

TouchSense® Solution for Fitness Equipment

Whether your exercise equipment includes membrane switches or touchscreens, you can restore the tactile qualities people like about mechanical buttons and switches.

Adding Immersion TouchSense tactile feedback to exercise equipment can increase user satisfaction, enhance the user experience, reduce equipment abuse, and support improved industrial designs.

Highlights

- Gives users a great experience with your product
- Provides immediate and unmistakable confirmation to help increase user confidence and satisfaction
- Overcomes limitations of audio/visual feedback in the often noisy, distracting gym environment
- Helps reduce user frustration that can lead to equipment abuse, repair costs, and downtime
- Enables the next-generation touch interface including LCD touchscreens integrated with touch controls
- Overcomes disadvantages of membrane switches

TouchSense tactile feedback helps you meet demand for intuitive access to a growing number of features and supply a better user experience.

Tactile feedback for touch controls

For many years, mechanical and membrane switches with tactile domes were common controls for fitness equipment. Though effective in many ways, including for providing unmistakable tactile feedback, moving parts made them susceptible to wear. Many manufacturers replaced them with no-travel digital touch controls to provide an aesthetic design, greater durability due to no moving parts, and sealable, easily cleanable enclosures. But in these touch control surfaces, tactile feedback was lost completely, and with it, certainty of response and a satisfying connection for the user.

As the demand for more features and for a more immersive and entertaining exercise environment increases, reconfigurable LCD touchscreens are emerging as a popular solution. Whether you choose touch surfaces, touchscreens, or a combination of the two, the TouchSense® system lets you add tactile feedback to increase interactivity. TouchSense tactile feedback helps you meet demand for intuitive access to a growing number of features and supply a better user experience.

Clearer confirmation, less wear

In the gym environment, sound and visual cues can be ineffective because distractions, noise, and headphones interfere with the user's attention. Latency, or lag time, between when a user presses a control and when the system responds can also be confusing. Without effective and immediate feedback, equipment controls can be perceived as unresponsive. This perception can lead to user dissatisfaction, harsh treatment, damage, repair needs, and equipment downtime, which frustrates club members.

But with controls that “touch back,” users can immediately understand that their input was accepted. The equipment seems more responsive. Fewer and less forceful presses are needed, which can increase user satisfaction and reduce abuse, repair, and equipment downtime.

Users prefer touch feedback

Because users know instinctively that their input was received by the system, they can be more efficient and confident. Confidence usually inspires acceptance and use, important outcomes for passing installation trials and winning larger orders. Further, independent research* shows that tactile feedback:

- Increases speed and accuracy of data input
- Reduces cognitive loading, making operation easier
- Increases user satisfaction

A competitive advantage

You want to avoid control clutter, provide intuitive access to multiple controls, and maintain ease-of-use. This is a tall order, but the TouchSense system can be used in creative ways to guide the user according to the context of operation. The heightened interactivity provided by tactile feedback can also provide a more engaging, as well as a possibly more motivating, exercise experience that can give your equipment a competitive advantage.

*For a summary of recent published findings on the value of tactile feedback in human-computer interaction, see the Immersion white paper *The Value of Haptics*, available at www.immersion.com/docs/Value-of-Haptics_May07v1-lr.pdf.

How it works

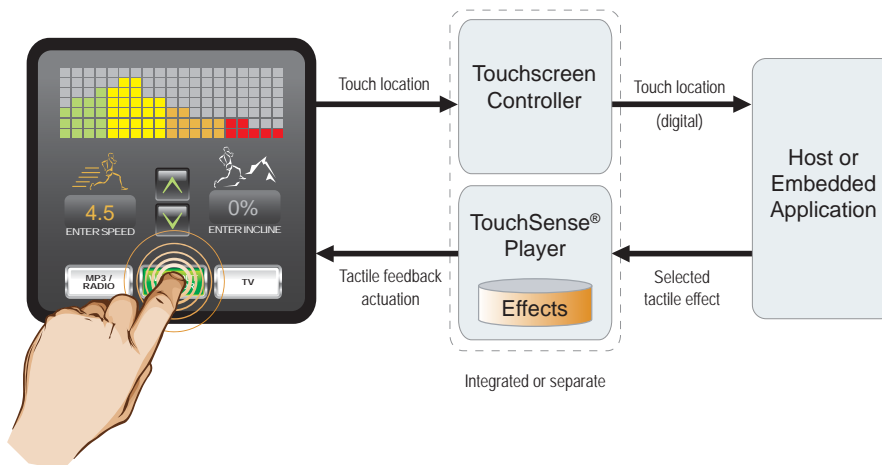
In response to presses on a touch surface or touchscreen, the TouchSense system uses software and firmware to control an actuator in producing a wide variety of vibrations or “effects.”

TouchSense system components include:

- TouchSense player and control electronics embedded on a circuit board
- TouchSense actuator(s)
- Tactile effects library

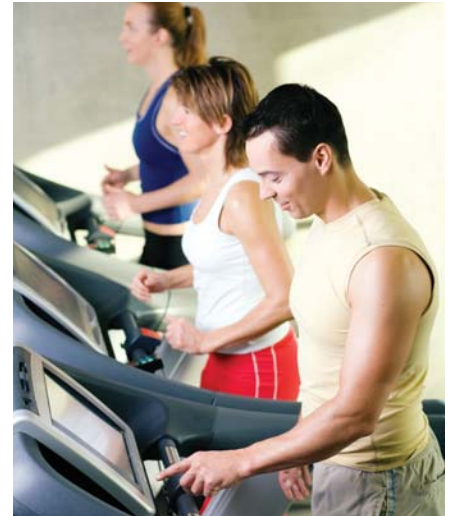
A design kit, including software toolkit, makes it easy to get started.

When the user touches the screen, a position signal is sent to the host application. The host application interprets this signal and commands the TouchSense player to control the actuator in playing one of a wide range of tactile effects. The actuator transfers its vibrations to the touch surface or screen, which gives the user the perception of pressing a button or sliding a scrollbar.



Fifty predefined effects vary in frequency, magnitude, wave shape, and duration. This variation provides a wide range of effects—from those that reproduce the press and push-away characteristics of various mechanical switches to complex nonlinear vibrations. The feedback creates a tactile communications link between the user and the device that is limited only by the designer’s imagination. Customized effects can be added to achieve unique tactile sensations to clearly differentiate selections and provide context-appropriate confirmation. For example, continuing to press a button or move a slider to increase resistance levels can be accompanied by the feeling of increased intensity.

Reliable TouchSense actuators and electronic components are automotive-rated. Detailed electromechanical design and integration guidelines and the software toolkit help ensure an optimal implementation of the TouchSense system in your equipment.



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About Immersion

Touch

Haptic technologies are transforming digital devices everywhere. Electronics manufacturers are providing digital controls with authentic tactile confirmation. Industrial and commercial manufacturers are increasing the accuracy, efficiency, and safety of the user experience. Content developers are creating a more engaging experience for mobile handset users. And game developers are captivating users with more intense and enjoyable entertainment. Immersion technology puts the sensation of touch in the hands of visionary manufacturers worldwide.

Medical

TouchSense haptic technology has revolutionized medical education. Medical schools and hospitals train practitioners in minimally invasive procedures using our surgical simulators. Our patented technologies bring tactile, audio, and visual realism to medical education, creating an engaging multisensory experience that increases clinical proficiency, decreasing medical errors and cost.

Founded in 1993, Immersion Corporation is the recognized leader in digital touch technology and products. Immersion's technology is deployed across automotive, consumer electronics, entertainment, industrial, medical training, and mobile products. Immersion holds more than 700 issued or pending patents in the U.S. and other countries.

For more information about adding tactile feedback to your fitness equipment, visit www.immersion.com/products/touchscreen-feedback/ or e-mail: touch@immersion.com.

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