User's Manual Computerized Dew Annihilator (Models Meade CDA-R)

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User's Manual

for the

Astro-Smart

Computerized Dew Annihilator

(Models Meade CDA-R)

Contents

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(Model Meade CDA-R)

A. Overview

The **Meade CDA-R** can be setup with your telescope *As-is* placed in automatic mode for trouble-free operation or can be controlled and monitored remotely via automatic or manual modes via a computer with the supplied com port interface. A typical connection diagram is shown below.

Astro-Smart is the innovator of this elegant *automatic solution to your dew problem*. The **Meade Computerized Dew Annihilator (Meade CDA-R)** is one to the most advanced dew controllers made available to the amateur or professional Astronomer and at a price comparable by no other system on the market. **The Meade Computerized Dew Annihilator (Meade CDA-R)** is designed to be used to fit into the Meade fork arm telescope which has more features than any other dew control system being offered at a fraction of the cost. The **Meade CDA-R** will solve your dew

problems automatically while informing you every step of the way. Its like having a hired dew specialist posted at your telescope 24/7.

The (**Model – Meade CDA-R**) integrates dew control into the fork arm of the very telescope you are using. Most users of the LX200 GPS/R/ACF; RCX400; and LX600 don't use, let alone rely on, the battery compartment to run their telescope. Astro-Smart's unique approach offers the clean and efficient use of this space to minimize loading and wire clustering and to provide a complete replacement solution to the existing battery compartment and cover currently offered for Meade 7"-14" LX200GPS/R/ACF, 8"-14" RCX400 ACF, and 10"-14" LX600 telescopes. In addition, the scope can be brought back to its original condition without alteration in the event you need to send your scope back to the manufacturer or want to sell in the future. The **Meade CDA-R** will solve your dew problems automatically while informing you every step of the way. Its like having a hired dew specialist at your disposal.

The **Meade CDA-R** module incorporates a four port heater capability controlling multiple channels using multiple channel temperature sensors. For instance, one sensor(DTS-12) may be used for the main imaging telescopes corrector plate for dew control while the second(DTS-34)is used for another mounted imaging scope, guider or finder scope or your eyepieces. Each monitored sensor channel location is then paired with its associated output heat strap channel for dew control. For instance, DTS12 sensor would be placed on the optical corrector and the heat strap would go around the optical interface tube for instance CH1 or CH2 or both.

In Figure 1 below you can see the normal LX200 GPS/R/ACF, RCX400 ACF, and LX600 battery compartment, the installed 4 port controller (Model Meade-Meade CDA-R), and the circuit board with its 4 heat channels and coupled temperature sensor channels(CH1/CH2<--->DTS-12)(CH3/CH4<--->DTS-34). The center ATHS channel is for ambient temperature and humidity monitoring normally placed against the optical tube of your main imaging telescope. LEDs next to CH1/CH2 and CH3/CH4 show the dew control PWM rate when operating.

Figure 1: Computerized Dew Annihilator (Meade CDA-R).

Installation is simple. Just replace the battery compartment on your telescope with the Meade CDA-R as shown above.

B. Features

Since, the inception of this unique product at Astro-Smart, the Meade CDA-R 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. Features such as Patent Pending Heat Distribution which minimizes heat currents on optics during imaging, Humidity Measurement, Dew point and Differential Temperature Alarms with automated decision making on Dew Control, Updateable Firmware, Computer Control and Intelligent Software Computer GUI interface to name a few. The Meade CDA-R is finally here!!! The Astro-Smart **Computerized Dew Annihilator** (Model Meade CDA-R) **is an Observatory Class Dew Removal System** designed to be user friendly, serviceable, elegant and reliable.

The Astro-Smart **Computerized Dew Annihilator (Model – Meade CDA-R)** has these

innovative and Unique features:

1. Worry Free Warranty Program For Life With Product Sale.

2. Full Computerized Automatic Or Manual Operated Dew Control Solution.

3. 4 Output Port Heat Control Automated or User Control Capable of 120 Watts(12V, 10Amps).

4. Computer Control Interface for Entry of Full System Parameters and Control Functions.

5. 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.

6. LED Flash Indicators For Heat PWM Output Ports.

7. Audible Alarms For Dew Point Approaching and Differential Delta Monitoring.

8. 2 Differential Temperature and 1 Ambient Temperature/Humidity Measurement and Control.

9. Automated Dew Point and Temperature Variance set point for Dew Control.

10. Dual Fahrenheit or Celsius Temperature Display Feature.

11. Updatable Firmware and Standalone Software OS GUI Interface.

12. Long Distance Remote Control Interface To Observatory including Windows Software Interface Via Remote Computer. The Meade CDA-Remote interface supports Serial RS-232, USB, Ethernet and RF Wireless(New!) backhauls.

13. Automated System Data Logger Storage, Retrieval and Plot Comparison Capability.

14. High quality design employs multi-layer PCB form factor and only the best quality components with conformal coatings for outdoor use.

15 Void of RFI(Radio Frequency Interference) protected to enhance Astro-Imaging .

16. Price point set below development cost for such a system while providing more features.

The Astro-Smart Computerized Dew Annihilator Meade (**Meade CDA-R)** 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

C. Contents of Box

1. **Meade CDA-R** Controller Module.

2. CD with Meade CDA-R, Control SW, manual and video tutorials.

3. One Ambient Temperature Sensor.

4. One USB to serial interface Cable.

D. Input / Output Power Specifications

The Meade **Meade CDA-R** 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 Meade CDA-R 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 Meade CDA-R is dependent on the resistance of each dew strap being used with the Meade CDA-R . 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:

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

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

- Center positive voltage, sleeve ground, sees Figure 2.

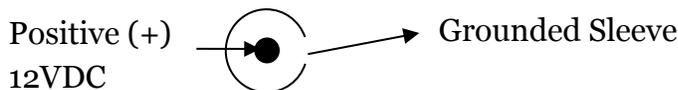Positive (+)   ●————→ Grounded Sleeve
12VDC

Figure 2 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.

E. Meade CDA-R Front Panel And Connector Diagram

➤ **Computerized Dew Annihilator (Model-Meade CDA-R)** Configuration . See Figure 3 below.
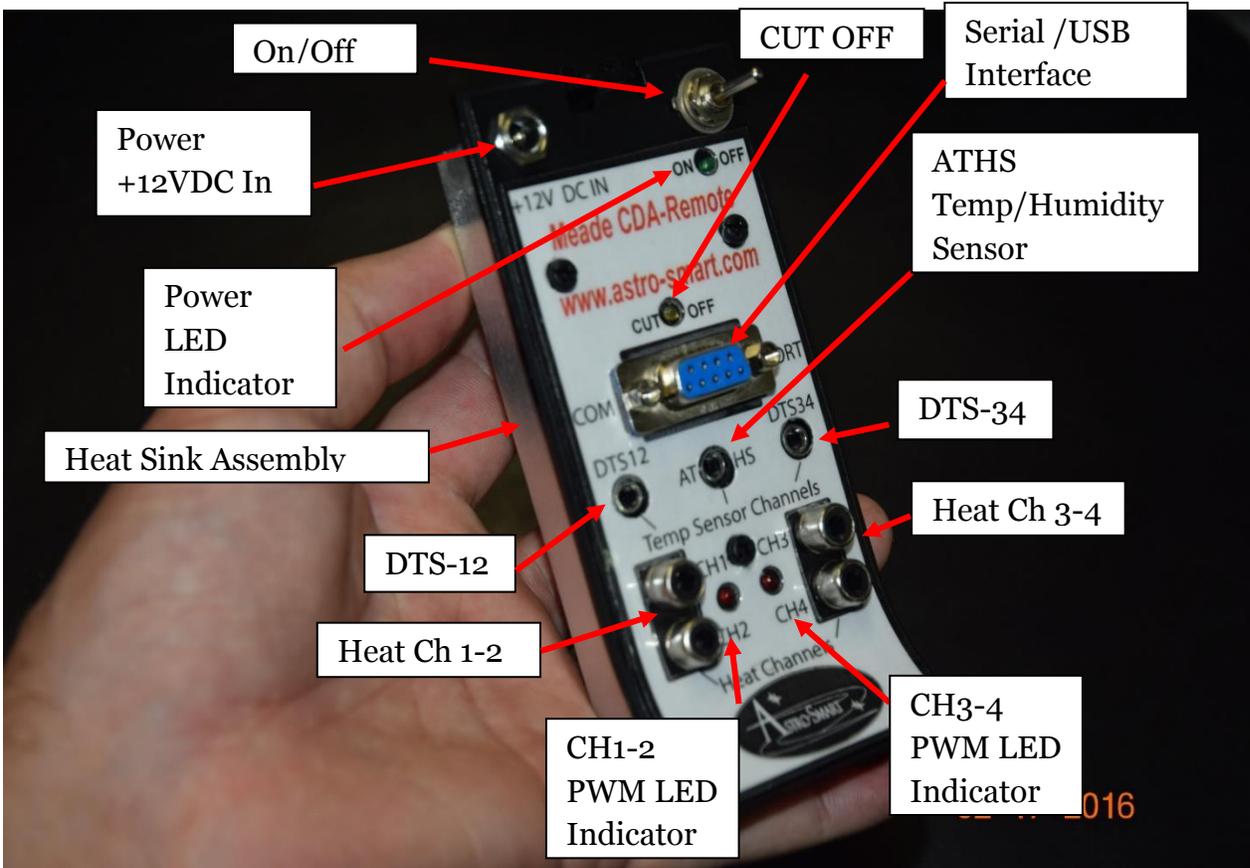

On/Off

CUT OFF

Serial /USB Interface

Power +12VDC In

ATHS Temp/Humidity Sensor

Power LED Indicator

DTS-34

Heat Sink Assembly

Heat Ch 3-4

DTS-12

Heat Ch 1-2

CH3-4 PWM LED Indicator

CH1-2 PWM LED Indicator

Figure 3 Meade CDA-R Overview Model (2016).

F. Basic Functionality

The user can watch as the Meade **Meade CDA-R** adjusts heat and controls dew on your telescope based on humidity, dew point, local ambient and temperature differential from optical interfaces with the surrounding environmental conditions. The automatic bootup default control summary features are explained below with user override options for manual control during standard operation described below in next section. simplistic

G. BootUp: Default

1. Fix all connections to your Meade CDA-R as depicted in Figure 3. This includes heater straps CH1/CH2 and at least one external temperature sensor plugged in DTS12 and power supply interface as specified in Figure 1, Figure 2.(Expected Def Operation.)
2. Turn On power switch from center(OFF) to Up position(ON).. Boot up sequence. All functions are a go when the "Beep" is heard.

   Note:"Meade CDA-R-PRO Requires AHTS and DTS's Plugged IN."

   *Note:" ** " denote "not used" until DTS34 option is plugged in and the user activates the channels to the system as described below."*

   Note:" The Meade CDA-R 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

H.PC Dew Control User Interface Introduction

Your Meade CDA-R can be monitored or controlled from your computer. Just connect the serial to usb cable and in the device manager of your operating system, you must know what port is used when connected. The settings will be automatic and the host PC install program provided will list all available serial ports to connect. You just pick the correct one. A video tutorial is listed in the support page of our website to go thru the basic operations of this feature. Some basic features are listed below.

The simplicity of operation can be seen in the following figure below.
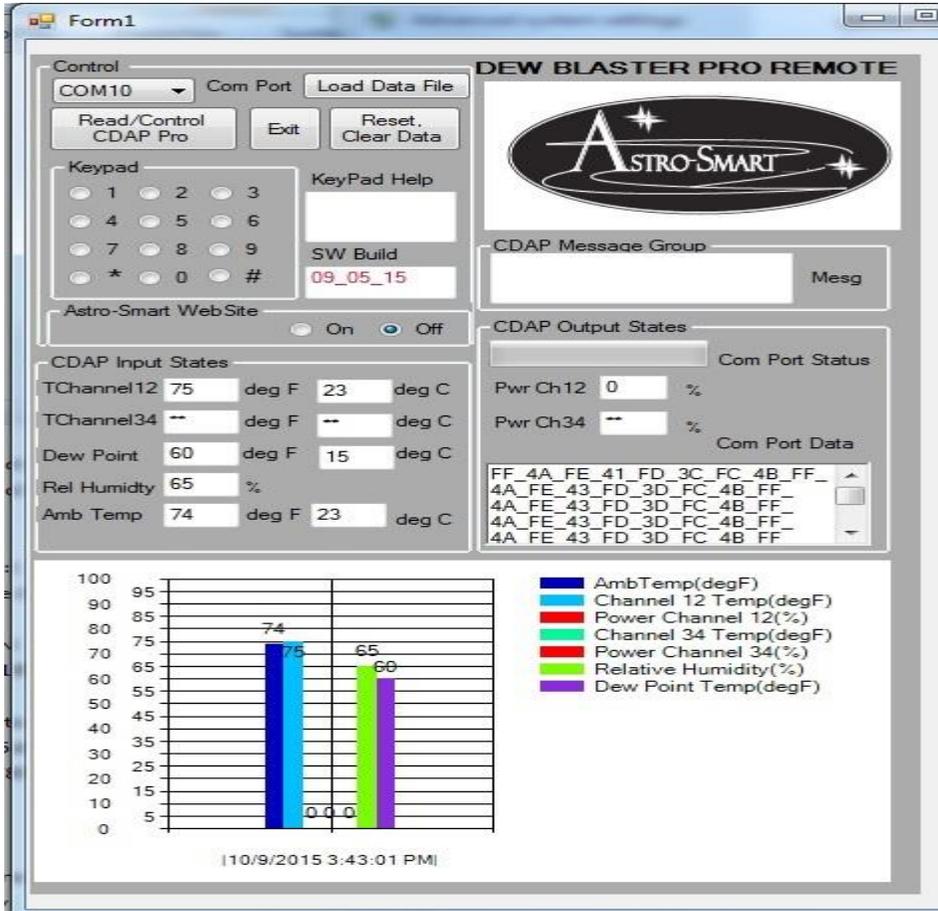
❖ **The HW/SW requirements for the Meade CDA-R to work with PC communication are the following:**

1. Connect serial to USB cable provided by Astro-Smart.
2. Install the Meade CDA-R SW on your computer(Win XP, Win 7 or Win 8).
3. Install the USB drivers if required with supplied CD.
3. Turn on the Meade CDA-R, then run the device manager on your PC OS to determine which port the Meade CDA-R is attached to. Then run the Meade CDA-R SW. For compatibility select XP

compatibility and Admin control for Win 7 and 8 after installed before running.
4. While in Meade CDA-R PC interface, select the serial port Meade CDA-R is attached to.
5. You now have two options for mode of operation. Monitor or Remote Control.

Note: When using your Meade CDA-R, operation using the computer keypad software interface should perform as if you had a standalone Meade CDA-R with display and keypad.

Instructions shown below are the same regardless if you enter keystrokes on the physical keypad on a Meade CDA-R or using the simulated keypad SW interface..

❖ **If Meade CDA-R Monitoring operation is preferred using standard Meade CDA-R SW**.
> i. Select Read/Control button and watch the data arrive in the Output status window.
> ii. In about 5-8 secs, the data will be parsed and reported in I/O status window and also on the graphic output. Anytime, you wish to update from the device, simply press this button again using the standard Meade CDA-R SW interface. Using the super Meade CDA-R SW enables
>   real time monitor and or control as explained later.
> iii. In this mode you query the Meade CDA-R without the use of the SW keypad in the WebGUI.

❖ **If Control of the Meade CDA-R operation is preferred using standard Meade CDA-R SW**.
> i. In this mode you can also control the Meade CDA-R in addition to query its operation.
> ii. Select key strokes on the SW keypad while the SW is collecting data in the Output status window.
>   ->. For example, if it is desired to set the power on the Meade CDA-R 40% on CH12 the sequence would be:
>   1. Hit Read/Control button.
>   2. Followed by a 7 and 2 on the keypad interface.
>   ->. For example, if it is desired to set the power on the Meade CDA-R 40% on CH12 the sequence
> iii. To Return to Automatic Mode,
>   Select the Control Meade CDA-R button followed by keypad entry's of "*" .
> iv. Anytime, you wish to update from the device, simply press the Read/Control button again, enter data within 5-8 secs and repeat the process to control or monitor the Meade CDA-R.

❖ **Automatic Data File Logging Feature->Saving, Retrieval and Plotting**.
This feature is very powerful when wanting to collect and compare prior data results from your Meade CDA-R as a data logger.

To activate this feature do the following:
> i. After performing and collecting multiple samples from your Meade CDA-R using the Read/Control Meade CDA-R button, the system automatically stores the files on your hard drive in C:\CDA-Pro_Data directory.
> ii. Hit the Load Data File button and the software takes you to the directory to select a file of interest. The files are time stamped and will be recognized by
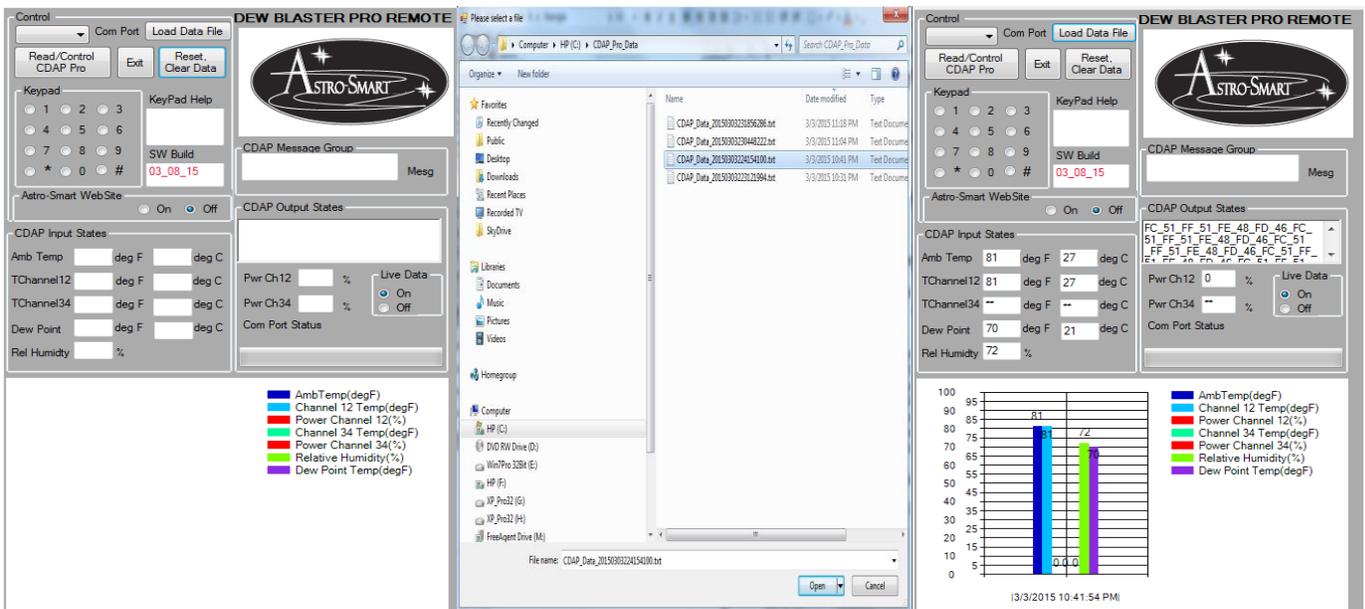
the program when loaded. These files are plotted and data is shown with the prior history time stamp to compare and or retrieve data taken from prior night sessions.

   iii.   The figures below show this behavior.

❖ **Automatic Data Logger and File Retrieval Plotting Capability:**

Enhancements to the software will be made based on user input on a continual basis and can be uploaded from our site for your convenience.

Note: For a full summary of keypad commands, please see section L. Section I,J,K provide tutorials. Other features of the GUI and examples can be seen by demonstration on our website to browse support pages, video tutorials of this product and others.

http://www.astro-smart.com/index.php?p=1_49_Video-Overviews
This link above is for the video tutorials.

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❖ **Super Meade CDA-R Software Suite Capability:**

The super professional version upgrade of the software increases the capability of your CDAP pro to even a higher level.   This includes a data acquisition and processing suite for Multi-Channel Real Time Data Acquisition, Variable Acquisition Rate, File Storage and Plot Retrieval for Extended Regression Data Analysis including .csv, .txt, .png file formats for easy interface to Office Products(Excel, etc) and a Simulator Trainer Mode. Snapshot shown below.

Meade CDA-R Super Real Time Data Acquisition and Regression Analysis Suite

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I. Summary Keypad Entry Commands (System Control)

Note: Use keypad entry instructions below when using buttons on keypad on standalone Meade CDA-R or simulated keypad on the PC software interface.

Note: Picture examples of modes are shown below of what to expect in MSG window on the Meade CDA-R Display CDU before the system responds to the user action invoked. Otherwise, if using the remote PC SW interface, the message box will display the meaning of the following used keys below.

➢ **'#' Enter:** *on keypad or WEBGUI will perform a soft Meade CDA-R reset of the system.*

 MSG>RSRT CDU Only

➢ **'*' Enter:** *on keypad or WEBGUI will place the system back in Automatic Mode when entering Manual mode operation. Automatic mode is the default mode.*

 MSG>AUTO CDU Only

➢ **'o' Enter:** *on keypad or WEBGUI will enable audible alarms such as dew point approaching or optic temperature delta greater than 10 degrees requiring emergency heat. Default mode is sound on.*

 MSG>SNDO CDU Only

➢ **' 1' Enter**: *on keypad or WEBGUI is used if user wishes to set a **variance setpoint between ambient and optic temperature DTS CH1-2** or re-calibrate DTS CH1-2 channel. This has been done at factory. Default activation on power up and reset user modification from sensor value. For example pressing 1 followed by another 1 in subtraction mode will cause DTS CH1-2 to be lowered by 1 deg F. If it is desired to add value to DTS CH1-2, mode 5 must be pressed to go into add mode before performing operation. See below in option 5.*

➢ **' 2' Enter**: *on keypad or WEBGUI is used if user wishes to set a **variance setpoint between ambient and optic temperature DTS CH3-4** or re-calibrate DTS CH3-4 channel. This has been done at factory. Default activation on power up and reset user modification from sensor value. For example pressing 1 followed by another 1 in subtraction mode will cause DTS CH3-4 to be lowered by 1 deg F. If it is desired to add value to DTS CH3-4, mode 5 must be pressed to go into add mode before performing operation. See below in option 5.*

- **' 3' Enter**: *on keypad or WEBGUI is used if user wishes to set a **variance setpoint between optics and ambient temperature T ambient(ATHS)** or re-calibrate ATHS channel. This has been done at factory. Default activation on power up and reset user modification from sensor value. For example pressing 1 followed by another 1 in subtraction mode will cause ATHS to be lowered by 1 deg F. If it is desired to add value to ATHS, mode 5 must be pressed to go into add mode before performing operation. See below in option 5.*

- **' 4' Enter**: *on keypad or WEBGUI is used if user wishes to disable audible alarms when quite mode is required.*

   CDU Only

- **' 5' Enter**: *on keypad or WEBGUI is used if user wishes to set a **variance add mode setpoint** between sensors by using a value offset in add mode. This has been done at factory. Default activation on power up and reset subtracts from sensor value. For example pressing 5 followed by a 1 and then another 1 will cause DTS CH1-2 to be increased by 1 deg F. If it is desired to return to subtract mode, either reset the system or use the mode 6 button to return to subtract value mode. See example below.*

   CDU Only

- **' 6' Enter**: *on keypad or WEBGUI is used if user wishes to set a **variance subtract setpoint** between sensors by using a value offset in subtract mode. This has been done at factory. Default activation on power up and reset subtracts from sensor value. For example pressing 6 followed by a 1 and then another 1 will cause DTS CH1-2 to be decreased by 1 deg F. See example below.*

   CDU Only

- **'7' Enter** *: on keypad or WEBGUI to enter Meade CDA-R **full manual operation mode for all 4 channels**. The user will have the ability to manually operate dew power to straps. In this mode all sensor monitoring is ignored from automatic mode and will not be displayed. Only the output power is shown. The offering is at 20-40-60-80-100% on all or individual channels CH1-2-3-4 at the users discretion. Combinations can be made to have CH12 on Manual while CH34 is automatic or vice versa. If all manual operation is wanted, then simply select the channels desired until completed. The steps are shown below to achieve this. Press 7 and hold until the MSG>Key? is seen then release and press the desired power percent mode and channel as shown below and witness MSG> Done.*

   CDU Only

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> **Summary of all manual modes of button sequences are below:**

Note: Examples below indicate pressing a 7 followed by the 0-9 for various power combinations shown on next page.

> 7-1 → Power CH1-2, 20%
> 7-2 → Power CH1-2, 40%
> 7-3 → Power CH1-2, 60%
> 7-4 → Power CH1-2, 80%
> 7-5 → Power CH3-4, 20%
> 7-6→ Power CH3-4, 40%
> 7-7→ Power CH3-4, 60%
> 7-8→ Power CH3-4, 80%
> 7-9→ Power CH1-2-3-4, 100%
> 7-0→ User Break Command. This cancels entry in mode 7.

MSG>BRK! CDU Only

Note: Example.
a. Pressing 7-1 give CH1-2 at 20%, Pressing 7-7 now give CH3-4 at 60%.

a. **Pressing 7-1 gives CH3-4 at 20% with CH1-2 in automatic mode.**

> **'8' Enter:** *on keypad or WEBGUI to enter Meade CDA-R with all 4 Channels activated CH 1-2-3-4*

MSG>4CHs CDU Only

> **'9' Enter:** *on keypad or WEBGUI to enter Meade CDA-R with only 2 Channels CH 1-2 activated.*

MSG>2CHs CDU Only

Meade CDA-R Firmware:

➢ *Currently, the Meade CDA-R is designed for optimum performance using the following control profile in relation to the optic temperature compared to ambient.*

- *-(>5 or greater) deg 100%,-(4) deg 80%,-(3) deg 60%,-(2) deg 40%,-(1) deg 20%, +(0 or greater) deg 0%.*

➢ *The Meade CDA-R's firmware can be updated on user request for special features not listed and or for future use and updates. One such feature under investigation requested was to provide manual control for a user entered delta temperature profile for ambient and optic sensors. The user would be able to enter a desired delta turn on point. The Meade CDA-R would then calculate the profile for remaining delta and set appropriate power levels. Ie. If the user entered 4 deg delta, Meade CDA-R would create a profile as shown: -(>4 or greater) deg 100%,-(3) deg 80%,-(2) deg 60%,-(1) deg 40%, 0 deg 20%, +(0 or greater) deg 20%. Today, the user can perform this operation without the need to make a formal firmware update. The user can simply lower one or both optic sensors by a newly calibrated temperature that would yield the desired results. For instance, assuming the default Meade CDA-R profile is used and the user wished to add a 1 degree offset to the profile to get the new user profile above, the user would subtract 1 degree from both calibrated optic sensors or add 1 degree to the ambient calibrated sensor.*

J. External Temperature Sensor Hints:

Install DTS Sensors at each location navigating under the dew straps. Try to attach to an area where no heating element is in contact with the sensor . You want to monitor optic temperature, not the heating element. For best results, mount the ambient temperature sensor (ATHS) on the optical tube with supplied Velcro while the optic Sensors DTS12/34 on the optical surfaces or inside the optical tube. See Figure 4 below

Figure 4

If no other option is available, route the sensors cables along with the dew strap cables underneath the fabric portion where no heating element resides. A convenient way to do this is to braid the two cables together, Figure 5 below.

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If you have two Sensors route one with the dew strap that is used for your telescope's front corrector. Route the second Sensor cable along with either the dew strap that is used for your eyepieces or your finderscope.

Figure 5

Route Sensor cable with Dew Strap cable

K. Accessories

Optional Accessories:

Optional remote sensors are available (2RSCDDDH-D) to operate differential mode dew removal. One sensor is needed to operate Channels 1 and 2 output and a second sensor is required to operate Channels 3 and 4. These Remote Sensors allows you to control the heating of separate optical elements. For instance, one remote sensor would be placed with your heater at the corrector and a second sensor could be placed on your finder scope objective lens or eyepiece or use two sensors on one large objective with two heater straps control. In these setups, each pair of heaters are controlled by their respective sensor while the supplied ambient temp sensor which comes with standard **Meade CDA-R** purchase can be placed on the main optical tube objective for ambient sensor collection. Using these sensors in this configuration allows greater dew control for the user. These items can be purchased at the same time as you purchase your **Meade CDA-R** or at a later time.   Note: Other accessories are available. Dew Straps can be acquired by any common vendor. We like Astro-zap!

Optional Professional remote sensors are available (3RSCDDDH-D) to operate differential mode dew removal that are suitable for higher accuracy and faster response in all environments . One sensor is needed to operate Channels 1 and 2 output and a second sensor is required to operate Channels 3 and 4. These Remote Sensors allows you to control the heating of separate optical elements. For instance, one remote sensor would be placed with your heater at the corrector and a second sensor could be placed on your finder scope objective lens or eyepiece or use two sensors on one large objective with two heater straps control. In these setups, each pair of heaters are controlled by their respective sensor while the supplied ambient temp sensor which comes with

standard CDAP-PRO purchase can be placed on the main optical tube objective for ambient sensor collection. Using these sensors in this configuration allows greater dew control for the user. These items can be purchased at the same time as you purchase your **Computerized Dew Annihilator Pro** (Model -CDAP-PRO) or at a later time.   Note: Other accessories are available. Dew Straps can be acquired by any common vendor. We like Astro-zap!

Another convenient accessory that Astro-Smart offers is a right angle heater connector (RAHC-DM).This allows your heater to be connected to the **Meade CDA-R** 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 **Meade CDA-R** 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).

Another product Astro-Smart offers is our Premium Dew Heater Straps. Astro-Smart is proud to announce the offering of our Premium Dew Controller straps that can be used with the Astro-Smart Dew Controller products and compatible with other vendor dew controllers with RCA jack input to control temperature of your telescope optics, cameras, camera lens, telescope eyepieces and sensitive electronics.

The materials used for these Premium Dew Straps include Industrial Velcro, High Quality Insulating Material to project heat toward the optics and away from the atmosphere, 5 foot power cord with male RCA connector and Power Conductor Current capable of 10 Amps.
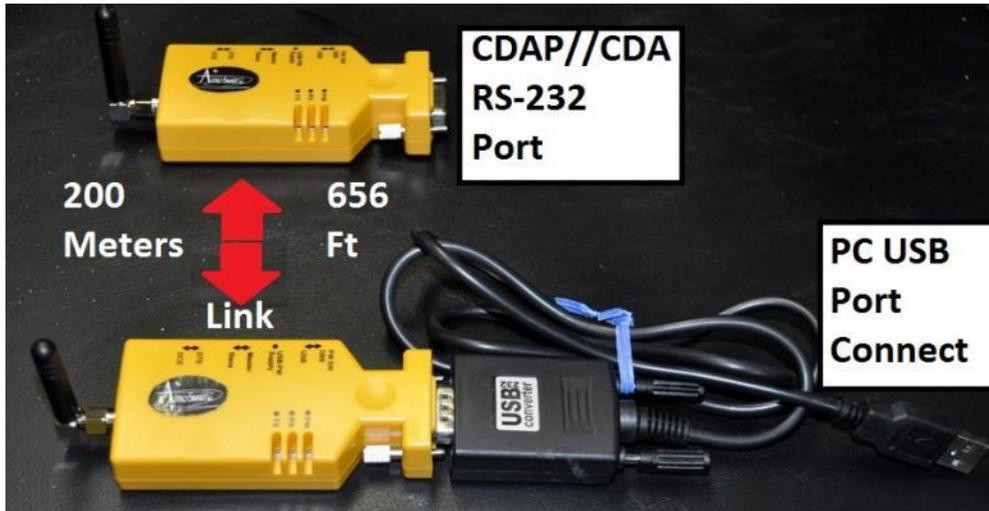

Another convenient accessory for your **Meade CDA-R** that Astro-Smart offers is a Ethernet interface specifically designed for the CDA-Remote. You just plug the supplied RS-232-USB connector that comes with your **Meade CDA-R** into the female USB to Ethernet converter. Now, plug in the desired length of ethernet CAT-5 to your remote control computer location to the other CAT-5 termination and simply plug in the USB connector to your computer(ETHER-DM).

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Another convenient accessory that Astro-Smart offers is a RF Wireless interface specifically designed for the **Meade CDA-R**. You just plug the supplied RS-232-USB connector that comes with your **Meade CDA-R** into the female RF-Wireless Adapter converter which is attached to your remote Computer's USB port. Now, plug in the other RF Wireless interface unit to the RS-232 port of the **Meade CDA-R** and you now have a Wireless connection that supports a RF link wire free upto 200 meters(656 feet) of unit separation. (RF200M-DM).

Please note that when purchasing the Astro-Smart **Meade CDA-R**, you can use the heater straps you may already have.

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, your 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).