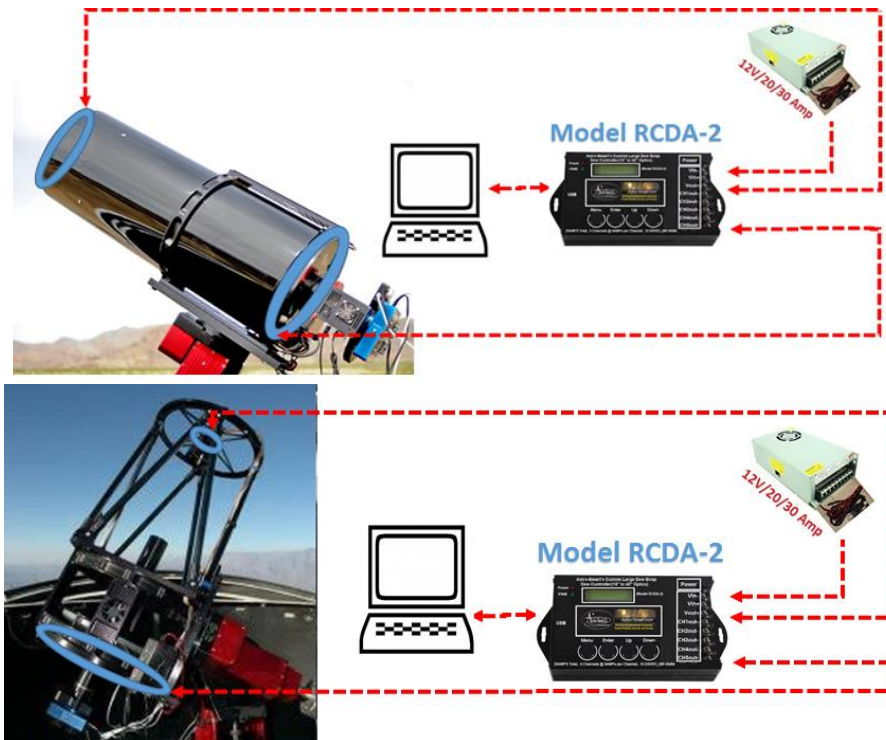




# User's Manual Computerized Dew Annihilator (Model RCDA-2)



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Sept 25 2018

**User's Manual**  
**for the**  
**Astro-Smart**  
**Computerized Dew Annihilator**  
**(Model RCDA-2)**

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### A. Overview

Astro-Smart's Computerized Dew Annihilator(**RCDA-2**) is a turn-key solution for professional or amateur dew control **designed specifically for large observatory telescopes with optical surfaces requiring dew straps greater than (18" to 50" Telescope Apertures).**

The customer merely needs to select the diameter of his optics and the system will be designed around that criteria with sufficient current to remove dew from the optics.

The **RCDA-2** is designed for distributed power to the custom large dew strap design to maximize current demand while preserving optical integrity for imaging or visual observing with Astro-Smart's patented PWM wave interference algorithms. These algorithms distribute heat for **large telescope optical surfaces from 18" to 50" optics** targeted to be used with this one device or can also be used with smaller scopes providing plenty of power reserve.

The RCDA-2 offers the following benefits.

1. **Large Telescope Aperture Dew Control(18" to 50" Telescope Apertures).**
2. Plenty of Heat Demand and Power Reserve Upto 25Amps distributed across the custom dew strap design.
3. Standalone Computerized Control With LCD Display and User Menu, Enter and UP, Down Button Interface.
4. Computer Control with supplied USB interface and GUI Software interface.
5. Power LED and PWM distributed strap power LED indicators.
6. Mounting Brackets
7. Low Cost.



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In the following picture you can see **RCDA-2** system with common 4 heat channels, LCD Display, User Button Interface and Power supply input.



**Figure 1: Computerized Dew Annihilator  
(RCDA-2)**

**Typical Configurations for the RCDA-2 is shown below on variations of ritchey-chretien but can be used with any reflector, refractor, newtonian Dobsonian or schmidt-cassegrain telescope.**

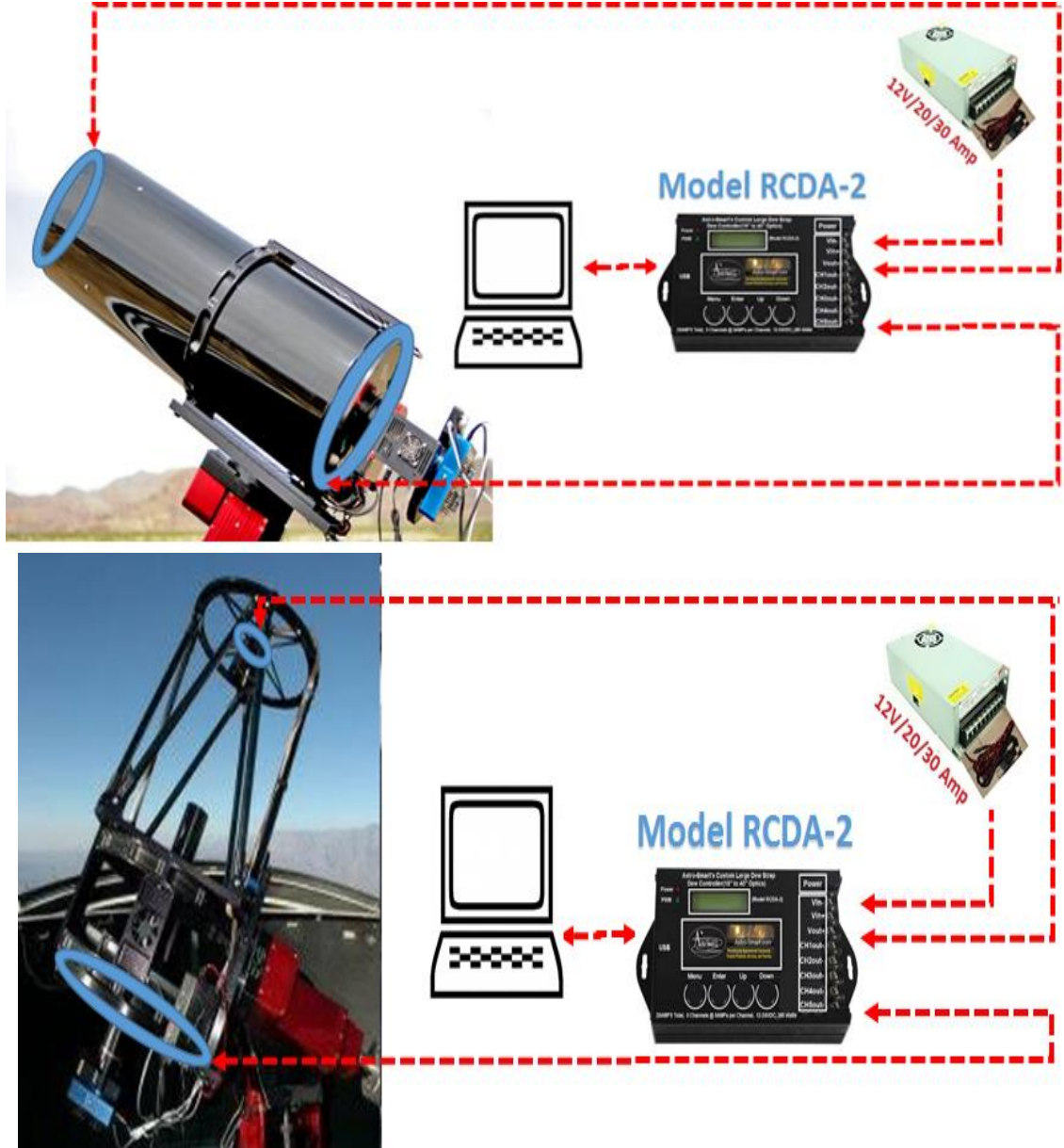


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This system has been tested on a 32 inch Mirror Reflector Truss And A 42 inch Dobsonian Telescope which has performed with amazing results.



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### B. Features

Since, the inception of this unique product at Astro-Smart, the **RCDA-2** was many years in the making, over long periods in astronomy using existing products on the market to control dew, identifying their weaknesses and limitations making the product you see before you. The **RCDA-2** is finally here!!! The Astro-Smart **Computerized Dew Annihilator** (Model **RCDA-2** is designed to be user friendly, serviceable, elegant and reliable and include the following features shown below:

1.	<i><u>Worry Free Warranty Program For Life Of Product Sale.</u></i>
2.	<i>Full Computerized Dew Control Solution.</i>
3.	<i>5 Output Port Heat Channels User Control Capable of 300 Watts(12V, 25Amps). Works with custom designed dew strap configured to customer telescope aperture.</i>
4.	<i>Variable Power Control Duty Cycle 0-100%, 1.5KHz. Patented Asto-Smart Wave Cancellation Method And Pulse Width Modulation(PWM) for Efficient Heat Output Tailored for Extreme Dew Removal, Reduced Wave Interference with CCD Imaging and Conservation of Power Drawl.</i>
5.	<i>Lifetime Updatable Firmware and Standalone Software GUI Interface.</i>
6.	<i>Mounting Brackets and High quality Aluminum housing enclosure which employs small form factor and rugged design for outdoor use.</i>
7.	<i>Void of RFI(Radio Frequency Interference) protected to enhance Astro-Imaging .</i>
8.	<i>Price point set below development cost for such a system while providing more features.</i>

The Astro-Smart Computerized Dew Annihilator (**RCDA-2**) was designed with the same Astro-Smart USER-Friendly design philosophy as all our other products:

- Usable
- Serviceable
- Elegant
- Reliable
- Build with burn in time testing before ship.
- ... USER-Friendly





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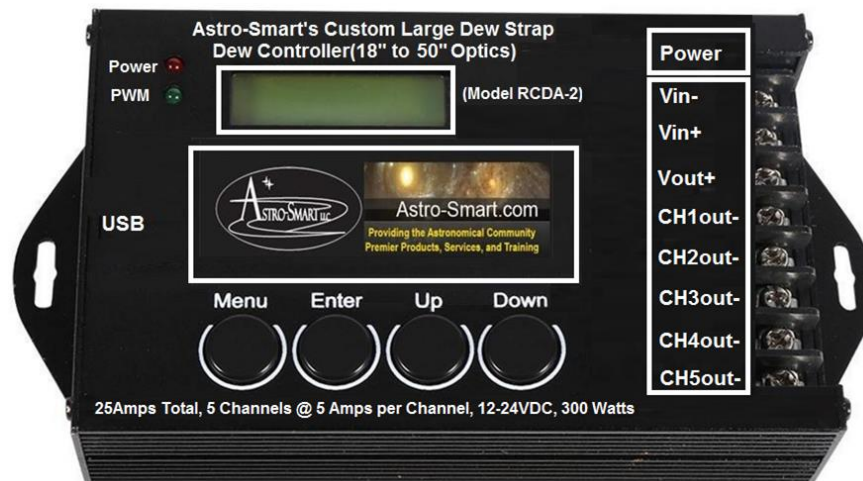
## C. Contents of Box

**The package contents Of RCDA-2 are shown below:**

*1. RCDA-2 Dew Controller, USB Cable and Control Software. Configurations can be made upon request.*

*2. User Selected Dew Strap For Telescope Optics Between 18" and 50".*

*2. User Selected 20 or 30 Amp power supply.*





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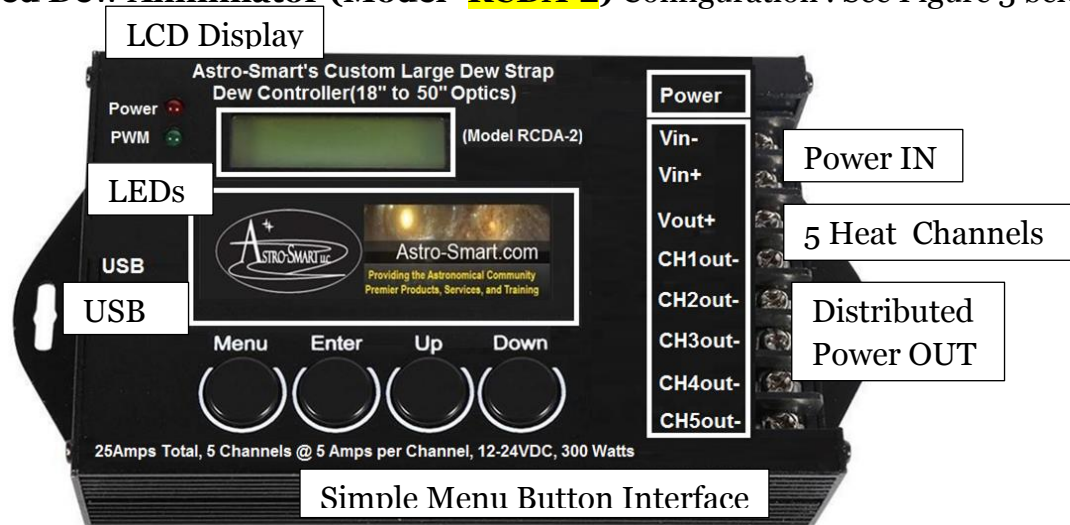
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## D. RCDA-2 Front Panel And Connector Diagram

- **Computerized Dew Annihilator (Model- RCDA-2)** Configuration . See Figure 3 below.



**Figure 2 RCDA-2 Overview Model (2018).**





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### E. Basic Functionality

The user can watch as the **RCDA-2** adjusts heat and controls dew on your telescope based on manual selection of mode control for all channels or by computer control based on software programmability.

### F. BootUp: Default

1. Fix all connections to your **RCDA-2** as depicted in Figure 3. This includes heater straps CH1/CH2/CH3/CH4 and power supply interface as specified in Figure 1, Figure 2.(Expected Def Operation.)
2. Plug in power and LCD display should show time and date, current status of dew controller channels, and Menu icon.

*Note:* "The RCDA-2 requires a complete circuit meaning the heat straps being plugged in to provide current drawl and heat applied to the optics."

Online video demo's of operation can be found on our website at :

[http://www.astro-smart.com/index.php?p=1\\_24](http://www.astro-smart.com/index.php?p=1_24)



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### G. Summary Keypad Entry Commands (System Control)

*Note: Use keypad entry instructions below when using buttons on keypad on standalone RCDA-2 keypad.*

Note: Picture examples of modes are shown below of what to expect when pressing the keypad before the system responds to the user action invoked.

- **'Mode'** button will Exit Any Level 1 layer up in menu system.
- **'Enter'** button when pressed will enter power mode.
- **'Up or Down'** button will toggle through power levels indicated below.
  - *CHs\_OFF*
  - *20%PW12*.--→20% PWM channels 1 and 2
  - *40%PW12.*
  - *60%PW12.*
  - *80%PW12*
  - *100%P12*
  - *20%PW34*.--→20% PWM channels 3 and 4
  - *40%PW34*
  - *60%PW34*
  - *80%PW34*
  - *100%P34*
  - *20%P1-4.* --→20% PWM channels 1, 2,3 and 4
  - *40%P1-4.*
  - *60%P1-4.*
  - *80%P1-4*
  - *100%1-4*
  - *20401-4*.--→20% Channels 1 and 2, 40% channels 3 and 4
  - *20601-4*
  - *20801-4*
  - *40601-4*
  - *40801-4*.--→40% Channels 1 and 2, 80% channels 3 and 4

\*Other modes can be added upon user request to firmware.



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## **Example Operation.**

1. Plug power in unit with appropriate power supply.
2. Display shows time, data , current port status of heat channels and menu icon
3. Hit Enter first time gets you to mode menu.
4. Hit Enter again gets you to power level menu.
5. Now you can use up or down arrows to select power setting you want based on table summary above.

\*\*\*\*\*



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## H. Accessories

### Optional Accessories:



**360W  
12V30A**

Another convenient accessory for your **RCDA-2** that Astro-Smart offers is Two versions of power supplies based on your dew heating needs for 30Amp 12 VDC supplies ([PS12V30AMP-D](#)).

Custom Dew Straps user specified for telescope optics between 18 and 50 inch apertures are required to be designed with the RCDA-2.



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## I. Warranty, Policies and Copyright Notice

# Life Time Warranty

All products are guaranteed to the original purchaser to be free from defects in material and workmanship for the life of the product from the date of original purchase. Simply put, once you buy a Astro-Smart product we make sure it works for as long as you keep the product for free upgrades of software and firmware for the product. Warranty coverage excludes normal wear and tear, or damage caused by improper installation, any modification, abuse, misuse, improper maintenance, and unauthorized repairs or modifications to the original product. Shipper is responsible for proper packaging, shipping and insurance on applicable upgrades or repair items. . Upon receipt of returned product, Astro-Smart will assess the item/s to determine if they comply with the conditions of our warranty. Astro-Smart is not responsible for damage caused by the freight carrier, i.e.: USPS, UPS, FED EX, etc., to our product. A claim to repair or replace the product must be initiated by the recipient. In no event shall Astro-Smart be liable for any claim for incidental or consequential damage arising out of or in connection, manufacture, delivery or use of any product offered on this website or by information received by US mail, E-mail, data files or fax.

# Return Policy

Merchandise must be returned in new (mint) condition within 30 days of receipt for exchange/refund which may be subject to 20% restocking charge (Shipper is responsible for proper packaging, shipping, and insurance.). We must receive the returned merchandise within 30 days of the date you received it. All items must be in new (mint) condition. Returned items cannot show evidence of use or wear, dirt, or blemishes of any kind. Merchandise must be returned in its original packaging and should include all supplied materials, instructions, original accessories, hardware, and any CD software disks provided. Software purchases via email or download since released are non-refundable. Astro-Smart is not responsible for lost or damaged packages. Return shipping costs are the responsibility of the customer. Any returned items must be in "as new" condition. We ask that you open and inspect your order upon receipt. No insurance or damage claims will be accepted more than 3 days after delivery. All customers MUST email Astro-Smart before returning products for warranty or repair to get an RMA# (Return Merchandise Authorization).



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