An Injection Moulded Case for AudioMoth Dev

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The AudioMoth Dev Case is a waterproof injection moulded enclosure for AudioMoth Dev (Figure 1) that supports full hardware configuration flexibility, with integrated mounts and slots that enable the use of external microphones, GPS, large batteries and custom auxiliary boards. The case is designed to be easy to deploy, with two clasps that compress a replaceable o-ring seal. It is robust enough to endure extended deployments in remote locations, made from tough polycarbonate with a moulded rain shield and waterproof acoustic vent to help protect the internal microphone. At the front of the case is a rectangular label area measuring 62.5 x 29.5 mm. The underside of the case has an M16 cap that can be interchanged to fit external cable glands for external plug-in-powered (PIP) microphones or hydrophones.

Items included with the AudioMoth Dev Case:

1	AudioMoth Dev Case Lid and Base
2	Velcro strap for deployment (Installed)
1	D-cell battery holder with cable (Installed)
1	Velcro strap for batteries (Installed)
1	GAW334 acoustic vent (Installed)
2	GAW334 acoustic vent (Spare)
1	O-ring seal (Installed)
1	Spare o-ring seal (Spare)
1	M16 cable gland cap (Installed)
2	Clasp (Installed)

Figure 1: *AudioMoth Dev Case (Front).*

Figure 2: *AudioMoth Dev Case (Back).*

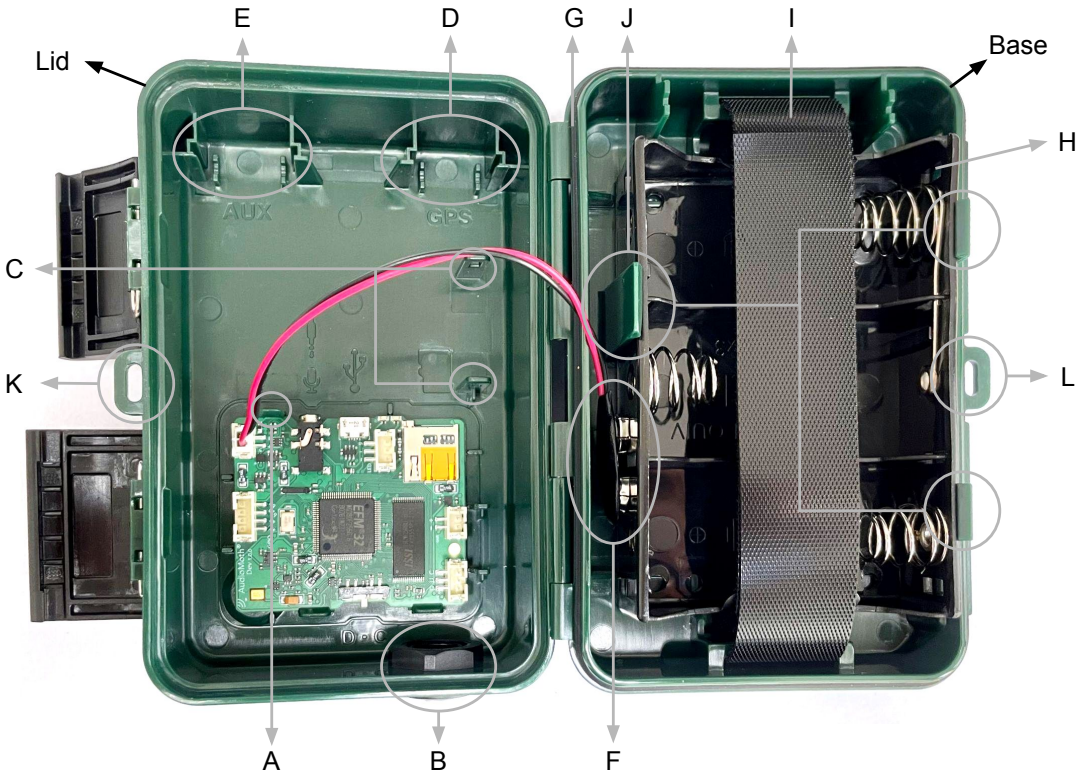

Figure 3: *Inside an AudioMoth Dev Case Lid and Base with an AudioMoth Dev installed and connected to the D-cell battery holder. (A) Flexible clip to attach or detach the AudioMoth Dev to the lid, (B) M16 cable gland cap, (C) wiring cable-tie points, (D) slot for the AudioMoth GPS Board, (E) slot for a custom auxiliary board, (F) clip-connector to JST-PH cable assembly, (G) o-ring seal, (H) D-cell battery holder, (I) battery strap, (J) flexible mounting clips for the D-cell battery holder, (K) lid lock eyelet and (L) base lock eyelet.*

At the back of the case are two velcro straps that allow for secure attachment in the field (see Figure 2). In between the clasps sits a lock eyelet, designed to deter device tampering. The case measures 100 x 140 x 65 mm and weighs 340 g without batteries.

Hardware configurations

There are a number of ways the AudioMoth Dev Case can be physically configured. These include basic configurations using AudioMoth Dev only, to more complex hardware configurations, such as the integration of alternate batteries, external audio sensors, GPS or custom auxiliary boards to extend functionality.

1. AudioMoth Dev

AudioMoth Dev can be installed simply by pushing the board down, by the JST-PH headers, onto the outlined location marked inside the lid. Care must be taken to correctly align the board (see Figure 3) so that it is appropriately orientated and sitting between the mounting points. To ease installation, the flexible clip (Figure 3, A) can be gentle prised upwards with the thumb. When secured, AudioMoth Dev can be transported to the deployment site inside the case.

To give AudioMoth Dev power the JST-PH connector on the D-cell battery cable assembly (Figure 3, F) must be firmly pushed into the two-pin JST-PH header on the top left of the board. For full guidance on connecting power to AudioMoth Dev consult the AudioMoth Dev datasheet[1].

To configure AudioMoth Dev by USB, it should be completely removed from the case to avoid putting the USB connector under unnecessary strain and causing damage. To remove the board, gently push the flexible clip (Figure 3, A) until the board is clear of it and pivot upwards from the bottom edge. The battery connection can remain installed during configuration. For detailed instructions on configuring AudioMoth Dev, consult the AudioMoth Operation Manual[2].

[1] https://github.com/OpenAcousticDevices/Datasheets/blob/main/AudioMoth_Dev_1_0_1_Datasheet/AudioMoth_Dev_1_0_1_Datasheet.pdf

[2] https://github.com/OpenAcousticDevices/Application-Notes/blob/master/AudioMoth_Operation_Manual.pdf

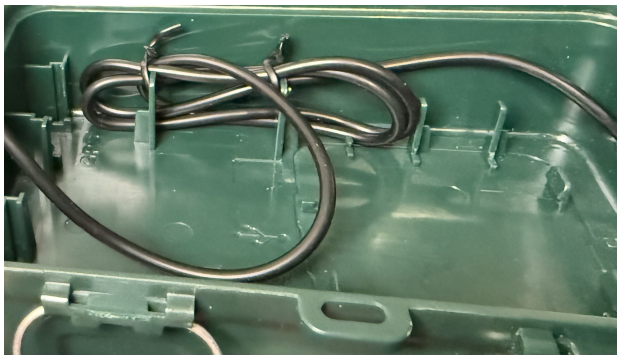

Figure 4: *An example of how the cable-tie points can be used.*

2. External sensors

The M16 cable gland cap (Figure 3, B) can be replaced with any off-the-shelf M16 cable gland to allow wired external sensors, such as an electret condenser microphone or plug-in-powered hydrophone, to pass outside while remaining watertight. Sensor wiring can be stored using the cable-tie points (Figure 3, C). An example of use can be seen in Figure 4.

3. AudioMoth GPS Board

Inside the lid, located on the top right, there is a slot designated for the AudioMoth GPS Board (Figure 3, D). The GPS board slides into position within the grooves and should be orientated with the magnetic reed switch pointing down towards the inside surface of the lid (Figure 5). It is recommended to attach the AudioMoth GPS Board JST-PH cables before inserting the board into the slot. For detailed instructions on using the AudioMoth GPS Board, consult the AudioMoth GPS application note[3]. Note that the AudioMoth GPS Hat hardware variant is not compatible with AudioMoth Dev.

4. Auxiliary Boards

Inside the lid, located on the top left, there is a slot designated for custom auxiliary boards (Figure 3, E). This space is intended for user-made expansion boards measuring 24 x 26 mm, with a thickness of 1.6 mm (Figure 5). Some examples of expansion board usage could include audio filtering, microphone amplification, additional non-audio sensors, buzzers or wireless communication.

5. Batteries

The D-cell battery holder is located in the base of the case and is held down by three clips (Figure 3, J). To prevent the individual batteries falling out during operation, the velcro strap (Figure 3, I) should be tightly secured. To remove the battery holder, clips (J) should be prised apart and the entire black battery holder unit taken out. User-defined alternative batteries must fit within a 106.6 x 70.96 x 28.10 mm spacing. For further guidance on input power specifications, consult the AudioMoth Dev datasheet[4].

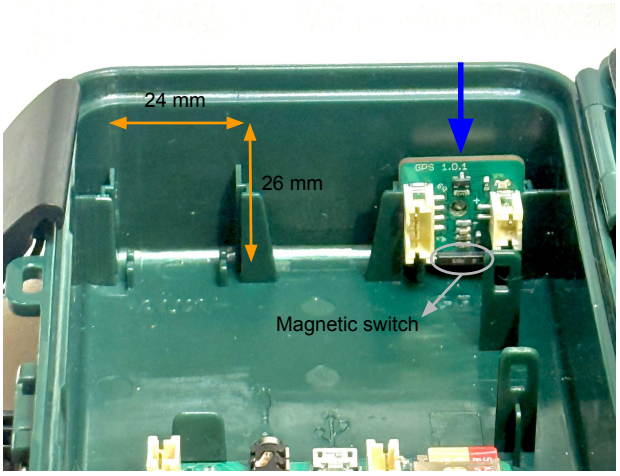

Figure 5: *Auxiliary board dimensions (left) and AudioMoth GPS Board orientation (right).*

Waterproof Rating

The AudioMoth Dev Case has been fitted with a Gore GAW334 acoustic vent with a 9.5 mm outer diameter and 5.0 mm inner diameter[5]. The vents are tested by the manufacturer for waterproofness to the IP68 standard. Similarly, we have tested the case with acoustic vent (and AudioMoth Dev) for waterproofness to 1 m for 30 minutes, in accordance with the IPX7 standard. The acoustic vents should be checked for damage before each deployment, this can be achieved by holding an open case lid up to the sky and examining the vent opening for pin-hole punctures. Two spare acoustic vent replacements are supplied with the AudioMoth Dev Case.

The AudioMoth Dev Case has been fitted with an o-ring seal. Always ensure that the o-ring is in good condition, is correctly positioned and is not twisted, when closing the case. A spare o-ring seal is supplied with the AudioMoth Dev Case.

[3] https://github.com/OpenAcousticDevices/Application-Notes/blob/master/Using_the_AudioMoth_GPS_Board_and_Hat/Using_the_AudioMoth_GPS_Board_and_Hat.pdf

[4] https://github.com/OpenAcousticDevices/Datasheets/blob/main/AudioMoth_Dev_1_0_1_Datasheet/AudioMoth_Dev_1_0_1_Datasheet.pdf

[5] https://www.gore.com/system/files/2024-06/PEV-219-TEC-EN-APR24_WEB.pdf