

Knock Box Requirements

The Knock Box comes in pairs. There must be two connected boxes for them to properly function. These boxes provide a way to feel more connected to those you care for by giving them a physical representation of your love.

General Requirements

1. The Knock box shall be of cuboid shape
2. The walls of the cuboid shall be made out of a wooden material
3. Shall be able to record and send audio
4. An incoming message shall be signaled by an LED which turns off after the received audio message has been played
5. A speaker (power supply < 12V) shall play the received audio message when a button has been pressed

User Interfaces

Audio Recording

- There shall be a button to hold when the user wants to record an audio message.
- A microphone shall record a voice message for up to 10 seconds.

Haptics

- The user will be able to knock on their box to trigger a simulated knock on the corresponding paired box.
- The knocking shall be detected by a force sensor
- The knocking sound on the corresponding box shall be accomplished by a hammer-like object that is attached to a servo motor.

Communications

WiFi

1. The Knock Box shall be capable of functioning as a WiFi client on 802.11 b/g/n wireless networks to communicate with another Knock Box

Power

1. The Knock Box shall be powered by an internal rechargeable battery.
2. The Knock Box shall be able to be mains powered via an AC power adapter.

3. The AC power adapter shall be capable of providing power using mains voltages from 100 VAC to 240 VAC \pm 10% with line frequencies of 50 to 60 Hz.
4. The Knock Box shall be able to run for over 8 hours when powered from its fully charged internal Li-Ion batteries.
5. The internal Li-Ion battery shall be able to be charged via the USB port.
6. The internal Li-Ion battery shall be able to be charged via the AC power adapter port.

Environmental

1. Ingress protection for the Knock Box shall be IP 41 per ANSI/IEC 60529
2. The Knock Box shall operate over a temperature range of 0 °C to +40 °C with the internal Li-Ion battery installed.
3. The Knock Box shall operate over a temperature range of 0 °C to +50 °C without the internal Li-Ion battery installed.
4. The Knock Box shall sustain no damage while stored or placed in a non-operating condition over a temperature range of -20 °C to +60 °C with no internal Li-Ion battery installed.
5. The Knock Box shall be operable under the following temperature / humidity conditions:
 - a. 10 °C to 30 °C - up to 95% relative humidity, non-condensing
 - b. 30 °C to 40 °C - up to 75% relative humidity, non-condensing
 - c. 40 °C to 50 °C - up to 45% relative humidity, non-condensing
6. Under non-operating conditions, the Knock Box shall sustain no damage from 0 % to 98% relative humidity, non-condensing over the temperature range from -20 °C to +60 °C.
7. The Knock Box shall be operable from 400 m below mean sea level to 3,000 m above mean sea level.
8. A non-operational Knock Box shall sustain no damage from exposure to altitudes from 500 m below mean sea level to 12,000 m above mean sea level regardless of exposure duration.
9. The Knock Box shall be capable of operating under conditions of sinusoidal vibration of 3 g maximum according to MIL-PRF-28800F, Class 2.
10. The Knock Box shall be capable of operating under conditions of 30 g shock according to MIL-PRF-28800F, Class 2.
11. The Knock Box shall suffer no damage when dropped from a height of 10 cm per MIL-STD-810H

Regulatory

1. The Knock Box shall meet or exceed the requirements of electromagnetic compatibility standards EN IEC 61326-1:2021 and EN IEC 61326-2:2021 for emission and immunity.

2. The Knock Box shall meet or exceed the requirements of UL61010-1:2023, CAN/CSA C22.2 No. 61010.1-12, EN 61010-1:2010.
3. The Knock Box shall meet or exceed the requirements of IEC / EN 61000-4-2 testing.