### Features

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

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 µA, 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**

- MSP430FR2522 and MSP430FR2533
  - For full list of devices see [selection table](#)

**Evaluation kits**

- Capacitive touch **BoosterPack™ plug-in module**

**Software**

- **CapTIvate Design Center**

**User’s guide**

- **CapTIvate Technology Guide**

**Reference designs**

- Access control panel with BLE and capacitive touch
- E-Lock with capacitive touch
- Liquid-tolerant capacitive touch HMI

**Overview videos**

- Access control panel featuring Bluetooth® low energy and capacitive touch
- Liquid-tolerant capacitive touch
- Demo of capacitive touch **BoosterPack™ module with LaunchPad™ kits**
- Low-power features of CapTIvate technology

**Technical training**

- MSP MCUs featuring CapTIvate technology training series
- Fundamental PCB layout and design guidelines
- Introduction to EMC challenges and design with CapTIvate MCUs
IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale (www.ti.com/legal/termsofsale.html) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2018, Texas Instruments Incorporated