

Failure Mode	Possible Causes	Effect	Mitigation/Action			
No output from HX711	Incorrect wiring between HX711 and Load Cell	No data from load cell	Double-check the connections to ensure the load cell's wires (Red, Black, White, Green) are correctly connected to the HX711 pins (E+, E-, A-, A+).			
	HX711 not powered or misconnected	HX711 not operational	Ensure that the HX711 is connected to the power and ground rails (5V and GND) correctly. Confirm the microcontroller is powered and supplying the correct voltage.			
	HX711 initialization failure in code	Arduino doesn't read the load cell	Check that the scale.begin() function in the code is called properly and verify the pin assignments for LOADCELL_DOUT_PIN and LOADCELL_SCK_PIN.			
	Load cell damaged or defective	No readings	Test the load cell on a different system or try replacing the load cell to see if readings are outputted.			
No RPM signal detected (Interrupt Pin)	Incorrect load cell calibration	Wrong data output	Adjust the MULTIPLIER value in the code according to the specific calibration for your load cell. Use a known weight to calibrate it.			
	Incorrect wiring of the RPM signal pin	No RPM count or timing data	Verify the wiring of the interrupt signal (Pin 2 on the Arduino) from the RPM sensor. Ensure the sensor is outputting a pulse.			
	Interrupt pin not configured correctly	Arduino does not react to RPM signal	Ensure the attachInterrupt() function is used correctly and the pin mode is set as INPUT_PULLUP for the interrupt pin. Check if the interrupt is enabled in code.			
No current data from ACS712	Debouncing issue (frequent false interrupts)	Inaccurate RPM readings	Ensure the debounce logic in the interrupt service routine (ISR) is implemented correctly. Check the debounce delay (debounceDelay) for appropriate timing.			
	Incorrect analog pin connection	No current readings	Check the connection of the ACS712 output pin to the correct analog pin (A0) on the Arduino. Verify the analogRead() function is correctly reading the data.			
	Incorrect power supply to ACS712	ACS712 not operational	Verify that the ACS712 is correctly powered (5V) and ground is connected to the Arduino.			
	Faulty ACS712 sensor	No current data	Replace the ACS712 sensor with a known working one to verify the sensor is functioning.			
Arduino code not running correctly	Incorrect calibration of ACS712	Wrong current reading	Double-check the offset and sensitivity values in the code. Adjust ACS712_OFFSET and ACS712_SENSITIVITY according to your specific sensor and setup.			
	Incorrect pin assignments in code	Data from sensors not read or output	Verify that the pin assignments in the code match the actual hardware wiring. Ensure all pins are declared correctly in the setup() function.			
	Incorrect serial communication setup	Data not output to Serial Monitor	Check that Serial.begin(115200); is initialized in the setup() function. Confirm that the Serial Monitor baud rate is set to 115200.			
	Missing or incorrect data processing functions	No output in serial monitor	Ensure functions like getLsrData() or readSensors() are being called within the main loop, and check that each sensor's data is being processed and printed.			
	Unstable or blocking code (infinite loops, delays)	Arduino unable to process other tasks	Avoid using delay() in your main loop, use millis() for non-blocking timing. Review your code for infinite loops or blocking calls that might halt data collection.			