

HAPTIC SENSORS

Haptics uses a vibrating component (sometimes called actuator) such as a vibration motor or a linear resonant actuator which is driven by an electronic circuit. It is common for a microcontroller to decide when to vibrate and with which pattern, and for a dedicated haptic driver chip to control the actuator. Of course there are a range of varieties on the engineering side, you can read about them in the Essentials for Haptics section of the Adding and Improving Haptics page. But first we continue with our introduction to haptic technology.

Whilst the old LEDs and other notification methods are still effective in many applications, there are many others where product functionality can be improved by replacing or combining our sense of hearing and sight with our sense of touch.

Adding haptic feedback has two major benefits for manufacturers. First, it can improve user experience. Even everyday products are now being built with touch displays and interfaces. They're cheaper to construct than control panels with buttons or switches, and designers can make context specific user interfaces simply by changing the graphical layout on the screen.

Second, haptics can also improve the performance of operators. Using vibrations to transmit information through the control system allows the user to concentrate on the task at hand. This can range from simpler input confirmations, safety alarms, or even positioning information. Medical applications that use a haptic confirmation when data has been entered has been proven to help reduce patient misdosing in hospitals. A simple example of these benefits can be found in tablet PCs. When typing on a touchscreen virtual keyboard, a simple short 'button press' effect lets the user know the keystroke has been recognised, and differentiates from a 'long press' effect. This haptic feedback enables the user to type quicker with less mistakes, whilst making the process less frustrating and more like typing on a real keyboard.

Haptic Feedback vs Vibration Alerting

Vibration Profile

Haptic Feedback
Advanced vibration patterns to convey information, simulate clicks & button presses with predefined haptic waveforms.

Vibration Alerting
Simple vibration patterns to notify users of an event. Strong vibrations to catch operator's attention.

Haptic Feedback Benefits:
• Conveys Information (i icon)
• Discrete (speaker icon)
• Enhanced Experience (smiley face icon)

Vibration Alerting Benefits:
• Simple & Inexpensive (\$) (dollar sign icon)
• Discrete (speaker icon)
• Effective Alert (! icon)

Applications:

- Telecommunications
- Auto Dashboards
- Capacitive Touch
- Touchscreens
- Control Sticks
- Videogames
- Scanners and Detectors
- Safety Equipment
- Electronic Tools
- Pagers
- Meters
- GPS

Components:

- LRA / ERM
- Haptics Driver
- Motor IC / MOSFET
- ERM / LRA