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› LM2596 DC-DC Buck Converter Step Down Module User Manual

## NooElec LM2596 Module

# LM2596 DC-DC Buck Converter Step Down Module User Manual

Brand: NooElec

## 1. INTRODUCTION

This user manual provides essential information for the safe and effective operation of the LM2596 DC-DC Buck Converter Step Down Module. Please read this manual thoroughly before use and retain it for future reference.

## 2. PRODUCT OVERVIEW AND FEATURES

The LM2596 DC-DC Buck Converter is a step-down power supply module designed to efficiently convert a higher input voltage to a lower, adjustable output voltage. It is suitable for various electronic projects requiring a stable and regulated power source.

### Key Features:

- **Input Voltage Range:** DC 3V to 40V. Note: Input voltage must be at least 1.5V higher than the desired output voltage.
- **Output Voltage Range:** DC 1.5V to 35V, continuously adjustable.
- **Maximum Output Current:** 3A.
- **High Efficiency:** Designed for efficient power conversion.
- **Quality Components:** Features SANYO solid capacitors, 36u thickening circuit boards, and high-Q inductance.
- **Integrated LED Indicator:** Power indicator LED.
- **Compact Dimensions:** Approximately 45mm (L) x 20mm (W) x 14mm (H) including the potentiometer.



Figure 2.1: Top view of the LM2596 DC-DC Buck Converter module, showing the input/output terminals, potentiometer, inductor, and capacitors.

### 3. SPECIFICATIONS

Parameter	Value
Input Voltage	DC 3V - 40V
Output Voltage	DC 1.5V - 35V (Adjustable)
Output Current (Max)	3A
Conversion Efficiency	Up to 92%
Switching Frequency	150KHz
Operating Temperature	-40°C to +85°C
Dimensions (L x W x H)	45mm x 20mm x 14mm
Weight	Approx. 4.2 ounces (0.12 kg)
Model Number	LM2596 Module
UPC	692011137280

### 4. SETUP AND WIRING

Proper wiring is crucial for the safe and correct operation of the module. Always ensure power is disconnected before making any connections.

## 4.1. Pinout Description:

- **IN+:** Positive input voltage terminal.
- **IN-:** Negative input voltage terminal (Ground).
- **OUT+:** Positive output voltage terminal.
- **OUT-:** Negative output voltage terminal (Ground).

## 4.2. Connection Steps:

1. Identify the IN+ and IN- terminals on the module. Connect your DC power source (e.g., battery, power adapter) to these terminals. Ensure correct polarity: positive to IN+ and negative to IN-.
2. Identify the OUT+ and OUT- terminals. Connect your load (e.g., LED, motor, circuit) to these terminals. Ensure correct polarity.
3. Before applying power, use a multimeter to measure the output voltage. Adjust the blue potentiometer (trimmer) clockwise to increase the output voltage and counter-clockwise to decrease it. **It is highly recommended to adjust the output voltage to the desired level BEFORE connecting your sensitive load.**
4. Once the desired output voltage is set, you can connect your load and apply power.



Figure 4.1: Example of the LM2596 module connected to a power supply and a load, demonstrating input and output wiring.

## 5. OPERATING INSTRUCTIONS

### 5.1. Voltage Adjustment:

The output voltage is adjusted using the onboard multi-turn potentiometer. Use a small screwdriver to turn the potentiometer. Turning it clockwise increases the voltage, and counter-clockwise decreases it.

- Connect the input power source (within 3V-40V DC).
- Measure the output voltage using a multimeter connected to OUT+ and OUT-.
- Carefully turn the potentiometer until the desired output voltage is achieved.
- Once set, the module will maintain this output voltage as long as the input voltage is sufficient and the load current does not exceed 3A.

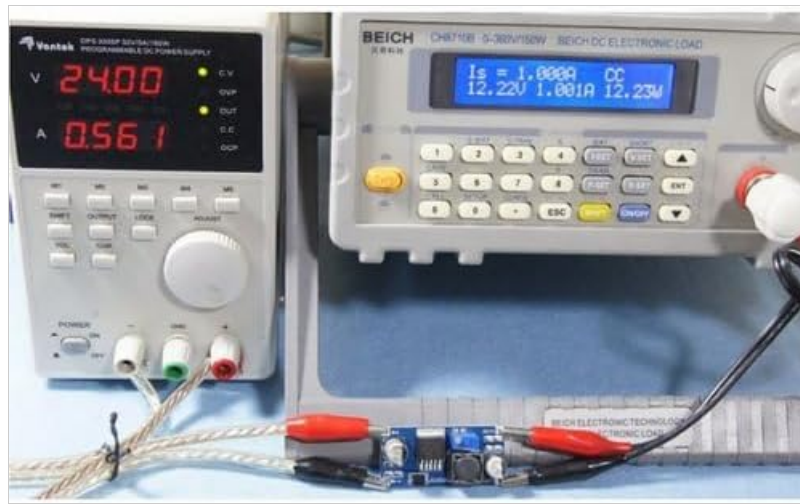


Figure 5.1: The LM2596 module undergoing testing, demonstrating an input voltage of 24.00V and an adjusted output voltage of 12.22V, with current and power readings.

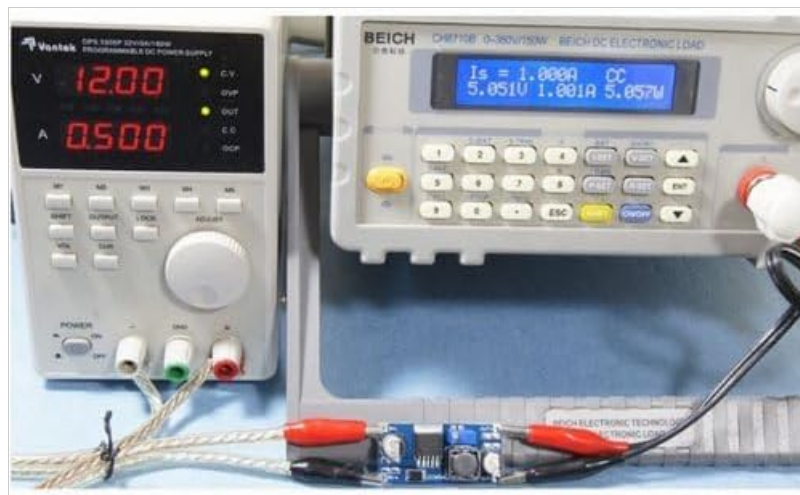


Figure 5.2: The LM2596 module undergoing testing, demonstrating an input voltage of 12.00V and an adjusted output voltage of 5.01V, with current and power readings.

## 5.2. Current Limitations:

The module has a maximum output current of 3A. Exceeding this limit may cause the module to overheat or fail. For continuous operation at higher currents, consider adding a heatsink to the LM2596 IC.

## 6. MAINTENANCE

- Keep the module clean and free from dust and debris.
- Avoid exposing the module to moisture or extreme temperatures.
- Regularly check connections for tightness and ensure no loose wires are present.
- If operating at high loads, monitor the temperature of the LM2596 IC. If it becomes excessively hot, consider improving ventilation or adding a heatsink.

## 7. TROUBLESHOOTING

Problem	Possible Cause	Solution
No output voltage.	No input voltage; incorrect wiring; module failure; potentiometer set to minimum.	Verify input power; check wiring polarity; test module with known good input; adjust potentiometer.
Output voltage is unstable or fluctuating.	Input voltage too low or unstable; load current exceeds maximum; faulty components.	Ensure stable input voltage (at least 1.5V above output); reduce load; inspect module for damage.
Module gets excessively hot.	Load current too high; insufficient ventilation; large voltage difference between input and output.	Reduce load current; ensure proper airflow; consider adding a heatsink to the LM2596 IC.
Output voltage cannot be adjusted.	Faulty potentiometer; module failure.	Ensure potentiometer is not damaged; replace module if necessary.

## 8. SAFETY INFORMATION

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- Always disconnect power before making or changing connections.
- Do not exceed the maximum input voltage (40V DC) or output current (3A).
- Ensure correct polarity when connecting input and output. Reverse polarity can damage the module and connected devices.
- Keep the module away from water, flammable materials, and high temperatures.
- This module is intended for experienced users and hobbyists. If you are unsure about any aspect of its use, seek professional guidance.
- Do not touch the module components when power is applied, as some parts may become hot.

## 9. WARRANTY AND SUPPORT

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NooElec products are designed for reliability and performance. For technical support or inquiries regarding this product, please visit the official NooElec website or contact their customer service. Please refer to your purchase documentation for specific warranty terms and conditions.

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