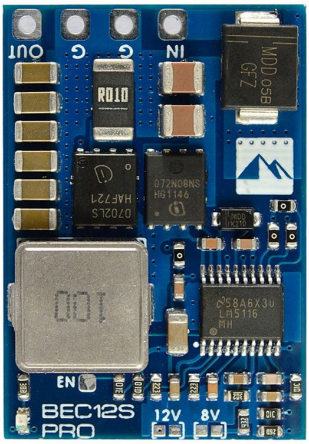
BEC12S-PRO

Matek Systems
Switching voltage regulator (BEC) 9–55 V → 5.2 / 8 / 12 V, 5 A



Read this entire manual before first use. The regulator has no reverse-polarity protection on the input – incorrect wiring will damage it permanently.

www.rotorama.com

Contents

1. Product description

1.1 What it is for

1.2 Specifications and package contents

1.3 Parts overview

2. Safety instructions

3. Use

3.1 Selecting the output voltage

3.2 Wiring

3.3 Check before connecting the load

3.4 Protection features and their limits

4. Troubleshooting

5. Information for the EU and Czech Market

5.1 Importer and responsible person in the EU

5.2 Disposal of electrical equipment

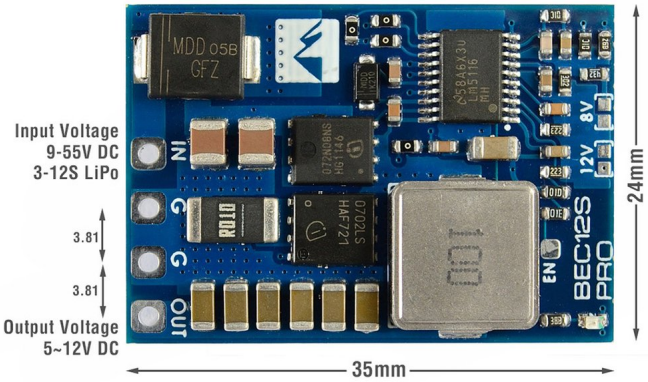
6. Warranty and rights arising from defective performance

1. Product description

1.1 What it is for

The **Matek BEC12S-PRO** is a switching step-down voltage regulator (BEC, *Battery Eliminator Circuit*). From the voltage of a 3S to 12S Li-Po flight battery it produces a regulated voltage for powering on-board electronics – servos, video transmitter (VTX), camera, receiver or other devices that require 5.2 V, 8 V or 12 V.

The output voltage is selected by bridging solder pads on the board (factory setting 5.2 V). The regulator delivers up to 5 A continuously and up to 9 A peak. The input is protected against voltage spikes by a TVS diode, and the regulator has thermal and overcurrent protection. The board is designed to be soldered into a model – it has no connectors and no housing.



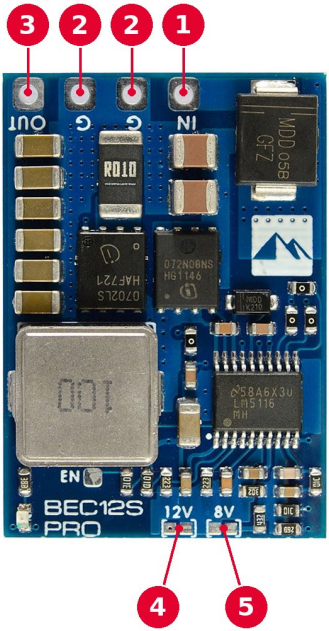
Matek BEC12S-PRO – board dimensions and pin spacing (values in mm).

1.2 Specifications and package contents

Product designation	Matek BEC12S-PRO (printed on the board)
Manufacturer	Matek Systems, www.mateksys.com
Type	synchronous switching step-down (buck) regulator
Input voltage	9–55 V DC (3S–12S Li-Po), TVS diode protection
Output voltage	5.2 V (factory setting), 8 V or 12 V – selected by solder bridge
Output current	5 A continuous, 9 A peak
Efficiency	typically 88–96 %
Output ripple	30 mV (input 50 V, output 5.2 V at 5 A) 60 mV (input 50 V, output 12 V at 5 A)

Standby current	5–10 mA
Dropout voltage	2 V; an input voltage of at least 14 V is required for a stable 12 V output
Protection	thermal shutdown; overcurrent protection with self-recovery; output short-circuit tolerant for 2 s
Reverse-polarity protection	**none**
Pin spacing	3.81 mm
Dimensions, weight	35 × 24 × 5.5 mm, 5 g
Package contents	1× BEC12S-PRO regulator
Not included	wires, connectors, heat-shrink tubing, battery

1.3 Parts overview



① **IN** – power input (+), 9–55 V DC from the flight battery.

② **G** – ground (−). Both G pads are a common ground for input and output.

③ **OUT** – regulated output (+) 5.2 / 8 / 12 V.

④ **12V** – solder jumper for 12 V output.

⑤ **8V** – solder jumper for 8 V output.

※ Both jumpers open = 5.2 V output (factory setting).

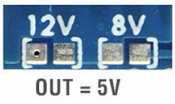
2. Safety instructions

- The regulator has **no reverse-polarity protection on the input**. Before connecting the battery, always check that the positive wire goes to the **IN** pad and the negative wire to **G**. Reversed polarity will destroy the regulator permanently and may damage the connected electronics.
- Do not exceed the input voltage of **55 V**. A fully charged 12S Li-Po battery has 50.4 V (4.20 V/cell), a 12S LiHV battery 52.2 V (4.35 V/cell). Check other power sources (mains adapters, sources with voltage spikes) in advance.
- Solder and change the jumpers **only with the power disconnected** – the battery must be unplugged.
- Before connecting a load, check the output voltage with a multimeter. A 5 V device will be permanently damaged if 8 V or 12 V is set by mistake.
- The bare board must not come into contact with a carbon frame or other conductive parts. After soldering, insulate it with heat-shrink tubing and secure it so that it cannot chafe or move freely.
- The regulator heats up under higher load. Place it where there is airflow and do not cover it with thermally insulating material.
- Do not operate the regulator in damp conditions, in the rain or near flammable materials. Do not continue to use a damaged, short-circuited or overheated board.
- Disconnect the flight battery after use – the regulator draws standby current even without a load, and a permanently connected battery would gradually be deeply discharged.
- This product is not a toy. Keep it out of the reach of children.

3. Use

3.1 Selecting the output voltage

Set the output voltage with a solder bridge across pad pair ④ **12V** or ⑤ **8V**. The manufacturer specifies these three states:



OUT = 5V



OUT = 8V



OUT = 12V

12V jumper	8V jumper	OUT output
open	open	5.2 V (factory)
open	bridged	8 V
bridged	open	12 V

- Bridge **no more than one** pad pair at a time. The manufacturer does not specify any other combination.
- The 12 V output requires an input voltage of at least **14 V**. With a 3S battery (12.6 V when fully charged) a stable 12 V output is therefore not possible.
- In the picture the factory setting is labelled “OUT = 5V”; the nominal output voltage is 5.2 V.

3.2 Wiring

① Disconnect the flight battery and set the output voltage as required (Chapter 3.1).

② Solder the positive wire from the flight battery (e.g. from the power pads of the flight controller (FC) or a power distribution board) to the **IN** pad and the negative wire to one of the **G** pads.

③ Solder the positive supply wire of the load to the **OUT** pad and its ground to the other **G** pad.

④ Choose the wire gauge according to the current drawn (up to 5 A continuous, 9 A peak).

⑤ Check that no solder balls or short circuits remain between neighbouring pads on the board (spacing only 3.81 mm).

⑥ Insulate the board with heat-shrink tubing and secure it.

3.3 Check before connecting the load

① Do not connect the load yet (or unplug its connector).

② Connect the flight battery – ideally through a current limiter (smoke stopper).

③ Measure the voltage between the **OUT** and **G** pads with a multimeter. It must match the selected output of 5.2 V, 8 V or 12 V.

④ Only then disconnect the battery, connect the load and test the complete setup.

3.4 Protection features and their limits

- **TVS diode input protection** suppresses short voltage spikes coming from the battery side. It does not protect against continuous overvoltage or reversed polarity.
- **Overcurrent protection** limits the output in the event of overload; once the cause is removed, the regulator recovers by itself.
- **Thermal shutdown** switches off the output when the regulator overheats. In flight this means a loss of power to the connected electronics – size the regulator with a margin and ensure cooling.
- The regulator tolerates an **output short circuit** for only **2 seconds**. A longer short circuit may damage it.

4. Troubleshooting

Problem	Possible cause and solution
No output voltage	Check the polarity and the joints on the IN and G pads, and the battery voltage (min. 9 V). If the input was reverse-connected, the regulator is destroyed.
12 V output is lower or unstable	The input voltage is below 14 V (e.g. a 3S battery or a discharged 4S battery). Use a battery with more cells.
Output voltage does not match the selection	Check the 12V and 8V jumpers – no more than one may be bridged; the solder bridge must not reach neighbouring components.
The load switches off during operation	Overload or overheating of the regulator – check the current drawn by the connected devices (max. 5 A continuous) and the cooling.
The regulator is very hot	High current draw or a large difference between input and output voltage; ensure airflow and reduce the load.

5. Information for the EU and Czech Market

5.1 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

5.2 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.

6. Warranty and rights arising from defective performance

Rights of the buyer under Czech law

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 5.1.
- 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.