copenhagen atomics

AC box V6.4

4 channel, 8A, 400V AC, Triac, zero crossing switching, with current measurements.

Photo showing version 6.4

Introduction

Usage

The AC box is meant to be used to turn things like valves, heaters, fans and relays on and off. It can take 100 - 250V AC input voltage and switch this on each one of the 4 channels using a TRIAC. It is possible to run PWM on each channel with 100 Hz frequency, following the Burst Firing Control method.

The box has a fan which turns on if the TRIACS get too hot. If the fan is not enough to cool the box, then the firmware will power down the output on the overheated channel.

Each channel has current measurement which enable you to monitor how much current a given heater, relay or valve is drawing.

Data communication

Data communication happens over USB with the serial communication protocol (COM-port, /dev/ttyXX).

Baud rate 115200, with 8 data bits, no parity, and 1 stop bit. (8N1)

After you connect to the box it will output one line of text to the terminal every 0.1 second (10 Hz).

The content of this line is specified on the next page.

You can also send commands to the box. Just type in a command, then the box will turn channels on and off accordingly.

This video gives an introduction to serial data and commands: https://youtu.be/-64MM8h5SdI

Introduction

Integration with TurboCtrl

TurboCtrl AutoConfig will detect the box and insert each channel in IO.conf as a heater config line. Each port (“heater”) can be on or off and set to a certain PWM value. The web chart show how many amps are drawn on each port and the heat sink temperature. On / off value is shown in plots.

PWM commands / status is not in the vector.
This video gives an introduction to autoconfig: https://youtu.be/MhT1DqOuWLE

This video gives an introduction to TurboCtrl programming: https://youtu.be/MhT1DqOuWLE

TurboCtrl.ai supports many sensor and actuator types:
Temperatures, pressure, humidity, oxygen and other gasses, gas and liquid flow sensors, DC ports, AC ports, VFDs, current, voltage, oven controllers, light controllers, motors, audio, video, scales, position, liquid level, density, viscosity, integration with Festo and other pneumatics systems. And much more

Buy connectors

This box uses Phoenix Contact 1873362 connectors for output and 1720479 for AC input. You can buy the connectors here:

Input:
https://www.digikey.dk/en/products/detail/phoenix-contact/1718494/3596898

Output:
https://www.digikey.dk/en/products/detail/phoenix-contact/1873362/3605542

The box come with a USB-C to USB-C cable included and standard DIN rail mounting.

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For more information, please contact sales@copenhagenatomics.com

Specs

Serial terminal output (baud: 115200)

Output	p1 current	p2 current	p3 current	p4 current	heatsink temp.	status code
Unit	[A]	[A]	[A]	[A]	[°C]	[-]

Commands

Command	<Arguments>	Description
p<1-4> <on/off>	Port nr., on/off-state.	Turn specific port on/off.
p<1-4> on <0-99>	Port nr., on-time	Turn on specific port for a given time.
p<1-4> on <0-99> <0-100>%	Port nr., on-time, percentage on.	Turn on specific port for % of a given time.
all <on/off> <0-99>	on/off-state.	Turn on/off all ports with a timeout.
fan <on/off>	on/off-state.	Turn on/off fan, will automatically turn on when too hot.
Status	-	Verbose output of the current box status.
Serial	-	Verbose output of serial number and calibration.

Specification

Parameter	Condition	Value	Unit(s)
Operational temperature (heatsink)	min.	0	°C
	max.	80	°C
Single channel load	max.	8	A
Total load (all four channels on), NB! Ensure proper wiring!	max.	32	A
Max on-time based on avoiding overheating*	w. fan, typ.	100	%
	w.o. fan, typ.	50	%
Voltage (RMS)	max.	250	V
Switching frequency	typ.	100	Hz
USB power	max.	1.2	W
USB current	max.	230	mA

* If all channels run 100% properly dimensioned wiring must be used, otherwise the input connector and/or wiring can be damaged.

Specs

Status code

The last output of the AC box is a 32-bit status code. The 16 most significant bits are general status bits available across all boxes as listed below.

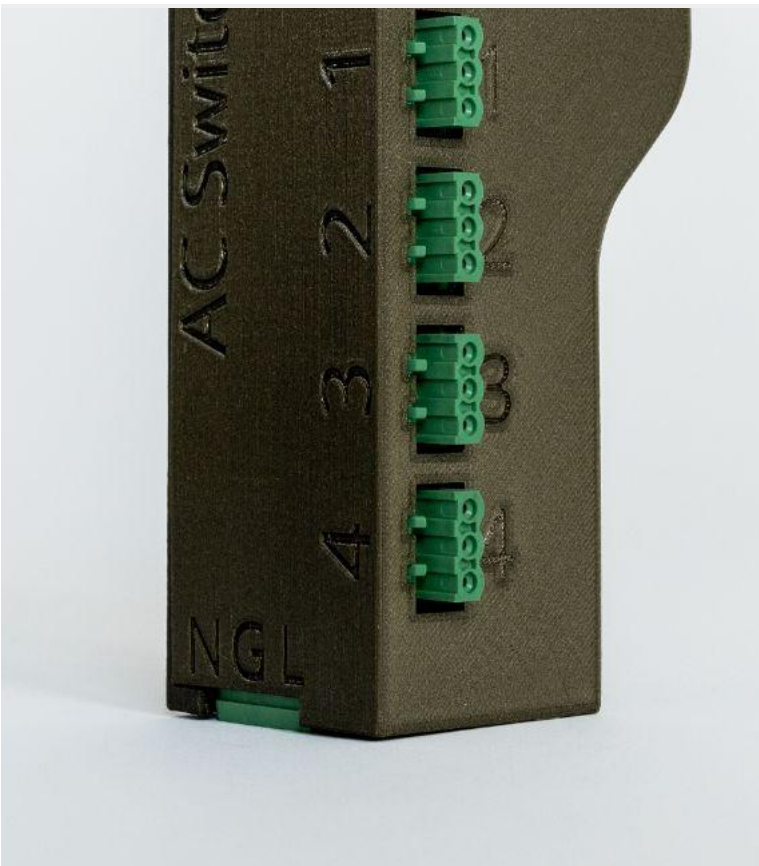
Bit 31 (MSB)	Bit 30	Bit 29	Bit 28	Bit 27	Bit 26	Bit 25
Error bit	Over temperature	Under Voltage	Over Voltage	Over Current	Version error	USB error

The 16 least significant bits of the status code are AC box specific and described below.

Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 (LSB)
Port 4 On/Off	Port 3 On/Off	Port 2 On/Off	Port 1 On/Off	Fan On/Off

All bit fields not described above are unused.

Product photos



Contact
Copenhagen Atomics

sales@copenhagenatomics.com
copenhagenatomics.com

Copenhagen Atomics A/S
Oliefabriksvej 77
2770 Kastrup
Denmark

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