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## **BTC-OEM-SERIES: THE FIRST CHOICE FOR BUILT-IN TEMPERATURE CONTROLLERS IN THE LAB**

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The new gold-standard for highest-precision temperature control  
in lab equipment and analytical instruments.

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[www.belektronig.de](http://www.belektronig.de)

# FLEXIBLE TEMPERATURE CONTROL UP TO 0.001°C



Made in  
Germany

## The Flexible Integrable Built-in Temperature Controller Made in Germany

The BELEKTRONIG built-in temperature controllers are used to control heating and Peltier elements. As an OEM component with a wide range of functionality it is used in numerous professional laboratory and analytical instruments. The temperature control is performed by a PID algorithm in combination with a high-precision temperature measurement. The control output generates a PWM signal. An optional output filter for generating DC output voltage is also available.

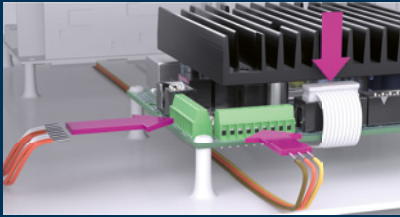
- ✓ Built-in temperature controller with extended peripherals
- ✓ PWM control output up to 36V, 10A
- ✓ Fan control 0 ... 12V, 0.3A
- ✓ Freely usable command set
- ✓ USB interface, serial interface
- ✓ Including PC software, USB driver, LabView VIs

## BTC Soft: Measuring, Monitoring and Recording Temperature Curves

The PC software BTC Soft enables the operation of the BELEKTRONIG built-in temperature controller via the USB interface of the computer. Thanks to plug-and-play functionality, your controllers are immediately ready for use - without any extra installation. The graphical user interface shows the most important parameters of the running operation and allows intuitive reading and setting of all available functions e.g. PID parameters or temperature limits. The program is included in the standard scope of delivery of our controllers and is available in the latest updated version via download link. The Pro version with extended functionality can be ordered additionally.



## Connected and Ready to Use in Three Simple Steps



### Connect

Connect the controller and the equipment to be controlled using the connection cable.



### Configure

Set the controller settings (PID parameters, limit values, fan settings, data acquisition, operating mode) using the PC software or your own code.



### Control

The controller now automatically performs the precision control of the temperature of the main device and any peripheral functionality.

## We Develop Customer-Specific Solutions - also for your Research

Our built-in temperature controllers have been specifically designed for sophisticated scientific and medical measuring equipment such as the one shown here - for devices where in addition to controlling the temperature, other parameters such as safety measures, or valve control, as well as the detection and evaluation of operating conditions are needed. With BELEKTRONIG you are free to use all options.

- › Adaption of the controller firmware to your requirements
- › Implementation of special sensor characteristics
- › Implementation of special functions for digital IO
- › Development of individual temperature controlled laboratory instruments and sample stages
- › Dimensioning of heating and Peltier elements
- › Design of controlled systems for your temperature control applications

### BTC-OEM

Control temperature and peripheral functions

### Display and Input-Panel

User-interface controlled by BTC-OEM, display and adjust device settings

### Status LED

Display of device conditions e.g. if the door is open, setpoint temperature reached, routed through the BTC-OEM

### Development

Of individual temperature controlled laboratory instruments and sample stages



### Fan Control

Fans for sample chamber and waste heat removal in peripheral electronics separately controlled by BTC-OEM

### OEM Output Filter

Smoothing of the PWM control signal to DC signal

### OEM Air Cooler

Air-to-air heat exchanger for temperature control of the sample chamber

Solution example: Laboratory analyzer with integrated temperature controlled sample stage

## Technical Data for Built-in Temperature Controller BTC-OEM-Series

### Temperature Measurement

- › Measurement range: -200 ... +800 °C
- › Resolution: 0.1 °C, 0.01 °C, 0.001 °C
- › Sampling rate: 10 Hz
- › Inputs for resistive temperature sensors or thermocouples:
  - › PT100, PT1000, (NTC, PTC on request) or type K, type J
- › Accuracy of measurement: ± 0.05 °C
- › Temperature coefficient: 0.05 mK/K

### Temperature Control

- › Digital PID control algorithm
- › Adjustable PID parameter
- › Adjustable temperature ramps and limits

### Modes of Operation for Peltier elements

- › [1] Manual control only
- › [2] Heating operation only
- › [3] Cooling operation only
- › [4] Heating and cooling operation

### Modes of Operation for heating elements

- › [1] Manual control
- › [2] Heating operation

### Control Output

- › PWM with 20 kHz output with adjustable voltage up to 36V,
- › maximal 10A (depending on power supply)
- › Adjustable duty cycle limits
- › Adjustable current limits in combination with BELEKTRONIG
- › Output Filter

### Fan Control Output

- › DC Output: 0 ... 12V DC, maximal 300 mA
- › Modes: [1] Manual control, [2] Associated with temperature control output

### Digital IO

- › 9 digital inputs or outputs, adjustable data direction
- › TTL level: 0 ... 5V
- › On request: customer-specific logic functions

### Digital Out

- › 16 digital outputs to connect LED, relays, signal wires, etc.
- › TTL level: 0 ... 5 V, maximal 150 mA
- › Notification of status messages
- › On request: customer-specific logic functions

### Interfaces

- › USB 2.0, UART 0 ... 5 V (level converter for RS232 optional)

### Software Control

- › PC software, LabView VIs, ASCII command set

### Dimensions and Conditions of Operation

- › Dimensions (L×W×H): 100×80×50 mm<sup>3</sup>
- › Weight: ~250 g

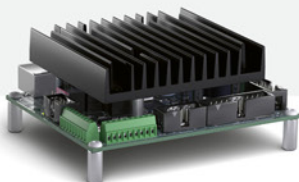
### Scope of Delivery

- › Built-in temperature controller module
- › Assembly material (4 spacers M3×14, 8 screws M3×8)
- › PC software

## Configurations

BTC-OEM - ...	A10	A20	A100	A200	A1000	A2000
Temperature resolution [°C] / Control accuracy [°C]	0.1 / ± 0.1		0.01 / ±0.01		0.001 / ±0.003	
Number of temperature sensors / Number of fan outputs	1	2	1	2	1	2

Temperature controllers with similar functionality are also available as laboratory devices.



Learn more about the technical details of our devices and easily request a quote for your individual temperature control needs.

[www.belektronig.de](http://www.belektronig.de)

