Sensor Box Project – QA/QC Checklist

Mechanical, Electrical, and Assembly Quality Assurance

Box Number: _____   **Operator:** _____   **Date:** _____

Mechanical Assembly Checklist

- ▫ 4 screws, 4 spring washers, 4 nuts for solar panel mount
- ▫ 3 plastic washers (top) and 3 plastic screws (back) for solar panel mount
- ▫ 4 spacers for back screws
- ▫ 4 allen bolts with Loctite for cross members
- ▫ 4 screws with Loctite for cross members
- ▫ 6 isolating washers for PCB standoffs
- ▫ 3 screws for PCB standoffs (below mesh)
- ▫ 3 screws for PCB standoffs (above mesh)
- ▫ 2 screws and 2 bolts for sound sensor
- ▫ 4 isolating washers for sound sensor
- ▫ 2 screws on mesh plate for sound sensor
- ▫ 2 nuts behind mesh plate for sound sensor
- ▫ 1 zip tie for temperature sensor cable management
- ▫ 1 zip tie for sound sensor and solar panel USB cable management
- ▫ Tape the cellular module antenna
- ▫ Check silicone in gland
- ▫ Apply glue to mesh inside box
- ▫ Perform shake test
- ▫ Perform gasket uniformity test for gland
- ▫ Silicone check for solar panel charging wire

1. Soldering and Continuity Checks

☐ Sockets in correct orientation; continuity verified

☐ Passive components soldered (resistors, capacitors, MOSFETs)

☐ Check alignment and seating of components

☐ RTC and SD card module orientation match PCB markings

☐ Connectors/screw terminals firmly mounted

☐ Female receivers soldered and tested

☐ Active components (MCU extit[Microcontroller Unit], sensors) soldered correctly

☐ Plug in components only after full soldering

2. PCB Assembly Inspection

☐ Solder joints clean, properly wetted, and bridge-free

☐ No excess solder, missing pads, or lifted traces

☐ Power and ground connections have no shorts

3. Module Mounting and Cable Connections

☐ LTE, Arduino, RTC, and SD module mounted and oriented properly

☐ Power, sound, and temperature cables firmly connected; no excess exposed wire

4. Functional Testing

☐ RTC shows correct date/time

☐ Temp/sound sensors return expected values

☐ Stable system operation (no resets)

☐ Data uploads to cloud continuously for 30+ minutes

5. Final Verification and Stability

☐ All modules initialize without errors

☐ Light mechanical stress confirms connections

☐ No overheating during normal operation

☐ Document all test results; resolve issues before deployment

Common Mistakes to Watch For

☐ Incorrect SD card module orientation

☐ Incorrect RTC module orientation

☐ RTC battery missing or improperly seated

☐ SD card greater than 32 GB or improperly inserted

☐ SCL/SDA pin soldering incomplete on Arduino Pro Mini

☐   Missing or poor solder joints on Arduino Pro Mini

☐   Resistor or MOSFET misorientation

☐   Loose, misaligned, or unconnected wiring/components

☐   Cellular antenna not taped or poorly positioned