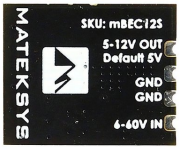
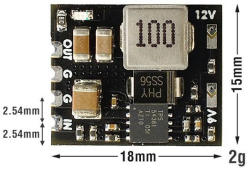
Matek mBEC12S

Micro BEC 6–60 V → 5 / 9 / 12 V
User manual





Read the entire manual before connecting the module. The module has no reverse polarity protection on the input – swapping + and − will destroy it.

Rotorama, s.r.o. · www.rotorama.com · info@rotorama.cz

Contents

1. Product description

1.1 Purpose

1.2 Specifications and package contents

2. Use

2.1 Pin description

2.2 Setting the output voltage

2.3 Wiring

2.4 Load capacity and cooling

3. Safety and troubleshooting

3.1 Safety instructions

3.2 Troubleshooting

3.3 Regulations of the country of use

4. Information for the EU and Czech Market

4.1 Importer and responsible person in the EU

4.2 Disposal of electrical equipment

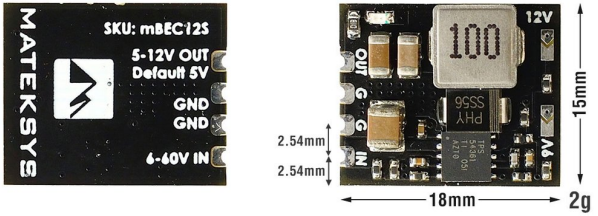
5. Warranty and rights arising from defective performance

1. Product description

1.1 Purpose

The Matek Micro BEC (designation **mBEC12S**) is a miniature switching voltage regulator (step-down DC/DC converter). From an input voltage of 6–60 V, typically the main battery of a drone, aircraft or other model, it produces a regulated **5 V, 9 V or 12 V** supply for electronics – for example a camera, video transmitter (VTX), receiver, LEDs or other accessories that cannot be powered directly from the battery.

The module is soldered directly into the power wiring of the model. As delivered it outputs 5 V; 9 V or 12 V is selected by bridging solder pads on the board. With dimensions of 18 × 15 (16) mm and a weight of 2 g, it fits even into small models.



Matek mBEC12S – bottom side with pin labels (left) and top side with components (right)

1.2 Specifications and package contents

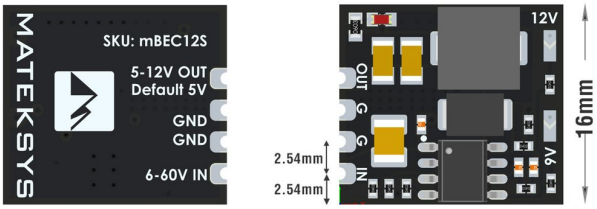
Product designation	Matek Micro BEC 6–60 V to 5 V/9 V/12 V-ADJ, SKU **mBEC12S** (printed on the board)
Input voltage	6–60 V DC
Start-up voltage	≥ 6.7 V
Output voltage	5 V, 9 V or 12 V (selectable by jumper pad), factory setting 5 V
Maximum duty cycle	100 % – if the input voltage is lower than the set value, output voltage = input voltage
Continuous output current	depends on input voltage and heat dissipation – see the table in chapter 2.4
Output ripple	20 mV (5 V), 30 mV (9 V and 12 V)
Standby current	< 5 mA
Protection	overcurrent protection (OCP) with hiccup mode, thermal shutdown, output short-circuit tolerant for 3 s/min
Reverse polarity protection	**none**
Pin pitch	2.54 mm
Dimensions	18 × 15 (16) × 4.5 mm
Weight	2 g
Package contents	1 × mBEC12S module
Not included	connecting wires, connectors, heat-shrink tubing, heat sink

※ Due to a chip shortage, the manufacturer replaced the regulator IC with an SOP-8 package version. The new board version is 1 mm wider (18 × 16 mm); according to the manufacturer the performance is identical. This manual applies to both versions.

2. Use

2.1 Pin description

The connections are solder pads along one edge of the board at a pitch of 2.54 mm. The labels are printed on the bottom side of the board:



Pin description (left: bottom side, right: top side of the new board version)

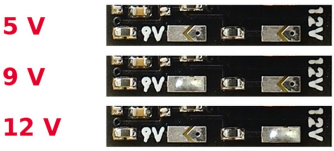
Label on bottom side	Label on top side	Function
5-12V OUT	OUT	regulated voltage output (+), factory setting 5 V
GND	G	ground (−) – common for input and output
GND	G	ground (−) – common for input and output
6-60V IN	IN	power input (+) 6–60 V

2.2 Setting the output voltage

The output voltage is selected by bridging solder pads on the top side of the board (at the edge opposite the connections, marked **9V** and **12V**):

- **5 V** – factory setting, no pad bridged,
- **9 V** – bridge the pad marked **9V** with solder,
- **12 V** – bridge the pad marked **12V** with solder.

Always bridge only one pad as shown in the picture. Set the voltage and check it with a multimeter before connecting the powered device to the output.



Voltage selection pads: 5 V (not bridged), 9 V, 12 V

2.3 Wiring

① Disconnect the battery from the model.

② Set the output voltage if required (chapter 2.2).

③ Solder the **IN** input to the positive supply pole (+) and one of the **G** pads to the negative pole (−). Check the polarity carefully – the module has no reverse polarity protection.

④ Solder the powered device to the **OUT** output (+) and the other **G** pad (−).

⑤ Insulate the module electrically, e.g. with heat-shrink tubing, and mount it so that it cannot touch conductive parts of the model (e.g. a carbon frame).

⑥ Before connecting a load for the first time, connect the battery and measure the output voltage with a multimeter. Only when it matches the setting, connect the powered device.

The converter starts at an input voltage of at least 6.7 V. If the input voltage drops below the set output value, the converter runs at 100 % duty cycle and the output approximately equals the input – with the 12 V setting and a low cell count battery, the output will not reach 12 V.

2.4 Load capacity and cooling

The continuous output current depends on the input voltage and on heat dissipation. The manufacturer states the following values at an ambient temperature of 22 °C without an additional heat sink:

Output	Input 50 V	Input 24 V	Input 16 V	Ripple	Peak
5 V	1.8 A	2.3 A	2.8 A	20 mV	3.5 A, 2 s/min
9 V	1.5 A	2.1 A	2.6 A	30 mV	3 A, 2 s/min
12 V	1.3 A	2 A	2.5 A	30 mV	3 A, 2 s/min

- The “Input” columns show continuous currents. Peak current is allowed for max. 2 seconds per minute.
- The higher the input voltage, the lower the continuous current. At higher ambient temperature or without airflow, expect a lower load capacity.
- When overheated, the thermal protection switches the module off; when overloaded, it enters hiccup mode.

3. Safety and troubleshooting

3.1 Safety instructions

- The module is intended for installation in models and electronics. Soldering experience is required; solder only with the battery disconnected.
- **The module has no reverse polarity protection on the input.** Swapping + and − destroys it immediately and may damage the connected electronics.
- Do not exceed the input voltage of 60 V. A fully charged battery has a higher voltage than its nominal value – Li-Po 4.20 V/cell, LiHV 4.35 V/cell.
- The output tolerates a short circuit for no more than 3 seconds per minute. A permanent short circuit or long-term overload is not permitted.
- Always measure the output voltage before connecting a load. A voltage of 9 V or 12 V can destroy a device designed for 5 V.
- The module heats up under load. Do not place it near flammable materials and ensure heat dissipation.
- Insulate the board electrically so that it cannot touch conductive parts of the model (carbon frame, metal parts).
- Do not leave Li-Po batteries connected unattended. Disconnect the battery when storing the model – the module draws current even at idle (< 5 mA) and could deeply discharge it.
- This product is not a toy. Keep it out of the reach of children.

3.2 Troubleshooting

Problem	Possible cause and solution
No output voltage	Input voltage is lower than 6.7 V; cold or broken solder joint; reversed input polarity (the module is probably destroyed).
Output voltage lower than set	Input voltage is lower than the set value (the converter passes the input voltage through); the module is overloaded.
Output repeatedly switches off and on	Overload or short circuit on the output (hiccup mode); overheating – reduce the load and improve cooling.
Output voltage differs from what is needed	Check the bridging of the 9V / 12V pads (chapter 2.2).

3.3 Regulations of the country of use

Chapters 4 and 5 are based on Czech law, as the product is sold in the Czech Republic. For the operation of the product and of the models in which it is installed, the law of the country of use is decisive.

4. Information for the EU and Czech Market

4.1 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

4.2 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.

5. 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 4.1.
- 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.