ROTEM®
Control & Management

RLD - 14 Two Channel Light Dimmer

User & Installation Manual

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. Load cells are not covered by ROTEM's warranty.
3. 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.
4. 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.
5. ROTEM's sole liability under this warranty is the repair or replacement of the defective item of product.

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: 2.0
Document version: 2.0

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User's Profile

This manual is meant to be used by either a poultry farmer or its' authorized personnel who owns a poultry pen. The RLD-14 is based on the fact that poultry farmer wants to control the light and brightness in the poultry pen. Moreover, this manual is meant to be used by any poultry farmer who owns either AC-2000 or Platinum Plus working together with the RLD-14.

Device Description

The RLD-14 Digital is a 2 independent channels device controlling all light functions inside the poultry house. It has some 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 0-10VDC 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 3600VA for 115VA
- Slave device option.

**The settings are immediately saved after being defined*

Abbreviations and Terms

Abbreviations/Terms	Meaning Description
1. **LED**	Light Emitting Diode – An electronic device used to indicate the status of various functions on the front panel.
2. **Default**	A value permanently stored in memory and is used to define the parameter in the absence of a user-defined value.
3. **Restart**	The procedure that aimed to renew the device state.
4. **Cold Start**	The procedure that restores default (factory) values of the parameters
5. **"bu"**	Bulb – This parameter defines the bulb type (Incandescent, fluorescent, cold cathode)
6. **"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.
7. **"Lo"**	Low – This parameter aims to prevent lamps from burning out through defining a minimum brightness limit
8. **"br"**	Brightness Restriction – by this parameter one can restrict the upper limit of the output voltage. It's values can be within "On" (100) and "0" (0%)

User Interface

Keypad

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

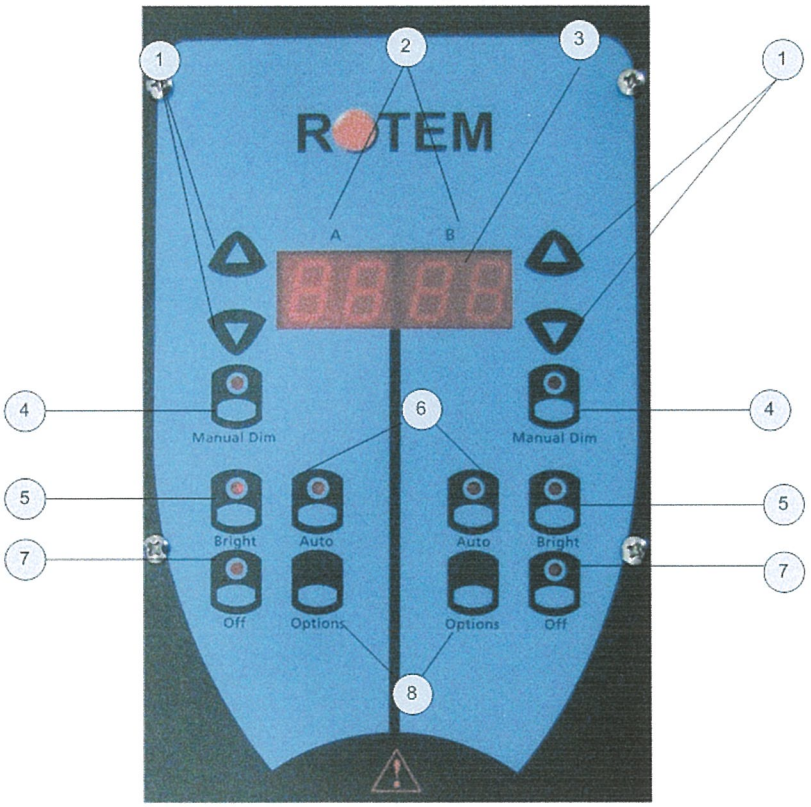


Figure 1: Front Panel

1. ***Cursor keys***: These keys can 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***: Where both values of voltage and parameters are displayed.
4. ***Manual Dim***: Pressing this button will set the RLD-14 channel on manual mode. In manual mode you can set the light percentage using the arrow keys. Make sure you make changes on the correct channel.
5. ***Bright***: Pressing this button will gradually increase the channel to full brightness for a period of 20 minutes. By pressing the up/down cursor keys, the amount of time (in minutes) is adjusted. Every minute the passes for either channel, the display flashes the number of minutes remaining before the lights start to gradually turn OFF.
6. ***Auto***: Pressing this button will utilize the analog input card 0-10V output and will be controlled via lighting table program.
7. ***Off***: Pressing this button will set the channel gradually to 0% light intensity.
8. ***Options***: This is the RLD-14 system parameters menu.

Using the RLD-14 Digital

Cold Start

It is important to perform Cold Start to ensure the RLD-14 is in its default state:

1. Open the RLD-14 lid and press simultaneously the RESET+UP+DOWN buttons on channel 1 (the left side).
2. Release RESET button and once the display shows "-- --" release the two other buttons.
3. The software version number (for example, "01 03" means version 1.3) will be displayed followed by "OFF".
4. The LED of the "OFF" mode will be turned on.

**To check the software version, simply press the RESET button.*

Preliminary setup - "Options"

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

The **"Options"** button is also used as an exit from this menu.

SYSTEM PARAMETER 1 – BULB TYPE

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

- Lb – Incandescent (Tungsten)
- CC – Cold Cathode
- FL – Fluorescent

It is important to define the type of bulb since each type has different electrical properties.

SYSTEM PARAMETER 2 – CHANNEL

The "**ch**" (Channel) parameter sets the connection mode. This parameter may vary from 0 through 8. **0** - represents connection via voltage controlled mode using 0-10VDC Analog input and 1-8 represents connection via communication feature of the controller.

In the first case connect 0-10V cable to the dimmer's terminal between "0-10V A" and "0-10V B" (+) and COM (-). The "**ch**" parameter must be "0" for each channel running on this mode.

If one wants to control both channels simultaneously, then short the terminals "0-10V A" and "0-10V B".

In the second case connect communication line to RX, TX, and COM. If one wants to control each channel independently parameter "**ch**" must be different for each channel. For example, to control the brightness by communication line independently one should set parameter "**ch**" for channel A to "1" and for channel B to "2". Setting the same value of "**ch**" for both channels causes the identical behavior of ones.

SYSTEM PARAMETER 3 – LOW LIMIT

The "Lo" parameter is for defining the minimum brightness limit (0%-99%). This parameter is used for prevention of the lights burning out; the light will only begin to operate when the brightness level reaches and exceeds this value. The light will cease to operate once the intensity level is 10% below the value in this parameter (for example: when set to 20% the light will turn off at 18%). Default: 20%

SYSTEM PARAMETER 4 – BRIGHTNESS RESTRICTION

Pressing "Options" a fourth time displays the "**br**" parameter (Brightness Restriction). Its' function is to restrict the maximal value of brightness according to user request. The default value is "On" which signifies 100%. Adjust the desired limit through use of the "UP" and "DOWN" buttons. Take for example; when "60" is the set maximal output voltage that can be reached, then 115 x (60:100) will equal approximately 70VAC. This is useful when there is no need in maximal voltage and helps to save power.

Bright

The bright option will gradually increase the light intensity to the maximum value set in the "**br**" parameter.

The **Bright Mode** duration is at a default of 20 minutes, but can be adjusted through the "UP" and "DOWN" cursor keys during **Bright Mode** operation.

The feature will be useful, for example, when a farmer is willing to have the light ON for a specific period of time in the poultry house. After that time period, the light will dim gradually down to fully OFF condition. Note that the system counts down residual time and displays the minutes remaining.

For continuous operation, use **Manual Dim**.

Manual Dim

Pressing the "**Manual Dim**" button enters the device into "Manual Dim" mode. The display changes and indicates the voltage percentage value for that channel.

In manual mode the user can change the light brightness by using the UP and DOWN arrow keys.

Auto Dim

Pressing the "**Auto**" button allows to interact with an external controlling device such as the Platinum Plus or AC-2000 controllers.

There are 2 ways to connect the RLD-14 to a controller:

1. Via analog output card 0-10VDC.
2. Via communication card.

NOTE: Connect the RLD-14 to a controller using one option only! Connecting the RLD-14 using both methods together will result in faulty light levels.

CONNECTING VIA ANALOG OUTPUT

First make sure parameter "**ch**" is set to "**0**".

Connect 0-10VDC (+) and COM (–) wire from the external device to the "0-10V A", "0-10V B" and COM of the terminal.

If want to control of both channels simultaneously, short "0-10V A" and "0-10V B".

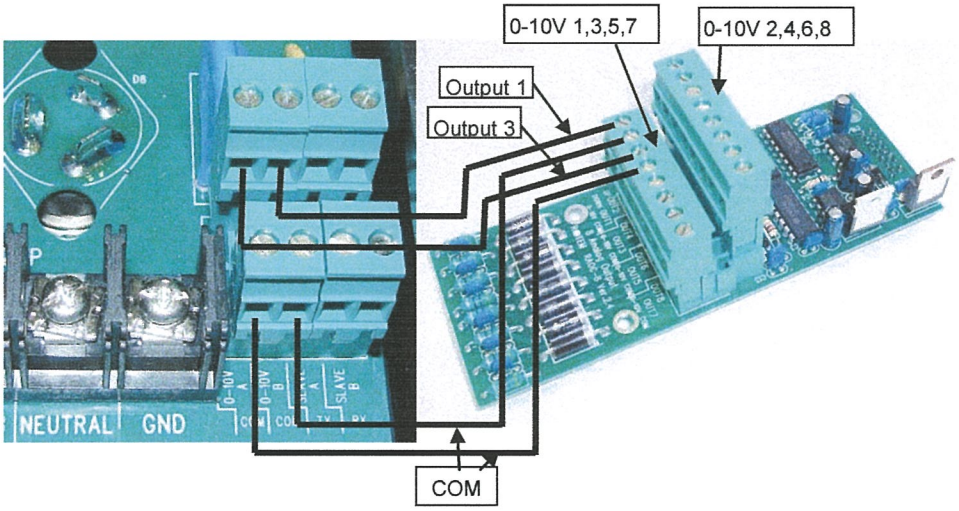


Figure 2: RLD-14 to RAOC-8 (Analog Output) wiring diagram

CONNECTING VIA COMMUNICATION (RELEVANT ONLY FOR P+/PJ)

To control output voltage via communication card make sure the parameters "**ch**" are each set to different numbers, for example "01" and "02". It should **NOT** be set to "0".

There are two numbering options:

1. Different numbers to each channel with up to 8 different channels (when multiple RLD units are in use).
2. Same number to more than one channel if same behaviors from these channels are required.

For example, one has two RLD-14, so 4 channels may be controlled by 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%

Connect communication wire to RX, TX, and COM of the Dimmer or several Dimmers.

If during 2 minutes there is no change to the current state of the RLD-14, the controller will automatically save its last values (working mode, voltage, parameters). This is a back up for cases when the power shuts down and then back on, the controller will then continue operating as in its last saved state.

Specifications

Input Voltage

Two phase.....230 VAC 50/60 Hz

Output Maximal Load (Per Channel)

30 Amps

The Maximal Power (Per Channel)

230VAC.....3600 VA

Operating Temperature Range

0°C to 60 °C

Humidity

85%

Enclosure

Water and dust tight. (IP66)

Fuses

Main Fuse: 315 mA slow blow

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.

Warning

ROTEM products are designed and manufactured to provide a reliable operation. Strict tests and quality control procedures are applied to every product.

At the same time there is a possibility that something may fail beyond our control, and the user should recognize this possibility. As these products are designed to operate climate control systems in livestock confined environments -where a failure may cause a severe damage - the user should provide adequate back-up and alarm systems to operate vital climate control systems to support livestock even in case of a ROTEM system failure. Neglecting to provide such back-up systems will be regarded as the user's willingness to accept the risk of loss, injury and financial damage.

Installation

IMPORTANT: *ONLY an authorized electrician may install the RLD-14.* Power must be disconnected to avoid electrical shock and damage. To avoid exposing the RLD-14 to harmful gases or high humidity, it is recommended to install it in the service room.

Installation Category (Over voltage Category) II

1. Mount the RLD-14 on the wall, using the 4 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.
3. To connect the "0-10" volt DC wire to the controller, use two conductor #18-#24 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. The wires that supply power to the RLD-14 schematics also supply power to the light. The cross-section of the copper cable must not be less than $10mm^2$.

Make sure the correct wires for the load are in use.

5. Mount the RLD-14 Slave on the wall, using 4 supplied screws through the mounting holes and place the required cables through the cable holders at the bottom of the unit. Connect the wires according to the wiring diagrams, i.e. output controlling signals "Slave A" and "Slave B" of RLD-14 Master connect to the RLD-14 Slave corresponding input "Slave A" and "Slave B" with shielded wire. The length of the connective wire must not be greater than 2.5m.
6. Close the RLD-14 enclosure lid carefully and tightly. Use RTV silicon or equivalent sealant to seal the cable holders.

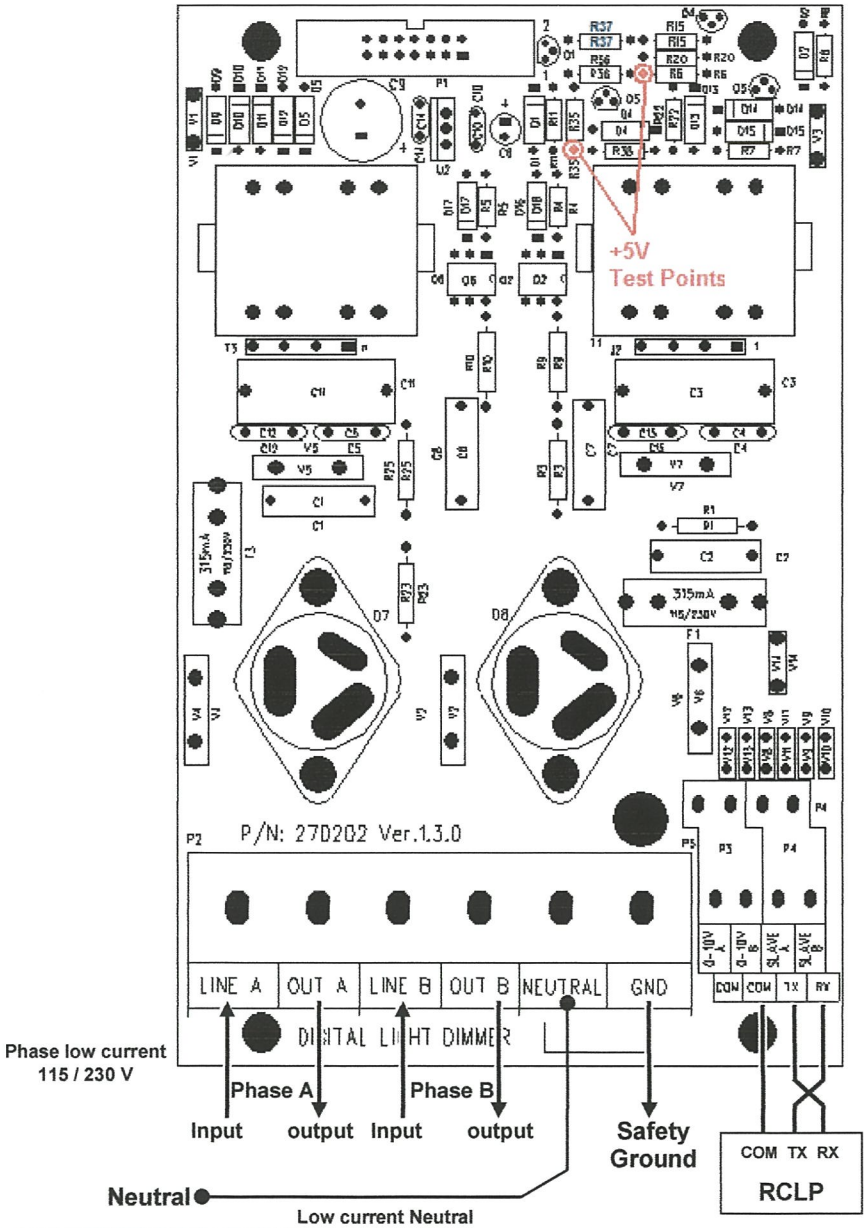
After installation has been completed, operate the RLD-14 and the controller for a few hours and re-check for proper operation.

Problems and Troubleshooting

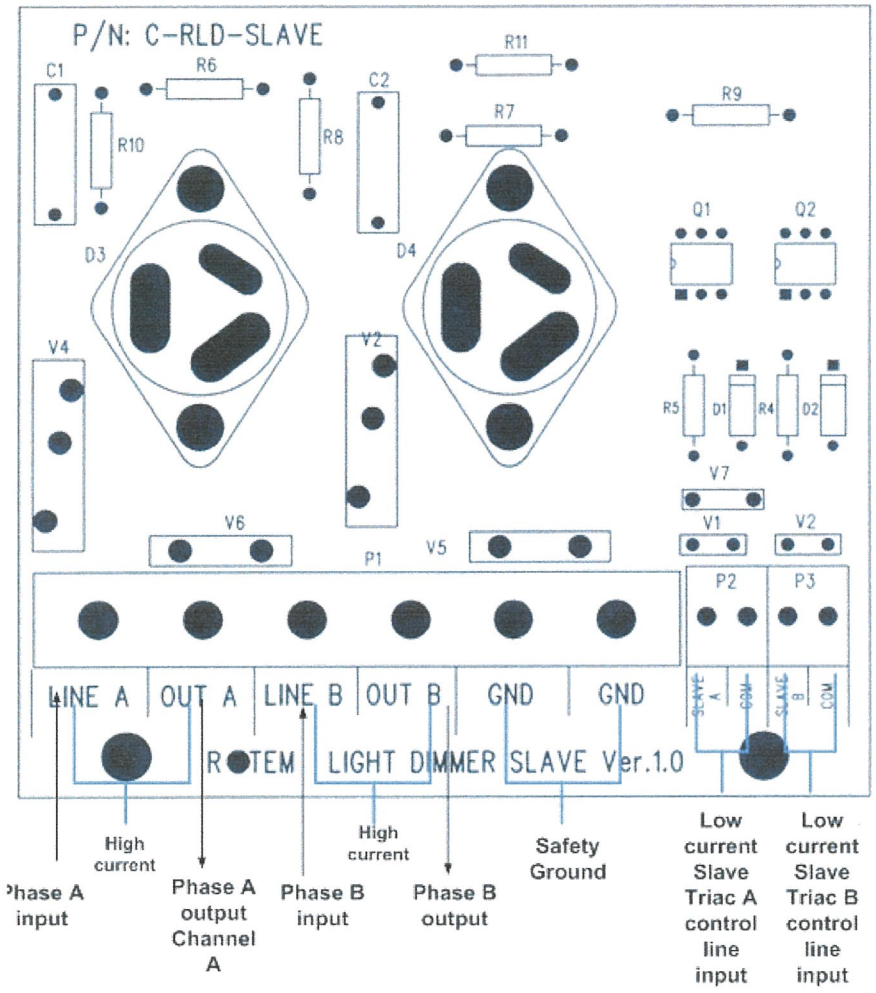
To ensure proper Light Dimmer operation, do not connect any ***inductive*** devices to the output (e.g. transformers, reactors, chokes).

#	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 230VAC.) 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	a. Make sure the "+" and "COM" of "0-10V" cable is connected correctly. Set 5V from controller and measure this value at the RLD terminal. b. Make sure the RX, TX are connected correctly (interchange RX and TX).
3	There is no OUTPUT when SLAVE box is connected.	Check the correctness of cable connection to the terminal "Slave A", "Slave B", "COM".
4	A blinking is observed when working at low voltage levels.	Make sure there are no inductive devices (e.g. transformers, power coils etc.) load.

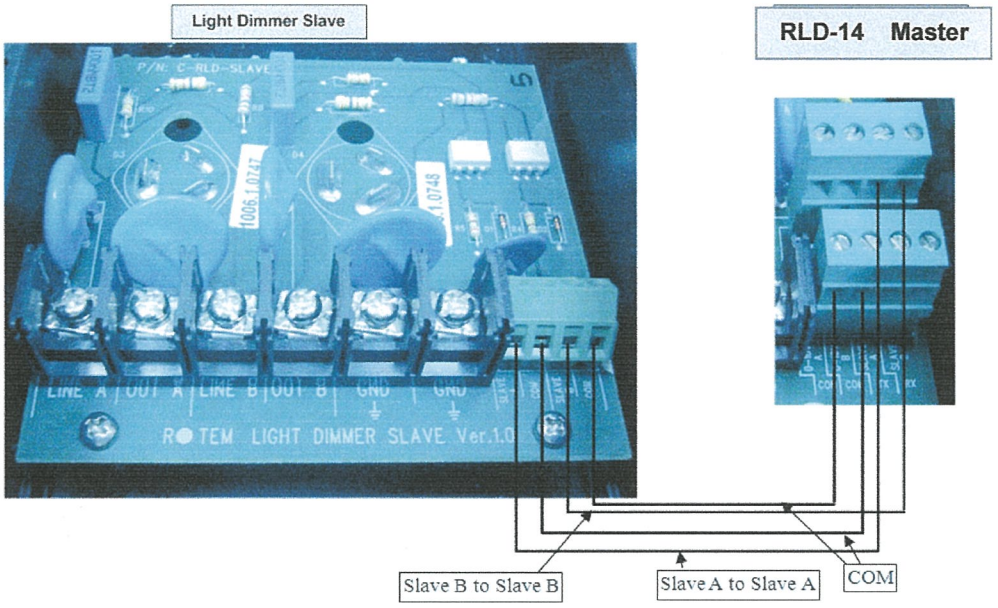
RLD-14 WIRING DIAGRAM



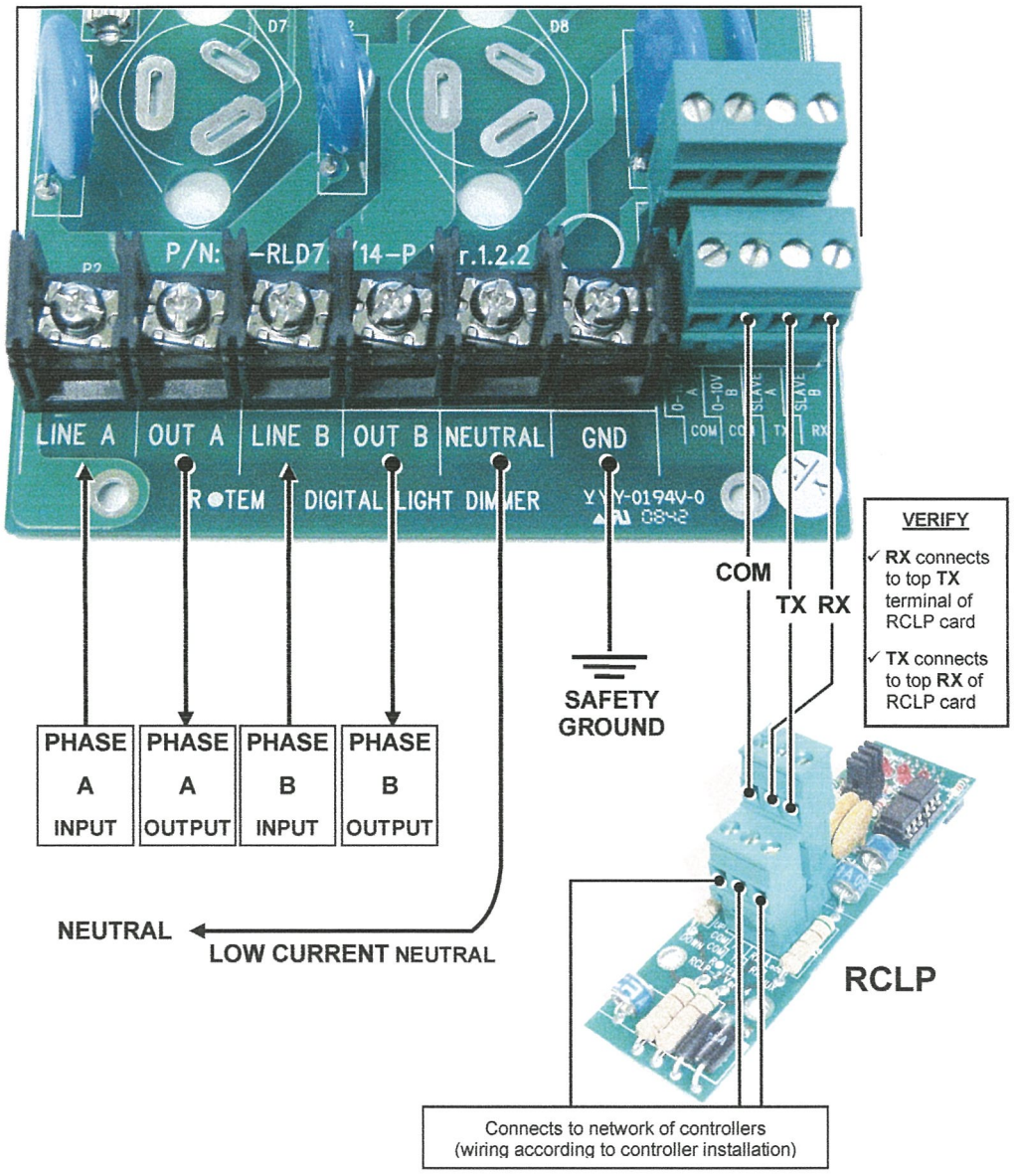
SLAVE UNIT WIRING DIAGRAM



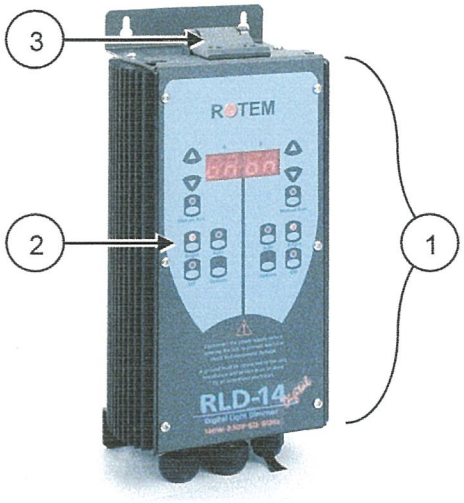
MASTER TO SLAVE WIRING DIAGRAM

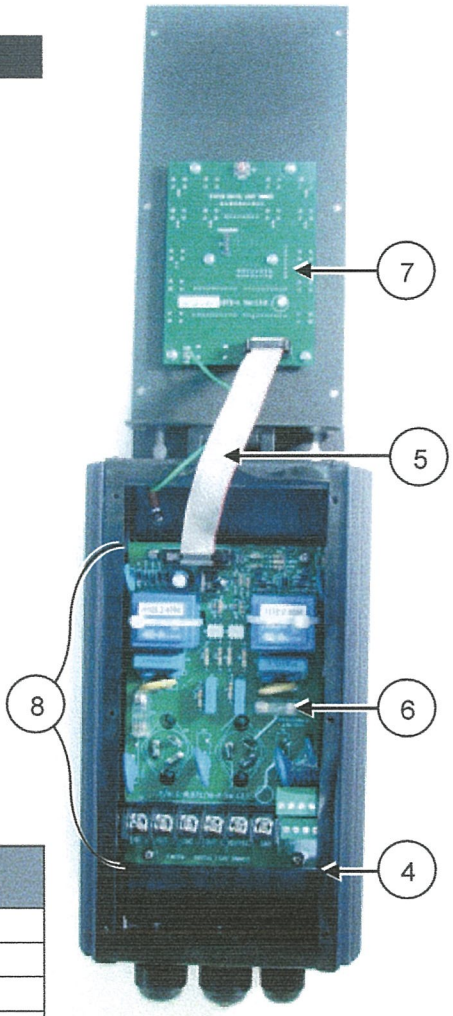


RLD-14 MASTER ELECTRIC DIAGRAM



Parts Catalog





Cat. No.	Part Number	Description
1	122099	FRONT PANEL
2	350188	STICKER
3	122044	DOOR HINGE
4	200025	SQUARE SEAL
5	141023	FLAT CABLE
6	190004	FUSES: 0.1A 250V 5*20mm BUS (S504) LF (218)
7	C-RLD72-L	RLD-72-CPU-CARD
8	C-RLD72-P-V2	RLD-72 POWER CARD 230V

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