

# LamaPLC: Allegro ACS758 Hall-effect linear current sensors

The provided part numbers refer to specific models within the **Allegro ACS758 series** of Hall-effect linear current sensor integrated circuits (ICs), which primarily differ in their current-sensing range, sensitivity, and operating temperature range.



| Part Number                       | Current Range | Sensitivity (Typ.) | Operating Temp. Range |
|-----------------------------------|---------------|--------------------|-----------------------|
| <b>ACS758LCB-050B (CJMCU-758)</b> | ±50 Amps      | 40 mV/A            | -40 to 150 °C         |
| <b>ACS758LCB-100B</b>             | ±100 Amps     | 20 mV/A            | -40 to 150 °C         |
| <b>ACS758KCB-150B</b>             | ±150 Amps     | 13.3 mV/A          | -40 to 125 °C         |
| <b>ACS758ECB-200B</b>             | ±200 Amps     | 10 mV/A            | -40 to 85 °C          |

- **Supply Voltage:** 3.0 to 5.5 V.
- **Internal Conductor Resistance:** Ultra-low 100  $\mu\Omega$ , providing minimal power loss.
- **Bandwidth:** Typically 120 kHz.
- **Zero Current Output:** For these bidirectional (“B”) models with a 5V VCC, the output voltage is typically VCC/2 (2.5V) when no current is flowing.

## CJMCU-758 Pinout

### Low power



- **VCC:** Power supply input (3.0V to 5.5V).
- **GND:** Ground connection.
- **OU1:** Direct analog signal from the sensor.
- **OU2:** Buffered signal through an onboard op-amp (often a Texas Instruments LM358 or similar) to reduce noise and drive longer cables.

### Power path

- **IP+:** Current input.
- **IP-:** Current output.

**Directionality:** For bidirectional (“B”) models, current can flow in either direction. For unidirectional

("U") models, current must flow from IP+ to IP- for a positive voltage increase.



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## Arduino code

This code reads a bidirectional sensor (such as the models you listed) and computes the DC current. It assumes a 5V Arduino and that the sensor is powered by 5V.

Select the *mVperAmp* value based on your specific ACS758 model:

- 050B: 40 mV/A
- 100B: 20 mV/A
- 150B: 13.3 mV/A
- 200B: 10 mV/A

```
const int sensorPin = A0;           // Pin connected to CJMCU-758 OUT
int mVperAmp = 40;                  // Change to 20, 13.3, or 10 based on model
int ACSoffset = 2500;              // 2.5V (VCC/2) is the 0A midpoint for
bidirectional sensors

void setup() {
  Serial.begin(9600);
}

void loop() {
  // 1. Read raw ADC value (0-1023)
  int rawValue = analogRead(sensorPin);

  // 2. Convert raw value to voltage in mV
  // 5000mV / 1024 ADC steps = 4.88mV per step
  double voltage = (rawValue / 1023.0) * 5000;

  // 3. Subtract offset and divide by sensitivity to get Amps
  double current = (voltage - ACSoffset) / mVperAmp;

  Serial.print("Raw: "); Serial.print(rawValue);
  Serial.print(" | Voltage(mV): "); Serial.print(voltage);
  Serial.print(" | Current(A): "); Serial.println(current, 2);

  delay(500);
}
```

}

## Key Considerations

- **Calibration:** The quiescent offset (voltage at 0 Amps) is theoretically 2500 mV but often varies slightly due to power supply noise or stray magnetic fields. Measure the voltage at 0 A, and update the ACSoffset in your code for improved accuracy.
- **3.3V Microcontrollers:** If using an ESP32 or Arduino Due, you must use a voltage divider on the output to drop it below 3.3V, or use a 3.3V reference in your calculations (the sensitivity will also be lower).
- **Averaging:** To reduce jitter, take 10-100 samples in your loop and compute the mean.

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