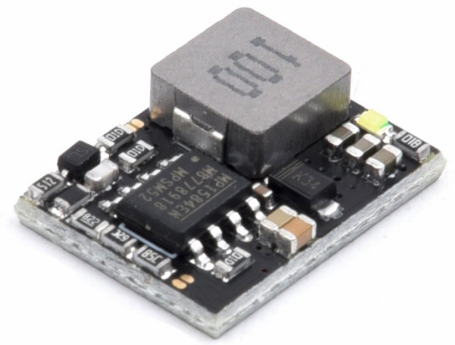
BEC 12V 3A

Switchable voltage regulator 12 V / 3 A
User manual



Read Chapter 2.1 Safety and wiring rules before connecting.

www.rotorama.com

Contents

1. Product description

1.1 What it is for

1.2 Technical data and package contents

2. Use

2.1 Safety and wiring rules

2.2 Wiring

2.3 Switching on and off – COM pad

2.4 Control from the flight controller (Betaflight PINIO)

2.5 Troubleshooting

3. Information for the EU and Czech Market

3.1 Importer and responsible person in the EU

3.2 Disposal of electrical equipment

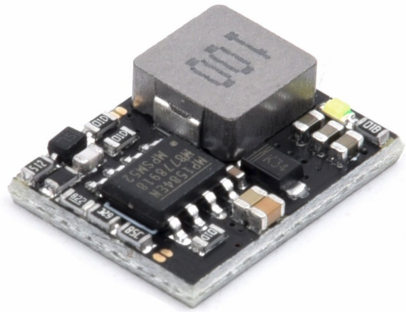
4. Warranty and rights arising from defective performance

1. Product description

1.1 What it is for

The **BEC 12V 3A Switchable** is a small switching voltage regulator (BEC – Battery Eliminator Circuit). It converts the voltage of a 4S to 6S flight battery into a regulated **12 V** with a current rating of up to **3 A**. It is suitable for powering a video transmitter (VTX) or 12 V LED strips on a drone or aircraft.

The board has a pad marked **COM** that switches the BEC output on and off. When 5 V is applied to COM, the BEC switches on. When COM is not connected or is connected to ground (GND), the BEC stays off. This allows the power supply of a VTX or lighting to be controlled, for example, from the flight controller (FC) with a switch on the radio.



BEC 12V 3A Switchable (dimensions 12 × 15 mm)

1.2 Technical data and package contents

Product designation	BEC 12V 3A Switchable
Type	switching voltage regulator (BEC) with control input
Input voltage	4–6S (14–26 V)
Output voltage	12 V
Max. output current	3 A
Dimensions	12 × 15 mm
COM control input	5 V = on not connected or GND = off
Package contents	1× BEC
Not included	wires, connectors, heat-shrink tubing, battery or the powered device

2. Use

2.1 Safety and wiring rules

- Always solder and wire **with the battery disconnected**. Soldering requires basic experience with electronics.
- Check the polarity of all pads before soldering. Swapping plus and minus, or input and output, may permanently damage the BEC and the connected device. Do not rely on reverse-polarity protection.
- The input voltage must be within **14–26 V**. A fully charged 6S LiPo battery has 25.2 V. A fully charged **6S LiHV** battery has 26.1 V, i.e. **more than the permitted 26 V** – do not use it with this BEC.
- With a 4S battery, the voltage at the end of a flight (3.5 V/cell = 14.0 V), and especially under load, approaches or falls below the lower limit of the input range. Below 14 V, a 12 V output is not guaranteed.
- The connected device must be designed for a **12 V** supply and its current draw must not exceed **3 A**. For a VTX, check the supply voltage range in its documentation.
- The BEC heats up at higher loads. Mount it where it is exposed to airflow and do not cover it with foam or insulation that prevents heat dissipation.
- Protect the board from short circuits: a carbon frame is electrically conductive. Insulate the BEC (e.g. with clear heat-shrink tubing) and mount it so that it does not touch the frame or other parts.
- Before the first flight, test the function on the bench – switching the output on and off, and 12 V at the output measured with a multimeter.
- When operating the model in which the BEC is installed, follow the regulations of the country in which you operate the model.

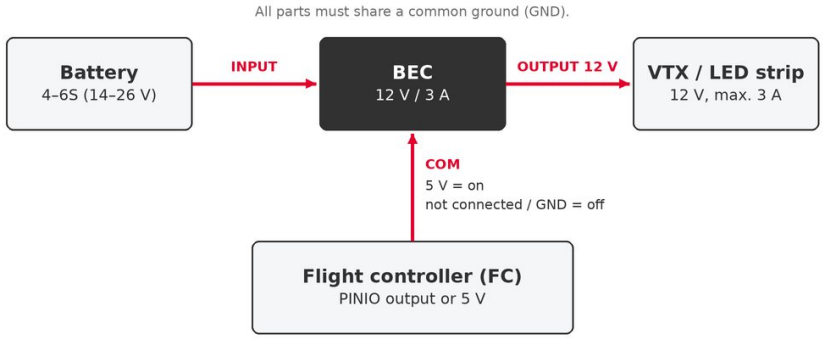
2.2 Wiring

The BEC is connected between the battery (or the power pads of the flight controller or power distribution board) and the device. Solder the wires directly to the pads of the board:

① **Input** (+ and −) – to the 4–6S battery voltage, e.g. to the VBAT and GND pads of the flight controller or power distribution board.

② **12 V output** (+ and −) – to the power input of the VTX or 12 V LED strip.

③ **COM** – control input; connect it as described in Chapter 2.3.



BEC wiring diagram

The ground of the control signal must be common with the ground of the BEC – this is the case when the BEC is powered from the drone battery to which the flight controller is also connected.

2.3 Switching on and off – COM pad

COM pad state	12 V output
connected to 5 V	on
not connected	off
connected to GND	off

Choose one of the options depending on how you want to use the BEC:

- **Always on** – connect COM to a 5 V pad of the flight controller. The BEC is on whenever the battery is connected.
- **Control from the radio** – connect COM to a flight controller output configured as PINIO (Chapter 2.4). You then switch the VTX or lighting on and off with a switch on the radio.
- **Other signal source** – COM can be controlled by any circuit that applies 5 V relative to the common ground.

2.4 Control from the flight controller (Betaflight PINIO)

Betaflight firmware can switch a free flight controller output using the **PINIO** function and link it to the *USER1* mode, which you activate with a switch on the radio. Procedure:

① Connect the COM pad to an unused pad of the flight controller (e.g. TX of an unused UART or the LED_STRIP pad).

② In Betaflight Configurator, open the *CLI* tab and use the *resource* command to find out which processor pin corresponds to the selected pad (e.g. *SERIAL_TX 2*). The pad assignment can be found in the flight controller documentation.

③ Free the pin and assign it to PINIO, for example:
resource SERIAL_TX 2 NONE
resource PINIO 1 <pin>
set pinio_box = 40,255,255,255
save
The value 40 in *pinio_box* assigns PINIO 1 to the *USER1* mode; replace *<pin>* with the pin found in step ②.

④ On the *Modes* tab, assign a channel and switch position on the radio to the *USER1* mode.

⑤ Check the function: with the switch in the on position, the BEC output must show 12 V; in the off position, 0 V. If the logic is reversed, set *set pinio_config = 129,1,1,1* (129 = inverted output) and save with *save*.

※ Flight controller outputs usually operate at a 3.3 V logic level, whereas the BEC is specified with a 5 V switching voltage. Therefore, always check before flight that the BEC switches reliably from the output of your flight controller.

When using other firmware (e.g. INAV), follow its documentation for the PINIO / USER function.

2.5 Troubleshooting

Problem	Possible cause and solution
The BEC output does not switch on	There is no 5 V on COM: check the COM wiring, the PINIO settings and the *USER1* mode assignment. Check whether the flight controller output level is sufficient for switching (Chapter 2.4).
The BEC cannot be switched off	COM is permanently connected to 5 V, or the PINIO logic is reversed – adjust *pinio_config*.
The device does not work although the BEC is on	Check the output polarity, the solder joints and the input voltage (14–26 V).
The device switches off or restarts	The current draw exceeds 3 A, or the battery voltage under load drops below 14 V (typically 4S at the end of a flight).
The BEC is very hot	Current draw too high or insufficient cooling – reduce the load and place the BEC in the airflow.

3. Information for the EU and Czech Market

3.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorama.cz
Phone	+420 252 252 098
Website	www.rotorama.com

3.2 Disposal of electrical equipment



- The crossed-out wheeled bin symbol on the product, its packaging or in the documentation means that at the end of its service life the product **must not be disposed of together with mixed municipal waste**.
- Hand it over at a take-back point for electrical equipment – at a collection yard, at a take-back point of a collective system, or at the retailer when purchasing a new equivalent product. Take-back is free of charge for the end user.
- The obligations under Act No. 542/2020 Coll., on end-of-life products, are fulfilled by the importer through a collective take-back system.
- Proper disposal helps prevent negative impacts on the environment and human health and contributes to the reuse of secondary raw materials.

Through its contractual partner **ASEKOL a.s.**, the company ensures the take-back of waste electrical equipment from households and the separate collection of waste electrical equipment, batteries and accumulators in accordance with the applicable legislation. The customer is entitled to hand over old electrical equipment or a battery or accumulator at any collection point of the above contractual partner. The addresses of these take-back points are listed at www.asekol.cz, www.ecobat.cz and also https://visoh2.mzp.cz/RegistrMistZO/RegistrMistZOPublic/MapaMistZpetOdberu.

4. Warranty and rights arising from defective performance

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 3.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.