

# Capacitive touch for building security systems using MSP430™ microcontrollers with CapTIvate™ technology



Features	Benefits	Applications
<5 $\mu$ A average power—Industry's lowest-power capacitive touch solution	Extends battery life and enables putting wireless radio in low power state	Electronic smart locks
Short range proximity sensing	Illuminates keyboard when approaching	Video doorbells
Support for metal touch	Enables waterproof, dirt-proof, glove-friendly designs with a metal overlay	Door keypads and readers
8–16 KB of FRAM non-volatile memory	Unlimited write endurance and very low power for storing user's preferred passcode	Intrusion HMI keypads and control panels

Electronic smart locks (eLocks) and access control panels with capacitive touch are becoming more popular. While these applications offer convenience and appeal, they bring up new challenges including managing power and environmental conditions including water, dirt and temperature changes.

Using MSP430™ microcontrollers (MCUs) with integrated CapTIvate™ touch technology, electronic lock and access control panel manufacturers can operate at < 5  $\mu$ A, while having a fully operational keypad. Additionally, the wake-on proximity functionality allows the keypad to illuminate when a user is within a short distance to further reduce power.

Electronic keypads are also subject to harsh environmental conditions such as heat, cold, high humidity, dirt, etc. Using highly robust capacitive sensing and smart sensor design, engineers can overcome these challenges.

CapTIvate touch MCUs are fully programmable with FRAM non-volatile memory. Designers can easily add features like haptics, audible alerts and motor control on the same MCU. Through FRAM and virtually unlimited write endurance, key codes can be securely stored and reprogrammed millions of times.

Learn more at [www.ti.com/CapTIvate](http://www.ti.com/CapTIvate)

## Get started with CapTIvate technology for eLocks and access control panels

Featured MCUs with CapTIvate technology	<a href="#">MSP430FR2522</a> and <a href="#">MSP430FR2533</a> For full list of devices see <a href="#">selection table</a>
Evaluation kits	Capacitive touch <a href="#">BoosterPack™ plug-in module</a>
Software	<a href="#">CapTIvate Design Center</a>
User's guide	<a href="#">CapTIvate Technology Guide</a>
Reference designs	<ul style="list-style-type: none"> <li><a href="#">Access control panel with BLE and capacitive touch</a></li> <li><a href="#">E-Lock with capacitive touch</a></li> <li><a href="#">Liquid-tolerant capacitive touch HMI</a></li> </ul>
Overview videos	<ul style="list-style-type: none"> <li><a href="#">Access control panel featuring Bluetooth® low energy and capacitive touch</a></li> <li><a href="#">Liquid-tolerant capacitive touch</a></li> <li><a href="#">Demo of capacitive touch BoosterPack™ module with LaunchPad™ kits</a></li> <li><a href="#">Low-power features of CapTIvate technology</a></li> </ul>
Technical training	<ul style="list-style-type: none"> <li><a href="#">MSP MCUs featuring CapTIvate technology training series</a></li> <li><a href="#">Fundamental PCB layout and design guidelines</a></li> <li><a href="#">Introduction to EMC challenges and design with CapTIvate MCUs</a></li> </ul>

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