USB Temperature Controller Kit
Part No. 523-211

2I-523-211-5

USB Temperature Controller

User Manual

2I-523-211-5

Index

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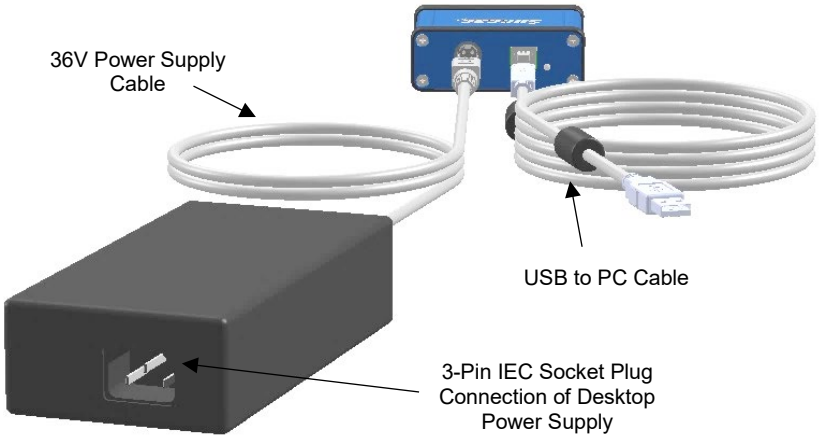
Quick start Guide

1. Correctly install the heated Specac accessory into the Spectrometer which is to be controlled by the USB Temperature Controller before proceeding (See the accessory's user instruction manual for further guidance).

2. Once the accessory's installation has been completed, connect the thermocouple and heater leads to the USB Temperature Controller connections. To help orient the connectors polarity there is a red dot on the top of each connector.

3. Now connect the desktop power supply DC output cable and the USB cable to the connections on the opposite side of the USB Temperature Controller box as shown below.

4. Finally, connect the mains lead supplied to the desktop power supply, before connection of the mains plug to the earthed, mains supply socket.



5. To operate the Specac accessory USB Temperature Controller follow the software instruction provided (See Section 5).

6. To shut down, turn off the temperature controller using the software. Allow the Specac accessory to cool, if necessary, back to room temperature before disassembly.

1. Introduction

Thank you for purchasing a Specac product.

The USB Temperature Controller is a high stability temperature controller for use with heated Specac accessories. Operation of the temperature controller is provided via the Windows® software supplied.

The USB controller can be used with various Specac accessories, however for each type of accessory the firmware installed must be specifically configured to operate the device correctly. Ensure the that the controller is used with the correct accessory model number as stated on the rating label of the USB controller device.

The software also provides identification of the accessory it is configured for at the top of the screen above the graph display area.

Important! Don't use the USB temperature controller with an accessory it has not been configured for. This could cause damage to the USB controller and/or the accessory.

Important! This user instruction manual should be read in conjunction with the manual provided with the Specac accessory.

2. Safety Warnings

List of Safety Symbols

Safety Symbol	Meaning
	**Caution** (Reference ISO 7000-0434B, 2004-01)
	**Caution – Hot Surface** (Reference IEC 60417-5041, 2002-10)
	**Caution – Possibility of Electric Shock**
	**Indoor Use Only**

General Safety

It is important to read any associated safety information in the accessory manual before operating the USB Temperature Controller.

Caution! This user instruction manual should be read in conjunction with the manual provided with the intended Specac accessory for which this controller was supplied.

Caution! For indoors use only. Do not subject to dripping or splashing. Not for use in wet locations.

Warning: Only use with the power supply provided with the USB controller. If a replacement is required contact Specac Technical Support or our sales team.

Warning: Only use the mains cord set supplied with the USB controller. If an alternative cord set is required, replace it only with an equivalent type of the same rating which is acceptable for use in the country for which the controller is to be used.

Warning: Do not operate the appliance with a broken cord or plug, or if the appliance malfunctions, or is dropped or damage in anyway.

Warning: No user serviceable parts within. Contact Specac and/or your local Specac authorised agent for all service and repair requirements.

Warning: Disconnect the device from the mains supply before cleaning. Only clean with a soft, lightly dampened cloth. Do not use harsh and/or abrasive cleaners on any Specac product. Consult Specac or their authorized agent if in any doubt.

Warning: Do not position the equipment so that it is difficult to access the disconnecting device (Mains plug and/or appliance coupler) when in use. Only use a main outlet socket that is accessible during operation.

Warning: Check before use that the safety protection provided has not been compromised or impaired. The controller should be made inoperative and be secured against unintended operation if in any doubt.

The protection is likely to be impaired if for example the controller:

- Shows visible damage.
- Fails to perform its intended use.
- Has been subjected to adverse storage conditions.
- Has been subjected to severe transport stresses.

Hot Surface: Accessories used with this controller may display a hot surface label, which warns that a nearby surface may get hot. These surfaces must not be touched.

Caution: If the equipment is used in a manner not specified within this manual, the protection provided by the equipment may be impaired

WEEE Directive for Equipment Disposal

The symbol (above) on the back of the controller indicates that this product complies with the Waste Electrical and Electronic Equipment Directive (WEEE). If this product is in use and was purchased within the European Union, please contact your local sales agent or Specac to arrange for disposal of this equipment.

3. Specifications

USB Temperature Controller – Thermocouple and Accessory Heater power connections

USB Temperature Controller – DC supply input and USB connections

Operating Temperature: 0-60°C, 0-90% Humidity non-condensing
Storage conditions: -10 to +85°C
Altitude: Up to 2000m
Pollution Degree: 2
Dimensions:
USB Controller – 70mm (long), 80mm (wide), 32mm (high).
Desktop Power Supply - 185mm (long), 84mm wide, 45mm (high).
USB Temperature Controller:
DC supply rating: 36Vdc, 4.17A, 150W
USB Connection: USB 2.0, Type B connection
Desktop power supply (PSU):

Input Voltage: 100-240 VAC, 2.5A, 50-60Hz (Class I earthed)
Mains supply fluctuations: ±10%
Over Voltage Category: II

The temperature controller is provided with a USB interface intended solely for communication with external equipment such as a personal computer or equivalent device.

The USB port is rated as follows:

- Maximum voltage: 5 Vdc
- Maximum current: 500 mA
- Maximum input power: 2.5 W

In accordance with IEC 61010-1, Clause 6.6.1(b), the USB port is not intended to be connected directly to hazardous live circuits. Any external equipment connected to this USB port shall provide double or reinforced insulation between hazardous mains voltages and the USB interface, such that hazardous voltages cannot be transferred to the temperature controller.

This requirement is typically fulfilled by certified external devices, such as personal computers or equipment powered by certified power supplies, which inherently provide the required double or reinforced insulation from mains supply voltages.

Failure to comply with this requirement may result in the temperature controller being subjected to hazardous voltage levels, which could compromise safety and regulatory compliance.

4. Unpacking and Checklist

On receipt of your USB Temperature Controller please check that the following have been supplied.

- USB Temperature Controller (P/N - 261-058)
- Desktop PSU (P/N - 267-045)
- Mains power cable suitable for your country
- USB cable
- USB memory stick that has user instruction manuals & software

5. USB Temperature Controller Software

The controller is supplied with Window® software on the USB drive supplied. The software provides two methods of controlling the USB Temperature Controller and its associated hardware.

The default method is **Manual** where the user sets the Target temperature (set point) and the Ramp rate and manually turns the controller On and Off via the application interface.

The second method is to create a **Program sequence** for the application to run automatically.

Installation

The software is provided on a USB drive and can be installed by running the executable.

E.g. SpecacTemperatureController_1_0_17_0.exe

System Requirements

The USB Temperature Controller software is designed to work on the following system specification:

- Windows 7 SP1, 8 or 10
- Dual core Processor.

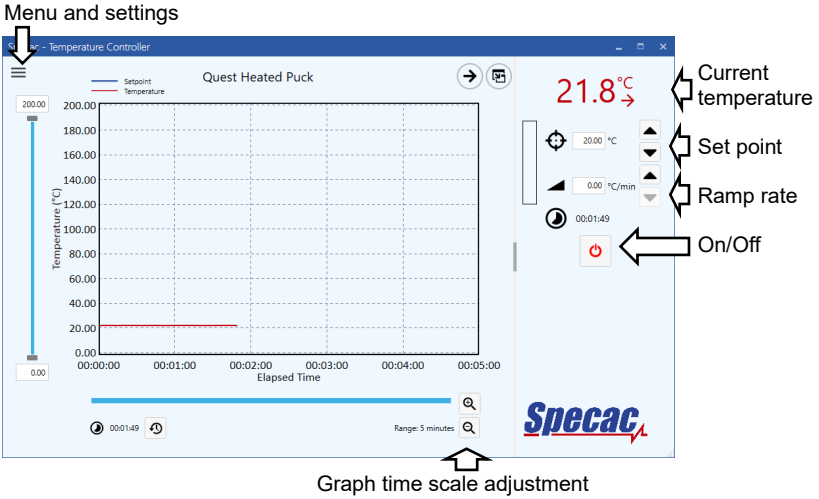
- 4 Gb of memory.
- 2 GHz processor.

The application install size is circa 20MB or 200MB including .NET framework 4.6.2. Additional storage space is needed for data logging.

Software

The software that controls the USB Temperature Controller provides for the following;

- PC control of the accessory temperature.
- Graphical display of temperature.
- Datalogging of temperatures to file.
- Temperature sequence programming.



Temperature Controller Software interface

Further instructions for operation of the USB Temperature Controller are found within the software user instruction manual.

This is located by clicking the “menu” button at the top left of the display screen in the application, followed by the help button near the bottom left of the display screen. This help will guide you through all the features provided with the software.

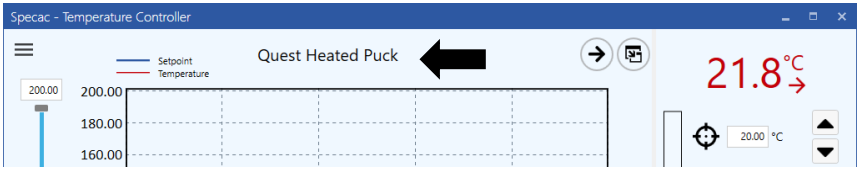
Menu button.

Help button.

6. Identification of USB Temperature Controller firmware configuration

Different accessories from Specac have different power and heating requirements. Each USB Temperature Controller is assembled and configured to match the specific requirements of the accessory with which it is to be used.

When the controller is attached to the PC the software displays what accessory it has been configured for at the top of the window



Do not use the wrong accessory with the wrongly configured controller.

7. Macro Control / Command Line Control

The temperature control software, version 1.0.23.0 onward, can now be controlled using command line instructions and so be controlled using the macro functionality in most Spectrometer software.

The command is added to Windows Path by the installer and so can be executed by typing the following into a console window:

`specac.cmd`

When running it from a macro you may need to put the complete path. This depends on where the software is installed, but typically:
`"C:\Program Files (x86)\Specac\Temperature Controller\1.0\bin\specac.cmd.exe"`

Only one instance of the Specac.Cmd program can execute at any one time. The arguments are all validated before the first command is issued, if errors are found they will be logged in:
Documents\Specac Temperature Controller\CmdErrorLog\

On/Off Commands

`on`	Turn On
`off`	Turn Off

Change Temperature Units Commands

`c`	Set Temperature Units to Celcius
`f`	Set Temperature Units to Farenheit
`k`	Set Temperature Units to Kelvin

Query Commands

`sp?`	Get Current Setpoint
`ramp?`	Get Current Ramp Rate
`temp?`	Get Current Temperature

Commands With Accompanying Value

`ramp <value>`	Set A New Ramp Value

`sp <value>` Issue a new Setpoint value
`sp <value> w` Issue a new Setpoint value and wait for the temperature to be reached
`tol <value>` Sets a +//- Temperature Tolerance for the Set Point Wait commands to use

Example:
```
specac.cmd on sp 110 w
```

or using a macro:
```
"C:\Program Files (x86)\Specac\Temperature Controller\1.0\bin\specac.cmd.exe on sp 110 w"
```

Turns the controller on, changes the setpoint to 110, and then waits for the temperature to be reached before exiting (useful for delaying the next step in your macro until the accessory has reached the correct temperature)

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