P’Hug - Maintenance instructions

Below, you can find some maintenance instructions if there is an issue with either the puppet or the jacket. Most parts can be replaced and these parts are connected to the respective boards via wire connectors that can be tightened/loosened using a screwdriver. If a part needs further instructions for replacement it is specified under “Specific parts”.

Giffy

For all Giffy part replacements and access to the board:

1. Open the zip on the back of the puppet
2. Remove the soft stuffing inside the puppet
3. Carefully pull out the long force sensor from the guides
4. Carefully take out the head of the puppet with all of the electronics
5. **Perform the required maintenance**
6. Carefully put everything back in the puppet (reverse steps 1-4)

Power

Replacing the batteries of the puppet can be done without removing the puppets head from the puppets body. In order to change the batteries of Giffy:

1. Pull out the battery pack on the bottom of the head
2. Remove the 4 AA-batteries from the battery pack
3. Insert new batteries in the battery pack
4. Reinsert battery pack into the holder on the bottom of the head

Part replacement

For all part replacements:

1. Remove the three screws fixing the dome to the plate of the head
2. Disassemble the ears by separating the two ear parts (one ear could be enough, but easier with both removed)
3. Remove the dome from the plate
4. **Disconnect the wires for the desired part**
5. **Connect new part**
6. Reassemble the head (reverse steps 1-3)

Specific parts:
The servo motors, the speaker and the NFC are all soldered directly to the board, and in order to change these parts resoldering is necessary.

Access to board

To access the board in order to upload code and/or debug:

1. Remove the three screws fixing the dome to the plate of the head
2. Disassemble the ears by separating the two ear parts (one ear could be enough, but easier with both removed)
3. Remove the dome from the plate
4. Connect a Micro-USB cable to the Arduino MKR1000
5. Upload/debug code
6. Disconnect the Micro-USB cable
7. Reassemble the head (reverse steps 1-3)

Jacket

For all jacket part replacements and access to the boards:

1. Remove the bands over the box on the back of the jacket
2. Carefully pull the wires connected to the box out from the jacket slightly
3. Remove the smaller elastic bands around the box
4. Remove the plate from the box and turn the box so that the electronics are exposed.
5. **Perform the required maintenance**
6. Put everything back in its place (reverse steps 1-4)

Power

In the left hand pocket of the jacket there is a USB-connected power bank. This power bank can be recharged and/or replaced with another power bank of the same characteristics. The power bank is used only to power the heating part of the jacket, you can easily disconnect this power bank in order to not feel the heating sensation. The maximum current allowed is 2.1A, and we are using a power bank with capacity of 16750mAh.

In the right hand pocket of the jacket there is a battery pack. It powers all the electronics. In order to change the batteries of the battery pack:

1. Take the battery pack out of the pocket
2. Open the battery pack
3. Remove the 4 AA-batteries
4. Insert new batteries in the battery pack
5. Close the battery pack
6. Reinsert the battery pack into the pocket

Part replacement

For all part replacements:

1. Disconnect the wires for the desired part
2. Connect new part

Specific parts:
The vibration motors are sewn onto the inside of the jacket and must be detached and resewn in order to replace them. They can be easily accessed via the zips on the inside of the jacket.

The air pump and air chamber was originally from a sphygmomanometer and we **don't** recommend that they be changed, as the code is tuned specifically for this air pump and this air chamber.

We also **don't** recommend that you replace the heating system, as it was integrated in the jacket when we received it.

Access to boards

The Micro-USB ports of the two boards are easily accessible even when the box is closed, though it is recommended to open the box when uploading or debugging code.

1. Connect a Micro-USB cable to the Adafruit Feather HUZZAH and/or the Raspberry Pi Pico
    a. If code has to be uploaded to the Adafruit Feather HUZZAH, also disconnect one of the serial communication wires (TX) connected to the Raspberry Pi Pico (the gray one) unscrewing the screw on the connector
2. Upload/debug code
    a. If code was uploaded to the Adafruit Feather HUZZAH, also reconnect the serial communication wire to the Raspberry Pi Pico
3. Disconnect the Micro-USB cable