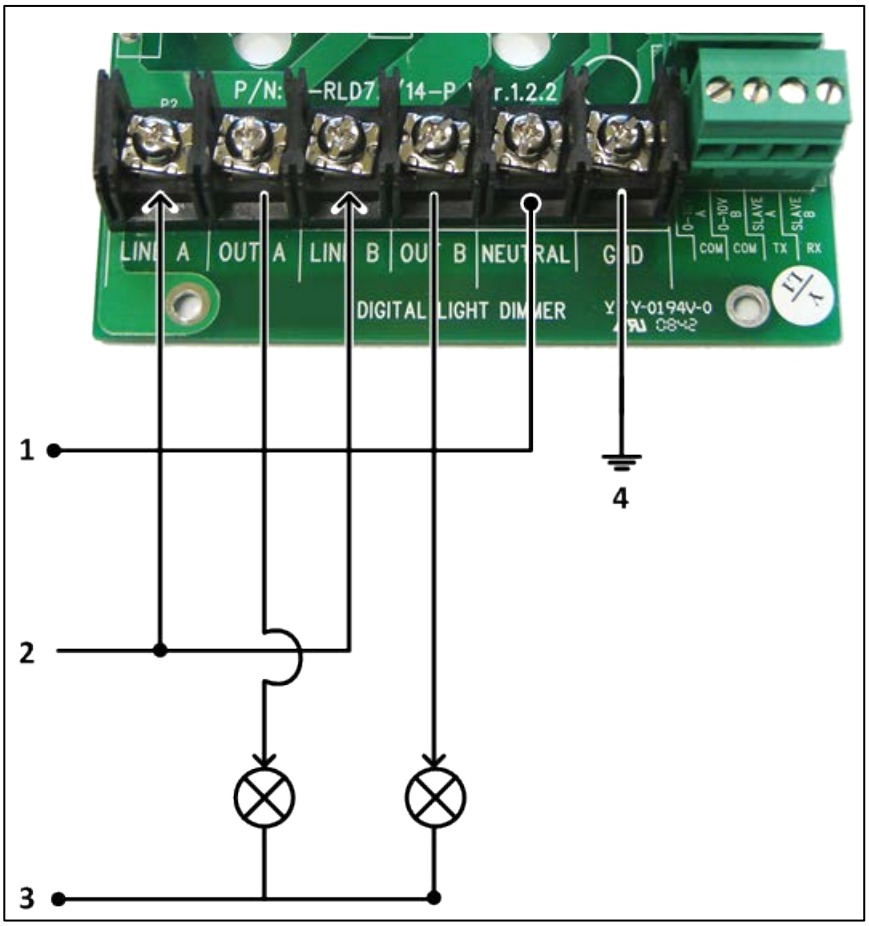


Figure 4: RLD 230V Single Phase Wiring

- Key:
  - 1: Neutral
  - 2: 230 VAC
  - 3: Neutral
  - 4: Safety ground

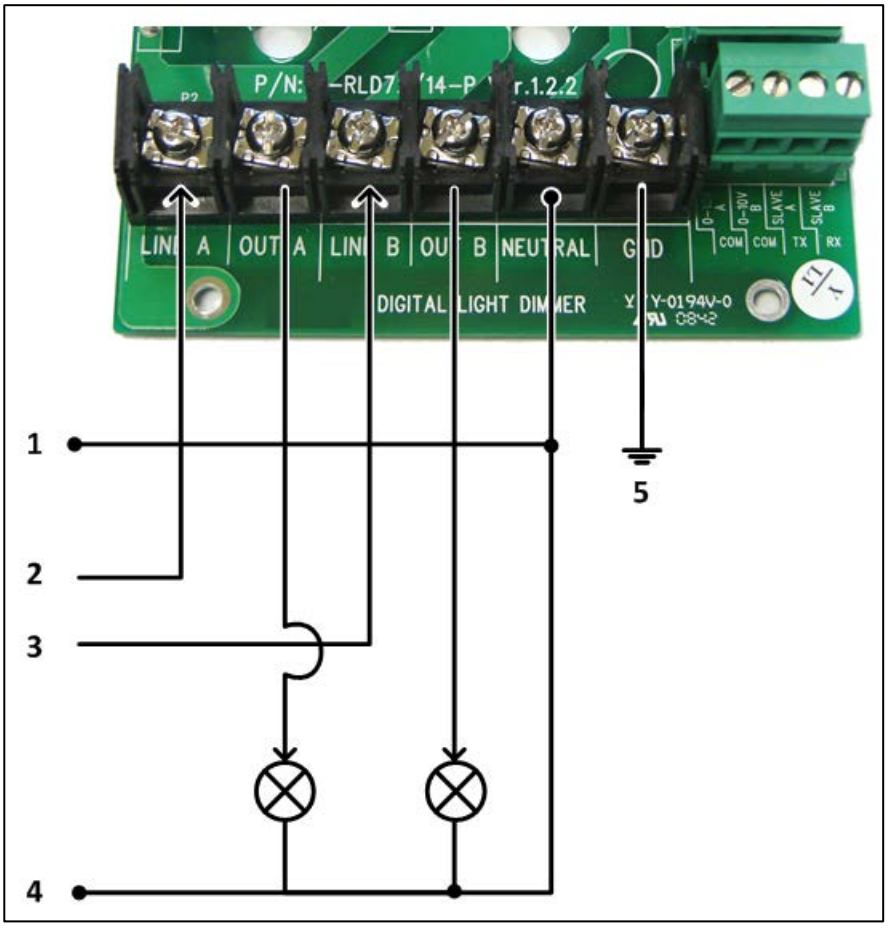


Figure 5: RLD 230V Two Phase Wiring

- Key:
  - 1: Neutral
  - 2: 230 VAC Phase A
  - 3: 230 VAC Phase B
  - 4: Neutral
  - 5: Safety ground

)

6.2 Configuring the Channel Levels

The following sections detail how to configure the channel levels.

- Using an Analog Output Card, page 18
- Using a Communication Card, page 20

6.2.1 Using an Analog Output Card

NOTE: Verify that parameter "**ch**" is set to "**0**" (refer to System Parameter 2 – Channel, page 10).

1. Connect the 0 – 10 VDC (+) and COM (–) wires from the external device to terminal ports "0-10V A", "0-10V B" and COM (Figure 5 and Figure 6).

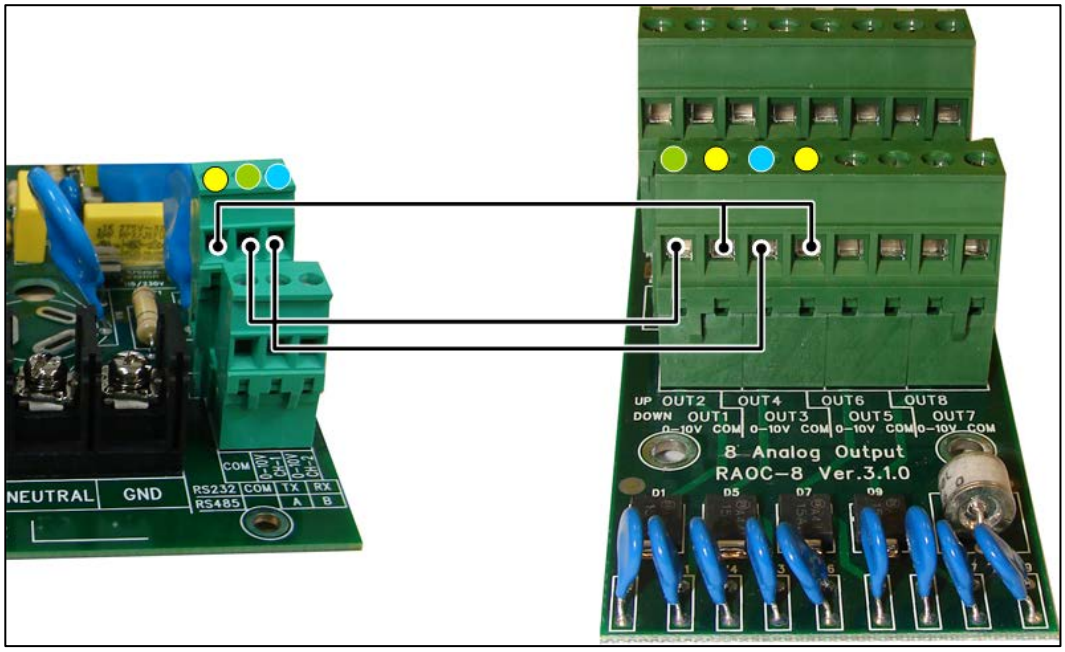


Figure 6: RLD (Board Version 2.1) to RAOC-8 (Analog Output) Wiring Diagram

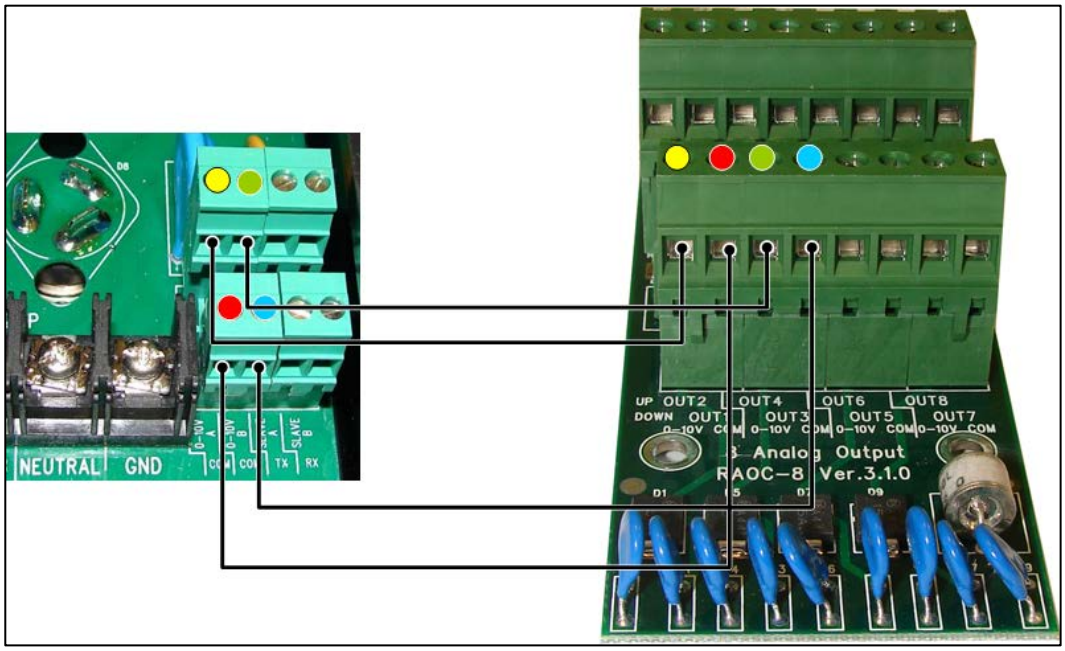
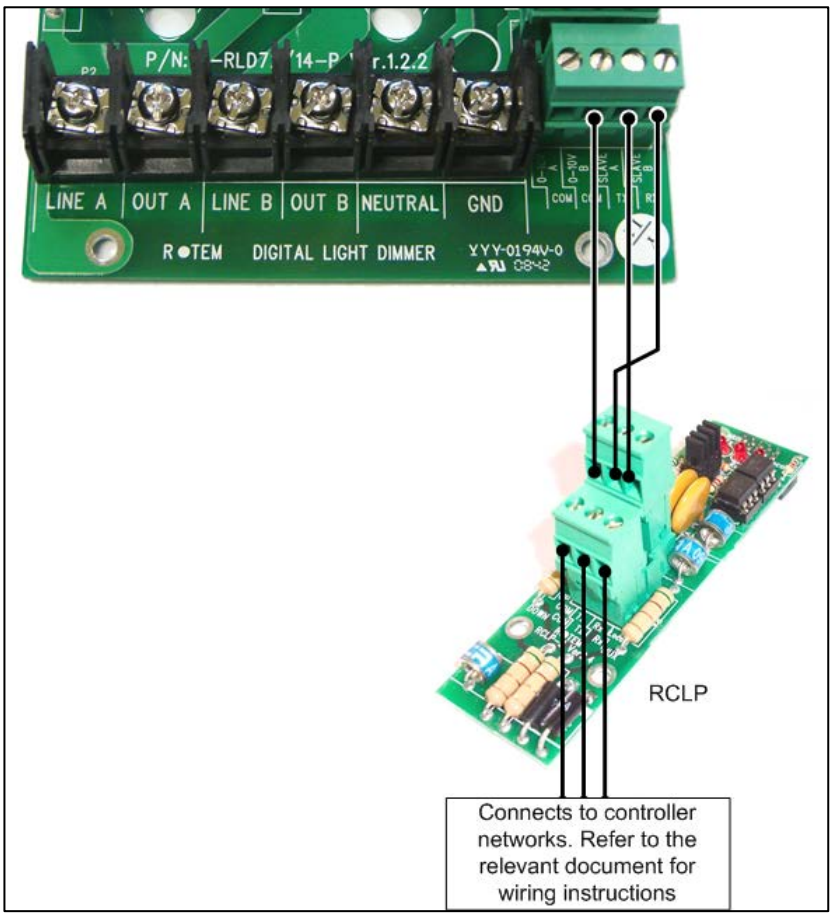


Figure 7: RLD (Board Version 1.3.1) to RAOC-8 (Analog Output) Wiring Diagram

2. To control both channels simultaneously, short "0-10V A" and "0-10V B".
3. To configure the channel levels go to the:
    - Analog output table (Platinum and SuperGuard/Piguard)
    - System parameters (AC-2000)

6.2.2 Using a Communication Card

1. Connect the RLD to an RCLP card.



NOTE: Verify that parameter "**ch**" is set to "**1 - 8**" (refer to System Parameter 2 – Channel, page 10).

2. Configure the channels. There are two numbering options:
   - Different numbers to each channel, with up to 8 different channels (when using multiple RLD units).
   - Same number for more than one channel if you require the same behaviors from these channels.

For example, two RLD units can control four channels using the communication line:

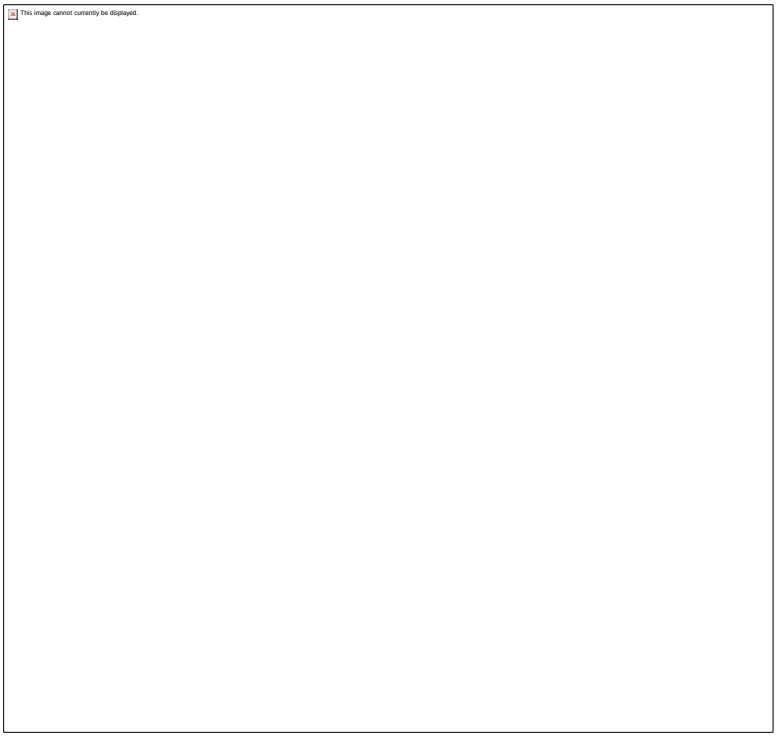
- 1st channel (A1) #1: 20%
- 2nd channel (A2) #2: 10%
- 3rd channel (B1) #2: 10% (same as A2)
- 4th channel (B2) #3: 90%

7 TROUBLESHOOTING

CAUTION **To ensure proper Light Dimmer operation, do not connect any *inductive* devices to the output (for example transformers, reactors, chokes).**

#	Problem Description	Troubleshooting
1	When Power is connected the seven-segments and LEDs indicate nothing.	1. Check the power. 2. Check the main fuse F3 and F1 (when working with 230 VAC). 3. Check +5V. 4. Check flat cable connection.
2	Power is ON, but there is no Output when working in "AUTO" mode with: a. "0-10V" control voltage b. RX, TX communication lines	1. Make sure the "+" and "COM" of "0-10V" cable is connected correctly. Set 5V from controller and measure this value at the RLD terminal. 2. Make sure the RX, TX are connected correctly (interchange RX and TX).
3	The lights blink when working at low voltage levels.	Make sure there is no inductive devices (for example transformers and power coils) integrated into the electrical load system.

8 PARTS CATALOG



No.	Description	RLD-7.2 Part Number	RLD-14 Part Number
1	Front Panel	SP-RLD/E-122099	SP-RLD/E-122099
2	Sticker	SP-RLD-350187	SP-RLD-350188
3	Door Hinge	SP-RLD/E-122044	SP-RLD/E-122044
4	Square Seal	SP-RLD/E-200025	SP-RLD/E-200025
5	Flat Cable	SP-RLD/E-141023	SP-RLD/E-141023
6	Fuses: 0.1a 250V 5*20mm Bus (s504) lf (218)	190007	190004
7	RLD-72-CPU-Card	C-RLD72-L	C-RLD72-L
8	RLD-72 Power Card	C-RLD72-P-V1 (110V)	C-RLD72-P-V2 (230V)

NOTE: The RLD-7.2 has one transformer only.