SLICE-QT Four-Channel Temperature Controller Quick Start Guide

Model No. SLICE-QT

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Please read Limited Warranty and General Warnings and Cautions prior to operating the SLICE-QT.

SLICE-QT Owner's Manual SLICE-QT web page.

Description

The SLICE-QT is a high-precision temperature controller (see figure 1).

Fig. 1: The SLICE-QT



Purchase Includes

- SLICE-QT Temperature Control Unit
- AC power cord with appropriate wall plug for you location (if known)
- Four single-ended 6-ft control cables[1)]

List of Symbols

	Warning. Pay special attention to procedures and notes.
	Potential for electrical hazard.

Getting Started

- When presented with a given view, it is possible to select the functionality or change the values in any field bordered in blue. When a particular field is actively being edited, its border will be yellow.

1. From the Home screen, touch the CH icon for the channel to be used to go to the Channel Detail screen.
2. Touch Settings > Load Limits
    1. Set the Current and Power limits for you transducer.
    2. Touch the Return icon.
3. Touch Settings > Plant
    1. Enter in the parameters for your thermistor.
       Note: Enter EITHER Beta, Reference Temperature, and Reference Resistance OR the Steinhart-Hart Constants, A, B, and C. The other set of parameters will be automatically calculated.
    2. Select the Transducer Type: either TEC/Bipolar or Heater/Monopolar.
    3. When choosing TEC/Bipolar, also select Negative of Positive Polarity,
4. Using table 1, make connections from the SLICE-QT to your thermal plant via the cables supplied by Vescent. Peel the drain (shield) back to make connections. The shield is grounded at the SLICE-QT. Use caution grounding the shield at the transducer end as ground loops may be formed, degrading performance.
5. Use the supplied AC power cord to provide power to the SLICE-QT. The power converter inside the unit will accept any line voltage within the range in table 2.
6. Turn on the SLICE-QT with the power switch on the back of the unit located on the power entry module.
7. Touch a Channel Label icon to enter the Channel Details screen.
8. Touch the Setpoint Temperature Icon to enter in the desired set point temperature.
9. Touch Settings > Limits
    1. Set the absolute minimum and absolute maximum temperature allowed for your plant.
    2. Set the lock range. This range determines over what value of $\Delta T = T_{act} - T_{set}$ the system is considered to be locked. If ΔT is outside of this range, the Error field will change from green to yellow. This range will appear as yellow dashed lines on the plot of ΔT vs. time on the Channel Detail screen.
10. Touch Settings > PID
    1. Set the PID parameters for your plant
        1. Touch each window to set the given parameter
        2. We recommend the Ziegler-Nichols method of setting your PID parameters[2)]
11. Touch the OFF icon to engage the temperature servo
12. Monitor on the performance screen to ensure system settles

	Use caution grounding the shield at the transducer end of the interface cable as ground loops may be formed, degrading performance.
	WHEN USING A RESISTIVE HEATER, be sure to set the transducer type (CH X > Settings > Plant) to Heater/Monopolar. If set to TEC/Bipolar, attempts by the SLICE-QT to actively cool your plant will result in a thermal runaway condition.

Connector Pin Number	Color	Function	AWG
1	Red	TEC/Heater+	18
2	Black	TEC/Heater-	18
3	White	Thermistor+	22
4	Blue	Thermistor-	22
Metal Sleeve	Thermistor Ground Shield		24

Tab. 1: Cable pinout

You may purchase more cables separately from Vescent Photonics. We do not recommend making cables, but if you do so, make sure the metal sleeve (drain) is well.

The SLICE-QT will accept input line voltages within the ranges in table 2.

Parameter	Value	Units
Input Line Voltage	90-250	VAC
Frequency	50-60	Hz
Phase	1	phase

Tab. 2: Input Voltage Specifications

Front Panel

Rear Panel

The rear panel can be seen in figure 3. The functions and connections are as follows:

1. Main On/Off power switch
2. AC line power in[3)]
3. Output trigger (BNC)
4. Input trigger (BNC)
5. USB port (Type B)
6. Connections to thermal plants[4)5)]



Fig. 3: View of rear of SLICE-QT

1)

More cables may be purchased separately

2)

A usable discussion of the Ziegler-Nichols method can be found here:
http://faculty.mercer.edu/jenkins_he/documents/TuningforPIDControllers.pdf

3)

See table 2 for acceptable input ranges

4)

Four-pin DIN connector

5)

In some early versions of the SLICE-QT, the order of these connectors is reversed.

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