

Automatic controller

(temperature sensing controller)

Instruction manual

Overview

The R-Sky automatic controller acts as a “switch on and forget” device.

Just connect the air sensor and the telescope sensor, set the desired temperature range that prevents dew from appearing on your lens (corrector, mirror, etc.) – and voila!

No endless messing with power settings and worries about the telescope misting up or overheating. The product is very easy to use with no complex controls that need to be worked with in darkness. Just turn the knob and forget about dew.



Figure 1. Controls

Controls

The controller has six outputs for connecting dew heaters (see Figure 1):

- (1) and (2) — outputs for connecting automatic heaters;
- (3) and (4) — permanent medium-power outputs used for heating non-demanding elements, such as the eyepiece, the finder scope, Telrad, etc.;
- (5) and (6) — full-power, 12V outputs used for connecting additional equipment or eyepiece/scope heaters if additional power is required.

The front panel features LED status indicators and a temperature difference/power knob.



Figure 2

Red LEDs indicate the operation of the automatic outputs (1) and (2).

For example, if the left LED (I) is on, it means that output (1) is enabled and the connected telescope is being heated. Same with the right LED (II) that indicates the status of output (2).

In the center is a **yellow LED** that signals when the battery charge level approaches a critical level. The LED glows dimly at 11V and reaches max brightness at 10,6V.

Please note: the LED brightness is optimized for darkness, which makes it hardly visible during the day.

The **control knob** is used for setting the difference between the air temperature and that of the telescope. When the controller is used without temperature sensors (see the “Operating Modes” section), the knob is used for setting the heating power.

The top part of the controller has two inputs for connecting temperature sensors (see Figure 2).

Air — for connecting the air sensor, **(I)** and **(II)** — for connecting telescope sensors.

Quick start

- Install the telescope and air sensors according to recommendations (see the “Sensor installation” section).
- Connect the heater and the sensors to the controller: the air sensor into the Air input, the telescope sensor into input (I) or (II). Please note: if you connect a sensor to input (I), the heater should be connected to output (1); if the sensor is connected to input (II), the heater should be plugged into output (2). This principle applies to simultaneous control of two telescopes.
- Connect the power socket of the controller to a 12V power source. If connected correctly, a red LED will light up on the power socket and front panel LED's will flash briefly. If it doesn't happen, unplug the controller and check the connection and polarity. Connect the controller again.
- Set the telescope/air temperature difference with the knob. For typical conditions, we recommend setting a value in the 4-6 degrees Celsius range. Values may differ depending on the environmental conditions and the optics used.

Please note: when the controller is working, the LED of the channel that the heater is connected to lights up and it does so only when heating is on. In the automatic mode, heating may stay off for a fairly long time, since the telescope's temperature may be higher than that of the environment. This is a fairly typical situation at the beginning of observation until your telescope has fully thermostabilized.

- Connect additional equipment that needs heating to vacant outputs.
- When the observation is over, disconnect the controller from the power source.

Operating Modes

One device fits all! The controller can simultaneously heat up to 2 optical tools in an automatic mode, e.g. two telescopes or a telescope and a finder (or guide); secondary mirror or finder, etc.

The 4 remaining outputs work in the following way. Two of them are powerful enough (medium-power) to heat up undemanding eyepieces, finders, remote controls, etc. The other two have a constant voltage of 12V. They can be used for connecting additional equipment or eyepiece/finder heaters when they need more power to stay dry.

If you are using automatic temperature control for one telescope only using output (1), output (2) switches to a medium-power mode and vice versa.

But what if you don't need automatic temperature control? No problem! Unplug all the sensors from the controller and change the temperature manually. The knob that you used for setting the temperature range turns into a gradual power adjuster that allows you to control the power in the 0-100% range for output (1) and output (2). Outputs (3) and (4) will still be in the medium power mode, and outputs (5) and (6) will be at full 12V.

This way, the controller can be easily adapted for your current and future needs.

Sensor installation

The **air temperature sensor** is installed on any convenient spot on the tube of the telescope. It is desirable that the air sensor is located in the vicinity of the lens or mirror to measure the temperature close to the optics being heated.

A good spot for an air sensor would be on the finder scope, the dew shield, along the tube, but not pressed against its surface.

Some examples of bad sensor placement: near the ground, on the mount, near the eyepiece, where air streams from the body or breath can create distortions. For easier identification, the air sensor is hidden into a white insulating tube.

The **telescope's temperature sensor** has a thermoinsulated pocket for reducing the effect of heat streams from the heater.

If you need to heat refractors and catadioptric telescopes, install the sensor under the heater so that it's pressed hard between the tube and the heater.

For installation, push the sensor through a hole in the pocket and press it flat (sensor flat side) against the tube. Once done, carefully put the dew heater onto the sensor and its case and install the heater (or slide the assembly under an already installed heater). This procedure can be carried out on a heater that has already been installed on the telescope by sliding a sensor and its case underneath it.

The case has a Velcro strap – pull it back and press against the heater. This way, the sensor will be reliably fastened to the telescope.



Figure 3 EXAMPLE. Telescope temperature sensor installed on refractor (SCT or MAC).

When heating a secondary mirror on a Newtonian telescope, the sensor can be installed under the heater. Alternatively, you can remove the sensor from the case and attach it to the surface of the mirror with thermoconductive silicone glue.

Watch the video manual here <https://youtu.be/ZsG28vV6RBU>

Technical support

Have questions? Write to us <http://r-sky.org/en/about-us/contact>

Some Key characteristics:

Temperature Sensing Controller

Line supply: 12V, DC

6 outputs: 2 automatic control, 2 medium power, 2 full power (12V)

Max. current per channel: 3 A (total 5A)

Pulse Width Modulation duty cycle control

The standard power cable length is 120 cm terminated by a cigarette lighter plug

Very easy to use

What's included

R-Sky automatic controller - 1 piece

Air Sensor - 1 piece

Telescope sensor - 1 piece

User Manual

Manual version: 1.1

Serial number

S/N : _____