



next system Vertriebsges.m.b.H.

Getting Started

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10.08.2022

Revision History

Version	Date	Description	Changed by
V0.1	2022-08-10	Document created	TPL

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Status: **approved**

Approved by	Michael Nussbaumer
Date	22.03.2023

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1. Overview

This document will help you to guide you through the first steps in exploring haptic feedback.

Connect the components and feel the difference. 😊



This document is valid for next system HapticTouch™ with piezo elements only!

2. Components

The following chapters will give you a short overview of the components included in the haptic evaluation kit.

2.1. Breakout Board

The breakout board is equipped with 4 piezo modules and can be used as a base for a 7" display application.

For larger or smaller sizes, the breakout board can be divided and the 4 piezo modules together with the carrier board can be positioned accordingly under a display. In this case, the individual elements need to be linked to the connector board via the pads X1, X2, X3 & X4.

For the most rigid mounting possible, the carrier board can be screwed in place using the two diagonally arranged holes.

Pinning of connectors X1, X2, X3 & X4

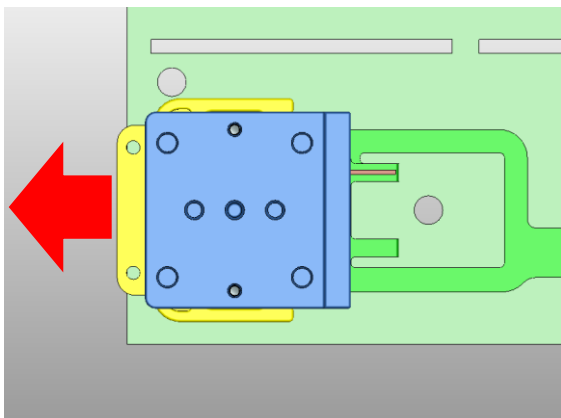
1	HV-
2	GND
3	CAPSENSE
4	HV+

Pin 1 is marked with a dot.

The 4 piezo actuators are fixed with a mounting bracket. This ensures that the actuator surfaces are aligned in parallel during liquid bonding.

After bonding, the mounting clamp must be removed.

To do this, take the mounting clip by the tab or the holes and pull it in the direction of the red arrow.



Piezo Controller

2.2. Piezo Controller

The piezo controller is used for driving the piezo assemblies on the breakout board.

The 4 piezo assemblies are connected in parallel to the controller. Separate control of each sensor is not supported.

For more detailed information see Hardware Documentation.

2.3. Piezo Cable

For connection between breakout board and piezo controller

2.4. USB Cable

For connection between computer and haptics controller

2.5. Power Supply

Power supply for haptics controller (12V DC, 1A min)

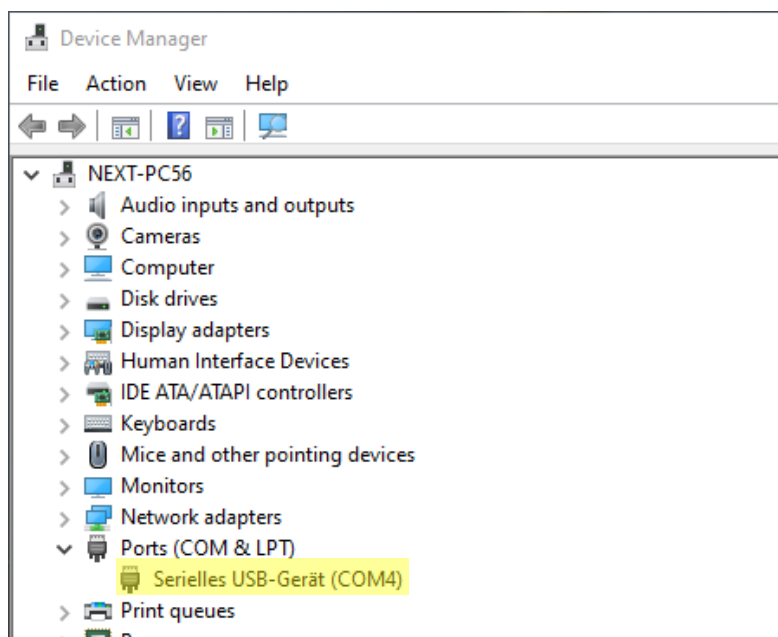
3. Software

The haptics can be controlled active via computer and the provided program "Piezo Demo v1.3" or can be used passive.

In the case of passive, no computer is required. The haptics are only triggered by the force measurement value pre-set in the haptics controller or use the external trigger input to play a pre-set haptic sentence. These features are available on request.

When the controller is connected to the computer, a COM driver is being installed.

A new COM port appears in the device driver. This port is required for establishing the connection in the Piezo-Demo v1.3 application.



3.1. Piezo Demo v1.3

PIEZO HAPTIC TEST & CONFIGURATION

PiezoSense: 100

CapSense: 100

COM-Port: COM1

Firmware version: 0.0.0.0

Piezosense(ON)/Capsense(OFF)

Release haptic

RECALIBRATE CAPSENSE

DAC Value	3650
Piezo Press Threshold	50
Piezo Release Threshold	0
Capsense Press Threshold	80
Capsense Release Threshold	50
Frequency [Hz]	150
Amplitude [%]	100
Signal form	2
Repeats	1
Pulse interval [ms]	0

SEND CONFIGURATION

READ CONFIGURATION

PLAY

STOP PLAYING

After correct input of COM port and successful connection the color of the connect button will change from red to green.

Following parameters are shown in the application and most of them can be configured:

Piezo Sense: this bar shows actual piezo sense value

CapSense: this bar shows actual CapSense sense value

The checkbox **PiezoSense (ON) / CapSense (OFF)** switches between the used force sensing method

- ON: PiezoSense is used
- OFF: CapSense is used

When checkbox **Release Haptic** is checked also release feedback will be generated. Otherwise only press feedback will be generated.

3.1.1. Force Sensing Functions

The parameters **DAC Value**, **Piezo Press Threshold** & **Piezo Release Threshold** are used for piezo sensing. For CapSense the parameters **CapSense Press Threshold** & **CapSense Release Threshold** are used.

DAC Value: Sets the maximum limit for the output voltage of a haptic feedback (value between 248 - 3650)

Piezo Press Threshold: PressThreshold when using Piezo sensing

Piezo Release Threshold: ReleaseThreshold when using Piezo sensing

CapSense Press Threshold: PressThreshold when using CapSense

CapSense Release Threshold: ReleaseThreshold when using CapSense

SendConfig: Send the configuration parameter for the force sensing function (DAC value, Piezo Press Threshold, etc...) to the haptic controller.

Read Config: Reads actual configuration parameters for the force sensing function from the haptic controller.

3.1.2. Haptics Profile

Frequency: number in range of 20 to 1000 (Hz)

Amplitude: number in range of 0 to 100. 100 means 120V output

Signal form: defines the used signal form for haptic impulse, the signal form has impact on haptic impression but also influences the generated audible sound.

- **1: Trapezoid**
- **2: Half sine**
- **3: Sawtooth**

Repeats: defines how often a haptic pulse will be repeated, 1 means a single pulse.

Pulse Interval:

- A value of 0 generates only one pulse (a single sentence).
- A value greater than 0 generates a periodically pulse in the given interval. (Repeat the sentence periodically) The given value is the time in milliseconds between each pulse.
- A value of -1 stops the pulsing if pulsing was activated.

Play: Send defined haptic sentence to the piezo controller which activates the piezo actuators.

Stop Playing: Stops the cyclic playing of a haptics profile.

3.2. API

The API can be used to control the haptic in your own application.

For details, please check Application Interface Description Haptics Controller.

4. Best practice

For getting a better feeling of the performance we suggest following steps:

- Try different values for frequencies.
- Change of the amplitude
- Choosing Half Sine as signal form generates a pleasant sound

CapSense is a static measurement and allows the finger to dwell on the actuator when pressed. PiezoSense only detects dynamic/rapid changes.