Innovative USB Temperature Controller for Heating and Peltier Elements

The temperature controller of the HAT Control-Series are freely configurable, robust and have a long durability. They come with 6 main configurations having a temperature resolution of 0.1, 0.01 and 0.001°C. Advanced setting options and the maximum output power of 270W give you the flexible solution for your temperature control applications in laboratory and field.

Temperature Controller HAT Control – B20

- ✔ **Temperature resolution: 0.1°C, 0.01°C, 0.001°C**
- ✔ **DC control output up to 270W (max. 10A)**
- ✔ **Fan control output**
- ✔ **USB interface**
- ✔ **Upgradeable**
- ✔ **Free usable command set**
- ✔ **Including user software HAT Soft Pro**

Made in Germany

Configuration

Name of configuration: HAT Control - ...	K10	K20	M10	M20	B10	B20
Temperature resolution [°C] / accuracy [°C]	0.1 / ±0.1		0.01 / ±0.01		0.001 /±0.003	
Number of temperature sensors and fan control outputs	1	2	1	2	1	2

Technical Data

Temperature measurement
- Type of sensors: Pt1000/Pt100
- Measurement range: -200...+400°C
- Resolution: 0.1°C, 0.01°C, 0.001°C
- Sample rate: 4Hz
- Measurement uncertainty: ±0.05°C (absolutely, add uncertainty of temperature sensors)
- Additional temperature sensors like NTC/PTC on request

Temperature control
- PWM output voltage: -27...27V, max. 10A
- Fan control output: 0...12V DC, max. 0.3A
- Optimized PIDT1 control algorithm
- Automated switch off if overshooting temperature limits

Operational modes
- 4 operational modes using Peltierelements
  (1) meas. only/manual (2) heating only
  (3) cooling only (4) heating & cooling
- 2 operational modes using heating elements
  (1) meas. only/manual (2) heating only

Measurement of electric current at PWM output channel
- Resolution: 0.03A
- Limitation of output current using OEM-LC-Filter
- Current measurement active from 12.6% output power

Dimensions and operation conditions
- Dimensions (L x W x H): 226 x 172 x 91mm³
- Weight: 3,2kg
- Operating temperature: 10...45°C
- Humidity: 0...80%

Scope of delivery
- Temperature controller incl. USB and power cable
- User software HAT Soft Pro for download
- Mating connectors (if ordered without measurement cable)

User software HAT Soft Pro
- Set and read HAT control settings via USB interface (set point, PID parameter, limits, ...)
- Continuous displaying of temperatures, output power
- Free usable command set to write user software e.g. using LabView, HP Vee, ...
- Upgrade dialogue for actualizations/ upgrades

Accessories
- Connecting cable 8polar for temperature controller
- Connecting cable 8polar for peltier modules
- Measurement cable (incl. Pt1000 and connector)
- Peltier modules: Air cooler/heater, Plate cooler/heater
- Customized controller configuration on request

Upgrade to Higher Configurations

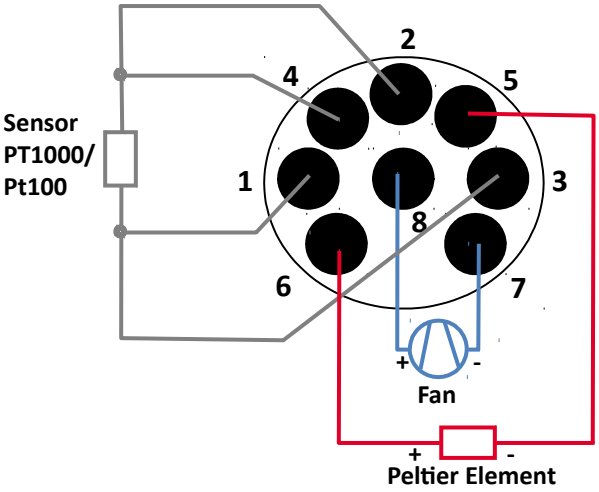
Upgrading the OEM temperature controller to higher configurations is possible using a special upgrade code which is transferred to the controller by the user software HAT Soft Pro. The following upgrad options are available:

to / from	K20	M10	M20	B10	B20
K10	√	√	√	√	√
K20	-	√	√	√	√
M10	-	-	√	√	√
M20	-	-	-	√	√
B10	-	-	-	-	√

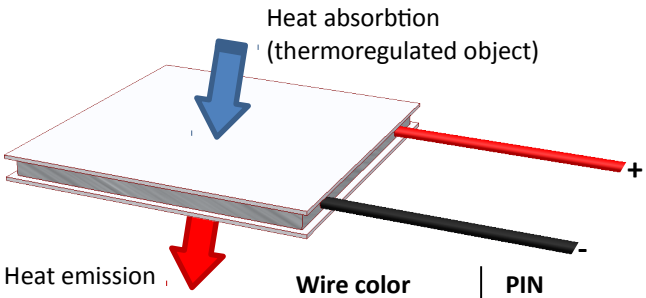
PIN Assignment and connection of Peltier Elements

The PIN assignment is valid for BelektroniG temperature controller. It is supposed to be used for individual assembling of cables. The following table shows the color codes that are valid for cables pre-assembled of BelektroniG.

Solder side of cable connector (Front view of device)



Connection of Peltier Elements (40x40x3.8mm²)



Wire color Peltier Element	PIN Assignment
red	PIN: 6
black	PIN: 5

No specific polarity has to be considered while connecting heating or power resistors.

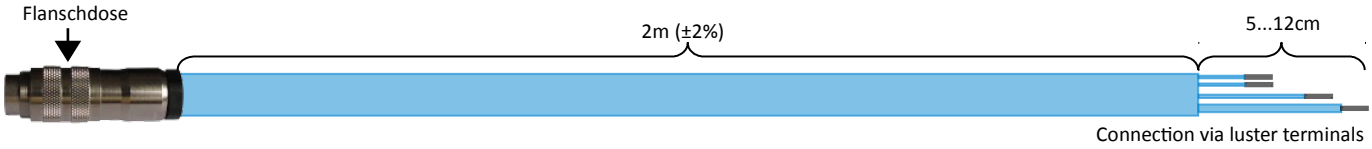
Color code of connecting cables and cable temperature sensor

	PIN	Connecting cable 8polar blue	Connecting cable 8polar green	Connecting cable 8polar orange	Cable temperature sensor 4polar
Color of sheath	-	blue	green	orange	wine red
Temperature sensor (Pt100/1000)	1	blue	yellow	blue	white
	2	brown	yellow/black	pink	red
	3	green	green	green	white
	4	yellow	green/black	violet	red
Heating- or Peltier Element	5	black	white/black	brown	-
	6	red	white	white	-
Fan (12V, max. 300mA)	7	grey	red/black	black	-
	8	pink	red	red	-

Dimensions of cables

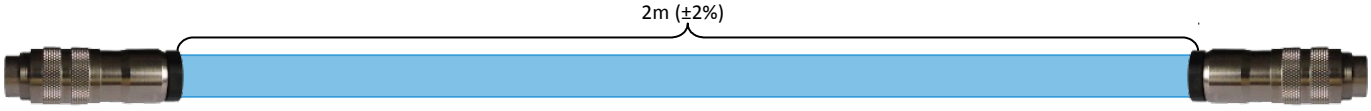
Connecting cable 8polar for temperature controller

to connect heating and Peltier Elements, or peltiermodules of other vendors



Connecting cable 8polar for peltiermodules

to connect BelektroniG-Temperature controller with BelektroniG-Peltiermodules



Measurement cable

for temperature measurements incl. cable connector and temperature sensor: Pt1000, Ø3x30mm²