



## Dew Controllers User Manual

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Thank you for purchasing a Lynx Astro dew controller. These controllers have been designed and built to our exacting specification in the U.K based on our years of experience serving the needs of astronomers. We have taken great care to select high quality components that will serve you for years to come.

Our products are made to a high standard and are compliant with all applicable British, European, RoHS and CE standards. At multiple points during manufacturing and assembly the products are tested to ensure they meet our exact operational and quality standards.

If you experience a fault or defect please contact us.

### Warranty

All Lynx Astro products come with a 2-year warranty against manufacturing defects. This warranty does not affect your statutory rights. We reserve the right to change the specifications without notice.

## Safety Precautions

- The products power input is protected with a fuse as per **Table 1**, if too many Amps are pulled the fuse will blow to protect your equipment.
- Do not exceed the total rated Amps, or individual channel Amp rating.
- Only replace the fuse with a fuse of the same rating and type.
- There are no user serviceable parts. Do not open the case. Opening the case will invalidate the warranty.
- The product must not be used for any purpose other than that specified
- Do not exceed the Voltage rating of this product.
- Do not enclose the product within another box or enclosure or run the cable through conduit.
- Fully uncoil cables whilst in use.
- If the product is damaged (for example, a cut or frayed cable) do not use.
- The product is not waterproof.
- Do not expose to direct heat, flames or submerge in water.
- Do not remove the attached cigarette plug this contains the fuse.
- Ensure care is taken routing cables to and from this product to avoid trip hazards, cord wrap and the potential for the cable to become trapped or damaged.
- Product may become warm in operation, including the lead.
- Ensure all connectors are firmly pushed in (to avoid localised heating due to poor connections and to minimise exposure to the elements).
- The cigarette plug metal contacts will become warm during use. Ensure the power supply is switched off and take care when unplugging.
- Follow the instructions enclosed in this manual.
- This product is regarded as electronic waste, please dispose of correctly.
- Only to be repaired by authorised personnel only - please do not attempt any repairs yourself.
- This product is not a toy. Do not allow children to play or handle it.
- No liability is accepted for damage caused through use of this product.
- Only clean with a damp cloth.
- When not in use, store in a cool, dry, dark location.
- When not in use, to save energy turn power to the product off.

## Intended Purpose & Features

The Lynx Astro dew controllers are designed to control the heat output of dew heater tapes for telescopes to prevent the formation of dew. Additional features include USB control functionality, DC power output and optional DSLR power supply output.

### 2-Way Dew Controller

- 2x RCA / Phono Dew Heater Outputs
- 1x Heating Channel Control Knob (0-100%) controls both outputs
- Optional 3.5mm 8V DSLR Power Supply Output

### 4-Way Dew Controller

- 4x RCA / Phono Dew Heater Outputs
- 4x Heating Channel Control Knob (0-100%). Individually controlled outputs.
- 2x 2.1mm 12V DC Power Output
- Optional 3.5mm 8V DSLR Power Supply Output

## Specifications

Table 1

Model	2-Way Dew Controller	4-Way Dew Controller
Fuse Rating	5A Quick Blow	10A Quick Blow
Total Maximum Load	5A	10A
Voltage Range	10-15V - we recommend 12-13.8V	
Max Output per Heater Channel	3A Continuous (Max 5A Surge)	
Max Output per 12V DC Power Output	N/A	3A Continuous (Max 5A Surge)
Max Output per 8V DSLR Power Supply	1.5A Max if Fitted	
Operating Temperature Range	Designed to be used between -5°C to 25°C Ambient	

**Do not exceed any of these specifications, these are absolute maximums.**

## Power Input

- 2 metre silicone flexible cable rated to 12 Amps.
- Fitted with a Cigarette plug with the fuse rating specified in **Table 1** with a red LED power indicator. Requires a DC centre positive power supply.
- Reverse polarity protection in case of accidental cable reversal.
- Fitted with strain relief to prevent damage.

## Dew Heater Outputs

- RCA / Phono style connector, tip positive.
- Suitable for most makes of dew heater tape available for astronomers.
- For maximum output per heater channel see **Table 1** **but be sure not to exceed the total device Amp rating.**
- Only use one heating load per RCA / Phono, do not use splicers or splitters as these may not be rated and may be more prone to risk of short circuits leading to the fuse blowing.
- To reduce the risk of damage only plug-in and unplug when the unit is powered off and full insert the connector to ensure a good connection.

## USB Input

- USB 2.0 Micro B Socket.
- Automatically installs as a 'USB to Serial' device on most computers but Windows drivers are available if required.
- Cable not supplied.

## 12V Unregulated DC Power Outputs

- Only available on the 4-way dew controllers.
- 2.1mm centre positive DC sockets.
- For maximum output per 12V unregulated DC power output see **Table 1** **but be sure not to exceed the total device Amp rating.**

- Suitable cables for connecting to a variety of mounts and other devices are available from Lynx Astro.
- Try to balance the load between both outputs, this will reduce any voltage drop and better share the current load across both outputs.
- To reduce the risk of damage only plug-in and unplug when the unit is powered off and full insert the connector to ensure a good connection.

### Optional DSLR Power Supply

- 3.5mm mono jack socket, tip positive.
- Regulated switch mode 8V power supply suitable for a range of DSLR cameras when used with appropriate dummy battery packs.
- For maximum output for the DSLR power supply see **Table 1 but be sure not to exceed the total device Amp rating.**
- A range of compatible cables and dummy DSLR batteries are available from Lynx Astro.
- Please only use to power one DSLR camera at a time, do not use for any other loads.
- To reduce the risk of damage only plug-in and unplug when the unit is powered off and full insert the connector to ensure a good connection.

### Enclosure / Box

- Hard wearing, durable, black ABS enclosure.
- Red LED power indicator on box.
- Red LED power indicator for each heating channel - brightness varies depending on power setting.
- Red LED intensities reduced to maintain dark adaptation.
- Velcro backed with matching sticky velcro pad to easily attach the box to your mount / pier / tripod / dovetail as required.
- High quality plastic knobs and all-metal potentiometers for durability and smoothness.

## Power Supply Requirements

You will need to plug the cigarette plug into a centre positive power supply capable of supplying between 10-15V, ideally 12-13.8V.

It is very important to check the power supply has the correct centre positive polarity and is capable of supplying the correct Voltage and Amperage required prior to connecting the dew controller.

If you are unsure, please get in touch with details of your power supply and we would be happy to help.

When determining your Amp requirements, it is a good idea to make a note of the Amps required for each item plugged into the dew controller. This total must not exceed the specification in **Table 1**. If you are not sure please check with the manufacturer of your dew heater strap or other devices.

For simplicity of determining your total Amp requirements allocate 2A of your total current allowance for using the optional DSLR power supply.

If you exceed the Amp rating or, there is a short or other fault with a piece of equipment you have plugged in then you may blow the fuse fitted to the cigarette socket. Instructions to change the fuse are provided on page 8 of this manual.

## Using the Dew Heater Controller

### Connecting a Dew Heater

Plug a suitable dew heater tape / strap / pad into one of the heater outputs on your dew controller. It's good practice to connect and disconnect whilst the controller is powered off.

Most dew heater tapes / straps / pads will be compatible but ensure they are rated for 12V operation and come fitted with a centre positive RCA / Phono plug. If in doubt, please get in touch and we can check for you.

## Adjusting the Heat Level

The heat level can be adjusted either by turning the knob on the device for that particular heater output or through software. The output can be set between 0-100% which varies the duty cycle on the pulse width modulated (PWM) output (essentially the heater turns on and off very quickly and how you set it determines how long it stays on and how long it stays off for). This is a very efficient way of controlling a heating element.

It's a good idea to set the power output level to match the conditions and the equipment you are using. In most circumstances you won't need to leave it 'full on' the entire time but a gentler setting can be used that will help battery life.

**Top tip:** Start the night with the dew heaters on around 20-30% rather than wait for dew to form which can then take a long time to remove. You may find a higher heat output is needed but this is a reasonable place to start the night. It's good practice to switch these to 0% at the end of a session.

## Using the DC Power Outputs

The 4-way dew controller features 2x DC power outputs. These are unregulated and simply pass through power from the input power supply at the supplied Voltage but are reverse polarity protected.

These are ideal for powering other devices such as your mount and camera cooler.

The sockets are designed for 2.1mm centre positive plugs commonly found in many astronomy products. Lynx Astro can provide a range of compatible cables at different lengths for a variety of equipment. Please get in touch if you need assistance.

Each DC power socket is rated as per the specification in **Table 1** but be careful you do not exceed the total current for the whole product also specified in **Table 1**.

## Using the DSLR Power Output

The Lynx Astro dew controllers are available with an optional DSLR power output. This is very handy for running your DSLR from a bigger power source over a longer period of time when doing astrophotography.

The 3.5mm mono, tip positive socket provides an 8v regulated switched power supply rated to the specification shown in **Table 1**.

Ensure you take into account the power used by any connected DSLR when calculating your total Amp requirements. For simplicity of determining your total Amp requirements allocate 2A of your total current allowance for using the optional DSLR power supply **but be sure not to exceed the total device Amp rating.**

The USB 2.0 micro B connection is provided to enable control of the product from an attached computer.

## Using the USB Connection

On most computers the dew controller will automatically install and appear as a 'USB to Serial' connection. It can be used as a direct serial device with commands sent manually, further information about the communication protocol used is available separately.

Lynx Astro provide drivers for older versions of windows as well as desktop software to operate and control the dew controller from a computer. Further information about these are available from the Lynx Astro website.



## Changing the Fuse

If the Amp rating has been exceeded or there has been a short or fault in one of the connected pieces of equipment then the fuse in the cigarette socket can blow to protect the equipment.

To replace this fuse you will need to first obtain a replacement fuse matching the specification in **Table 1**. These are readily available but please get in touch with us if you are unsure.

To swap the fuse, you need to first unplug the equipment from the power supply and carefully unscrew the silver, knurled ring around the tip of the cigarette plug. Be careful not to lose the spring or tip during disassembly.

Once removed the old fuse can be removed and a new fuse fitted.

Ensure you carefully screw the knurled silver ring back on ensuring the spring, fuse and tip are all put back correctly.

When re-assembled you should be able to depress the pin in the tip of the plug and feel some resistance from the spring inside.

If you are unsure, we recommend seeking the advice of a professional before proceeding.

## Troubleshooting

### **The product doesn't turn on.**

First check if it is plugged in and the red indicator light on the cigarette plug is lit.

If this is unlit, the fuse in the cigarette plug may have blown, try changing the fuse using the instructions on page 8 of this manual.

If the indicator light is lit but there are no lights lit on the product itself then this may indicate an issue with reverse polarity, a problem with a connected heater strap or other device or a fault.

Try unplugging all other items from the product and checking the polarity of your power supply. If it still doesn't work please get in touch.

### **The heater tapes aren't warming up.**

Heater tapes are not designed to get very warm so it may be difficult to tell if they are operating simply by touching them. Try turning the heater power up to full and waiting a few minutes and then testing.

Also check there is no physical damage to the tape that may be causing it to malfunction.

## EU Declaration of Conformity

This product carries the CE mark in accordance with the relevant European Directive and the UKCA mark in accordance with UK law.

This product is not designed for use in any “critical applications”. “Critical applications” means life support systems, medical applications, connections to medical devices, commercial transportations, nuclear facilities or systems or any other applications where product failure could lead to injury to persons or loss of life or catastrophic property damage.

This product is not a toy.

For consideration of electromagnetic compatibility this is a class A product. In a domestic environment this product may potentially cause radio interference in which case the user may be required to take adequate measures.

## Waste Electrical Product

This is an electrical product and must not be disposed of with your household waste.

Please recycle where such facilities exist. Check with your local authority for recycling advice.