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Comimark WCS1800

Comimark WCS1800 Hall Current Detection Sensor Module

User Manual

Brand: Comimark | Model: WCS1800

1. Introduction

The Comimark WCS1800 Hall Current Detection Sensor Module is designed for precise current measurement and overcurrent detection in DC and AC circuits. It provides both an analog voltage signal output, suitable for Analog-to-Digital Converter (ADC) integration, and a TTL level on-off signal output for microcontroller (MCU) IO port control. This module features an overcurrent indicator lamp for visual feedback.

2. Key Features

- **Dual Output Functionality:** Provides both an analog signal output (via power amplifier for A/D conversion) and an on-off signal output.
- **Adjustable Overcurrent Limit:** Users can preset a limit current value. When the actual current exceeds this preset value, the on-off signal transitions from low to high level.
- **Visual Overcurrent Indication:** Equipped with an LED indicator lamp that illuminates upon overcurrent detection.
- **Wide Current Detection Range:** Supports DC +/-35A and AC 25A (for analog output).
- **Simple Interface:** Clearly defined VCC, DOUT, GND, and AOUT pins for easy integration.

3. Setup and Connection

Proper connection of the WCS1800 module is crucial for accurate operation. Refer to the interface definition and diagrams below for guidance.

3.1 Interface Definition

- **VCC:** Power positive input (DC 5V).
- **DOUT:** TTL high/low level signal output (on-off value output). Connects to MCU IO port.
- **GND:** Power negative (ground).

- **AOUT:** Sampling current signal conversion voltage output port (analog output). Connects to ADC.

3.2 Module Overview

The image below shows the top view of the WCS1800 module, highlighting key components and pin headers.

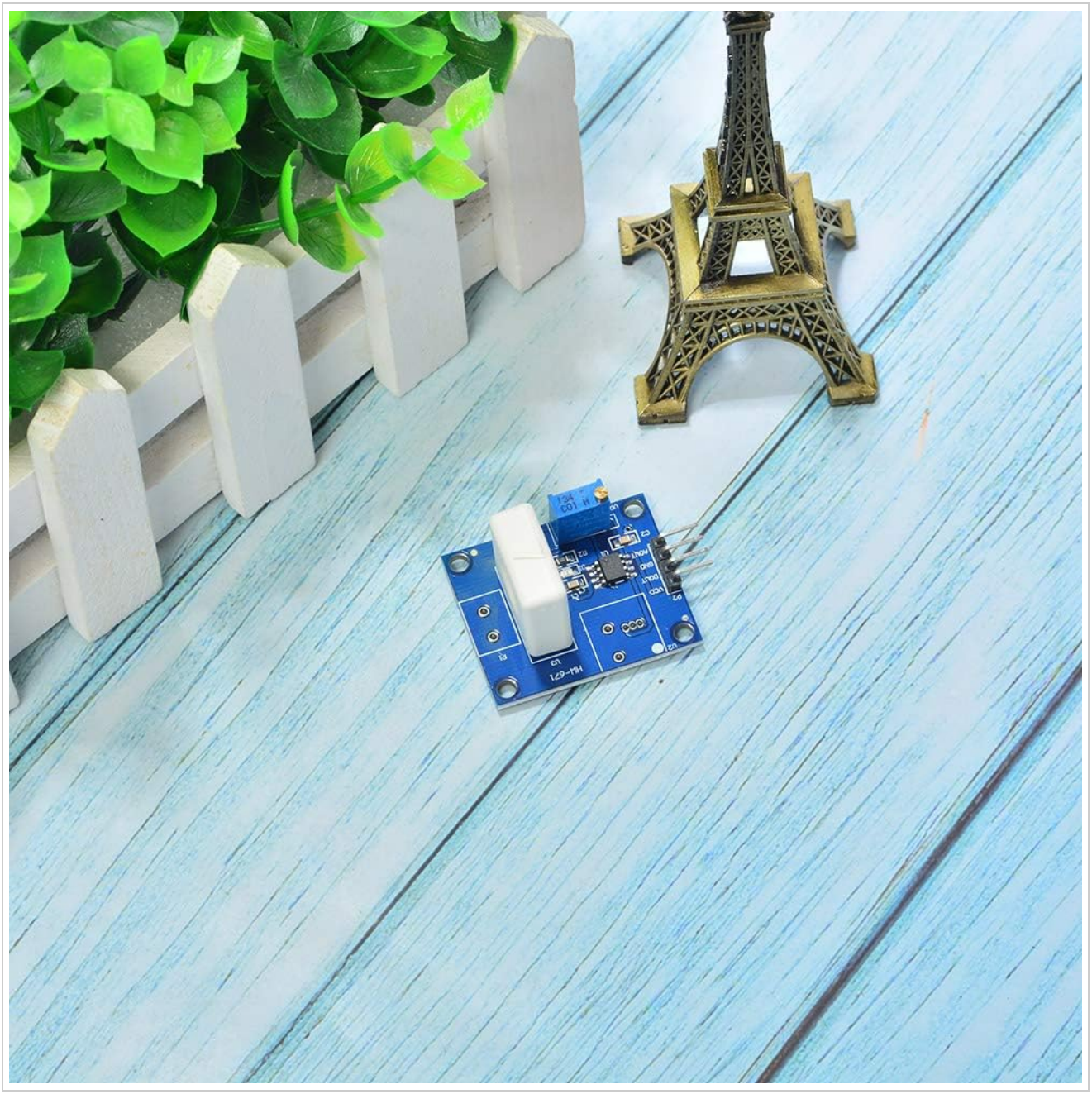


Figure 1: Top view of the WCS1800 module, showing the Hall sensor, potentiometer, and pin headers.

This image provides a closer look at the Hall sensor and the adjustable potentiometer, which is used to set the overcurrent limit.

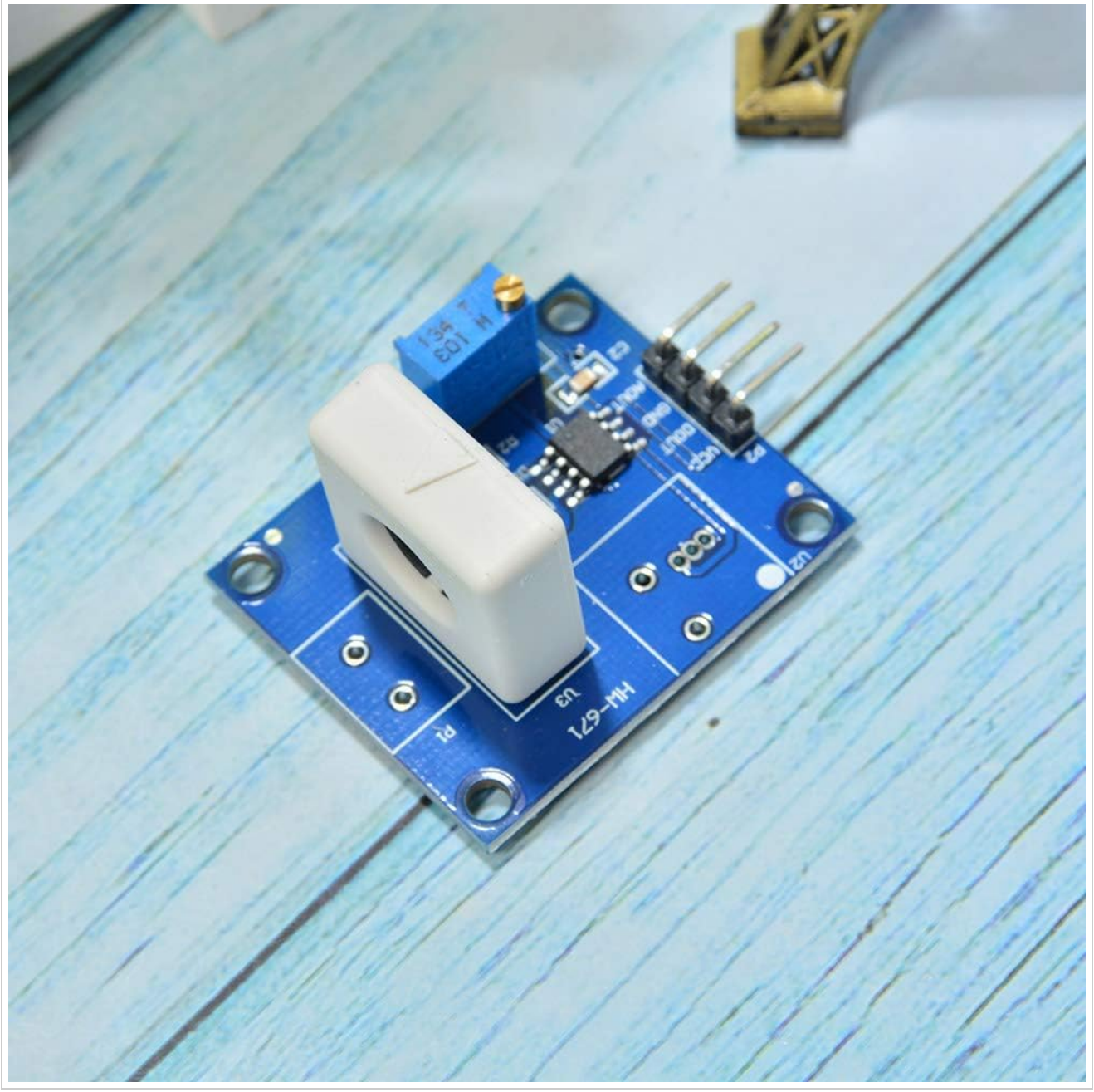


Figure 2: Angled view of the WCS1800 module, highlighting the Hall sensor and adjustment potentiometer.

The bottom view of the PCB shows the solder points and traces, which can be useful for advanced users or troubleshooting.

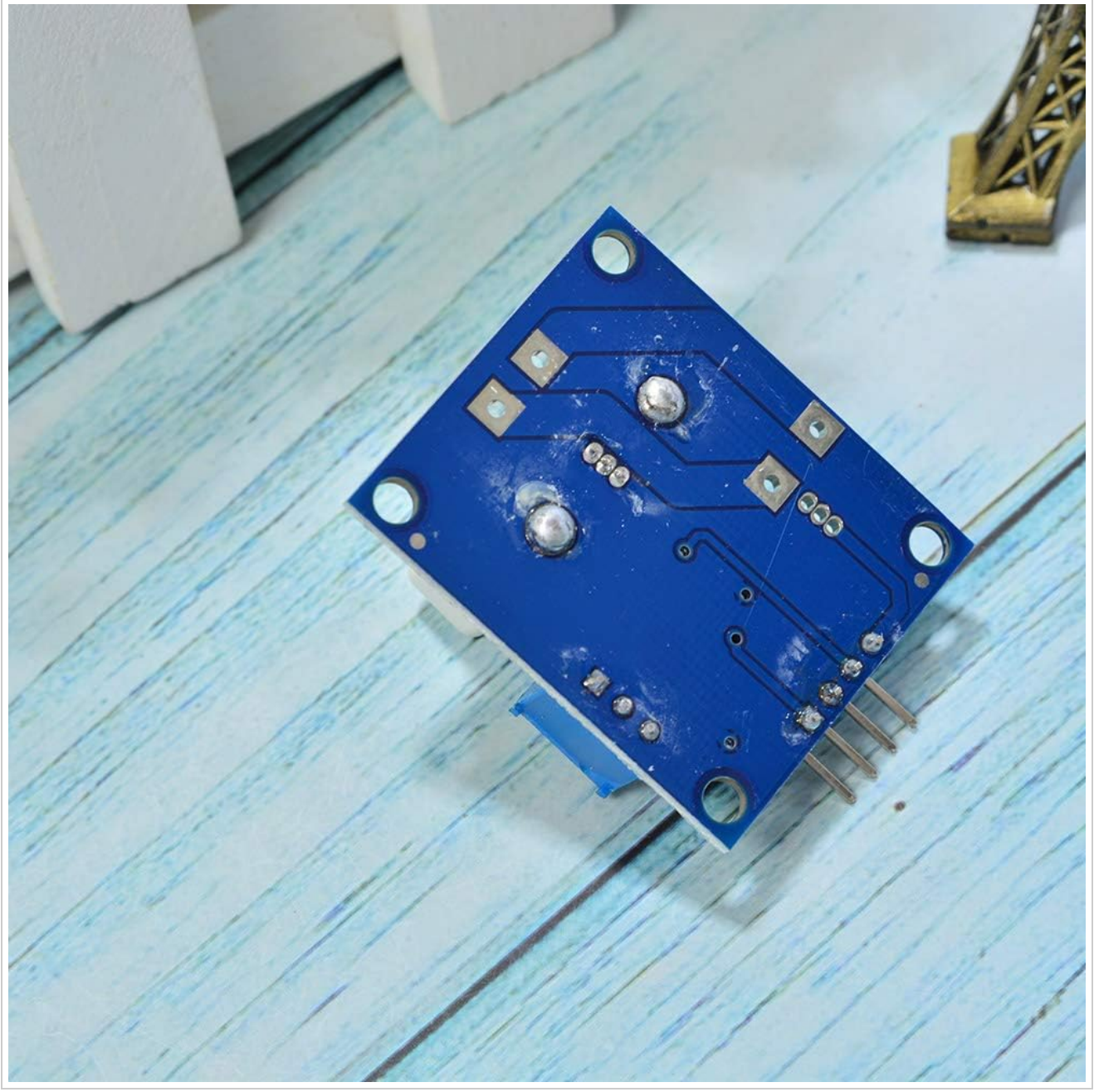


Figure 3: Bottom view of the WCS1800 module's PCB, showing solder points and traces.

4. Operating Instructions

4.1 Analog Voltage Signal Output (AOUT)

The AOUT pin provides an analog voltage signal proportional to the detected current. The relationship between the detection current (Ia) and the analog signal output (V0) is given by the formula:

$$V0 = Vcc * 0.5 + Ia * K$$

Where:

- **V0:** Analog output voltage.
- **Vcc:** Operating voltage (DC 5V).
- **Ia:** Actual current flowing through the current detection pin.
- **K:** Linearity of the sensor (60mV/A for WCS1800).

Example Calculations (Vcc = 5V, K = 60mV/A):

- **Current flows from positive direction (e.g., Ia = 1A):**
  V0 = (5V * 0.5) + (1A * 0.06V/A) = 2.5V + 0.06V = **2.56V**
- **Current flows from negative direction (e.g., Ia = -1A):**
  V0 = (5V * 0.5) - (1A * 0.06V/A) = 2.5V - 0.06V = **2.44V**
- **AC Signal (e.g., Ia = 1A peak):**
  The output voltage will fluctuate between **2.44V and 2.56V**.

Note: These are ideal values. Minor precision errors may occur in practical applications.

4.2 On-Off Value Output (DOUT)

The DOUT pin provides a digital signal indicating overcurrent conditions. Users can adjust the limit current value using the onboard potentiometer. When the actual current exceeds this preset limit:

- The DOUT signal will transition from a low TTL level to a high TTL level.
- The onboard LED indicator lamp will illuminate, providing visual confirmation of the overcurrent event.

This feature is useful for triggering alarms, protection circuits, or control actions in embedded systems.

5. Specifications

Parameter	Value
Operating Voltage	DC 5V
Current Detection Range (Analog Output)	DC +/-35A; AC 25A
Linearity (K)	60mV/A
Limit Current Range (On-Off Output)	0.5A - 35A (Adjustable)
Output Signals	Analog Voltage (AOUT), TTL Level (DOUT)
Indicator	Overcurrent Signal Lamp
Board Size	37mm x 31mm
Item Model Number	LY515
Package Dimensions	5.75 x 3.86 x 0.94 inches
Item Weight	0.493 ounces

6. Troubleshooting

If the module does not function as expected, consider the following troubleshooting steps:

- **Power Supply:** Ensure the module is receiving a stable DC 5V power supply. Incorrect voltage can lead to malfunction.
- **Connections:** Verify all connections (VCC, GND, AOUT, DOUT, and current path) are secure and correctly wired according to the interface definition.
- **Solder Bridges:** Inspect the PCB for any manufacturing defects such as solder bridges, especially around the Hall sensor pins. A solder bridge can short circuit components and prevent proper operation. If found, carefully remove the excess solder.

- **Potentiometer Adjustment:** For the on-off output, ensure the overcurrent limit potentiometer is adjusted correctly. If the limit is set too high or too low, the DOUT signal or LED may not behave as expected.
- **Current Direction:** For analog output, remember that the output voltage shifts based on the direction of current flow. Ensure your interpretation of the AOUT signal accounts for this.

7. Maintenance

The Comimark WCS1800 module is designed for reliable operation with minimal maintenance. Follow these general guidelines:

- **Cleanliness:** Keep the module free from dust, dirt, and moisture. Use a soft, dry brush or compressed air for cleaning if necessary.
- **Environmental Conditions:** Operate the module within its specified environmental conditions (temperature, humidity) to ensure longevity.
- **Physical Inspection:** Periodically inspect the module for any signs of physical damage, loose connections, or component discoloration.
- **Storage:** When not in use, store the module in an anti-static bag in a dry, cool environment.

8. Warranty and Support

For any issues or inquiries regarding the Comimark WCS1800 Hall Current Detection Sensor Module, please contact your retailer or the manufacturer directly. Refer to your purchase documentation for specific warranty terms and support contact information.

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