AZDelivery HW-140 DC-DC Buck Boost Power Converter User Manual

Brand: AZDelivery | Model: HW-140

1. Introduction and Overview

The AZDelivery HW-140 is a versatile DC-DC Buck Boost Power Converter module designed for a wide range of applications. It automatically steps up or steps down voltage, providing a stable output from a variable input. Equipped with an integrated LCD display, it provides real-time monitoring of input voltage, output voltage, output current, and output power. This module features precise voltage and current adjustment capabilities, making it suitable for various electronic projects, power supply applications, and battery charging.

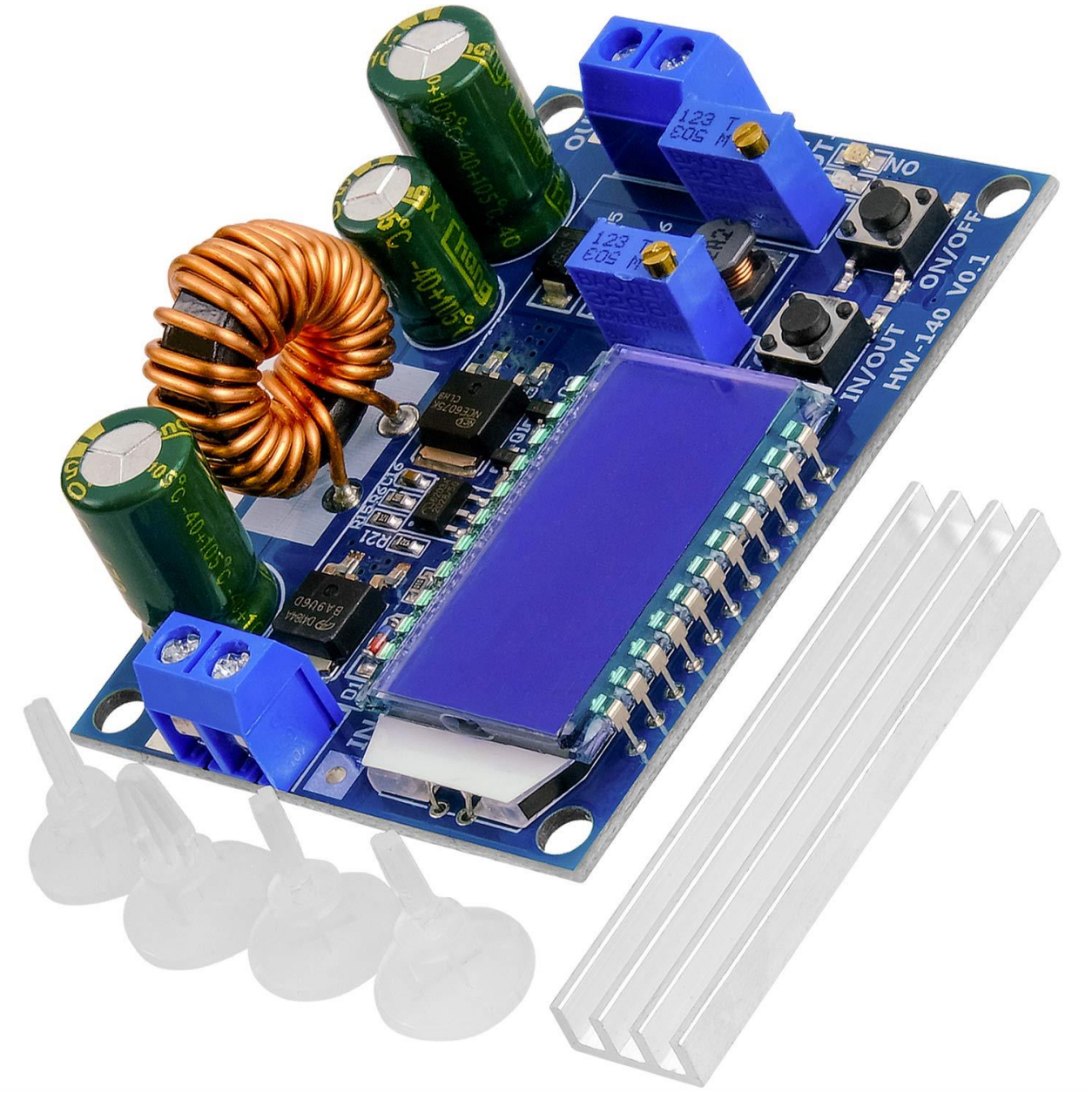


Figure 1: The AZDelivery HW-140 DC-DC Buck Boost Power Converter module with included heat sink and knob caps.

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2. Safety Instructions

Please read and understand these safety instructions before operating the AZDelivery HW-140 module. Failure to follow these instructions may result in electric shock, fire, or damage to the device or connected equipment.

- **Input Voltage:** Ensure the input voltage is within the specified range of 5.5V to 30V. Exceeding this range can damage the module.
- **Output Current:** Do not exceed the maximum output current of 3A. Prolonged operation at or near maximum current without adequate cooling may lead to overheating.
- **Polarity:** Always observe correct polarity when connecting input and output wires. The module includes reverse polarity protection on the input and an anti-backflow diode on the output for enhanced safety.
- **Overload Protection:** The module features overload protection. If the current limit is reached, the "DC" LED will illuminate. Reduce the load or adjust current settings to prevent damage.
- **Environment:** Operate the module in a dry, well-ventilated area. Avoid exposure to moisture, dust, and extreme temperatures.
- **Handling:** Handle the module with care to avoid damaging components, especially the exposed circuitry.
- **Disassembly:** Do not attempt to disassemble or modify the module. Refer to qualified personnel for any repairs.

3. Product Features

The AZDelivery HW-140 module offers a robust set of features for precise power management:

- **Automatic Buck-Boost Operation:** Automatically steps up or steps down the input voltage to maintain the set output voltage, regardless of whether the input is higher or lower than the desired output.
- **Integrated LCD Display:** Provides real-time display of input voltage, output voltage, output current, and output power.

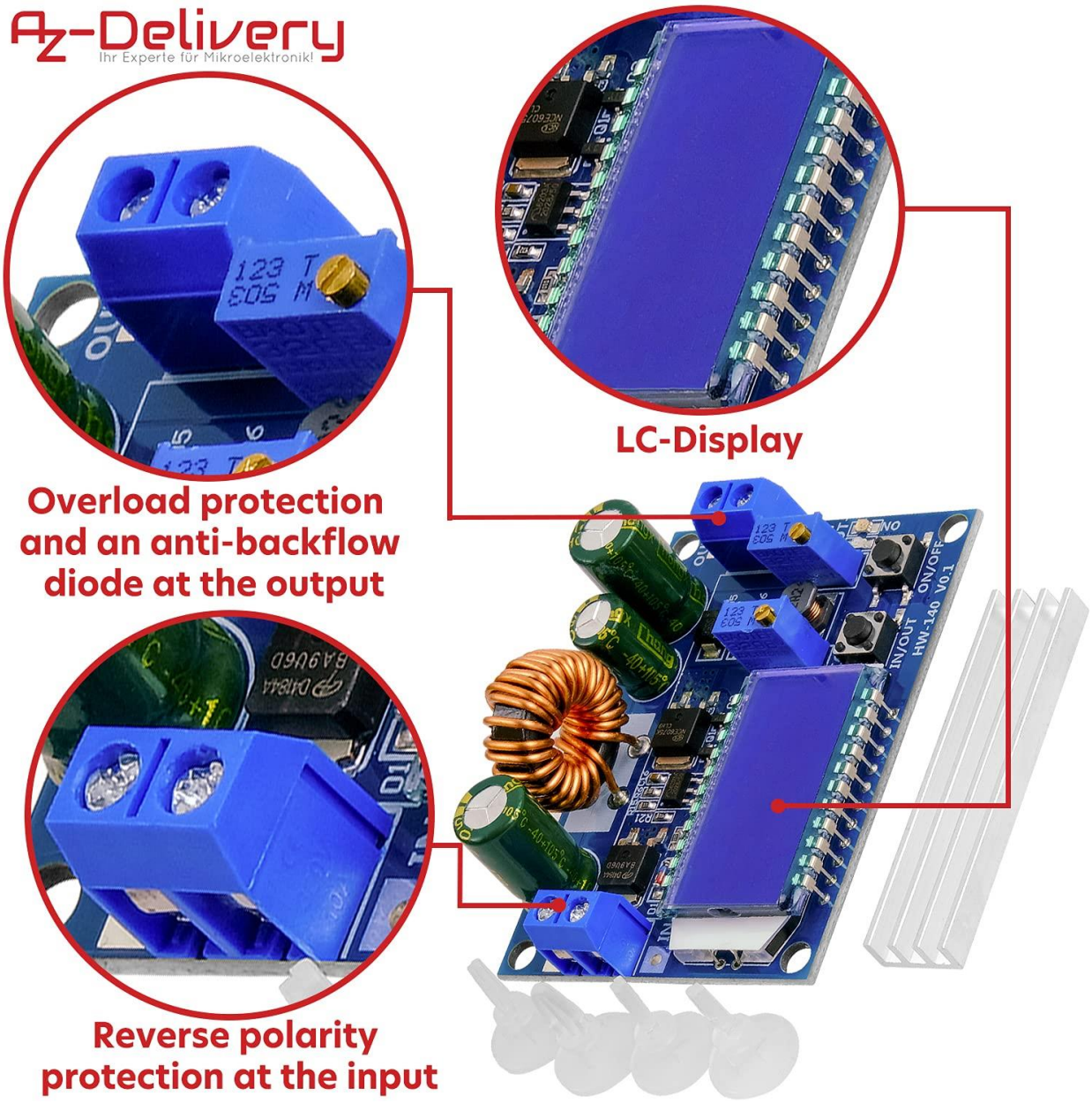


Figure 2: Detailed view highlighting the LCD display, input reverse polarity protection, and output overload/anti-backflow diode protection.

- **Precise Adjustment:** Equipped with multi-turn potentiometers (trimmers) for fine-tuning both output voltage and current limits. Voltage resolution is 0.05V, and current resolution is 0.005A (1mA).
- **Safety Protections:**
    - Input Reverse Polarity Protection.
    - Output Overload Protection (indicated by "DC" LED).

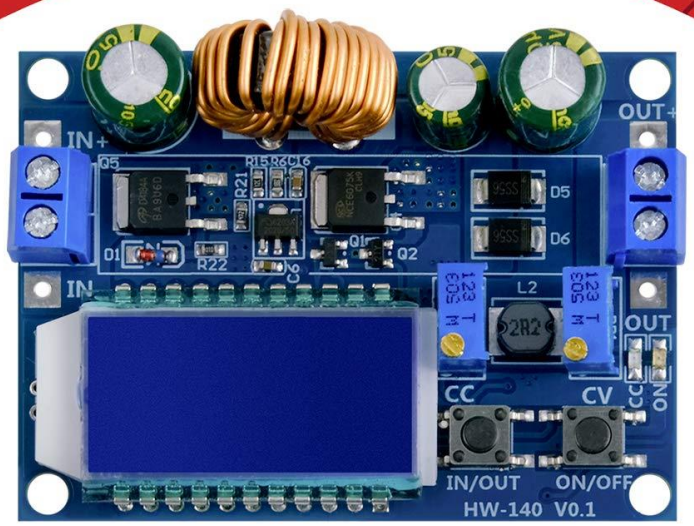
    - Output Anti-Backflow Diode: Prevents current from flowing back into the module, especially useful when charging batteries.
- **Soft Start Function:** When switched on, the output voltage gradually rises to the selected value, preventing sudden power surges to connected devices.
- **Versatile Applications:** Can be used as a general power supply, voltage limiter, battery charger, or high-power LED constant current driver module.

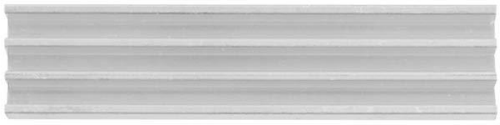
4. Setup and Installation

Follow these steps to set up your HW-140 module:

1. **Identify Terminals:** Locate the "IN+" and "IN-" terminals for input power, and "OUT+" and "OUT-" terminals for output power.
2. **Connect Input Power:** Connect your DC power source (5.5V to 30V) to the "IN+" (positive) and "IN-" (negative) screw terminals. Ensure connections are secure.
3. **Connect Load:** Connect your device or load to the "OUT+" (positive) and "OUT-" (negative) screw terminals.
4. **Install Heat Sink:** For applications requiring higher current or prolonged use, attach the provided heat sink to the main power chip on the module. Ensure good thermal contact.
5. **Attach Knobs (Optional):** Place the provided plastic knob caps onto the potentiometers for easier adjustment.

Front Side







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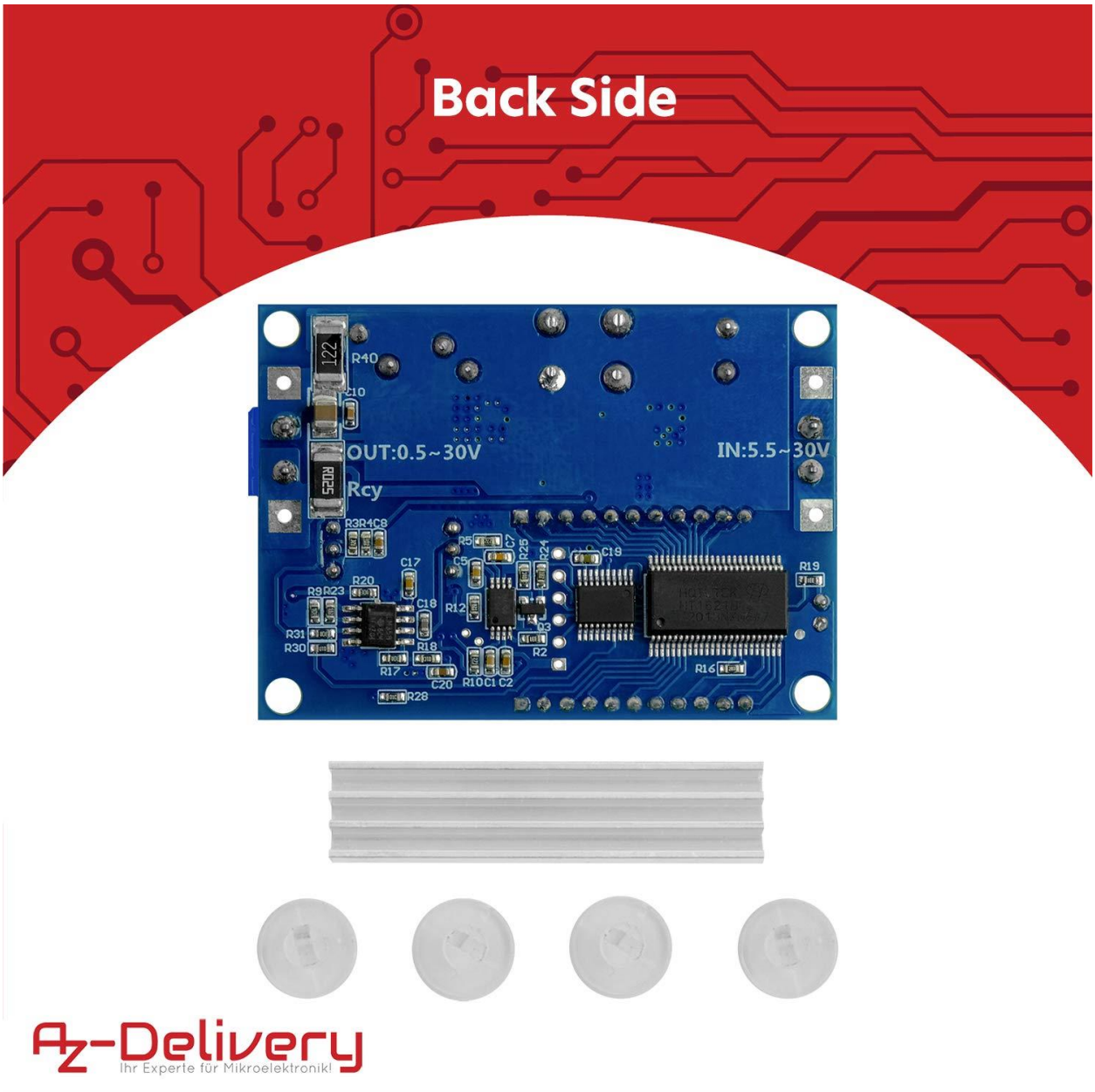


Figure 3: Front and back views of the HW-140 module, illustrating terminal locations and component layout.

For detailed wiring diagrams and project examples, refer to the included E-Book provided by AZDelivery.



Figure 4: The Quick-Start-Guide E-Book, providing additional setup information.

5. Operating Instructions

The HW-140 module is designed for user-friendly operation:

- **Power On/Off:** Once input power is connected, the module will power on. Use the "ON/OFF" button to toggle the output power. When the output is active, the "ON" LED will illuminate.
- **Display Modes:** Press the "IN/OUT" button to cycle through different display modes on the LCD:

    - Input Voltage (V_IN)
    - Output Voltage (V_OUT)
    - Output Current (A_OUT)
    - Output Power (P_OUT)
- **Adjusting Output Voltage:** Use the potentiometer labeled "CV" (Constant Voltage) to adjust the desired output voltage. Turn clockwise to increase voltage, counter-clockwise to decrease.
- **Adjusting Output Current Limit:** Use the potentiometer labeled "CC" (Constant Current) to set the maximum output current. This acts as a current limiter. When the output current reaches this set limit, the "DC" LED will light up, indicating current regulation is active.
- **Soft Start:** Note that upon activation, the output voltage will gradually ramp up to the set value, ensuring a smooth power delivery to your connected load.

6. Maintenance

The AZDelivery HW-140 module requires minimal maintenance. To ensure optimal performance and longevity:

- **Keep Clean:** Periodically clean the module with a soft, dry cloth to remove dust and debris. Do not use liquid cleaners.
- **Environmental Conditions:** Store and operate the module in a clean, dry environment, away from direct sunlight, high humidity, and corrosive substances.
- **Inspect Connections:** Regularly check all input and output wire connections to ensure they are secure and free from corrosion.
- **Thermal Management:** Ensure adequate airflow around the module, especially when operating at higher currents or in enclosed spaces. The included heat sink should be properly installed.

7. Troubleshooting

If you encounter issues with your HW-140 module, consider the following troubleshooting steps:

Problem	Possible Cause	Solution
No display or module not powering on.	No input power, incorrect input polarity, or input voltage outside range.	Verify input power supply is connected and active. Check input voltage (5.5V-30V) and ensure correct polarity.
No output voltage.	Output is switched off, output voltage set too low, or short circuit on output.	Press the "ON/OFF" button to activate output (check "ON" LED). Adjust "CV" potentiometer to increase output voltage. Check for short circuits on the output terminals.
Output current is lower than expected, or "DC" LED is on.	Current limit reached, or load resistance is too high.	Adjust the "CC" potentiometer clockwise to increase the current limit. Ensure the load is not drawing more current than the module's capacity (3A).
Module gets hot during operation.	Operating at high current, insufficient cooling, or high input-output voltage difference.	Ensure the heat sink is properly installed. Provide adequate ventilation. Reduce load current if possible. Consider external cooling if operating continuously at high power.
Inaccurate display readings.	Calibration issue (unlikely for new units) or external interference.	Verify readings with a calibrated multimeter. Ensure stable input power.

8. Specifications

Parameter	Value
Model	HW-140
Input Voltage Range	5.5V - 30V DC

Parameter	Value
Output Voltage Range	0.5V - 30V DC
Maximum Output Current	3 Amps
Voltage Display Resolution	0.05V
Current Display Resolution	0.005A (1mA)
Minimum Frequency	50 Hz
Maximum Frequency	180 KHz
Dimensions (L x W x H)	2.2 x 0.66 x 2.2 cm
Weight	50 g
Certifications	CE, UL, RoHS
Power Source	DC power supply

9. Warranty and Support

AZDelivery is committed to providing high-quality products and excellent customer support. While specific warranty details are not provided in this manual, AZDelivery typically offers support through various channels.

For further assistance, application examples, full installation guides, and access to e-books and libraries, please visit the official AZDelivery website or their Amazon store:

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AZDelivery also maintains an active community and provides regular blog entries with exciting projects to help you make the most of your microelectronics.