

# Technical Article

## Post an IoT Device on Your Fridge!

---



Asaf Carmeli

[Internet of Things](#) (IoT) technologies continue to mature across many industries, providing endless opportunities for developers to innovate. This growth has not only included their expanded uses, but also the now near-limitless flexibility for connecting IoT devices to the cloud.

When I began working on the [SimpleLink™ Wi-Fi® CC3200 wireless MCU-based Electrophoretic Display \(EPD\) TI Design](#), several use-cases initially came to mind. However, as work progressed my focus shifted to the most practical application – a digital sticky note that could be updated wirelessly and last for years on standard AA batteries. Because, who really wants to hold a pen these days?

Using an EPD, also known as E-Ink, allows the device to leverage its low-power capabilities alongside those of the SimpleLink™ Wi-Fi® CC3200 wireless MCU and connect it to the internet.

### So What Can It Actually Do?

At a high level, this CC3200-based EPD can receive information such as a title, descriptive text and an icon – wirelessly. This data is transmitted to the device over a local network or remotely through a cloud network.

The EPD display can also check for new messages at configurable intervals, which has a significant impact on the overall battery life. For perspective, here's an example of power consumption for an EPD display running on AA batteries.

Let's say the polling period is once an hour and new messages are sent every four hours, on average. Using these parameters, the projected lifetime of the battery would be more than three years!



Another use-case could involve synchronized updates. If the originally intended location for this sticky note is not receiving the desired visibility, any number of these displays can be updated simultaneously to increase potential viewership. It's as easy as assigning all desired displays the same name so they will update with identical content.

### Technical Details

The design for this EPD display incorporates an HTTP page that facilitates communication with your sticky note. Each message sent to the note will either use the MQTT protocol when working in “remote mode” or directly use an HTTP message when working locally.

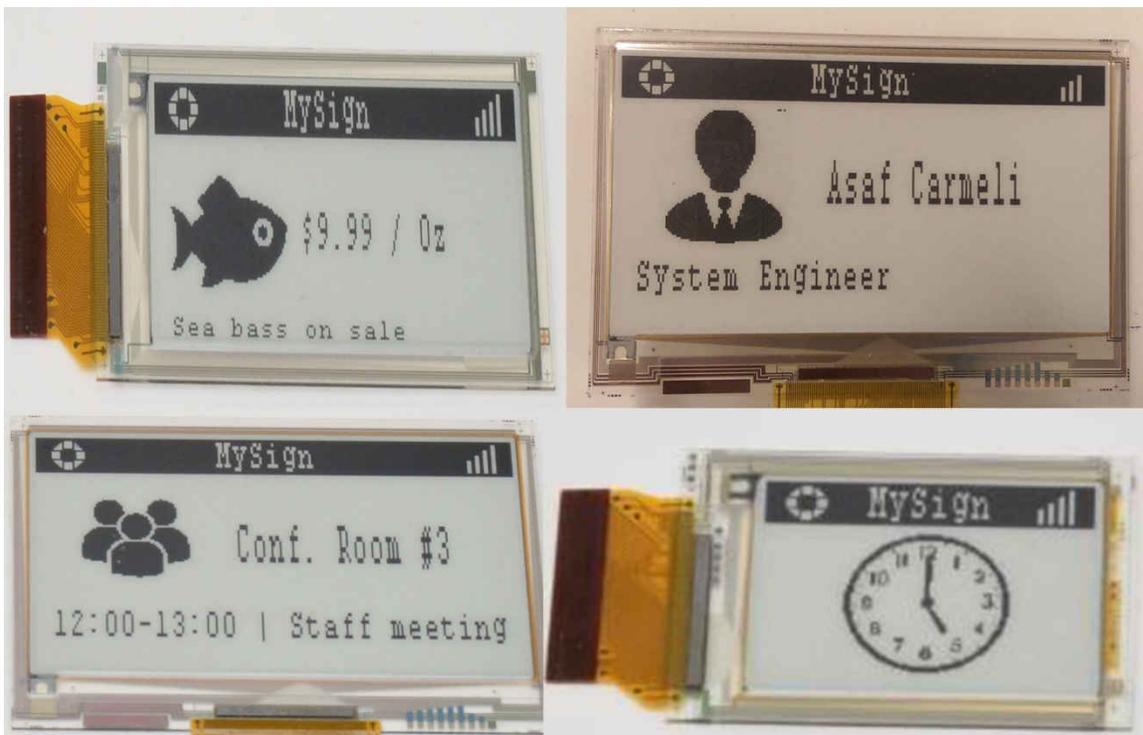
All messages include the icon index, title text and body text. In response, the sticky note shares its current status. The device can also send content back to the HTTP page, allowing everyone to see updates instantly when more than one person controls the note.

Additionally, custom icon graphics can be sent using separate messages over either HTTP or MQTT.

### Simplicity Is Key

Contrary to what you may think, these connected sticky notes are surprisingly easy to set up. The coding process only takes a few days, and personalization is seamless thanks to the software building blocks freely available in this TI Design reference design.

Below are a few other examples of this device in action.



EPDs can be used for a variety of use-cases, including wireless electronic shelf labels, name tags, indoor signs and wearable displays.

Check out the EPD TI Design today so you can create a wireless sticky note and [linked here](#) is a download for the source code, gerber files and HTTP page.

## IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), 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, regulatory 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](#) or other applicable terms available either on [ti.com](https://www.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.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
Copyright © 2023, Texas Instruments Incorporated