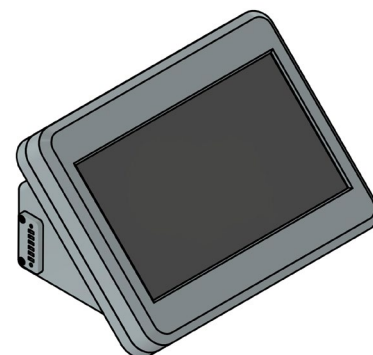




Hamso  
ENGINEERING

## HEBO Specification

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### 1. DESCRIPTION

The HEBO is a haptic evaluation board which is used to power various actuators used for haptic design. The HEBO can play signals with a chosen amplitude, frequency, and duration. The HEBO is intended for haptic design and prototype development. The HEBO plays signals through the mini jack output ports to the connected actuators.

The output signals are set in the HEBO graphical user interface shown on the touchscreen. Through the GUI, the user can set the play mode (Press, Release, Sweep or Load Wav) and the parameters of the signal.

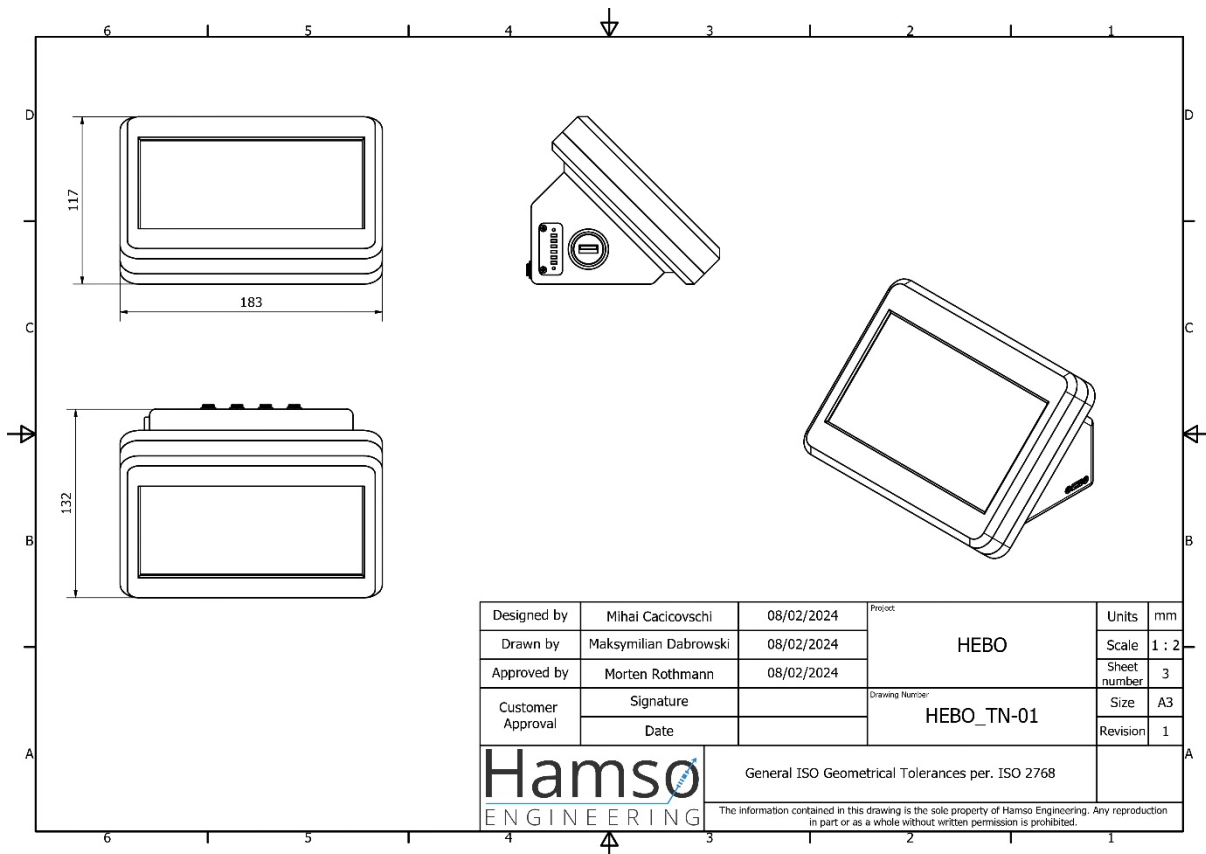
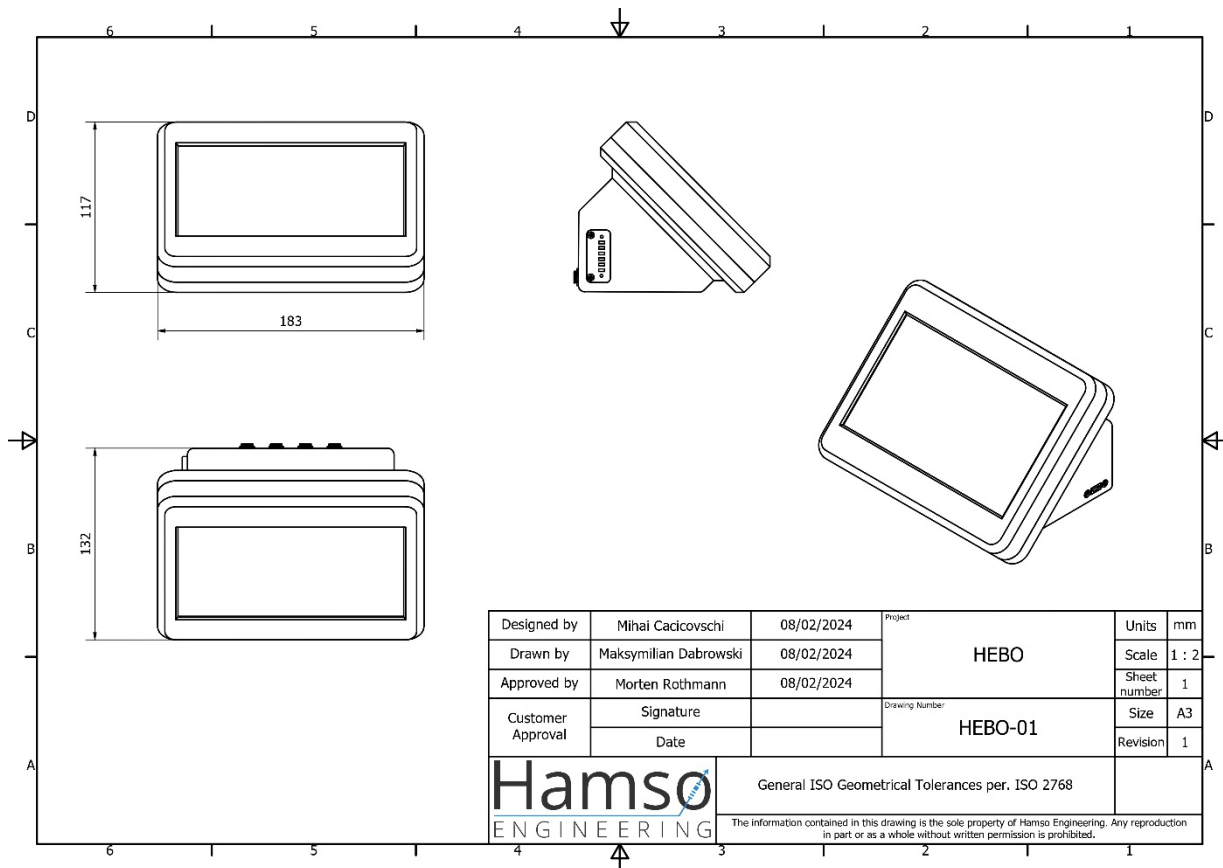
## 2. SPECIFICATIONS

Parameter	Unit	Conditions / Description	MIN	TYP	MAX
Dimensions	Mm	132x117x183			
Frequency range	Hz		10		4000
Output Voltage	V		0		4.6
Output Voltage (Boost)	V		4.7		10
Haptic Outputs				4	
Control Inputs				4	
Input Voltage	V		3.3	5	12
Operating Voltage	V			5	
Operating Power	W		1		8
Packaging				Flight Case	
Weight	g			500	

### Remark:

The maximum number of haptic outputs that can be active and play simultaneously is 2. The actuators connected to the HEBO should be selected according to the maximum power of the HEBO.

### 3. DRAWING



## 4. HAPTIC SIGNAL SPECIFICATIONS

The HEBO allows the user to set up haptic signals for Press, Release, Sweep and Input 1-4.

The default haptic signal is set up by controlling the Waveform, Sample Rate, Voltage, Frequency and Cycles (duration).

- Waveform can be set as Sine or Square.
- Sample rate can be set as 12, 24, 48 or 96 kHz.
- Voltage can be set from 0-4.6 V and 4.7V – 10V with boost.
- Frequency can be set from 10 – 4000 Hz.
- Cycles can be set from 1 to 15 or infinite.

The haptic signal can also be imported to the HEBO using unsigned 8-bit PCM .wav format files at the given sample rates from above.

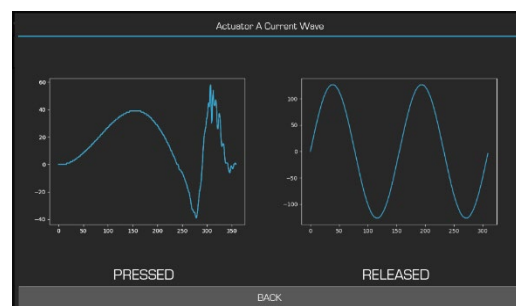
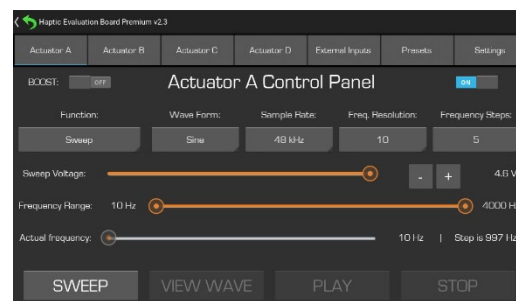
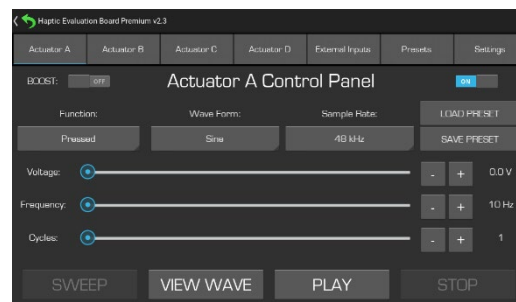
The .wav files' size can only be up to 12 kB. If the files are bigger, the file format or the sample rate is incorrect, the HEBO will not play them and display an error message.

Once the file has been imported to the HEBO, it can be played and viewed via the "Load Wav" function in the actuator control panel.

The Sweep function can sweep through a frequency range chosen by the user. The Sweep is set up between 2-20 steps. The HEBO displays the frequencies that will be played over the sweep. Each sweep step is played for one second by default.

For additional triggers, the HEBO can be used with the aXiom Experience Board\* (aEB) from TouchNetix. This allows utilization of the touchpad and the functionalities thereof. The TouchNetix board can be set up to allow for various force magnitudes and sensing methods (hover included). If the aEB is purchased together with the HEBO, the functionality will be integrated into the device.

For special use cases, please reach out to Hamsø Engineering ApS.



\* aXiom Experience Board is not a part of the HEBO package and should be bought separately.

## 5. HISTORY CHANGE RECORD

REV	CHANGE ITEMS		DATE
	TYPE	AFTER CHANGE	
1		Initial Version	08.01.2022
2	Initial Version	Version 2 – haptic signal specification	06.01.2023
3	Review	Updated specs to Q1 2024	09.02.2024

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