

ionopticks

PRODUCT USER MANUAL

HeatSync™ Controller

This manual applies to
HSHEATCON02



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The IonOpticks Dual-Channel HeatSync™ Controller is a dedicated temperature controller designed specifically for use with IonOpticks column heaters.

Equipped with two independent channels, each channel is capable of precise control of column heating, whether operated individually or simultaneously. This purpose-built instrument is optimized to heat IonOpticks columns within a typical range of 30°C to 60°C, ensuring stable and reproducible chromatographic conditions.

Each channel connects via Hirose connectors to IonOpticks column heaters and provides reliable, consistent heating performance.

The controller is designed exclusively for use with IonOpticks resistive heating elements and is calibrated to ensure compatibility and safety.

With independent control over each channel, users can manage single or dual-column configurations with ease. The unit is operated via a straightforward interface, allowing for stand-alone operation without the need for external control systems.

Contents of Package:

- + HeatSync™ Controller
- + Regional power cable

1.1 Unit Overview and Operational Elements

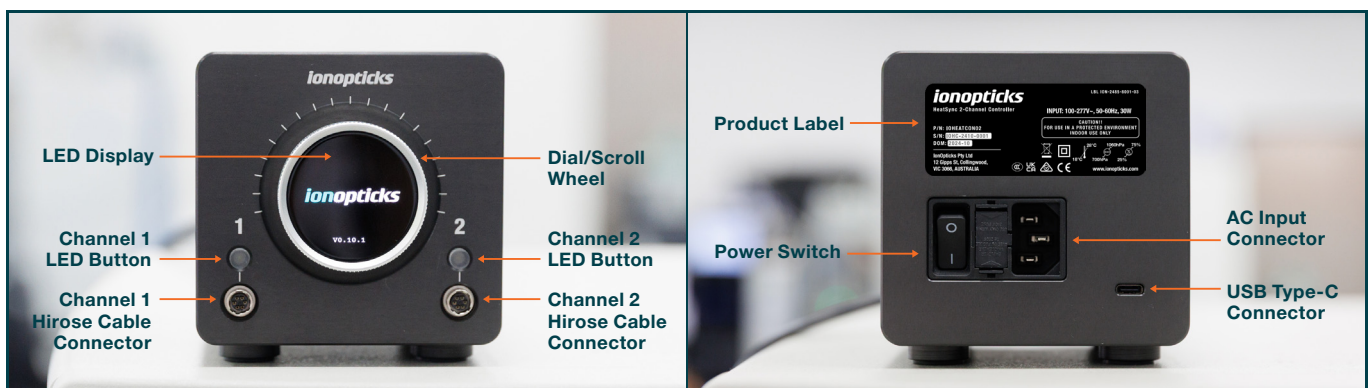


Figure 1. Operational elements of the HeatSync™ Controller for the front face (left image) and back panel (right image).

Descriptions

Part	Description
Dial/Scroll Wheel	Used for selecting/changing the temperature
LED Display	Main display for temperatures and device status
Channel 1 LED Button	Button used to enter/exit Channel 1 temperature selection mode
Channel 1 Hirose cable connector	Channel 1 connection for IonOpticks column heater and accessories
Channel 2 LED Button	Button used to enter/exit Channel 2 temperature selection mode
Channel 2 Hirose cable connector	Channel 2 connection for IonOpticks column heater and accessories
Power Switch	Used to turn the device on/off
AC Input Connector	Connector for regional power cable
USB Type C Connector	For software/firmware updates

Table 1. Descriptions of the operational elements of the HeatSync™ Controller

1.2 Hirose Connectors

On the front panel of the HeatSync™ Controller, there are two 6-pin Hirose connectors, each compatible for use with IonOpticks HeatSync accessories such as the column heater and regulator. The two connectors allow users to use 1 or 2

heaters for individual temperature control and operation. These connectors are to be used only with IonOpticks approved column heaters and accessories.

2.1 Label Symbol Definitions

Below is a list of symbols you may encounter in this manual or on your device and their descriptions.

Symbol	Description
	Waste electrical and electronic equipment (WEEE): the product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling
	Double insulation (Class II): the appliance does not require an earth connection for safety and has two layers of insulation.
	Ambient temperature limit: the equipment must be operated within the ambient temperatures listed on the device and outlined in this manual.
	Atmospheric pressure limit: the equipment must be operated within the atmospheric pressures listed on the device.
	Humidity limit: the equipment must be operated, stored, and transported within the humidity limits listed on the device.
	CE marking: mandatory conformity marking for products sold within EEA, indicating the product meets applicable EU health, safety, and environmental requirements.
	Regulatory Compliance Mark (CMS): the product is safe for use in Australia/New Zealand because it satisfies electrical safety and EMC testing standards.
	UKCA marking: signifies that the product meets the relevant UK regulations and replaces the CE marking for many products sold in Great Britain.
	CCC marking: indicates that a product has been tested and certified to meet specific safety and quality standards set by the Chinese government.

Table 2. Label regulatory and compliance symbols for device use.

2.2 Cautions & Warnings

All statements regarding safety of operation and technical data in this instruction manual will only apply when the unit is operated correctly.



SHOCK WARNING



HIGH VOLTAGE

To avoid electrical shock, the power cord protective grounding conductor must be connected to ground.
Do not operate without cover installed. Refer servicing to qualified personnel.



WARNING



For all applications, use an IEC320 compatible power cord fitted with a plug appropriate for your particular power socket. Make sure that the line voltage rating marked on the rear panel agrees with your local power supply and that the appropriate fuses are installed. Changing the main fuse can be done by the user. Apart from this fuse, there are no user-serviceable parts in this product.



ATTENTION



This unit must not be operated in explosive environments.

3.0 Using the System

3.1 Installation/Set-up

The HeatSync™ Controller should be placed on a flat, stable, and clean surface in a laboratory environment. Make sure the device is switched off and the power cord is disconnected.

The unit should be operated by laboratory personnel and the area should be free of any liquids or hazardous materials.

Be sure to operate the device in normal laboratory conditions and temperatures. The device should be operated in ambient temperatures between 18 to 28 °C. Setting the device to a temperature lower than ambient room conditions will cause an error.

See section 4.1 for more details on errors.

3.2 Powering On

To power on, make sure the power cable is plugged into the HeatSync™ Controller and the power outlet before switching the unit on using the power switch.

Once flipped on, the screen should illuminate with the IonOpticks logo, which can take a few seconds.



Figure 2. Back panel of the HeatSync™ Controller with power switch in "On" position and power cable connected.



Figure 3. HeatSync™ Controller loading/"splash" screen upon powering on.

3.3 Connecting/Disconnecting Hirose Cables

3.3.1 Connect Cable



CAUTION: HOT SURFACE



When heaters are plugged into the HeatSync™ Controller when the device is powered on, they will begin to quickly heat up. The heaters can become hot to the touch when being heated to high temperatures. Use protective equipment where necessary.

Hirose cables at the end of IonOpticks HeatSync accessories can plug into channels 1 and 2 of the HeatSync™ Controller device. These column heater cables have 1 orientation in which they enter into the Hirose connector.

Orient the Hirose cable at the channel 1 or channel 2 port while applying light pressure at the connection and rotate the cable until it clicks into place.



Figure 4. Plugging column heater cable into Channel 1.

3.3 Connecting/Disconnecting Hirose Cables

3.3.1 Connect Cable

The HeatSync™ Controller will automatically detect and confirm the connection of the column heater, or HeatSync Regulator, and will start to display temperature data. Cases with 1 and 2 channels in use are shown below. Note: the column temperature may take a few minutes to stabilise after the dial turns green. This is because the heater has reached the correct temperature, but the column lags a bit behind.

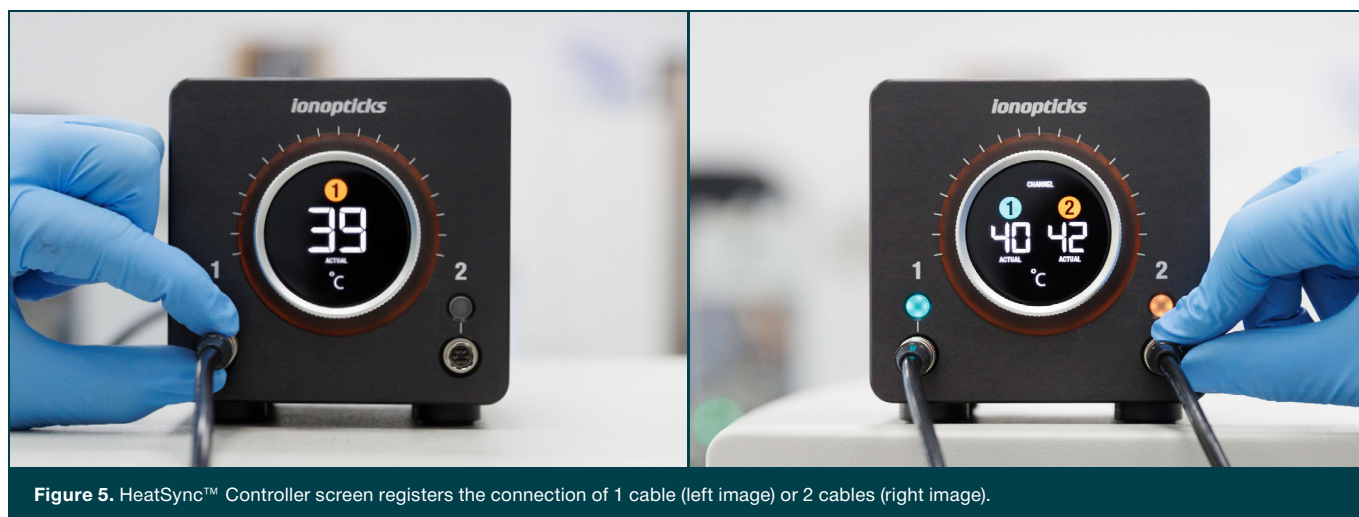


Figure 5. HeatSync™ Controller screen registers the connection of 1 cable (left image) or 2 cables (right image).

3.3.2 Disconnect Cable

The Hirose connection is, by design, locked in position while in use. To disconnect the cable, the ring sheath must be retracted while detaching the Hirose connection. Do not apply force to remove the connection using the heater cable, while Hirose connection is locked. It may take the HeatSync™ Controller a few seconds to register the disconnected cable and update the screen accordingly.



Figure 6. Demonstration of how to remove the Hirose cable from the HeatSync™ Controller by retracting the sheath.

3.4 UI Display Descriptions

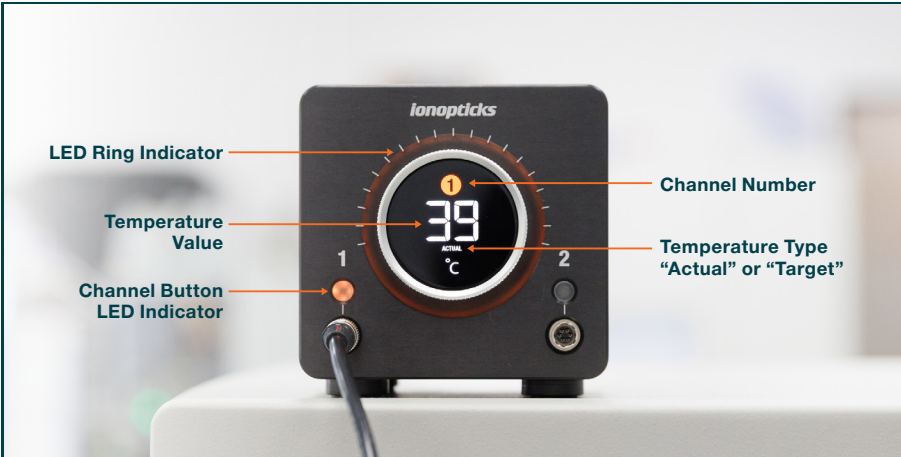
While powered on and operating correctly, the device will display 1 of 3 different screens depending on the number of connections registered by the device.



No Hirose cables attached.

IonOpticks logo is displayed with the current firmware version. In this orientation, the LED ring indicator is off and so are the 2 LED channel buttons.

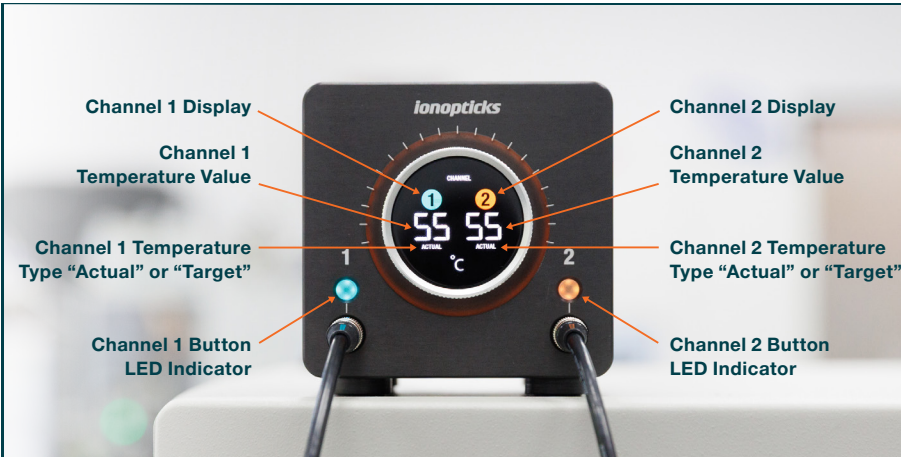
Figure 7. UI elements for loading screen.



1 heater cable plugged in.

In this use-case, the LED ring is illuminated, and the LED channel button is illuminated for the active channel as shown below.

Figure 8. UI elements for single channel screen.



2 heater cables plugged in.

In this use-case, the LED ring indicator and both LED channel buttons are illuminated.

Figure 9. UI elements for dual channel screen.

3.4 UI Display Descriptions

3.4.1 Idle/Wake Functionality

The HeatSync™ Controller screen will dim after a set period of inactivity (i.e. when no buttons have been pressed, or the dial has not been touched). The screen will increase in brightness when any of the above actions such as touching the display, turning the dial or pressing a channel button to put the device into temperature select mode.

3.5 Changing the Target Temperatures

3.5.1 Putting the Device into Temperature select mode

To change the temperature of a given channel on the HeatSync™ Controller, just press the desired LED Channel button. For instance, if the channel 1 target temperature needs to be changed, hit the button underneath the engraved 1 on the left hand-side of the HeatSync™ Controller.

Pressing this button will put the device into a temperature selection mode, characterized by the change of the word “actual” to “target” on the screen, and the change of lighting colours to white in the LED ring light, the LED channel button, and the channel number display on the screen as shown in the images below. Examples are shown for the single-channel and 2-channel active states.

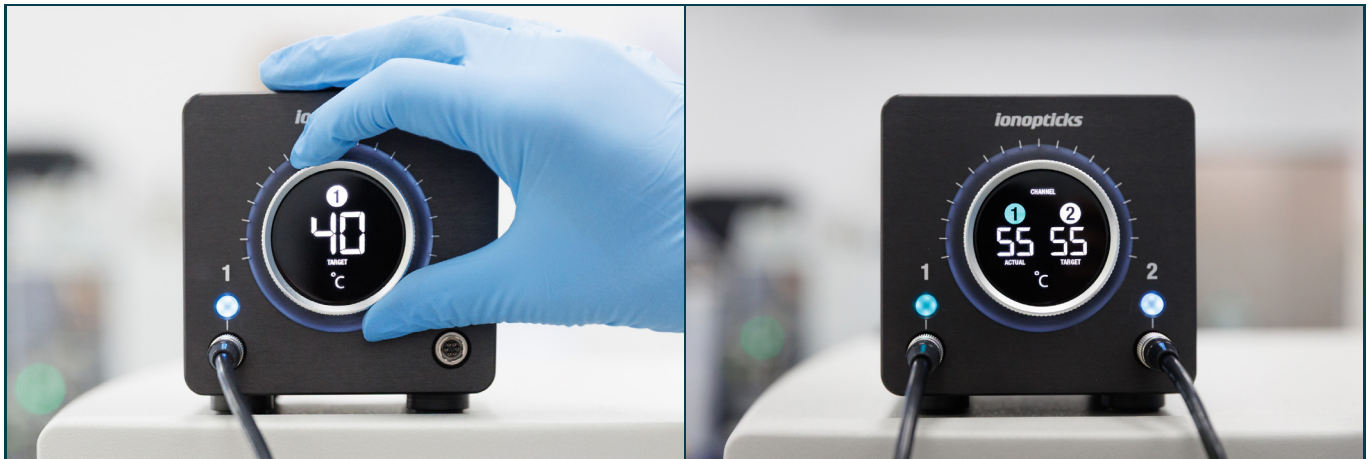


Figure 10. HeatSync™ Controller in temperature select mode for single channel mode (left image) and dual-channel mode (right image) with channel 1 and channel 2 target temperatures being adjusted respectively.

3.5.2 Changing the Temperature

The target temperature can be changed by rotating the dial clockwise/counter-clockwise. When rotating the dial, the temperature will change in 5°C increments, with the minimum and maximum temperatures being 30°C and 60°C respectively.

While changing the temperature, the HeatSync™ Controller will not start regulating the heating elements to the new temperature until the target temperature is confirmed.

3.5.3 Confirming the new Target Temperature

The target temperature can be confirmed in 2 ways:

- + 1. Pressing one of the LED channel buttons (if pressing the channel button that was not just being adjusted, the user will enter temperature selection mode for the other channel)
- + 2. Allow the selection process to time-out, which takes about 10 seconds.

Once the new temperature has been confirmed for a channel, all the display changes mentioned in 3.5.1 should revert to their original state and the “ACTUAL” temperature will be displayed.

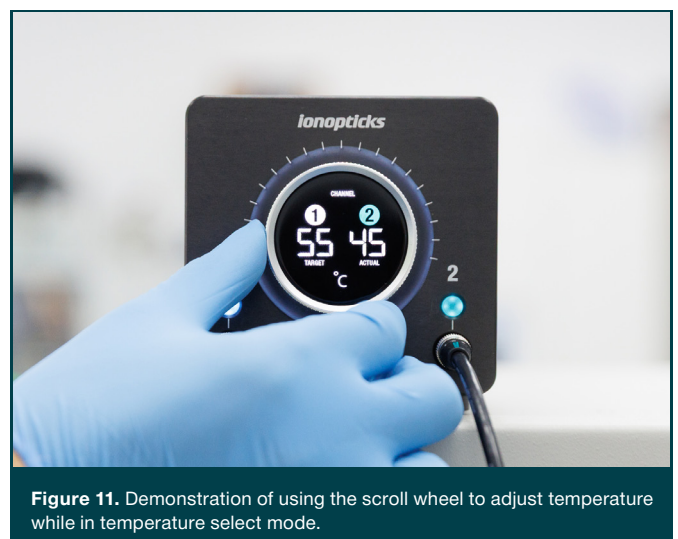


Figure 11. Demonstration of using the scroll wheel to adjust temperature while in temperature select mode.

3.6 Reaching Steady Temperature

The device has two major colour schemes to display whether the device is changing temperature as shown by the orange colours, or that the device has reached its target temperature, as shown by the teal/blue colours. The column temperature may take a few minutes to stabilise after the dial turns green. This is because the heater has reached the correct temperature, but the column requires more time to reach the target temperature. Examples are shown below.



Figure 12. Examples of HeatSync™ Controller with both channels in heating state (left image), channel 1 at steady temperature and channel 2 still heating (middle image), and both channels at stable temperature (right image).

3.7 Powering Off

To power off the device, switch off the device using the power switch on the back panel.

4.0 Troubleshooting & Support

4.1 Error Signals

During operation, the user may experience the following errors messages/signals:

- + **CH1 and CH2 LEDs flashing red:**
The dial screen is not responding to a command from the controller (likely the cable is detached)
- + **CH1 and RGB ring both flashing red:**
CH1 has detected overtemperature fault
OR CH1 has detected heating fault
- + **CH2 and RGB ring both flashing red:**
CH2 has detected overtemperature fault
OR CH2 has detected heating fault
- + **CH1 and CH2 and RGB ring flashing red;**
CH1 and CH2 has detected overtemperature fault
OR CH1 and CH2 has detected heating fault

If any of the above errors are experienced, try turning the unit on and off again to reset the device. If the issue persists, please contact IonOpticks support for assistance.

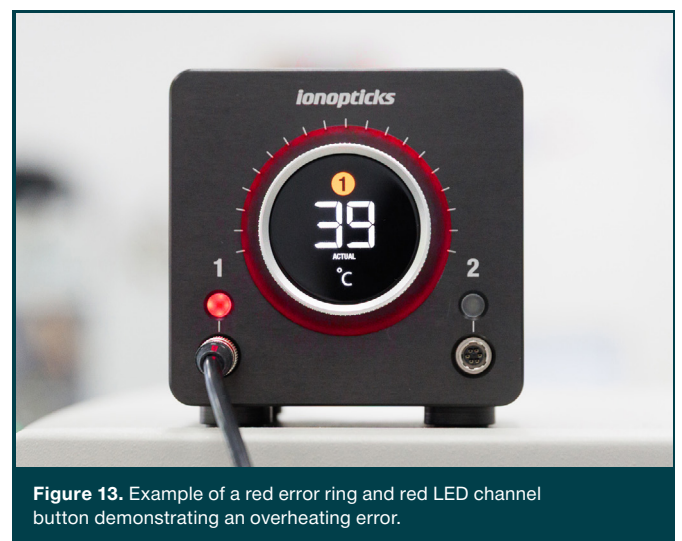


Figure 13. Example of a red error ring and red LED channel button demonstrating an overheating error.

4.2 Special Considerations

If the unit does not stabilise at the desired temperature after 1 hour but there is no error messages displayed, please get in contact with IonOpticks support.

4.3 Support



Support for the HeatSync controller and related products can be reached by emailing: support@ionopticks.com, by filling out an enquiry form on our website: <https://ionopticks.com/get-in-touch/> or by visiting our help centre: <https://helpcentre.ionopticks.com/portal/en/home>

5.0 Maintenance & Servicing

The only user-performed maintenance & service suggested by IonOpticks is fuse replacement & firmware updates.

5.1 Fuse Replacement

The fuse is located in the fuse compartment between the power switch and power inlet. Pull out the compartment and take out the used fuse. Please use 4A, 250 VAC fast blow fuses only for replacement (Part number F4AL250VP).

SHOCK WARNING

HIGH VOLTAGE

To avoid electrical shock, always power off the device and unplug the power cord before fuse replacement.

5.2 Firmware Updates

Firmware updates can be applied via USB-C connection into the back of the HeatSync™ Controller unit. In the case of a required firmware update, IonOpticks will offer more in-depth instructions to the customers directly.

Specifications	Value
Ambient Operating Conditions	18 - 28 °C; 25-75% relative humidity
Temperature Setting Range	30 – 60 °C
Temperature Setting Resolution	5 °C
Temperature Display Resolution	1 °C
Temperature Stability	+/- 0.2 °C of set temperature
Column Heater Connector Type	Compatible with Column Heater cable end connector: Hirose HR10A-7R-6S(73)
Sensor type	NTC Thermistor
Power input connector	IEC C13
Power Supply	100-240 VAC, 50-60 Hz Single Phase
Max Output Power per Channel	30W
Current Max	2 A
Max Output Voltage per Channel	15 V
Storage temperature	0 to 40 °C
Dimensions	11 (h) x 10.5 (w) x 12.5 (d) cm
Weight	1.2 kg

Table 3. HeatSync™ Controller technical specifications.

7.0 Regulatory

8.1 WEEE

As required by the WEEE (Waste Electrical and Electronic Equipment Directive) of the European Community (EC) and the corresponding national laws, IonOpticks offers all end users in the EC the possibility to return “end of life” units without incurring disposal charges.

This offer is valid for IonOpticks electrical and electronic equipment:

- + Sold after January 1st, 2025
- + Marked correspondingly with the crossed out “wheelie bin” logo (see below)
- + Sold to a company or institute within the EC
- + Currently owned by a company or institute within the EC
- + Still complete, not disassembled and not contaminated

As the WEEE directive applies to self-contained operational electrical and electronic products, this end of life take back service does not refer to other IonOpticks columns, such as chromatography columns and heater accessories.

Waste Treatment is Your Own Responsibility

If you do not return an “end of life” unit to IonOpticks, you must hand it to a company specialized in waste recovery. Do not dispose of the unit in a litter bin or at a public waste disposal site.

Ecological Background

It is well known that WEEE pollutes the environment by releasing toxic products during decomposition. The aim of the European RoHS directive is to reduce the content of toxic substances in electronic products in the future. The intent of the WEEE directive is to enforce the recycling of WEEE. A controlled recycling of end-of-life products will thereby avoid negative impacts on the environment.

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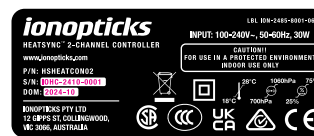
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Compliance

Our product is compliant across multiple territories, as signified by the compliance markings on the product label. <https://ionopticks.com/terms-conditions/>



Need Help?
helpcentre.ionopticks.com



ionopticks

12 Gipps St
Collingwood VIC 3066
Australia

www.ionopticks.com

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