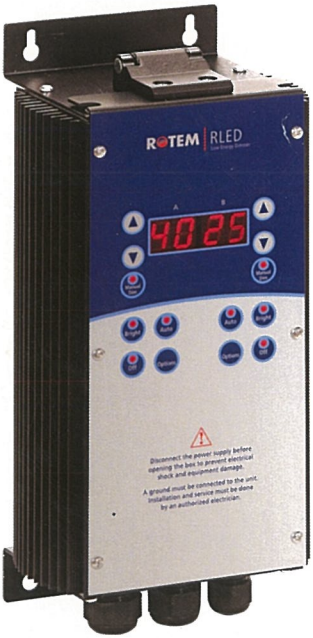
ROTEM®

Control & Management

RLED

Two Channel Low Power Light Dimmer



User & Installation Manual

P/N:110391

www.rotem.com

Take Control®

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: **4.03**

Document Version: **1.7**

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
1.0 / Nov 2013		Release document
1.1 / December 2013	4.1.1	Removed LB
1.2 / December 2013		
1.3 / May 2014	4.1.1.1	Updated list
1.4 / July 2014	4.1.1.1	Updated list
1.5 / October 2014	6.1	Wiring diagrams
1.6 / Jan 2015	4.1.1.1	Updated list
1.7 / Feb 2015	4.1/4.1.1.1	Updated procedure, list

2 PRECAUTIONS

ONLY an authorized electrician may install the RLED. Disconnect the power to avoid electrical shock and damage. To avoid exposing the RLED to harmful gases or high humidity, install it in the service room.

3 INTRODUCTION TO THE RLED

The RLED units enable controlling lighting systems in a poultry house, including LED-based lighting. The Rotem Platinum, AC-2000 and SuperGuard Controllers support the RLED.

- Device Description
- Abbreviations and Terms
- User Interface

3.1 Device Description

The RLED is an independent channel device controlling all light functions inside a 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 shutdown timer.
- Maximal output power for one channel
  - 230 VAC, 1400 watt
  - 110 VAC, 660 watt

NOTE: *The settings are immediately saved after being defined

3.2 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 (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.

Abbreviations/Terms	Meaning Description
"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.

3.3 User Interface

The following section details the keypad.

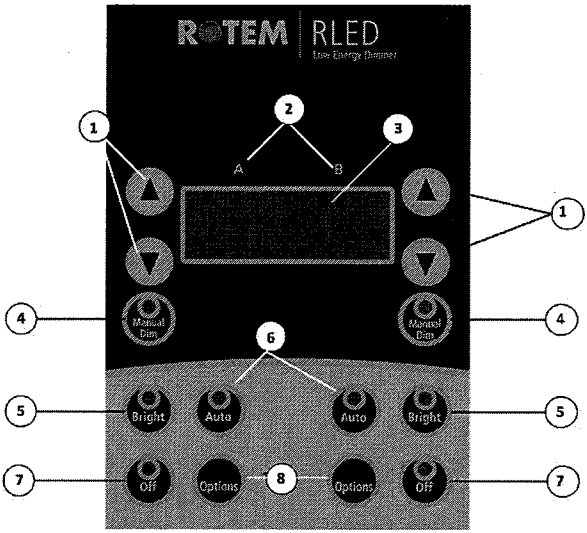


Figure 1: Front Panel

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 RLED 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 RLED system parameters menu.

4 USING THE RLED

The following sections detail how to use the RLED.

After setting the parameters, RLED 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.

- Cold Start
- System Parameters
- Bright Mode
- Manual Dim Mode
- Auto Mode

4.1 Input Voltage Frequency

RLED automatically detects the input voltage frequency (50 or 60 Hz). However to ensure that the detected frequency is correct, Rotem **strongly recommends** selecting the frequency.

1. Unplug the unit.
2. Reapply power; **simultaneously** press both **left-side** arrow buttons. The word *Cold* and then *1P50* or *1P60* (the detected frequency) appears.
   - If the frequency is correct, press **Options**.
   - If the frequency is incorrect, press a **left-side** arrow button and then press **Options**.

RLED sets the frequency and returns all parameters to their **default settings**.

CAUTION Only perform this procedure if required.

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

4.2 System Parameters

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

4.2.1 System Parameter 1 – Bulb Type

The **"bu"** parameter defines the bulb type. The options are:

- **CC**: Cold cathode
- **FL**: Fluorescent
- **LED Bulbs**: Refer to the following section (LED Bulb Profiles).

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

4.2.1.1 LED Bulb Profiles

Different brands and models of LED lamps vary in their light intensity characteristics. Multiple LED profiles provide light output linearization, when employing a selected LED profile (see Table 1). If the LED lamp employed is not listed:

- use one of the LED profiles and verify LED lamp behavior using a light meter or visually.
- use the L6 generic profile

Table 1: LED Bulb Profiles

Lamp Name	RLED Profile	Lamp Name	RLED Profile
Lumavue 7.5W PAR38	L1	Unilight 10W PAR38	L2
Overdrive 8W A19 3000K	L2	Greenlite 8W A19	L2
Visualed 8W A19 3500K	L1	GE 11 Wt	L1
Unilight 8W PAR38	L1	Earth Bulb 8 Wt	L1
Overdrive 8W A19 5000K	L1	Utilitech Pro 10W	L1
Overdrive 7.5W PAR38	L1	Nextgen 10W PAR30	L3
Overdrive 10W PAR38	L4	Overdrive 6W	L5
Overdrive 11W PAR38	L2	**Generic**	**L6**
Cree 9.5 Wt	L5	Techna	L8
Once Innovation	L7	For future use	L9

4.2.2 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 16 for wiring information.
- **Connecting via the controller's communication feature**: Set the parameter from **1 – 4.** . Refer to Using a Communication Card, page 17 for further details regarding numbering.

NOTE: Set the unit to Auto Mode when working with a controller (refer to Auto Mode, page 10).

4.2.3 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**.

4.2.4 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.

4.2.5 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.

4.3 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.**

4.4 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.

4.5 Auto Mode

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

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

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

Refer to Configuring the Channel Levels, page 16 for information of connecting the unit to a controller.

5 SPECIFICATIONS

Input Voltage	• One/Two phases, 230 VAC 50/60 Hz • One phase,110 VAC 50/60 Hz
Output Maximal Load (Per Channel)	6 Amps
Maximal Power (Per Channel)	• 230 VAC, 1400 watt • 110 VAC, 660 watt
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	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

NOTE: Installation Category (Over voltage Category) II

CAUTION **The wires that supply power to the RLED 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 RLED 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 RLED 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 RLED (and the controller, if connected) for a few hours and check for proper operation.
7. Continue the installation as detailed in the following sections.

- RLED Wiring Diagram
- Configuring the Channel Levels

6.1 RLED Wiring Diagrams

The following diagrams how to connect the RLED to:

- Power source
- Lighting

The particular wiring depends voltage and number of phases:

- 115 VAC
  - single phase
  - two phase
- 230 VAC
  - single phase

Refer to Configuring the Channel Levels, page 16 for instructions on wiring the unit to a controller.

6.1.1 RLED 115 VAC Wiring

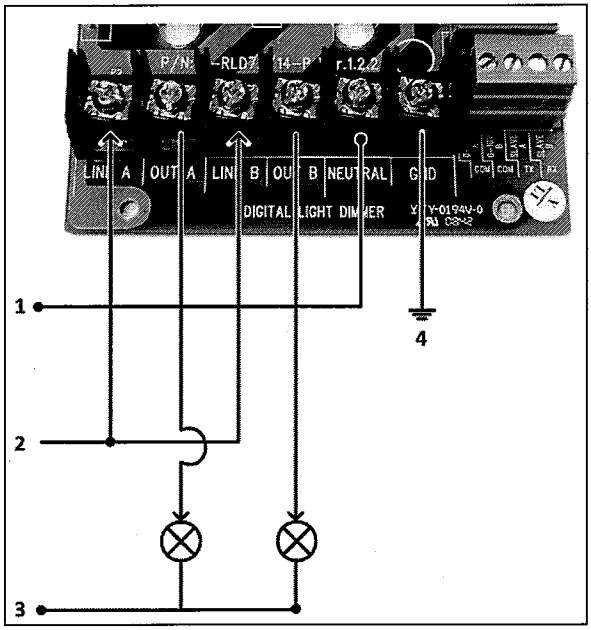


Figure 2: RLED 115V Single Phase Wiring

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

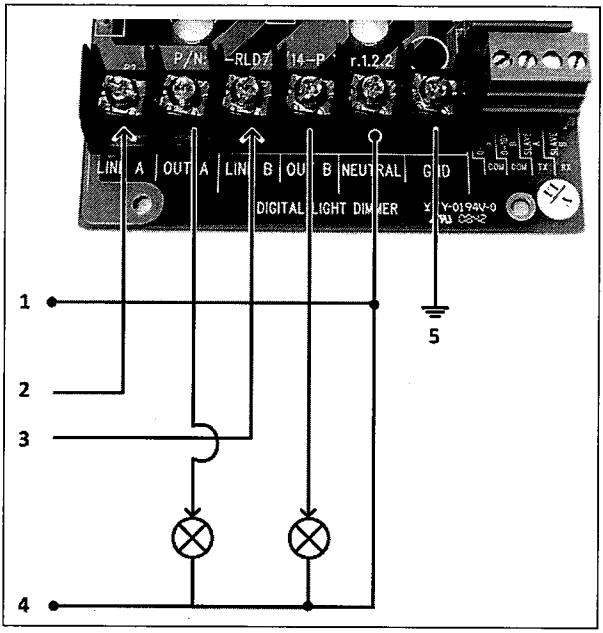


Figure 3: RLED 115V Two Phase Wiring

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

6.1.2 RLED 230 VAC Wiring

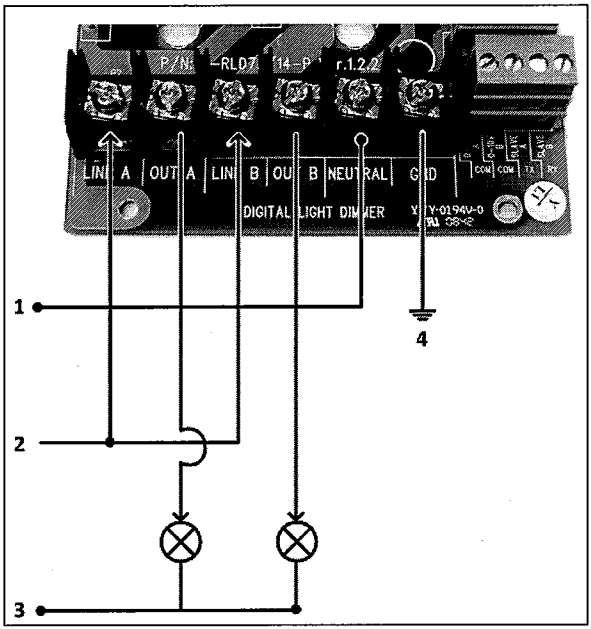


Figure 4: RLED 230V Single Phase Wiring

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

6.2 Configuring the Channel Levels

The following sections detail how to configure the channel levels.

- Using an Analog Output Card, page 16
- Using a Communication Card, page 17

6.2.1 Using an Analog Output Card

NOTE: Verify that parameter "**ch**" is set to "**0**" (refer to System Parameter 2 – Channel, page 9).

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 6).

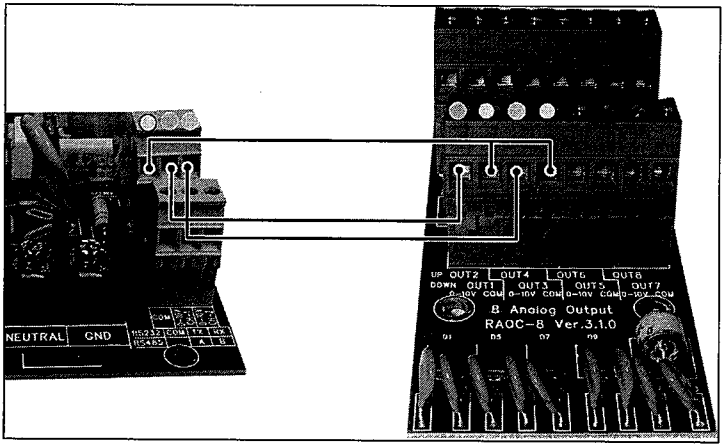
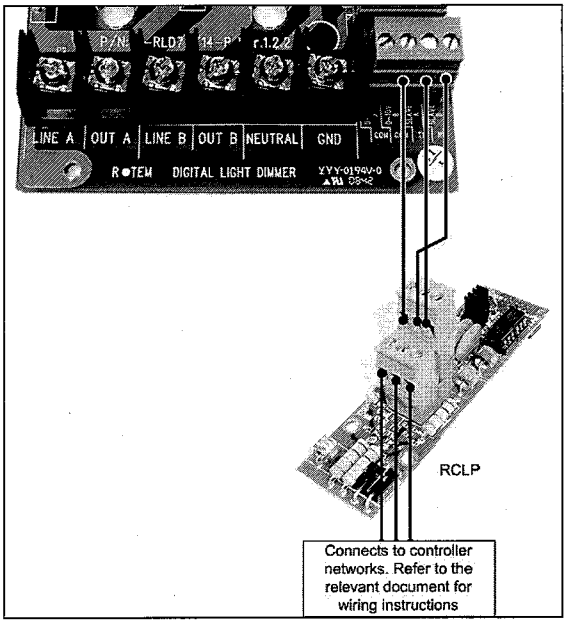


Figure 5: RLED (Board Version 2.1) to RAOC-8 (Analog Output) Wiring Diagram

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 RLED to a Platinum communication card.



NOTE: Verify that parameter "**ch**" is set to "**1 - 8**" (refer to System Parameter 2 – Channel, page 9).

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

For example, two RLED 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%

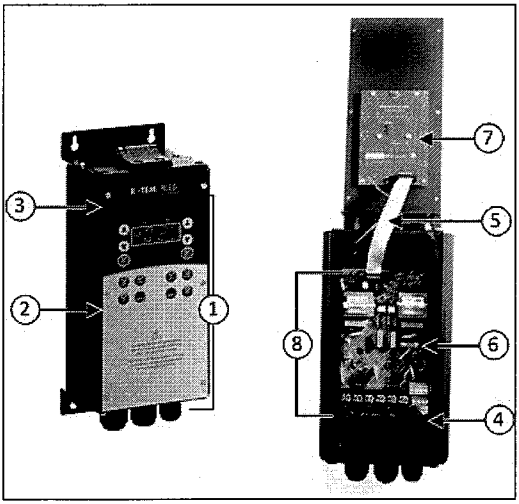
7 TROUBLESHOOTING

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: • "0-10V" control voltage • 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 RLED 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

- RLED-V1: RLED Dimmer, 115 Volt
- RLED-V2: RLED Dimmer, 230 Volt



No.	Description	RLED Part Number
1	Front Panel	122099
2	Sticker	350481
3	Door Hinge	122044
4	Square Seal	200025
5	Flat Cable	141023
6	Fuses: 0.1a 250V 5*20mm Bus (s504) If (218)	0.315A
7	RLED CPU-Card	B-RLD72/14-L (V1/V2 respectively)
8	RLED Power Card	B-RLD72-P-V2

ROTEM®

Control & Management

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