APODEMUS
field equipment

Apodemus Pippyg | Manual

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Apodemus Field Equipment
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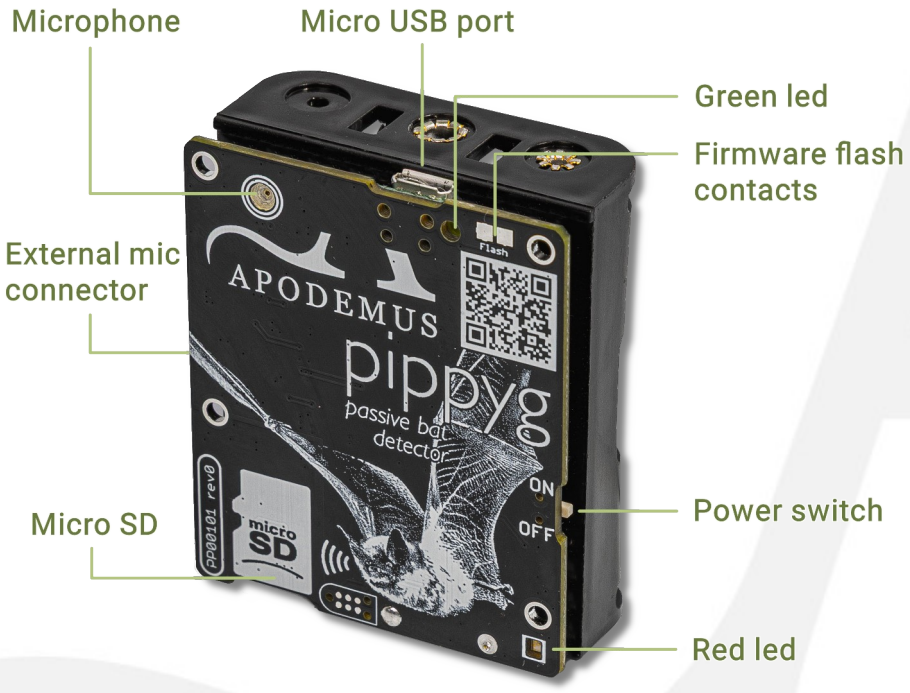
Trade register 14081365
KvK 57452598

Description

The Apodemus Pippyg is a static, full spectrum ultrasound recorder. The device is engineered for low cost operation and is ideal for large scale deployments of low cost devices, citizen science projects, or for enthusiast use.

Pippyg is built as a bare-pcb design and needs a separate external enclosure to protect from moisture, impact and otherenvironmental sources of damage.

You can configure the Pippyg via an audible chirp, produced by the configuration app.



Applicability

This manual applies to the Apodemus Pippyg, version number “PP00101 rev0” next to the SD card symbol.

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Setting up, configuration and deployment

Required materials

- 1x Apodemus Pippyg
- 3x AA battery
- 1x Micro SD card

Setting up the device

1. Download the Pipistrelle app (available for Android and iOS) on your app store.
   You will need this to set up the Pippyg.
2. Insert a microSD card into the designated slot.
3. Insert the AA batteries into the compartment on the back of the device, or connect an external power source via the USB micro port.
4. Turn on the device by sliding the power swith to the “ON” position.
5. The green and red led will indicate if the device is working properly.

GET IT ON Google Play

Download on the App Store

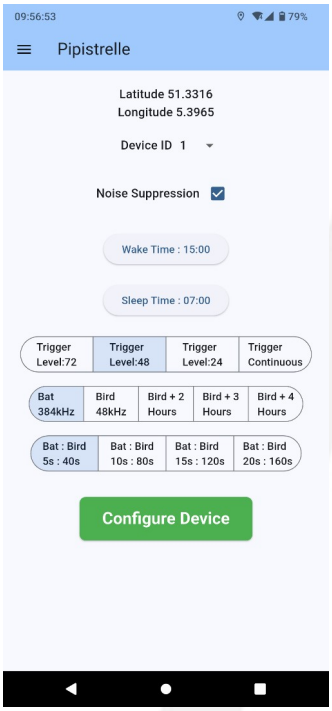
Insights:

- The green led is far less bright than the red led.
- When you need to connect the Pippyg to an external power source via USB, make sure to remove the batteries.

✓ If the SD card is functioning properly, the green led will stay on and the red led will flash eight times. Afterwards, the red led will respond to environmental sounds.
This means the device is ready, and listening for the configuration chirp sent by the Pipistrelle app.

✗ If both green and red leds remain continuously on, there is either an SD card error or no SD card inserted. Power off the device, (re)insert the SD card and power it on again.

Choose recording configuration



Open the Pipistrelle app on your phone

1. Choose a **Device ID**; this will be used to name the folders and files of the recordings to keep your files organized.
2. The **GPS coordinates** of the deployment location are stored in the WAV recording, and in an HTML file in the folder.
3. Check the **Noise Suppression** box to reduce false triggers due to constant noise.
4. Set the **Wake Time** and **Sleep Time** to define the daily recording period.
5. Choose a **Trigger Level** depending on your surroundings:

Trigger Level 72:	Low – Results in less recordings
Trigger Level 48:	Normal
Trigger Level 24:	High – Results in more recordings
Trigger Continous:	Very High (in bat mode) Continous (in bird mode) – Misses nothting

6. Choose **Recording Mode**:

Bat:	384 kHz sample rate Recording between Wake and Sleep time Wake … Sleep
Bird:	48 kHz sample rate Recording between Wake and Sleep time
Bird + 2 hours:	48 kHz sample rate, recording between Wake … Wake+2 and Sleep-2 … Sleep
Bird + 3 hours:	48 kHz sample rate, recording between Wake … Wake+3 and Sleep-3 … Sleep
Bird + 4 hours:	48 kHz sample rate, recording between Wake … Wake+4 and Sleep-4 … Sleep

7. Choose the required length of the recordings (even in continuous mode the recordings will be in individual files from selected size)

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Deploy device

Once you have chosen your preferred settings, you are ready to chirp the configuration from the Pipistrelle app to the Pippyg.

1. Ensure your phone's volume is on and set to at least 75 % of the maximum volume.
2. Keep the speaker of the phone close to the Pippyg microphone hole (approx 4 cm) and press **Configure Device**. You should hear a short chirping sound coming from your phone.
3. The Pippyg will decode this chirp and extract the configuration.
4. If the configuration is succesfully received, the red led will flash eight times.

Configuration sucessful:	

5. When succesfully deployed, the green led will indicate the current state of the device:

Sleeping:	flashes once every 5 seconds 
Awake:	flashes twice every 2 seconds 
Recording:	flashes rapidly for the duration fo the recording 

✓ When succesfully deployed, the red led flashes eight times.
After this, the red led should turn off completely

✗ If the red led still activates when sound is detected, the configuration was not succesfull, and the chirping process should be repeated.

Insights:

- The configuration is lost whenever the power of the Pippyg is switched off.
- The Pippyg is not water resistant on its own – you need a waterproof casing for unattended deployment

General deployment considerations

Positioning your Pippyg

- Place the Pippyg away from flat surfaces to minimize recording reflection. The ideal solution is to mount de Pippyg on a pole, with the Pippyg 2m or more above the ground. This will minimize the strength of reflections.
- Put the detector at height with the microphone pointing in the direction of expected bat activity.
- Make sure the microphone is kept dry.

Memory considerations

- The Pippyg devices are tested and developed using Sandisk Extreme 32 GB micro SD cards, formatted in exFAT file system. *These are the supported and advised cards to use.*
- Storage sizes up to 1 TB are expected to work.
- Other micro SD cards may work, but can produce analog and digital artefacts in your recordings.

Analysis of recordings

- Recordings produced are in the standard WAV file format. Metadata is embedded in the industry-standard GUANO format. The Pippyg GUANO implementation stores date and time of the recording, and geolocation information.

Options and developments

- There is an option to connect an external microphone. Contact Apodemus in order to use this.
- The Pippyg is still under active development. Specifications are to change without notice.

Advanced features

Firmware updates

To update the firmware of a Pippyg device, you will need:

- PC
- micro USB cable
- small piece of aluminium foil

Use the following procedure:

1. Download the newest Pippyg firmware file from apodemus.eu
2. Check that the file is meant for the Pippyg: the name should be “pippyg_xxx.uf2”, where xxx denotes the version number.
3. Remove the batteries from the Pippyg
4. Short the two **Firmware flash contacts** with a small piece of aluminium foil. Apply enough pressure.
5. While shorting the contacts, connect the USB cable: a new storage device should be detected by the PC.
6. Release the short.
7. Copy the Pippyg firmware file to the new storage device.
8. The firmware will be installed.

Usage warnings

- Remove batteries when the Pippyg is not in use. The solder point for the battery holder are exposed on the Pippyg, and care should be taken to not short these connections. These connections can be shorted even if the device is switched off.
- Always store a Pippyg protected from conductive materials.
- Always store a Pippyg dry and dust free to protect the microphone and electronics.
- When you need to dispose of a Pippyg, recycle the device as eletronic waste or send it back to the seller.

Product identification

The hardware identification number is printed on the visible side of the PCB. This manual is applicable to version “PP00101 rev0”.

The original firmware version and serial number is printed on the product label.

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Technical specifications

Type:	Full-spectrum static ultrasound recorder
Microphone:	MEMS – Knowles SPU0410
Trigger:	Bat mode: bat-trigger algorithm above 12 kHz Bird mode: sound level
Frequency range:	600 Hz … 110 kHz (S/N PP2505xxx and above) 3 kHz .. 110 kHz (S/N PP2504xxx and below)
Sample rate:	48 kHz (Bird mode) 384 kHz (Bat mode)
Battery:	3x AA battery (not included)
Power consumption: (typical consumption at 4.5 V)	Off: 0 mW Sleeping: 81 mW Awake: 159 mw Recording: 295 mW
USB port:	Micro USB B For updates and power
Storage:	microSD (not included)
Dimensions:	60 x 50 x 24 mm / 30 g
Packaging:	145 x 95 x 28 mm / 70 g
Country of origin:	The Netherlands

The original Pippyg has been designed by Phil Atkin. There is a self-build design available at www.pippyg.com.

The Pippyg described in this manual is the industrialized version by Apodemus, which comes fully assembled and tested.

Currently the IP rights are owned by Apodemus Field Equipment for the whole Pipistrelle family of devices.