



**User's Manual Astro-Cube Dew
Annihilator
(Model M-DA)**



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User's Manual
for the
Astro-Smart
Astro-Cube Dew Annihilator
(Model M-DA)

Contents

A.	Overview	2
B.	Features	5
C.	Contents of Box.....	6
D.	Input / Output Power Specifications	7
E.	CDA-R Front Panel And Connector Diagram	8
F.	Basic Functionality	9
G.	Accessories.....	10



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A. Overview

The **M-DA** can be setup with your telescope for troublefree operation controlled manually by the user supplied rotary dial.

Astro-Smart is the innovator of this elegant *solution to your dew problem*. The **Astro-Cube Dew Annihilator (Model: M-DA)** is designed for Astronomers and Astrophotography's who want a low cost, small compact yet powerful dew heater controller that can be put in your pocket ready to grab and go yet at the same time be able to perform just as well as a observatory grade dew controller. The Astro-Cube dew Annihilator can be used with Astro-Smart's RCA jack type dew straps or compatible RCA type dew straps such as Astro-Zap and Kendrick.

The **Astro-Cube Dew Annihilator (Model: M-DA)** is designed to be used with any make or model of telescope. Whether you have a refractor, newtonian, schmidt-cassegrain, or a ritchey-chretien, the **M-DA** will solve your dew problems while informing you every step of the way. Its like having a hired dew specialist posted at your telescope 24/7.

The **Astro-Cube Dew Annihilator (Model: M-DA)** systems incorporates a common two port heater capability controlling upto 2 heat channels controlled using a rotary dial with a visual indicator LED to display the PWM intensity rate applied to the heat channels. The **Astro-Cube Dew Annihilator (Model: M-DA)** is powered by a 12VDC input from car adapter or AC/DC power supply available at Astro-Smart which can drive upto 10Amps rated dew straps.

For instance, one channel CH1 heater may be used for the main imaging telescopes secondary corrector plate for dew control while CH2 heater can be used for the primary mirror, another mounted imaging scope, guider or finder scope or your eyepieces.

In the following picture you can see **M-DA** system with common 2 heat channels, PWM LED intensity indicators on CH1 and CH2.



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Typical Configuration for the M-DA is shown below on a ritchey-chretien but can be used with any reflector, refractor, newtonian or schmidt-cassegrain telescope.





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B. Features

Since, the inception of this unique product at Astro-Smart, the **M-DA** 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 **M-DA** is finally here!!! The Astro-Smart **Astro-Cube Dew Annihilator** (Model **M-DA** is designed to be user friendly, serviceable, elegant and reliable and include the following features shown below:

1. ***Worry Free Warranty Program For Life Of Product Sale.***
2. ***Full Manually Operated Rotary Dial Dew Control Solution.***
3. ***2 Output Port Heat Channels User Control Capable of 120 Watts(12V, 10Amps). Works with Any RCA type heat strap....Astro-Zap, RCA type dew strap such as Astro-Smart, Kendrick, etc.***
4. ***Variable Rotary Dial Power Control PWM Duty Cycle 0-100% @ 50 KHz Power Intensity.***
5. ***PWM LED Flash Intensity Indicator For Heat PWM Output Ports.***
6. ***Dimensions (2.3" Long x 2.5" Wide x 1.3" High.)***
7. ***4 X Mounting Brackets Top and Bottom Provided as Part Of Package Design.***
8. ***High quality design employs multi-layer PCB form factor and only the best quality components with conformal coatings for outdoor use.***
9. ***Void of RFI(Radio Frequency Interference) protected to enhance Astro-Imaging .***
10. ***Price point set below development cost for such a system while providing more features.***

The Astro-Smart Astro-Cube Dew Annihilator (**M-DA**) 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 are shown below with choice of:
RC-CDA-R or CDA-R.**

1. M-DA Dew Controller System

2. One CD with user manual, Videos, Tutorials and Astro-Smart Sales Brochures.





D. Input / Output Power Specifications

The **M-DA** requires the following:

- At a minimum of 12 Volts DC at 3.3 amps a 2.5mm DC power connector on your AC/DC supply. Based on the 4 channel configuration, the **M-DA** is rated at 5 Amps per duplexed channel or 10 Amps total. Ie. Ch1-2 5 Amp max + Ch3-4 5 Amp max for a total of 10 Amps at 12 VDC which gives a variety of heat strap configurations possible. A power supply rated at 12 VDC and 10 Amps rms is the ideal configuration which astro-smart recommends and provides as a purchase option.

Note: This current drawn through the **M-DA** is dependent on the resistance of each dew strap being used with the **M-DA**. The total current for all the dew straps must not exceed the power supply current rating.

The total resistance of all the dew straps used with the iDDHM must follow this equation for SAFE operation:

$$\frac{\text{Current Rating of Power Supply}}{\text{Voltage output of Power Supply}} = \frac{1}{R_{\text{strap 1}}} + \frac{1}{R_{\text{strap 2}}} + \frac{1}{R_{\text{strap 3}}} + \frac{1}{R_{\text{strap 4}}}$$

Astro-Smart assumes no responsibility if this warning is not heeded.

- Center positive voltage, sleeve ground, see Figure 1.

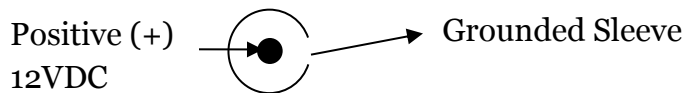


Figure 1 DC power plug

- Uses dew straps manufactured by other astronomical vendors.
- **Note:** Astro-Smart recommends you buy our certified tested power supplies for this product. Users can buy and connect their own power supplies to this product, but they do so at their own risk.



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E. CDA-R Front Panel And Connector Diagram

➤ **Astro-Cube Dew Annihilator (Model- **M-DA**)** Configuration . See Figure 3 below.

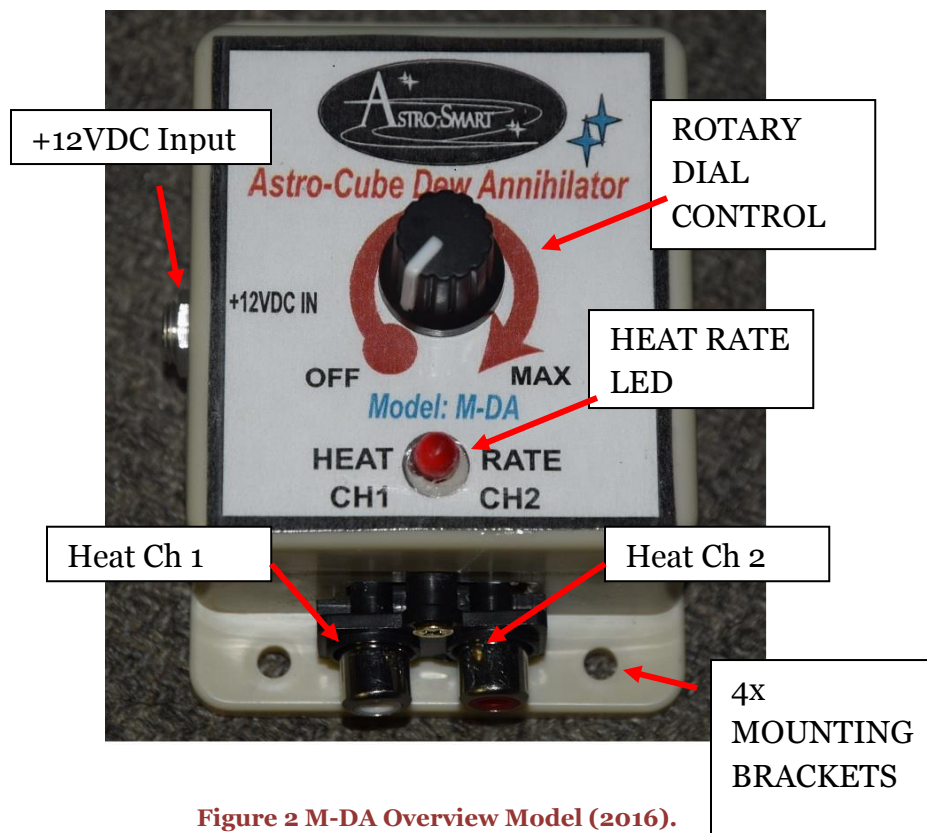


Figure 2 M-DA Overview Model (2016).



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F. Basic Functionality

The user can watch as the **M-DA** adjusts the heat and controls dew on your telescope based on user input on rotary dial for simplicity.

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

http://www.astro-smart.com/index.php?p=1_24



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G. Accessories

Optional Accessories:



Another convenient accessory that Astro-Smart offers for your **M-DA** is a right angle heater connector ([RAHC-DM](#)). This allows your heater to be connected to the **M-DA** at a right angle. This may be convenient for you to alleviate any bending that you have of your heater connector and wire.



Another convenient accessory that Astro-Smart offers is Two versions of power supplies based on your dew heating needs for 6 Amp or 10Amp 12 VDC supplies ([PC12V10AMP-D](#)).



Another convenient accessory for your **M-DA** that Astro-Smart offers is Two versions of power supplies based on your dew heating needs for 6 Amp or 10Amp 12 VDC supplies ([PS12VXAMP-D](#)).



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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).